



**DRAFT PROPOSED SECTION 32**

**CHAPTER 9**

**NATURAL AND CULTURAL HERITAGE**

**APPENDIX 7 - SITES OF ECOLOGICAL SIGNIFICANCE**



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Waimakariri Reserves Dry Plains Grasslands Lease Land

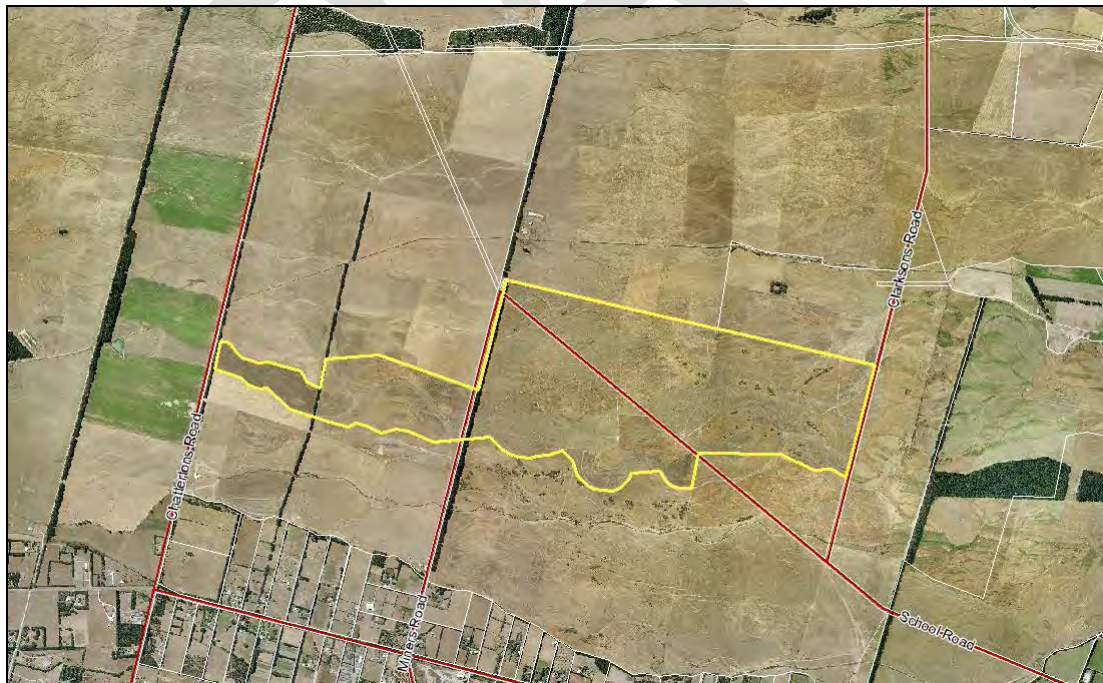
**Site number:** SES/LP/1

**Physical address of site:** 231 School Road & 290 Chattertons Road  
Yaldhurst  
Christchurch 7676

#### Summary of Significance:

The Waimakariri Reserves Dry Plains Grasslands Lease Land SES is significant because it contains a large area of vegetation that is representative of the Low Plains Ecological District including threatened plant species.

#### Site Map



### Additional Site Information

**Central point:** N5184460, E1556392

**Area of SES (ha):** 170.30 ha

### Site Description

The Waimakariri Reserves Dry Plains Grasslands Lease Land SES contains important semi-natural grasslands occupying old river terraces and riverbeds. Within this SES, the 'Molloy Plains Olearia Conservation Area' was withdrawn from grazing lease, a rabbit proof fence installed around the perimeter in July 2004, and experimental plantings of about 150 locally-sourced *Olearia adenocarpa* seedlings were carried out during 2005 and 2006.

The Chattertons Road Conservation Area (Refer below and Appendix 1) was withdrawn from a grazing lease and rabbit fenced in July 2004, primarily in order to protect 24 plains olearia shrubs present here. The rabbit-proof fence had deteriorated but was re-hung in 2011 and is now in good order. As in the Molloy Plains Olearia Conservation Area, these shrubs have responded well to protection from stock and wild animal browse pressure. Native broom shrub has also regenerated, and matagouri shrubs are healthy.

### Extent of Site of Ecological Significance

**Smythe Lease:** The extent of this area (138.30 ha; Refer Appendix 1, Figure 1) includes the Molloy Plains Olearia Conservation Area and is defined by fences and/or shelterbelts on the west, north and eastern boundaries, and by distinct changes in topography, unformed vehicle tracks and the rabbit-proof fence (refer above) along the southern side as shown on the location map.

**Birchdale Lot Conservation Area (C.A. 1):** This area (24.10 ha; Refer Appendix 1, Figure 2) is located between two north-south orientated shelterbelts and lies south of from an existing fence line to just north of the cattle yards which have been subjected to heavy cattle browsing and trampling (See Environment Canterbury 2013b).



Chattertons Road Conservation Area: This narrow area (80 – 150 m wide; 7.90 ha; Refer Appendix 1, Figure 3) spans from Chattertons Road in the west, through to the western boundary of the Birchdale Lot Conservation Area (C.A. 1), and roughly follows the line of the old river terraces as shown on the location map.

## Assessment Summary

The Waimakariri Reserves - Smythe Lease site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013a) (see below). Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1 & 2), and rarity/distinctiveness criteria (criteria 3 & 4).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

Despite being degraded, this site contains vegetation that is representative of the natural diversity of the Low Plains Ecological District, and combined with landforms comprises an area that is most similar in composition and structure to those communities that existed in 1840.

**Smythe Lease (Grazed Area):** Overall vegetation cover throughout the grazed conservation area (ie excluding the Molloy Conservation Area; Refer Appendix 1) is approximately 60-75% native and 25-40% exotic plant species. This is likely to represent the highest percent native vegetation cover of all Environment Canterbury's West Melton lease conservation areas (Environment Canterbury 2013b).

The grazed conservation area has a sparse cover of exotic grass, with native mosses (*Racomitrium spp.*, *Polytrichum juniperinum* and *Hypnum cupressiforme*) the predominant ground cover over much of the area. Common associated ground cover species are native dwarf broom (*Carmichaelia corrugata*), patotora (*Leucopogon fraseri*), and mat pohuehue (*Muehlenbeckia axillaris*) and exotic storksbill, catsear and sorrel. Other native plants present include scattered shrubs of matagouri (*Discaria toumatou*), native broom (*Carmichaelia australis*) and plains olearia (*Olearia adenocarpa*), dryland carex (*Carex breviculmis*), mat/cushion plants *Scleranthus biflorus*, *Raoulia australis* and *Raoulia monroi*, and dichondra (*Dichondra repens*) (Environment Canterbury 2013b).



**Molloy Plains Olearia Conservation Area:** This area contains several hundred *Olearia adenocarpa* shrubs in a range of age/size classes. Overall ground cover vegetation in the area was about 90% exotic grass and herbs and only 10% native species (moss, herbs) during a 2012 survey. However, some native groundcovers such as the cushion-forming *Scleranthus biflorus* and mat pohuehue were relatively common and were growing well amongst the exotic grass sward (Environment Canterbury 2013b).

**Birchdale Lot Conservation Area (C.A. 1):** Vegetation of this area is grass-mossfield. Naturalised needle grass, danthonia spp., blue wheat grass (*Elymus scaber*) and sweet vernal form an open canopy over a native moss-dominant ground cover. Associate native groundcovers present are dwarf broom, mat pohuehue and patotora. Occasional shrubs of native broom, matagouri, gorse and a single plains olearia are also present (Environment Canterbury 2013b).

Species recorded by Jensen (2012) within the Birchdale Lot Conservation Area (C.A. 1) site include:

- |   |                |
|---|----------------|
| • <i>Carmichaelia australis</i>             | broom          |
| • <i>Carmichaelia corrugate</i>             | broom          |
| • <i>Crassula colligata subsp colligata</i> |                |
| • <i>Discaria toumatou</i>                  | matagouri      |
| • <i>Leucopogon fraseri</i>                 |                |
| • <i>Microtis uniflora</i>                  |                |
| • <i>Muehlenbeckia axillaris</i>            | phuehue        |
| • <i>Olearia adenocarpa</i>                 | plains olearia |
| • <i>Oxalis exilis</i>                      | oxalis         |
| • <i>Raoulia monroi</i>                     | raoulia        |
| • <i>Rytidosperma exiguum</i>               |                |
| • <i>Xanthoparmelia semiviridis</i>         | lichen         |
| • <i>Hypnum sp.</i>                         | moss           |
| • <i>Racomitrium lanuginosum</i>            | moss           |
| • <i>Politrichum juniperinum</i>            | moss           |

**Chattertons Road Conservation Area:** Although this area has not been grazed for eight years, there is still 10-20% overall ground cover of native moss and other species, with mat pohuehue, prostrate broom, matagouri and patotora also present. The terrace riser at the northern margin of the area has been the site of native restoration planting efforts over the last few years. Plantings are locally-sourced shrubs, trees, and tussocks (Environment Canterbury 2013b). Here shrubs, trees, tussocks and groundcovers include:

- |                                   |                     |
|-----------------------------------|---------------------|
| • <i>Kunzea ericoides</i>         | kanuka              |
| • <i>Cordyline australis</i>      | cabbage tree        |
| • <i>Sophora microphylla</i>      | South Island kowhai |
| • <i>Pomaderris phyllicifolia</i> | podaderris          |
| • <i>Melicytus alpinus</i>        | porcupine shrub     |
| • <i>Olearia adenocarpa</i>       | plains olearia      |
| • <i>Poa cita</i>                 | silver tussock      |
| • <i>Carex comans</i>             | sedge               |
| • <i>Aciphylla subflabellata</i>  | spear grass         |



**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

Indigenous dryland vegetation on the Canterbury Plains comprises only fragments of what was previously present (Partridge 2007). At 170.30 hectares, this site is considered to comprise a relatively large example of this type of vegetation in the Low Plains Ecological District.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

This site contains vegetation that has been reduced to less than 20% of its former area in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion. This site contains three plant species listed by de Lange *et al.* (2013) as either Threatened or At Risk (Refer Environment Canterbury 2013b):

- *Carmichaelia corrugata* (At Risk/Declining)
- *Olearia adenocarpa* (Threatened/Nationally Critical)
- *Raulia monroi* (At Risk/Declining)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

Site not assessed under this criterion



### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet this criterion

### Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Site not assessed under this criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet this criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion

## Site Management

### Existing Protection Status

XXX

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitor pest plant infestations and implement weed control as required.</li> <li>Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Further species loss</li> </ul>	<ul style="list-style-type: none"> <li>Identify and mark existing native plant populations</li> <li>Re-introduce recently locally extinct species</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Changes to soil structure &amp; fertility as a result of changes in land management that threaten existing ecosystem function</li> </ul>	<ul style="list-style-type: none"> <li>Implement a land management change process so that inappropriate actions do not occur</li> <li>Assess any attempts to change the irrigation or fertiliser application regime as part of the land management change process.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Undesirable impacts of grazing</li> </ul>	<ul style="list-style-type: none"> <li>Develop a stock grazing programme that will allow continued use of the land for grazing purposes whilst preserving the existing ecological values.</li> <li>Promote research and monitoring to determine most appropriate stock management regime(s).</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>



<ul style="list-style-type: none"> <li>Browsing damage to plants</li> </ul>	<ul style="list-style-type: none"> <li>Consider installation of rabbit proof fencing where appropriate within the SES (including individual plant patches) and eradicate pest animals from within fenced area(s)</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Fire damage through excessive grass growth</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that fire risk is kept low without compromising existing ecological values</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Inappropriate planting</li> </ul>	<ul style="list-style-type: none"> <li>Ensure any planting (e.g. farm shelter, restoration plantings) do not compromise existing ecological values.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

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## References

De Lange, P. J., Rolfe, J. R., Champion, P. D., Courtney, S. P., Heenan, P. B., Barkla, J. W., Cameron, E. K., Norton, D. A., and Hitchmough, R. A. (2013) *Conservation status of New Zealand indigenous vascular plants, 2012*. Department of Conservation, Wellington, New Zealand.

Environment Canterbury (2013a) *Canterbury Regional Policy Statement 2013*. Environment Canterbury.

Environment Canterbury (2013b) *Ecological inspection of conservation areas on the West Melton Reserves, March – September 2012*. Unpublished Report. Environment Canterbury (TRIM 14/1404370).

Jensen, C. (2012) *Plant species lists – ECan dry plains grassland sites – Carol Jensen*. Unpublished data (TRIM 14/1403895).

Partridge, T. R. (2007) *Vegetation changes and management options for reserve at corner of Wilmers and Springs Road (EHS 15.06)*. CCCECO 07/07, Christchurch City Council, Christchurch, New Zealand.

Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 28<sup>th</sup> November 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 28<sup>th</sup> November 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.

Appendix 1: Location Plans

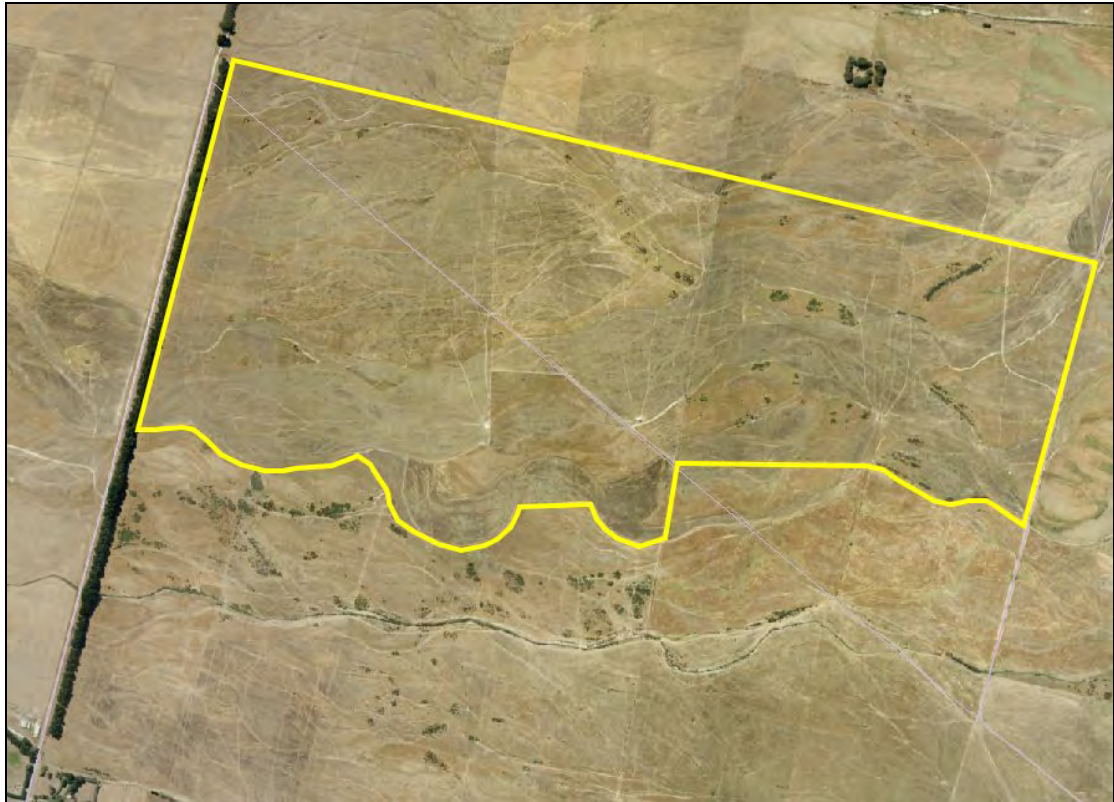


Figure 1: Smythe Lease (Including Molloy Plains Olearia Conservation Area).

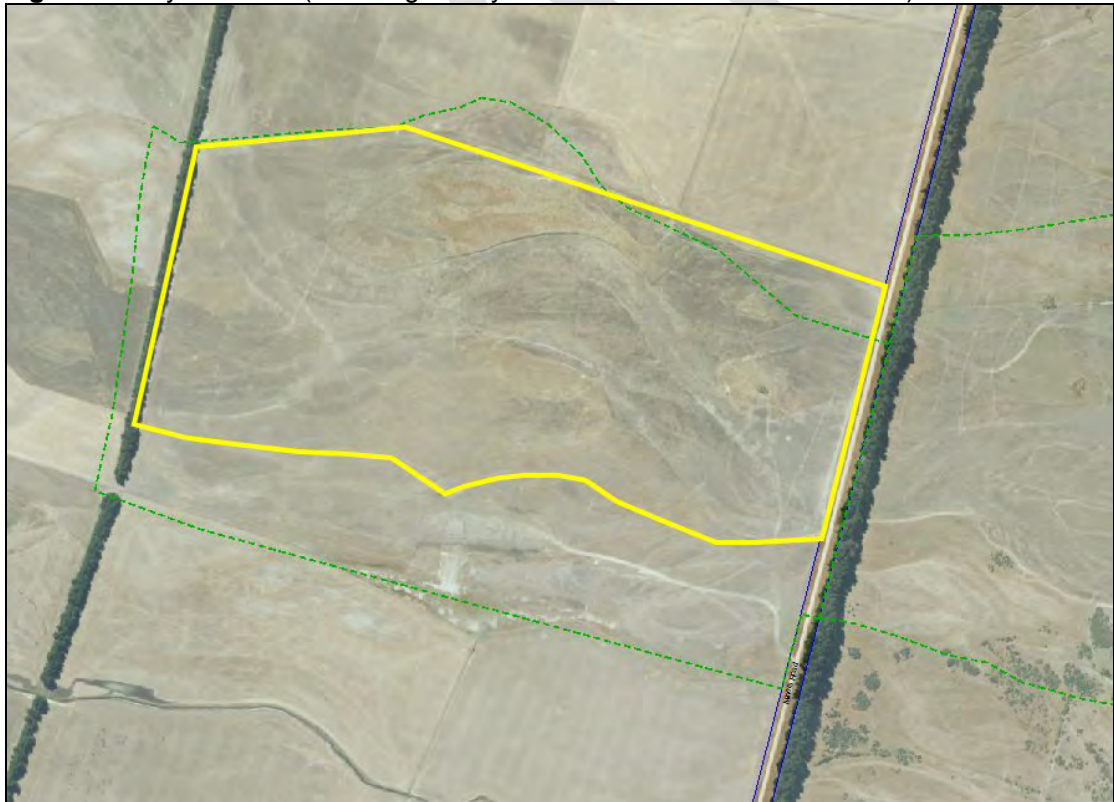


Figure 2: Birchdale Lot Conservation Area (C.A. 1) area showing the area of former Christchurch City Council Ecological Heritage Site (EHS 6.41) in green dashed line.



Figure 3: Chattertons Road Conservation Area.

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Travis Wetland

**Site number:** SES/LP/2

**Physical address of site:** 280 Beach Road  
Parklands  
Christchurch 8083

#### Summary of Significance:

The Travis Wetland site is significant because it contains a large area of vegetation that is representative of the Low Plains Ecological District including threatened and locally rare plant species, and also provides habitat that supports representative assemblages of native wetland birds including several threatened, at risk and locally rare species.

#### Site Map



**Additional Site Information**

**Central point NZTM:** N5185083, E 1575291

**Area of SES (ha):** 134.60 ha

**Site Description**

Travis wetland is the largest area of freshwater wetland in Christchurch, and supports a range of wetland vegetation communities, open freshwater water bodies planted native forest and both planted and remnant shrubland communities. The site was listed as a Primary Conservation Evaluation 'Category A' site by Meurk *et al.* (1993) on account of its high biodiversity values (more than 50 native plant species), large area, high representativeness and unusualness scores, and also a reasonably high score in terms of long-term viability. The wetland is of national importance for its soil and vegetation system, and of regional importance in terms of its pukeko population (CCC 1999).

**Extent of Site of Ecological Significance**

The extent of the Travis Wetland SES is defined by a) the roadside edge of the dune restoration plantings along the Mairehau Road northern frontage, b) the private property rear boundaries of the Mairehau Road residential properties along the north eastern side, c) the edge of the Frosts Road road reserve boundary along the eastern boundary, d) the northern edge of the shared pedestrian/cycleway along the Travis Road frontage, and e) along the private property rear boundary line along the west side of the SES to meet Mairehau Road. South of Travis Road, the SES extends to include the series of waterbodies and wetlands on both sides of ANZAC Drive as far south as New Brighton Road as shown on the location map.



## Assessment Summary

The Travis Wetland SES has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 & 2), rarity/distinctiveness (criteria 3, 4 & 5), diversity and pattern (criterion 7) and ecological context criteria (criterion 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Travis Wetland is considered the best representative example of wetlands that were once widespread in Low Plains Ecological District. It contains native plant species representing nearly 80% of the pre-European Christchurch wetland flora (Meurk 1995). Since Travis Wetland Park was created in 1992, Skilton (2010) reports that 82 indigenous plant species have been added to the original 83 species that existed prior to its creation.

The aquatic invertebrate community was identified by Sagar *et al.* (1996) as being representative of habitats and biological communities that have declined to less than 10% of their former extent of their pre-European distribution in Canterbury.

Forty-three species of native bird have been recorded within the Travis Wetland SES, as well as five Australian visitors and two northern hemisphere migrants (Refer Crossland 2013; 2014a; 2014b; Appendix 1). These species include a) all 24 species listed by Crossland (2014b) as being associated with freshwater lakes and ponds, b) all 23 species associated with freshwater rivers and streams, c) 19 out of 20 non-bush bird species associated with freshwater wetlands (swamps), d) all 17 inland wet grassland species, and e) 19 out of 20 bird species associated with coastal wet grasslands.



**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

Travis Wetland is one of the three largest lowland, freshwater wetlands in eastern South Island (Meurk 1995), one of the largest freshwater wetlands in the Low Plains Ecological District, and the largest area of freshwater wetland remaining within the Christchurch City boundary (Sagar *et al.* 1996).

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

Travis Wetland is an example of a wetland type that was once widespread in Low Plains Ecological District, but has now been reduced to less than 20% of their former extent. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

This site supports feeding and roosting habitat for 22 resident, seasonal or vagrant visitors that are classified as threatened or at risk bird species by Robertson *et al.* (2012), including the following (Refer CCC 1999; Crossland 2014a):

<b>Species</b>	<b>Threat Status</b>
• Grey Duck	Threatened/Nationally Critical
• White Heron	Threatened/Nationally Critical
• Black-billed Gull	Threatened/Nationally Critical
• Black Stilt	Threatened/Nationally Critical
• Black-fronted Tern	Threatened/Nationally Endangered
• Australasian Bittern	Threatened/Nationally Endangered
• Red Billed Gull	Threatened/Nationally Vulnerable
• Banded Dotterel	Threatened/Nationally Vulnerable
• Pied Cormorant	Threatened/Nationally Vulnerable
• Caspian Tern	Threatened/Nationally Vulnerable
• SI Pied Oystercatcher	At Risk/Declining
• Pied Stilt	At Risk/Declining
• Bar Tailed Godwit	At Risk/Declining
• New Zealand Pipit	At Risk/Declining
• Variable Oystercatcher	At Risk/Recovering
• Brown Teal	At Risk/Recovering





- |                          |                             |
|--------------------------|-----------------------------|
| • Eastern NZ Falcon      | At Risk/Recovering          |
| • Marsh Crake            | At Risk/Relict              |
| • Spotless Crake         | At Risk/Relict <sup>1</sup> |
| • Black Cormorant        | At Risk/Naturally Uncommon  |
| • Little Black Cormorant | At Risk/Naturally Uncommon  |
| • Royal Spoonbill        | At Risk/Naturally Uncommon  |

The following plant species occur at Travis Wetland, and although classified by de Lange (2013) as 'Not Threatened', they are considered regionally vulnerable (CCC 1996\*, 1999\*):

<b>Botanical Name</b>	<b>Common Name</b>
• <i>Baumea rubiginosa</i> <sup>+</sup>	swamp sedge
• <i>Carex flaviformis</i> <sup>+</sup>	swamp sedge
• <i>Nematoceras iridescens</i> <sup>+</sup>	spider orchid
• <i>Drosera binata</i> <sup>+</sup>	native sundew
• <i>Luzula spp</i> <sup>+</sup>	wood rush
• <i>Polygonum salicifolium</i> <sup>*</sup>	
• <i>Ranunculus glabifolius</i> <sup>+</sup>	buttercup

Locally rare plant species occurring within the Travis Wetland SES include the native buttercup (*Ranunculus glabrifolius*), a spider orchid (*Corybas macranthus*) (Skilton 2010), and another locally rare spider orchid (*Nematoceras iridescens*) that is not recorded elsewhere in Canterbury (Bissell 2014). The SES also contains the only substantial stand of manuka (*Leptospermum scoparium*) on the Canterbury Plains (CCC 1999).

Since 2002, more than 400 of the Threatened/Nationally Endangered (de Lange *et al.* 2013) shrubby tororaro (*Muehlenbeckia astonii*) that were collected at Kaitorete Spit have been planted into the dry coastal bush plant communities being established on the old dunes and other dry sites within the Travis Wetland SES area (Skilton 2011).

The Threatened/Nationally Vulnerable flightless crane fly (*Gynoplistia pedestris*) has been recorded on six occasions at Travis Wetland (Ford 2014).

Two species of skink have been recorded from the SES; common skink (*Oligosoma polychroma*) and McCanns skink (*O. maccanni*) (Travis Wetland Trust 2012). Although Hitchmough *et al.* (2013) list both species as Not Threatened under the NZ Threat Classification System, the common skink is a cryptic species complex, and this classification refers to one described clade only (*O. polychroma* Clade 1). Of the four un-described clades, Clade 4 and Clade 5 occur in the Low Canterbury Plains Ecological District (see Liggins *et al.* 2008), and are both described by Hitchmough *et al.* (2013) as being At Risk, where their total area of occupancy is estimated to be in excess of 10,000 ha, but with a predicted decline of 10-70% across their range.

<sup>1</sup> Spotless Crake photographed by CCC Regional Parks Ranger Kenny Rose on 22<sup>nd</sup> February 2015 at Travis Wetland



**5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.***

The site is significant under this criterion.

Travis Wetland is the northern distribution limit for the rare moth, *Glyphipterix aulogramma* (Brian Patrick *pers comms*<sup>2</sup>).

**6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

Site not assessed under this criterion

**Diversity and Pattern**

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

The estimated diversity of 700 – 900 insect species is a moderately high number compared with other lowland, largely non-wooded sites (CCC 1999).

**Ecological Context**

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

Site not assessed under this criterion

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

Site not assessed under this criterion

<sup>2</sup> Email Communication with Wildlands Consultants Entomologist Brian Patrick, 1<sup>st</sup> December 2014 (TRIM Reference 14/1471010).



**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

Travis Wetland provides a significant habitat for shortfin eels, where almost 1000 individuals were captured in 2009 compared with only 84 individuals in 1996 despite using similar inventory methods (Main and Taylor, 2010).

Travis wetland provides habitat for 8 species of native fish including inanga, giant bully, common bully, upland bully, black flounder, smelt, short-finned eel, lamprey and is important habitat/refuge for inanga to mature.

The wetland is of regional importance in terms of its pukeko population (CCC 1999; Refer also Appendix 1 & Crossland 2014a).

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**Site Management**

**Existing Protection Status**

To be completed

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor pest plant infestations and implement control as required.</li> <li>• Assess new pest plant incursions and implement control as required</li> </ul>	
<ul style="list-style-type: none"> <li>• Further species loss</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and mark existing threatened and/or uncommon native plant populations</li> <li>• Re-introduce recently locally extinct species</li> </ul>	
<ul style="list-style-type: none"> <li>• Anthropogenic and/or earthquake related change to water regime</li> </ul>	<ul style="list-style-type: none"> <li>• Any action relating to changes in the water regime need to be assessed in relation to impacts upon ecological state and functioning of wetlands.</li> <li>• Identify sites with in SES where populations and plant associations of rare plants can be established</li> </ul>	

<ul style="list-style-type: none"> <li>Natural process of change</li> </ul>	<ul style="list-style-type: none"> <li>If natural changes in wetland ecology, composition or functioning are determined to be detrimental to the ongoing viability of the values of the site, a recovery action plan should be initiated.</li> </ul>	
<ul style="list-style-type: none"> <li>Habitat loss through encroachment of infrastructure (e.g sewer pipes, biofilters)</li> </ul>	<ul style="list-style-type: none"> <li>Ensure thorough assessments of affects on ecological systems and processes of proposals are carried out by an ecologist</li> </ul>	
<ul style="list-style-type: none"> <li>Mammalian predators</li> </ul>	<ul style="list-style-type: none"> <li>Continue monitoring, trapping and poisoning maintain current level of mammalian pest control.</li> </ul>	
<ul style="list-style-type: none"> <li>Pest Fish are threat to aquatic ecosystem including macrophytes, native fish and water quality</li> </ul>	<ul style="list-style-type: none"> <li>Maintain current annual monitoring and control programme for rudd</li> </ul>	

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## References

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**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 8<sup>th</sup> April 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 8<sup>th</sup> April 2014

**Statement updated by:** XXX  
**Date:** XXX

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*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*





## Appendix 1: Wetland Bird Monitoring

Recent Wetland Bird Monitoring: Travis Wetland (Source: Crossland 2014). Note: Australasian Crested Grebes recorded at Travis Wetland and reported by Travis Wetland Trust, September 2013 (Source [www.traviswetland.org.nz](http://www.traviswetland.org.nz)).

Species	15/08/13	10/12/13	6/01/14	27/02/14	19/05/14	12/06/14	24/06/14
Black Cormorant		2		2	5	4	6
Pied Cormorant		1		0		0	
Little Cormorant		2		6		1	
Little Black Cormorant			1	0		0	
Spotted Shag				0		0	
White-faced Heron			1	6		1	
White Heron				0		0	
Cattle Egret				0		0	
Australasian Crested Grebe*							
Australasian Bittern				0		n.c.	
Royal Spoonbill				0		0	
Glossy Ibis				1		1	1
Black Swan	13	8		22		20	
Cape Barren Goose				0		0	
Paradise Shelduck	75	229		184		n.c.	83
Mallard/Grey Duck				133		n.c.	
Grey Duck				0		n.c.	
Grey Teal				156	430	n.c.	
Brown Teal	1			0		n.c.	
New Zealand Shoveler				86		n.c.	
NZ Scaup				16		n.c.	
Australasian Harrier				3	2	3	
New Zealand Falcon				1		0	
Marsh Crake				1		n.c.	
Pukeko				140		345	
Australasian Coot			2	1		2	
Variable Oystercatcher				0		0	
SIPO				0		1	1
Spur-winged Plover				31		51	43
Banded Dotterel				0		0	
Black-fronted Dotterel				0		0	
Bar-tailed Godwit				0		0	
Pectoral Sandpiper				0		0	
Pied Stilt				10		38	15
Black Stilt				0		0	
Black-backed Gull				1		n.c.	
Red-billed Gull				0		n.c.	
Black-billed Gull				0		n.c.	
Caspian Tern				0		0	
Whiskered Tern				0		0	
Black-fronted Tern				0		0	
NZ Kingfisher				0		2	
Welcome Swallow				1		n.c.	



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site Name:** No. 2 and Old No. 2 Drain  
**Site Number:** SES/LP/3  
**Physical Address of Site:** By QEII Drive, Burwood

#### Summary of Significance:

The No. 2 and Old No. 2 Drain SES supports at-risk fish species and contributes to an important ecological network/linkage and migration route for migratory species.

#### Site Map:



### **Additional Site Information**

**Central point NZTM:** N5184666, E1573405

**Area of SES (ha):** TBA

### **Site Description**

The ecosystem within the SES consists of two highly modified artificial streams which are tributaries of the Avon River. Both streams pass through grazed farmland, with No. 2 Drain eventually passing through a narrow esplanade reserve within in a residential subdivision, and Old No. 2 Drain passing through the highly managed Shirley Golf Course before discharging into Horseshoe Lake. Old No. 2 Drain within the Shirley Golf Course was naturalised in July 2007 (James, 2012).

### **Extent of Site of Ecological Significance**

The stream reach included in the SES extends from Mairehau Road downstream to the two respective discharge points into Horseshoe Lake as shown on the location map. The width of the SES varies (average of approximately ten metres) along the waterway's lengths, and is largely defined by the width of the stream between the top of banks to include the area of flowing water and marginal vegetation, and expands to include the indigenous riparian restoration plantings within the Shirley Golf Course on Old No. 2 Drain.

### **Assessment Summary**

The No. 2 and Old No. 2 Drains site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets rarity/distinctiveness (criterion 4) and ecological context criteria (criterion 8).



## Assessment of Significance Criteria

### Representativeness

1. *Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.*

Does not meet this criterion

2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

Does not meet this criterion

### Rarity/Distinctiveness

3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

Does not meet this criterion

4. ***Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.***

The site is significant under this criterion.

Blakely (2014) recorded the locally uncommon giant bully (*Gobiomorphus gobioides*) at two sampling sites in No. 2 drain 15 m and 250 m upstream from Lake Terrace Road respectively, and the At Risk/Declining (Goodman *et al.* 2014) inanga (*Galaxias maculatus*) at the most upstream site.

Inanga have also been recorded previously in Old No. 2 Drain, although not during the latest survey in 2013 (Greenwood, 2008; Greenwood *et al.*, 2008; James, 2012; Blakely, 2014).

James and McMurtrie (2012) also record the At Risk/Declining (Goodman *et al.* 2014) longfin eel in Old No. 2 Drain approximately 240 m upstream from Lake Terrace Road ('Site 2') as far upstream as Mairehau Road on No. 2 Drain ('Site 4'). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of No. 2 and Old No. 2 Drains downstream of the sampled locations to their confluences with the Horseshoe Lake SES is included as part of this SES.



James and McMurtrie (2012) recorded At Risk/Declining (Goodman *et al.* 2014) bluegill bully at two sites in Old No. 2 Drain ('Site 1' and 'Site 1A'). Bluegill bullies are found in high numbers at this site compared to other Christchurch sites (Greenwood 2008).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

Site not assessed under this criterion

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

Does not meet this criterion

**Ecological Context**

**8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is significant under this criterion.

The site supports longfin eel (*Anguilla dieffenbachia*). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of No. 2 and Old No. 2 Drains downstream of the sampled locations to their confluences with Horseshoe Lake are included as part of this SES. Note that the Horseshoe Lake SES, the Avon River, and the Avon Heathcote Estuaries area is contained within other proposed SESs, facilitating a continuous ecological linkage to the sea.

Semi-mature indigenous re-vegetation plantings along Old No. 2 Drain provide a good degree of buffering of the stream from adjacent land uses and provides shade and habitat complexity.



9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet this criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion

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**Site Management**

**Existing Protection Status**

None

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>• Weed invasion</li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing monitoring and eradication of biodiversity pest plants</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Artificial riverbank retaining, substrates and/or other structures that adversely affect ecological function of waterways</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to naturalise banks (i.e. remove retaining and create sloping banks with appropriate native vegetation) during bank maintenance works and through capital projects</li> <li>• Prevent construction of fish barriers (e.g. weirs) and remediate current barriers if present</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with landowners about benefits to biodiversity of waterways and riparian zone management.</li> <li>• Assistance as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>• Deficiency of high-quality riparian margins, resulting in a lack of habitat, high water temperatures due to a lack of shading, no buffer/filtering from urban impacts and affects on the functioning of ecological corridors (i.e. species movement)</li> </ul>	<ul style="list-style-type: none"> <li>• Supplement riparian margins with dense, native and locally-sourced vegetation of varying heights (i.e. include tall trees to provide shading to the waterway)</li> <li>• Focus on planting areas of unstable ground, to reduce erosion and sediment discharges</li> <li>• To maintain the riparian margin and ecological corridors, ensure waterway setbacks are maintained (i.e. resource consent is required to build, fill or excavate) and closed fences are not built</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with landowners about benefits to biodiversity of waterways and riparian zone management.</li> <li>• Assistance as appropriate.</li> </ul>

	adjacent to waterways	
<ul style="list-style-type: none"> <li>Discharge of contaminants</li> </ul>	<ul style="list-style-type: none"> <li>Treatment of stormwater to a high level prior to discharge into waterways</li> <li>Reduction in occurrence of wastewater overflows to waterways</li> <li>Prevent non-stormwater discharges (e.g. trade-waste) from entering stormwater network or waterways</li> <li>Effective sediment control mitigation measures during construction</li> <li>Removal of instream sediment (and therefore other contaminants attached to sediment)</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Excessive amount of leaf-fall from deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li>Plant indigenous locally-sourced evergreen species in riparian margins instead of deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about benefits to biodiversity of waterways and riparian zone management.</li> <li>Assistance as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Artificial light impacting on freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Minimise light-spill onto waterway</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about impact of artificial light upon freshwater fauna.</li> </ul>
<ul style="list-style-type: none"> <li>Lack of instream habitat for freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Maintain or enhance species-specific habitat; in particular, given this SES has significant bluegill bully populations, additional habitat enhancement (e.g. riffle areas) should be carried out throughout the remaining sections of waterway</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about benefits to biodiversity of waterways and riparian zone management.</li> <li>Assistance as appropriate.</li> </ul>



<ul style="list-style-type: none"> <li>• Pathogen input from waterfowl and dog faeces affecting water quality</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce ability for waterfowl to enter waterways, by densely planting riparian margins with appropriate native species</li> <li>• Encourage community not to feed the ducks</li> <li>• Encourage the community to pick up dog faeces</li> </ul>	<ul style="list-style-type: none"> <li>• Raise awareness about impacts on biodiversity of impacts of faeces upon water quality.</li> </ul>
<ul style="list-style-type: none"> <li>• Overfishing of inanga in lower reaches of Avon River</li> </ul>	<ul style="list-style-type: none"> <li>• Management of these waterways should take account of potential for overfishing</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

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**Assessment completed by:** Dr Antony Shadbolt

**Date:** 9th December 2014

**Statement completed by:** Dr Antony Shadbolt

**Date:** 9<sup>th</sup> December 2014

**Statement updated by:** XXX

**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.

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### Additional Site Information

**Central point NZTM:** N5180472, E1567304

**Area of SES (ha):** 7.58 ha

### Site Description

Riccarton Bush is the last remaining remnant of podocarp forest in the low Canterbury Plains Ecological District. It is dominated by New Zealand's tallest growing tree, kahikatea (*Dacrycarpus dacrydioides*) and an association of 82 other extant indigenous conifers and flowering plants as recorded by Molloy (1995) and listed in Appendix 1. Kahikatea forests once occurred throughout much of New Zealand's lowland areas, however are now represented by approximately only 2% of their former extent (Norton 1995). Reduced from its former (1849) extent of approximately 22 hectares (Murray 1924), the forested area of Riccarton bush now covers approximately 7.58 hectares and is estimated to be in excess of 600 years old.

Riccarton Bush is of importance in terms of its invertebrate fauna, with Lepidoptera (butterflies and moths) having been collected and studied here since 1859; longer than any other site in New Zealand. Twenty-seven moth species have their type locality as Riccarton Bush. The site boasts up to 260 species of Lepidoptera (moths and butterflies), of which 196 have been confirmed present in recent years. Five of these moth species are listed as endangered (see assessment sections below), and two species (*Grypotheca pertinax* and *Cateristes eustyla*) are endemic to Riccarton Bush and have not been found to occur elsewhere.

In recent years the forest area has been encircled with a pest proof fence that consists of a fine mesh cladding, a partially buried skirt and a pest proof capping to prevent exotic mammalian pest animals from moving through, under and/or over the fence respectively. As a result of this, and the potential for the eradication of mammalian pests from within the fenced area, managers of the forest reserve are able to maintain a pest-free mainland island environment where natural forest processes are able to occur without threat of predation (including seed predation) or herbivory from introduced pest animal species.

### Extent of Site of Ecological Significance

The extent of the SES for Riccarton Bush covers the areal extent of the drip-line of the remnant indigenous forest area, and extends to include the pest proof fence and associated clear-zone/setback which is measured to 4.5 m out from the alignment of the physical structure of the fence. The inclusion of this clear zone/setback within the SES is important as it forms an essential component of the functioning and integrity of the fence as the appropriate management and maintenance of this zone prevents domestic, community and feral cats from leaping the fence and entering the protected refuge.

**Note:** The SES for Riccarton Bush does not include the exotic woodland amenity area and grounds of Riccarton House.



## Assessment Summary

Riccarton Bush has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below), referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 & 2), rarity/distinctiveness (criteria 3, 4 & 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Riccarton Bush contains more than 70 species of native podocarp and flowering plant (Appendix 1; Molloy 1995) and is the best remaining representative example of tall native forest in the Low Plains Ecological District.

For birds, this site supports a high proportion of the “an association of indigenous species that is distinctive” and of “restricted occurrence”. Specifically, this site supports a high proportion of the “Lowland Plains Native Bush Species assemblage” for Christchurch (see appendix 2).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

Riccarton Bush (7.58 ha) is one of only two examples of tall native forest in the Low Plains Ecological District, with the second patch (Arowhenua Bush) occurring at Temuka (Harding 2009). Riccarton Bush is therefore a relatively large example of its type within the Low Plains Ecological District.



### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

Podocarp-hardwood forests have been substantially depleted throughout the Canterbury Region and are a high priority for protection (Harding 2009). Kahikatea forest is estimated to have covered between 1 and 5% of the extent of Low Plains Ecological District, and is now represented by less than 20% of its former extent. Riccarton Bush therefore represents indigenous vegetation AND habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Low Plains Ecological District (an acutely threatened land environment). The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

- 4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

Of the moth fauna known from Riccarton Bush, one is listed as Threatened – Nationally Vulnerable, three are listed as At Risk, and two are listed as Data Deficient (Stringer *et al.* 2012):

- *Zelleria sphenota* (At Risk/Declining)
- *Cateristes eustyla* (Data Deficient)
- *Gymnobathra ambigua* (Data Deficient)
- *Asaphotes obarata* (Nationally Vulnerable)
- *Tatosoma agrionata* (At Risk/Declining)
- *Circoxena ditrocha* (At Risk/Naturally Uncommon)

In addition, the site contains four species of moth that are considered uncommon in the Low Canterbury Plains Ecological District (B. Patrick pers. comm. 2014), including:

- *Grypotherca pertinax*
- *Mallobathra metrosema*
- *Reductoderces microphanes*

The site hosts the At Risk (Relict) moth *Hierodoris torrida* listed by Hoare (2005), and the At Risk (Relict) six-eyed spider (*Periegops suterii*) (C. Vink Pers. Comm. 2014).

Among the plant species, Riccarton Bush hosts the At Risk/Declining white mistletoe (*Tuperia antarctica*), and the Nationally Threatened/Vulnerable NZ wind grass (*Anemanthele lessoniana*).



Thus in total, two Threatened, seven At Risk, two Data Deficient, and three locally uncommon taxa are known from Riccarton Bush.

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

The Site supports a population of the moth *Stigmella kaimanua* which occurs at its northern limit in Riccarton Bush (B. Patrick pers. comm. 2014).

The site contains hinau (*Elaeocarpus dentatus*) which reaches its southern distributional limit in Riccarton Bush (Lloyd *et al.* 2013)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

Site contains three species of moth that are endemic to, and therefore restricted to Riccarton Bush (Muir *et al.* 1995), including:

- *Grypotherca pertinax*
- *Mallobathra metrosema*
- *Reductoderces microphanes*

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

Twenty-seven of the 39 families (approximately 70%) of Lepidoptera (moths & butterflies) occurring in New Zealand have been recorded from Riccarton Bush. These include 260 species of which 190 species were recorded by Muir *et al.* (1995), who also identified that 35 species not re-recorded during their survey were likely to still be present as they were known to occur in the immediate surroundings.

Riccarton Bush contains more than 70 species of extant indigenous conifer and flowering plants (Appendix 1; Molloy 1995).





### Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Site does not meet this criteria

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

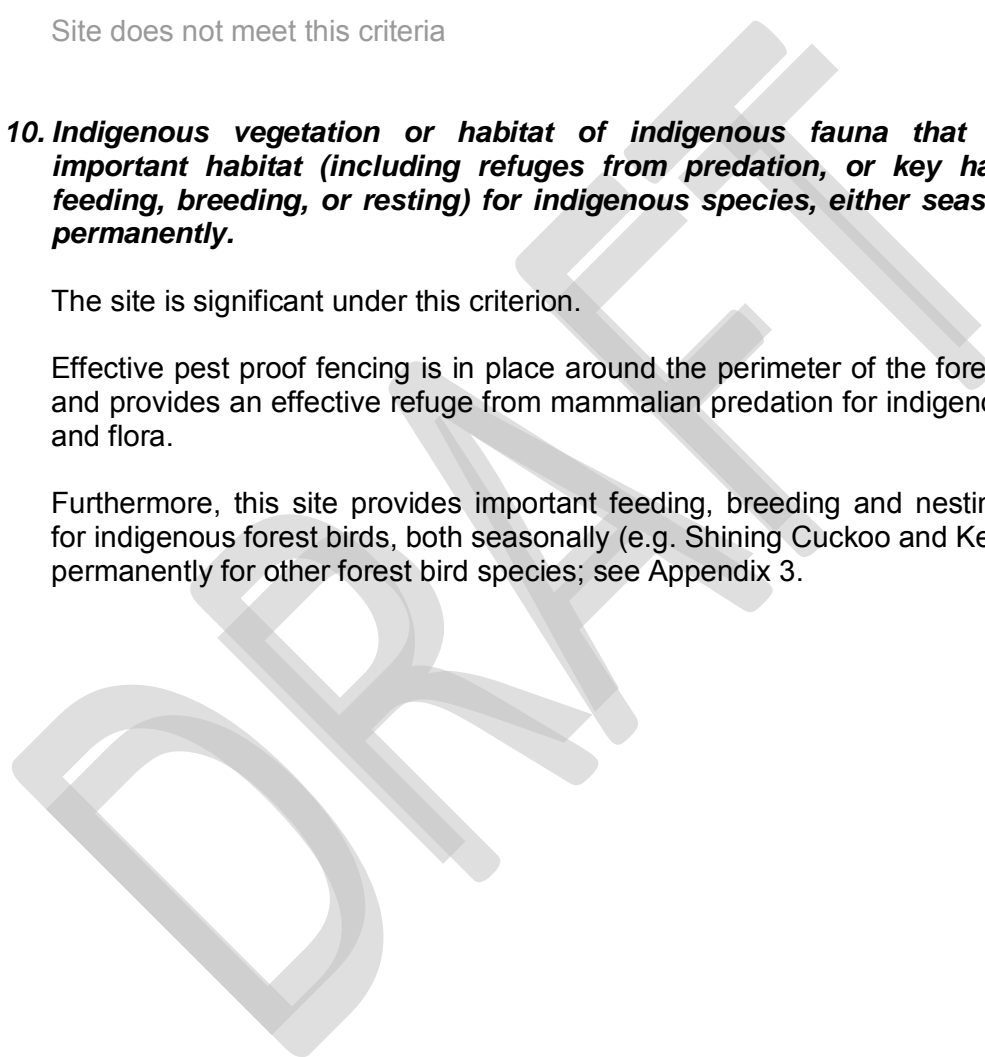
Site does not meet this criteria

- 10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

Effective pest proof fencing is in place around the perimeter of the forested area and provides an effective refuge from mammalian predation for indigenous fauna and flora.

Furthermore, this site provides important feeding, breeding and nesting habitat for indigenous forest birds, both seasonally (e.g. Shining Cuckoo and Kereru) and permanently for other forest bird species; see Appendix 3.



## Site Management

### Existing Protection Status

Protected under the Riccarton Bush Act 1914

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitor pest plant infestations and implement control as required.</li> <li>Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li>Information packages for neighbouring properties (e.g. 'Plant Me Instead')</li> </ul>
<ul style="list-style-type: none"> <li>Animal Pest Incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of possible animal pest incursions and trapping as necessary.</li> <li>Regular inspection and maintenance of pest proof fence</li> <li>Maintenance of effective clear-zone around perimeter of pest proof fence</li> </ul>	<ul style="list-style-type: none"> <li>Provide advice and guidance on pest animal monitoring</li> <li>Supply traps and related training as necessary</li> </ul>
<ul style="list-style-type: none"> <li>Erosion of genetic purity through hybridisation with non-local native plant species</li> </ul>	<ul style="list-style-type: none"> <li>Ensure any plant introductions to Riccarton Bush are sourced from the nearest natural plant populations</li> <li>Monitoring and eradication of problem non-local native plant species.</li> </ul>	<ul style="list-style-type: none"> <li>Information packages for neighbouring properties (e.g. 'Plant Me Instead')</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity Loss</li> </ul>	<ul style="list-style-type: none"> <li>Reintroduction of appropriate locally extinct plant and animal species based on historic records</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Fire</li> </ul>	<ul style="list-style-type: none"> <li>Consider limiting entry to reserve during times of drought</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>



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**Assessment completed by:** Dr Antony B. Shadbolt  
**Date:** 23<sup>rd</sup> September 2014

**Statement completed by:** Dr Antony B. Shadbolt  
**Date:** 23<sup>rd</sup> September 2014

**Statement updated by:** XXX  
**Date:** XXX

DRAFT

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.



## Appendix 1: Conifers & Flowering Plants

List of native conifers and flowering plants recorded from Riccarton Bush. Species in gray type indicate species that were recorded from previous surveys (See Molly 1995) of Riccarton Bush, but were not recorded by Molloy in 1993, and are no longer thought to be present. Species marked with an asterisk (\*) are non-local native species.

### TREES & SHRUBS

BOTANICAL NAME	COMMON NAME(S)
<i>Alectryon excelsus</i>	titoki/NZ ash
<i>Aristolelia serrata</i>	wineberry/makomako
<i>Carmichaelia robusta</i>	NZ broom/makaka
<i>Carpodetus serratus</i>	marbleleaf/putaputaweta
<i>Coprosma areolata</i>	thin leaved coprosma
<i>Coprosma crassifolia</i>	stiff-stemmed coprosma
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round leaved coprosma
<i>Coprosma propinqua</i> x <i>C. robusta</i>	hybrid coprosma
<i>Cordyline australis</i>	cabbage tree/ti kouka
<i>Coriaria sementosa</i>	tutu
<i>Corokia cotoneaster</i>	korokio
<i>Dacrycarpus dacrydioides</i>	kahikatea/white pine
<i>Elaeocarpus dentatus</i>	hinau
<i>Elaeocarpus hookerianus</i>	pokaka
<i>Elaeocarpus dentatus</i> x <i>E. hookerianus</i>	hybrid
<i>Fuchsia excorticata</i>	tree fuchsia/kotukutuku
<i>Fuchsia excorticata</i> x <i>F. perscandens</i>	hybrid fuchsia
<i>Griselinia littoralis</i>	broadleaf/kapuka
<i>Hebe salicifolia</i>	koromiko
<i>Hoheria angustifolia</i>	narrow leaved lacebark/houhere
<i>Hoheria sextylosa</i> *	North Island lacebark
<i>Hoheria angustifolia</i> x <i>H. sextylosa</i> *	hybrid lacebark
<i>Kunzea ericoides</i>	white tea tree
<i>Lophomyrtus obcordata</i>	NZ myrtle/rohutu
<i>Melicope simplex</i>	poataniwha
<i>Melicytus micranthus</i>	manakura/shrubby whiteywood
<i>Melicytus ramiflorus</i>	mahoe/whiteywood
<i>Melicytus micranthus</i> x <i>M. ramiflorus</i>	hybrid whiteywood
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red matipo
<i>Neomyrtus pedunculata</i>	NZ myrtle/rohutu
<i>Pennantia corymbosa</i>	kaikomako
<i>Pittosporum eugenioides</i>	lemonwood/tarata
<i>Pittosporum tenuifolium</i>	kohuhu/black matipo
<i>Plagianthus regius</i>	ribbonwood/manatu



<i>Podocarpus totara</i>	totara
<i>Prumnopitys ferruginea</i>	miro/brown pine
<i>Prumnopitys taxifolia</i>	matai/black pine
<i>Pseudopanax arboreus</i>	five-finger/pauhou
<i>Pseudopanax crassifolius</i>	lancewood/horoeka
<i>Pseudowintera colorata</i>	pepper tree/horopito
<i>Schefflera digitata</i>	seven-finger/pate
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	South Island kowhai
<i>Streblus heterophyllus</i>	milk tree/turepo
<i>Urtica ferox</i>	tree nettle/ongaonga

#### CLIMBING PLANTS

BOTANICAL NAME	COMMON NAME(S)
<i>Calystegia turguriorum</i>	NZ bindweed/powhiwhi
<i>Clematis paniculata</i>	NZ clematis/puawananga
<i>Clematis fosteri</i>	yellow clematis
<i>Fuchsia perscandens</i>	climbing fuchsia
<i>Metrosideros diffusa</i>	white rata/climbing rata
<i>Muehlenbeckia australis</i>	pohuehue/Maori vine
<i>Muehlenbeckia complexa</i>	shrubby puhuehue
<i>Muehlenbeckia australis</i> x <i>M. complexa</i>	hybrid pohue
<i>Parsonsia capsularis</i>	NZ jasmine/kaiwhiria
<i>Parsonsia heterophylla</i>	NZ jasmine/kaiwhiria
<i>Passiflora tetandra</i>	Kohia/NZ passion flower
<i>Ripogonum scandens</i>	supplejack/kareao
<i>Rubus australis</i>	bush lawyer/taramoa
<i>Rubus schmidelioides</i>	bush lawyer/taramoa
<i>Rubus squarrosus</i>	bush lawyer/taramoa
<i>Rubus australis</i> x <i>R. squarrosus</i>	hybrid lawyer
<i>Rubus australis</i> x <i>R. schmidelioides</i>	hybrid lawyer
<i>Rubus schmidelioides</i> x <i>R. squarrosus</i>	hybrid lawyer

#### MISTLETOES

BOTANICAL NAME	COMMON NAME(S)
<i>Ileostylus micranthus</i>	common mistletoe
<i>Korthalsella lindsayi</i>	dwarf mistletoe
<i>Tuperia antarctica</i>	white mistletoe/pirita

#### MONOCOT HERBS

BOTANICAL NAME	COMMON NAME(S)
<i>Anemanthele lessoniana</i>	hunangamoho/NZ wind grass
<i>Astelia fragrans</i>	bush flax/kahaka
<i>Astelia grandia</i>	bush flax/kahaka
<i>Carax coriacea</i>	sedge/rautahi
<i>Carex flagemifera</i>	shining sedge/mania
<i>Carex lambertiana</i>	sedge
<i>Carex raoulii</i>	sedge



<i>Carex secta</i>	sedge/purei
<i>Carex solandri</i>	sedge
<i>Carex virgata</i>	swamp sedge
<i>Carex lambertiana</i> x <i>C. solandri</i>	sedge
<i>Cortaderia richardii</i>	toetoe
<i>Gahnia xanthocarpa</i>	giant gahnia
<i>Hierochloa redolens</i>	holy grass/karetu
<i>Juncus distegus</i>	rush
<i>Juncus gregiflorus</i>	rush
<i>Libertia ixioides</i>	NZ iris/mikoikoi
<i>Liuzula picta</i> var. <i>limosa</i>	woodrush
<i>Luzula rufa</i>	woodrush
<i>Microlaena avenacea</i>	bush rice grass
<i>Phormium tenax</i>	NZ flax/harakeke
<i>Poa imbecilla</i>	weak poa
<i>Rytidosperma gracile</i>	danthonia/bush danthonia
<i>Uncinia leptostachya</i>	hooked sedge/matau
<i>Uncinia uncinata</i>	hooked sedge/kamu

**DICOT HERBS**

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Acaena anserinifolia</i>	piripiri/bidibidi
<i>Cardamine debilis</i>	NZ cress/panapana
<i>Epilobium billardieraenum</i>	willowherb
<i>Epilobium komarovianum</i>	willowherb
<i>Epilobium macropus</i>	willowherb
<i>Epilobium nummulariifolium</i>	willowherb
<i>Epilobium pallidiflorum</i>	willowherb
<i>Epilobium pictum</i>	willowherb
<i>Epilobium rotundifolium</i>	willowherb
<i>Geranium solenderi</i>	cranesbill/cut-leaved geranium
<i>Gnaphalium involucreatum</i>	creeping cudweed
<i>Hydrocotyle heteromeria</i>	NZ waxweed/hydrocotyle
<i>Hydrocotyle moschata</i>	hydrocotyle/marsh pennywort
<i>Microseris scapigera</i>	-
<i>Oxalis corniculata</i>	creeping oxalis
<i>Nertera depressa</i>	nertera
<i>Parietaria debilis</i>	NZ pellitory
<i>Pseudognaphalium luteoalbum</i>	common cudweed
<i>Ranunculus glabifolius</i>	NZ buttercup
<i>Ranunculus reflexus</i>	NZ buttercup
<i>Rumex flexuosus</i>	Maori dock/nuna
<i>Scenecio minimus</i>	fireweed
<i>Stellaria parviflora</i>	NZ stichwort
<i>Urtica incisa</i>	dwarf nettle/forest nettle
<i>Wahlenbergia gracilis</i>	NZ harebell



## Appendix 2: Bush Bird Assemblage

Comparison of bush bird species recorded at Riccarton Bush compared to the Lowland Plains Native bush Bird Species Assemblage for Christchurch. Species recorded at the study site are marked with a tick (✓); species considered to be breeding on site are underlined; species not recorded at site but part of the above assemblage are shown in grey font (Crossland 2007).

### **COMMON RESIDENT**

- |                       |                                      |
|-----------------------|--------------------------------------|
| ✓ <u>Grey Warbler</u> | <i>Gerygone igata</i>                |
| ✓ <u>Silvereye</u>    | <i>Zosterops lateralis lateralis</i> |

### **LESS COMMON BREEDING RESIDENT**

- |                               |  |
|-------------------------------|--|
| ✓ <u>Bellbird</u>             | <i>Anthornis melanura melanura</i>     |
| ✓ <u>South Island Fantail</u> | <i>Rhipidura fuliginosa fuliginosa</i> |

### **SCARCE BREEDING RESIDENT**

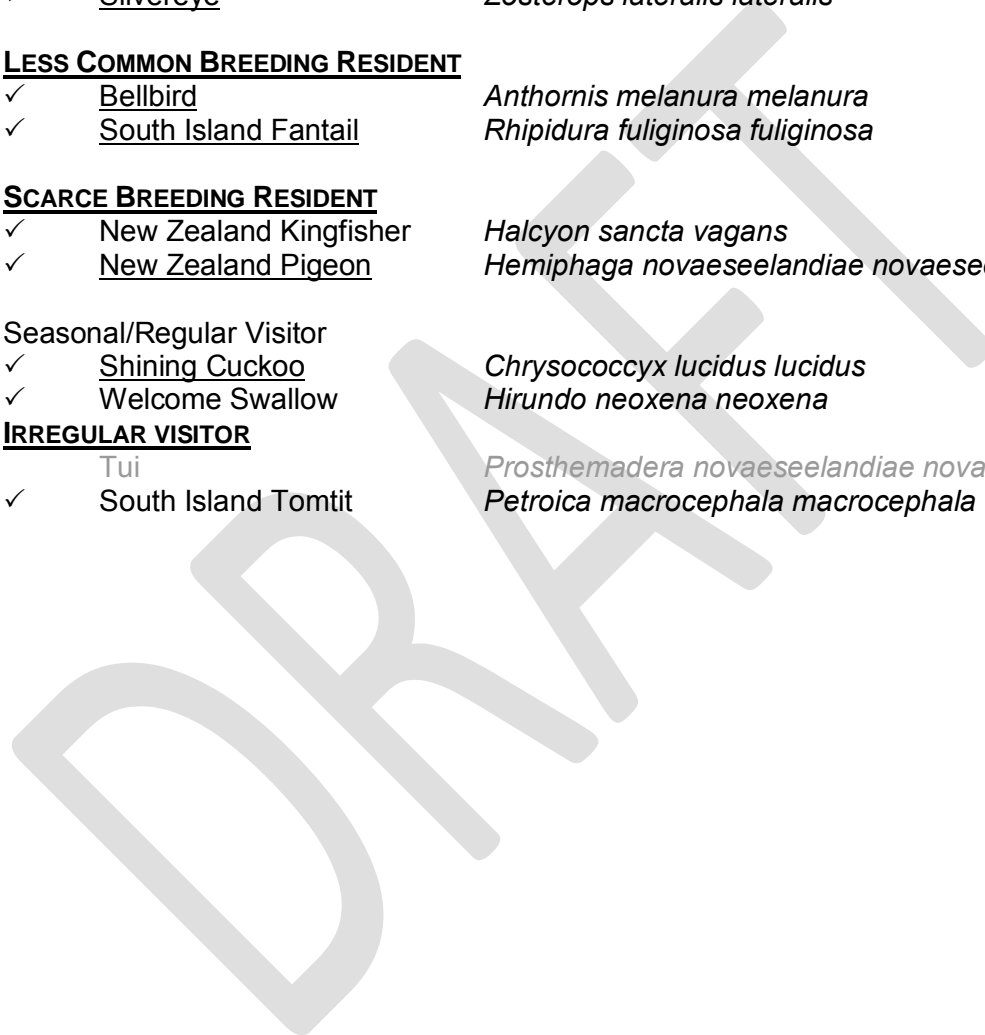
- |                                 |  |
|---------------------------------|--|
| ✓ <u>New Zealand Kingfisher</u> | <i>Halcyon sancta vagans</i>                     |
| ✓ <u>New Zealand Pigeon</u>     | <i>Hemiphaga novaeseelandiae novaeseelandiae</i> |

### Seasonal/Regular Visitor

- |                          |                                     |
|--------------------------|-------------------------------------|
| ✓ <u>Shining Cuckoo</u>  | <i>Chrysococcyx lucidus lucidus</i> |
| ✓ <u>Welcome Swallow</u> | <i>Hirundo neoxena neoxena</i>      |

### **IRREGULAR VISITOR**

- |                              |  |
|------------------------------|--|
| Tui                          | <i>Prosthemadera novaeseelandiae novaeseelandiae</i> |
| ✓ <u>South Island Tomtit</u> | <i>Petroica macrocephala macrocephala</i>            |





### Appendix 3: Bush Bird Monitoring

#### Bush Bird Monitoring Programme Riccarton Bush (TRIM 13/187988)

**Table 1:** Bush bird monitoring at Riccarton Bush 2004 – 2005; Observers A. Crossland & J, Moore.  
Transect length 810 m

Species	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Welcome Swallow	0	0	0	0	0	0	2	0	0	0	0	0
Grey Warbler	2	3	6	5	9	6	7	4	2	3	3	7
Fantail	10	6	6	5	4	4	3	3	6	4	10	12
Silvereye	35	10	54	14	41	18	37	44	37	11	65	43
Bellbird	0	0	0	1	1	1	0	0	0	0	1	0
Kereru	1	0	0	0	0	0	0	0	0	2	0	0
Chaffinch	2	1	4	3	10	7	8	4	6	8	5	1
Greenfinch	3	0	0	0	2	1	1	17	3	4	6	2
Goldfinch	4	0	0	0	0	1	1	1	1	0	2	0
Redpoll	3	4	3	0	1	3	1	16	6	7	10	0
House Sparrow	2	0	0	1	2	1	6	0	0	0	0	0
Dunnock	5	5	5	6	11	7	8	9	5	8	9	7
Blackbird	17	17	15	10	11	17	15	18	10	7	9	16
Song Thrush	3	5	8	7	2	3	7	2	3	3	4	2
Starling	13	78	12	0	2	2	12	4	0	0	0	4
Magpie	0	1	0	0	0	0	0	0	0	0	0	0

**Table 2:** Bush bird monitoring at Riccarton Bush 2008 – 2009; Observers A. Crossland & J, Moore.  
Transect length 810 m.

Species	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb
Grey Warbler	5	9	9	12	14	8	7	8	10	5	3	5
Fantail	7	9	13	6	4	5	9	7	13	12	5	10
Silvereye	56	18	21	26	47	32	41	35	29	29	59	20
Bellbird	2	2	2	2	1	2	4	2	2	1	2	1
Kereru	3	0	1	1	1	1	0	0	0	1	2	0
Rock Pigeon	0	0	0	0	0	0	0	0	0	1	0	0
Chaffinch	1	1	4	2	1	6	8	5	6	3	3	2
Greenfinch	0	0	1	0	0	4	14	19	23	28	20	4
Goldfinch	0	1	0	1	2	2	2	1	6	5	0	1
Redpoll	1	0	0	0	0	2	25	19	30	26	7	0
House Sparrow	2	3	1	3	4	4	0	1	2	2	4	0
Dunnock	2	8	7	6	5	5	4	6	9	7	4	3
Blackbird	16	16	16	12	9	13	9	10	0	12	14	4
Song Thrush	3	5	5	2	1	3	7	8	0	4	3	2
Starling	51	1	3	9	11	0	3	2	1	1	9	5
Magpie	0	0	0	1	1	1	1	0	1	1	0	0
California Quail	0	0	0	0	1	0	1	0	0	0	0	0

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Brooklands Lagoon

**Site number:** SES/LP/5

#### Summary of Significance:

The Brooklands Lagoon SES is an originally rare ecosystem that contains indigenous vegetation communities that have been greatly reduced within the Low Plains Ecological District, and is also of local, national and international importance in terms of it supporting a representative assemblage of indigenous and migratory birdlife, including 20 threatened, at-risk or uncommon species.

#### Site Map



### **Additional Site Information**

**Central point NZTM:** N5193870, E1576221

**Area of SES (ha):** 293.82ha

### **Site Description**

Brooklands Lagoon and its surrounding associated features comprise a mosaic of coastal environments, ecological units and vegetation types including extensive mudflats, salt marsh, and turf saltmeadow on riparian terraces, freshwater wetlands, a constructed tidal wetland, low dunes, remnant shrubland and planted coastal bush.

### **Extent of Site of Ecological Significance**

The Brooklands Lagoon SES extends from the mouth of the Waimakariri River in the north, to Heyders Road (Spencerville) in the south. The width of the SES varies along its length as defined by the base of the stable sand dunes along the eastern side (i.e. where the lagoon environment has more influence over the ecological values than does the coastal environment), and by the extent of indigenous plant communities along the western site, including the constructed Beacon Street tidal wetland.

### **Assessment Summary**

The Brooklands Lagoon Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 & 2), rarity/distinctiveness (criteria 3, 4 & 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 9 & 10).

### **Assessment against Significance Criteria**

#### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.



The Brooklands Lagoon SES comprises a continuous area of mostly undisturbed salt marsh vegetation, and most of the expected Canterbury salt marsh plants were recorded in a survey by Worner and Partridge (2008) (Refer also Appendix 1). Both the extent and native flora of Brooklands Lagoon are considered superior to that of the Avon Heathcote Estuary (Ibid).

Brooklands Lagoon hosts a typical association of indigenous snails, shellfish, worms, crustacean and other taxa recorded by ECan (2012) that are restricted to the estuarine environment, including:

<i>Austrovenus stutchburyi</i>	cockle
<i>Arithritica bifurca</i>	
<i>Mactra ovata</i>	soft shelled bivalve
<i>Paphies spp.</i>	pipi and tuatua
<i>Amphibola crenata</i>	mudflat snail
<i>Potamopyrgus estuarinus</i>	
<i>Capitellid spp.</i>	worm
<i>Nicon aestuariensis</i>	worm
<i>Scolecopides benhami</i>	worm
<i>Scolelepis spp.</i>	worm
<i>Oligochaetes</i>	worm
<i>Paracorophium spp.</i>	speckled hopper
<i>Halicarinus varius</i>	pill-box crab
<i>Helice crassa</i>	mud crab
<i>Macrophthalmus hirtipes</i>	stalk-eyed mud crab
<i>Elminius modestus</i>	barnacle
<i>Nemertine</i>	ribbon worm

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion. The Brooklands Lagoon wetland complex (comprising the lagoon proper, Brooklands Spit, inland saltmarsh and dune environments on the lagoon's western margin, the lower Styx ponding area, Styx rivermouth marshes, Kainga Road saltmeadow, Waimakariri Rivermouth and the Kaiapoi Oxidation Ponds) comprises one of the largest coastal wetland complexes in Canterbury (Crossland 2008). Brooklands Lagoon is the second largest of the two estuaries within Christchurch City. In terms of nesting habitat for wetland birds, Brooklands Lagoon is also the 4<sup>th</sup> most extensive area for nesting after Lake Ellesmere, the Ashley-Saltwater Creek Estuary, and Lake Ki-Wainono in the Low Plains Ecological District (Crossland 2004).

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The site contains wetland vegetation that has been reduced to less than 20% of its former extent in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover



remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site supports 20 bird species listed as threatened under the Department of Conservation threat classifications system (Robertson *et al.* 2013) as listed by Crossland (2013), including:

*Threatened/Nationally Critical*

- |                     |                                       |
|---------------------|---------------------------------------|
| • Grey Duck         | <i>Anas superciliosa superciliosa</i> |
| • White Heron       | <i>Ardea modesta</i>                  |
| • Black-billed Gull | <i>Larus bulleri</i>                  |

*Threatened/Nationally Endangered*

- |                        |                               |
|------------------------|-------------------------------|
| • Australasian Bittern | <i>Botaurus poiciloptilus</i> |
| • Black Fronted Tern   | <i>Sterna albostrata</i>      |

*Threatened/Nationally Vulnerable*

- |                         |   |
|-------------------------|---|
| • Pied Cormorant        | <i>Phalacrocorax v. varius</i>          |
| • Banded Dotterel       | <i>Charadrius obscurus</i>              |
| • Wrybill               | <i>Anarhynchus frontalis</i>            |
| • Red-billed Gull       | <i>Larus novaehollandiae scopulinus</i> |
| • Caspian Tern          | <i>Hydroprogne caspia</i>               |
| • White-flipped Penguin | <i>Eudyptula minor albosignata</i>      |
| • Red Knot              | <i>Calidris canutus rogersi</i>         |

*At Risk/Declining*

- |                                   |                                 |
|-----------------------------------|---------------------------------|
| • South Island Pied Oystercatcher | <i>Haematopus finschi</i>       |
| • Pied Stilt                      | <i>Himantopus leucocephalus</i> |
| • White Fronted Tern              | <i>Sterna striata striata</i>   |
| • Eastern Bar-tailed Godwit       | <i>Limosa lapponica baueri</i>  |

*At Risk/Relic*

- |               |                                |
|---------------|--------------------------------|
| • Marsh Crane | <i>Porzana pusilla affinis</i> |
|---------------|--------------------------------|

*At Risk/Naturally Uncommon*

- |                          |  |
|--------------------------|--|
| • Black Cormorant        | <i>Phalacrocorax carbo novaehollandiae</i> |
| • Little Black Cormorant | <i>Phalacrocorax sulcirostris</i>          |
| • Royal Spoonbill        | <i>Platalea regia</i>                      |

The site supports two threatened plant species (See Worner and Partridge 2008; de Lange *et al.* 2012):

- |               |                       |                            |
|---------------|-----------------------|----------------------------|
| • Shore sedge | <i>Carex litorosa</i> | At Risk/Declining          |
| • Native musk | <i>Mimulus repens</i> | At Risk/Naturally Uncommon |



5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. ***Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

The site is significant under this criterion.

Estuaries are listed by Williams *et al.* (2007) as historically rare ecosystems, and as such the associations of indigenous species that occur within Brooklands Lagoon are significant under this criterion.

### Diversity and Pattern

7. ***Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

The Brooklands Lagoon complex is made up of a range of micro-habitats, including inter-tidal mudflats, back-shore salt meadow and coastal shrubland (Crossland 2004).

In terms of its avifauna community, since the 1850s 106 species of bird have been recorded using Brooklands Lagoon, comprising 44 resident species, 24 seasonal visitors, 30 vagrants, and eight species which are now locally extinct. 55 of these species are indigenous species and still occur in and around the site (Crossland 2013). In terms of species richness, the Brooklands area probably has the fifth highest ranking in Canterbury behind Lake Ellesmere, the Avon-Heathcote Estuary/Bromley Oxidation Ponds, Lake Ki-Wainono and Ashley-Saltwater Creek Estuary. With 100 bird species recorded, Brooklands Lagoon has a comparable or higher species list than most other New Zealand estuarine systems. 70 species are classified as wetland/coastal birds, and numbers peak at >6000 in the late summer/autumn (Crossland 2008).

44 bird species occur year-round on Brooklands Lagoon, with 37 species breeding locally (Crossland 2008).



## Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Site not assessed under this criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

The site is significant under this criterion.

The extensive mudflats support an abundant and diverse invertebrate community which forms much of the food source for a wide variety of fish species, as well as resident and migratory waterfowl (Cromarty and Scott 1996).

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

The site is significant under this criterion.

The Brooklands Lagoon wetland complex is an important wintering site and migration stop for wetland/coastal birdlife that breed on the Waimakariri Riverbed as well as in other parts of Canterbury and the eastern South Island. Brooklands is also an important breeding ground in its own right.

The saltmarshes along the inside of the spit comprise good breeding habitat, especially for swampbirds (Pukeko, Bittern, Marsh Crake), waterfowl (Black Swan, Mallard, Grey Duck, NZ Shoveler), Harrier and Pied Stilt (Crossland 2008).

Mudflat habitats found within Brooklands Lagoon and along the banks of the lower Waimakariri River are important feeding grounds and low tide loafing areas for herons, spoonbills, waders, gulls and waterfowl. Mudflat and saltmarsh habitats along the inner (western) side of the spit comprise important feeding habitats for White-faced Heron, Australasian Bittern, Royal Spoonbill, Pied Stilt, South Island Pied Oystercatcher, Bar-tailed Godwit, Black-backed Gull, Caspian Tern, Black Swan, Canada Goose, Paradise Shelduck, Mallard, Grey Teal, NZ Shoveler, Pukeko, Marsh Crake and NZ Kingfisher (Crossland 2008).



The following 24 indigenous wetland/coastal bird species use Brooklands Lagoon and its environs in numbers of national (N), regional (R) or local (L) significance, where significance is defined by Crossland (2008) as >5% of local and/or regional populations, or > 1% of national populations, based on monitoring data and estimates for local, regional and national populations for each species.

- New Zealand Shoveler N
- Grey Teal N
- New Zealand Scaup N
- South Island Pied Oystercatcher R
- Bar-tailed Godwit R
- Pied Stilt R
- Paradise Shelduck R
- Pied Cormorant R
- White-faced Heron R
- Royal Spoonbill R
- Caspian Tern R
- White-fronted Tern R
- Black-fronted Tern R
- Black-billed Gull R
- New Zealand Kingfisher R
- Variable Oystercatcher L
- Banded Dotterel L
- Black Swan L
- Black Cormorant L
- Little Cormorant L
- Spotted Shag L
- Pukeko L
- Red-billed Gull L
- Black-backed Gull L



## Site Management

### Existing Protection Status

- Site is wholly contained within a CCC reserve

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>• Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor pest plant infestations and implement control as required.</li> <li>• Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Animal pest incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring of possible animal pest incursions and trapping as necessary</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Damage to vegetation and mudflats by vehicles, motorbikes and quad-bikes</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to restrict vehicles to official vehicles only.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Unknown future disturbances from surrounding new land uses</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure any future developments do not compromise the ecological functioning of the Horseshoe Lake ecosystem</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Loss of safe high-tide roosting sites</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain condition of Beacon Street wetland as a roosting habitat (ie; keep weeds down, maintain bare substrate surface).</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Disturbance of birds by humans and dogs.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure levels of human disturbance are minimised, for example by erecting temporary fencing and signage around nest sites.</li> <li>• Ensure that dogs are under control or on a leash.</li> <li>• Limit areal extent (and potentially phase out) waterfowl hunting on the lagoon and saltmarshes.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>

	<ul style="list-style-type: none"> <li>Prohibit hunting of non-game regulated bird species (like Canada Goose) outside of the prescribed duck-shooting season.</li> </ul>	
<ul style="list-style-type: none"> <li>Gamebird hunting disturbing non-target waterfowl.</li> </ul>	<ul style="list-style-type: none"> <li>Consider identifying sensitive locations where hunting is best prohibited and appropriate locations for gamebird hunting. This is considered to be particularly important now that Canada geese can be hunted year round. The hunting window now extends through the breeding season, the moulting season and the period of peak occupancy of non-target indigenous bird species (including threatened and at risk species).</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Natural process of change in wetland ecology and function</li> </ul>	<ul style="list-style-type: none"> <li>If natural changes in wetland ecology, composition or functioning are determined to be detrimental to the ongoing viability of the values of the site, a recovery action plan should be initiated.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

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**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 9<sup>th</sup> September 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 9<sup>th</sup> September 2014

**Statement updated by:** XXX  
**Date:** XXX

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*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



## Appendix 1: Indigenous Salt Marsh Flora

List of native flora recorded within the Brooklands Lagoon salt marsh areas by Worner and Partridge (2008)

### TREES & SHRUBS

#### BOTANICAL NAME

*Leptospermum scoparium*  
*Plagianthus divaricatus*

#### COMMON NAME(S)

manuka  
saltmarsh ribbonwood

### MONOCOT HERBS

*Apodasmia similis*  
*Bolboschoenus caldwellii*  
*Carex litorosa*  
*Eleocharis acuta*  
*Juncus caespiticus*  
*Juncus kraussii* var. *australiensis*  
*Juncus pallidus*  
*Phormium tenax*  
*Puccinellia stricta*  
*Schoenoplectus pungens*  
*Schoenus concinnus*  
*Triglochin striatum*  
*Typha orientalis*  
*Zostera capricorni*

oioi  
grassy club sedge  
shore sedge  
spike sedge  
grass-leaved rush  
sea rush  
giant rush  
harakeke, swamp flax  
salt grass  
three-square  
dwarf cushion sedge  
arrow grass  
raupo  
eel grass

### DICOT HERBS

*Apium prostratum*  
*Chenopodium glaucum*  
*Cotula coronopifolia*  
*Leptinella dioica*  
*Mimulus repens*  
*Samolus repens*  
*Sarcocornia quinqueflora*  
*Selliera radicans*  
*Senecio glomeratus*  
*Spergularia media*  
*Suaeda novaezelandiae*

NZ celery  
glaucous goosefoot  
bachelor's button  
turf daisy  
native musk  
sea primrose  
glasswort  
remuremu  
fireweed  
sea spurrey  
sea blite



## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Christchurch Coastal Strip

**Site number:** SES/LP/6

#### **Summary of Significance:**

The Christchurch Coastal Strip SES supports both remnant and planted indigenous plant communities that are representative of the Low Plains Ecological District, and supports several species of flora and fauna that are either nationally threatened, at risk or uncommon.

#### **Site Map (Refer Appendix 1)**





## Additional Site Information

Central point NZTM: N5190679, E1576722

Area of SES (ha): 387.21ha

## Site Description

The site is composed of the beach, coastal dune and back-swamp systems containing a mosaic of remnant native plant and animal populations, significant areas of fore and rear-dune re-vegetation using locally sourced indigenous plant species, and roosting and nesting sites for threatened native bird species.

## Extent of Site of Ecological Significance

The SES spans a distance of approximately 19 km from the Mouth of the Waimakariri River to the tip of the South Shore spit. The SES varies in width across this length as dictated primarily by the width of dune system, and also by the location of discretely significant areas within the SES (e.g. natural and/or constructed back-dune wetlands and ponds, remnant and significant planted indigenous coastal plant communities). Maps showing the extent of the Christchurch Coastal Strip SES are included as Appendix 1.

## Assessment Summary

The Christchurch Coastal Strip SES has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 5), and ecological context criterion (criteria 8).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***



The site is significant under this criterion.

The site contains some of the last remaining degraded examples of habitat of indigenous fauna that are representative and typical of the natural diversity of this part of the Canterbury coastline within the Low Plains Ecological District.

North of Heyders Road, remnant akeake (*Dodonaea viscosa*), tauhinu (*Cassinia leptophylla*), NZ flax/harakeke (*Phormium tenax*) are conspicuous along the dunes, with manuka (*Leptospermum scoparium*) and marsh ribbonwood (*Plagianthus divaricata*) along the western edge of the dunes. Near the end of the Brooklands Lagoon spit ngaio (*Myoporum laeum*) seedlings are now regenerating in the vicinity of the last remaining ngaio tree that recently died.

Native coastal forest and shrub-land restoration plantings dating from the early 1990s to present are scattered along the coastal dune (including back dunes) from the mouth of the Waimakariri River in the north to just south of the Spencer Park Surf Lifesaving Club.

From the end of Aston Drive south to the end of the South Shore spit, locally sourced native coastal forest restoration plantings that are representative of the natural diversity of the Canterbury coast within the Low Plains Ecological District are now starting to dominate the back-dune systems throughout much of this length. These plantings are typified by semi-mature dense plantings with full canopy closure (e.g. opposite Thompson Park, Mountbatten Street, Beatty Street, the south end of the spit and numerous other smaller pockets), connected by more sparse plantings and natural regeneration within a matrix of introduced marram grass. Vascular plant species identified during a rapid survey of this site by the Project Ecologist in July 2014 are listed in Appendix 2.

On the foredunes, at least 11 areas of local native sand binders that are representative of the natural diversity of the Canterbury coast within the Low Plains Ecological District have been established and have formed dense swards. These are listed in Appendix 3 and were ground-truthed by the Project Ecologist and the CCC Senior Coastal Ranger in June 2014, and subsequently measured by Coastal Ranger team in July 2014 to provide respective area coverage of each site.

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

Pingao (*Ficinia spiralis*) dominated restoration plantings along the fore-dune between Heyders Road and the Spencer Park Surf Lifesaving Club are likely to represent the largest area of native dominated fore-dune vegetation in the Low Plains Ecological District<sup>1</sup>.

Spinifex (*Spinifex sericeus*) plantings along the fore-dune south of New Brighton are likely to represent the largest area of spinifex fore-dune vegetation in the Low Plains Ecological District<sup>1</sup>.

<sup>1</sup> Discussion with Jason Roberts, Senior Ranger – Field Delivery, Coastal & Plains Ranger Team, Christchurch City Council, 11<sup>th</sup> July, 2014.





### Rarity/Distinctiveness

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The site is significant under this criterion. Lloyd *et al.* (2013) identify that “any indigenous vegetation on the Canterbury Plains” meet this Rarity/Distinctiveness criterion. Coastal vegetation has been reduced to less than 20% of its former extent in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site contains the threatened red katipo spider (*Latrodectus katipo*) (Patrick 2002).

The site supports a foredune specialist moth (*Agrotis ceropachoides*) which is described by Patrick (2013) as being uncommon in the Low Plains Ecological District

Large areas of pingao (*Ficinia spiralis*) planting have been established on the fore-dunes between the end of Heyders Road and the Spencer Park Surf Lifesaving Club, and elsewhere throughout the SES (Refer Appendix 3). Pingao is listed as At Risk/Declining under the Department of Conservation Threat Classification System (de Lange *et al.* 2012).



A number of other threatened species have been recorded from the coastal strip between the mouth of the Waimakariri River and the South Shore spit as identified by McCombs (2003), including:

Common Name	Botanical Name	Threat Status
Sand fescue	<i>Poa billardierei</i>	At Risk/Declining
Sea sedge	<i>Carex litorosa</i>	At Risk/Declining
Milkweed	<i>Euphorbia glauca</i>	At Risk/Declining

Occurrences of these species were subsequently confirmed during field visits with the CCC's Senior Field Delivery Coastal Ranger (See also Appendix 3).

The site contains populations of common skink (*Oligosoma polychroma*) and McCanns skink (*O. maccanni*) throughout the length of SES<sup>2</sup>. Although Hitchmough *et al.* (2013) list both species as Not Threatened under the NZ Threat Classification System, the common skink is a cryptic species complex, and this classification refers to one described clade only (*O. polychroma* Clade 1). Of the four un-described clades, Clade 4 and Clade 5 occur in the Low Plains Ecological District (see Liggins *et al.* 2008), and are both described by Hitchmough *et al.* (2013) as being At Risk, where their total area of occupancy is estimated to be in excess of 10,000 ha, but with a predicted decline of 10-70% across their range. Common skinks were sighted by the Project Ecologist in several locations along the coastal strip in July 2014.

Threatened/Nationally Vulnerable (D1/1) (Robertson *et al.* 2012) Banded Dotterel (*Charadrius bicinctus bicinctus*) regularly nest above the high-tide line towards the northern end of Brooklands Lagoon spit.

At Risk/Declining (B1/1) (Robertson *et al.* 2012) White-fronted Tern (*Sterna striata striata*) regularly roost along the New Brighton foreshore approximately 150 m north of the pier (regularly 80 birds), and approximately 50 m north of the end of Bowhill Road (regularly 40 birds) (Roberts *pers comms*)<sup>2</sup>.

A Threatened/Nationally Vulnerable species (Robertson *et al.* 2012) White-flipped Penguins (*Eudyptula minor albosignata*) are known to nest in the sand dunes at four active sites (Roberts *pers comms*)<sup>2</sup>. Accordingly, the penguin louse (*Austragoniodes waterstoni*) also occurs on and is endemic to these penguins (Refer Pawson and Emberson 2000) and therefore shares at least the same, if not heightened threat status of the White-flipped Penguins.

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

The dune system along the Christchurch coastline is the southern limit for spinifex (*Spinifex sericeus*), where the last known natural plant was recorded in 1944 (Bergin 2011). However this species has been reintroduced to a number of locations within the SES. Note that populations of Spinifex established at Taylors Mistake and at Okains Bay on Banks Peninsula are considered to be outside the historic natural range for this species.

<sup>2</sup> Discussion with Jason Roberts, Senior Ranger – Field Delivery, Coastal & Plains Ranger Team, Christchurch City Council, 11<sup>th</sup> July, 2014.



6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Site not assessed under this criterion

### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Site not assessed under this criterion

### Ecological Context

8. ***Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion. The SES represents a continuous linear ecological corridor with a high degree of functional connectivity between Brooklands Lagoon and the Avon Heathcote Estuary. Established coastal native forest restoration areas throughout the SES are also likely to provide functional connectivity for native bush bird species moving from the Port Hills north along the coast to (e.g.) Bottle Lake Forest, Styx River reserves etc. Evidence for this functional connectivity includes an increased incidence of Bellbirds and NZ Wood Pigeon along the coastal strip.

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet this criterion

10. ***Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

Brooklands Spit has an important role as a high tide roosting site for birds which forage along the adjacent coastline and within Brooklands Lagoon. At the Waimakariri Rivermouth and on the ocean beach, the foreshore is utilized as an important roosting area by many species, including Pied Cormorant, Spotted Shag, South Island Pied Oystercatcher, Variable Oystercatcher, Banded Dotterel, Bar-tailed Godwit, Black-backed Gull, Red-billed Gull, Black-billed Gull, Caspian Tern, White-fronted Tern and Black-fronted Tern (Crossland 2008).

## Site Management

### Existing Protection Status

- Coastal Conservation Area
- Department of Conservation

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>• Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor pest plant infestations and implement control as required.</li> <li>• Assess new pest plant incursions and implement control as required</li> </ul>	
<ul style="list-style-type: none"> <li>• Impact of recreation activities including horses, pedestrians and 4WD vehicles on dunes</li> </ul>	<ul style="list-style-type: none"> <li>• Fencing</li> <li>• Interpretation highlighting risks to biodiversity values</li> </ul>	
<ul style="list-style-type: none"> <li>• Fire</li> </ul>	<ul style="list-style-type: none"> <li>• Prohibition of open fires</li> <li>• Regular patrols during summer months</li> <li>• Interpretation highlighting risks of fire to biodiversity values</li> <li>• Discourage the use of fire-promoting plant species on the dune system to reduce the likelihood of fires establishing and causing greater damage.</li> </ul>	Fire extinguishers provided to surf club
<ul style="list-style-type: none"> <li>• Coastal erosion (including tsunami)</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage the planting of native foredune sand binders spinifex and pingao that reduce storm surge damage effects on the dune system</li> <li>• Ongoing revegetation to create wider &amp; more robust dune system</li> </ul>	

<ul style="list-style-type: none"> <li>• Inappropriate land use in a dune-land environment</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure that any changes to dune functioning do not compromise ecology of the system</li> <li>• Require proposals to commission biodiversity inventory</li> <li>• Ensure no net loss in biodiversity values</li> </ul>	
<ul style="list-style-type: none"> <li>• Animal pest incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring of possible animal pest incursions in penguin and wader breeding and wader/tern/gull/cormorant/shag roosting areas and trapping as necessary</li> <li>• Trap for incursions by feral cats, ferrets, stoats and other wild mammalian predators</li> </ul>	
<ul style="list-style-type: none"> <li>• Disturbance to wildlife from dogs</li> </ul>	<ul style="list-style-type: none"> <li>• Prohibit dogs within nesting and roosting areas</li> <li>• Interpretation highlighting the impacts dogs can have on wildlife values</li> </ul>	



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**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 14<sup>th</sup> January 2015

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 14<sup>th</sup> January 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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**Appendix 1 Site Maps:**

**Christchurch Coastal Strip Area 1: Brooklands Lagoon Spit**



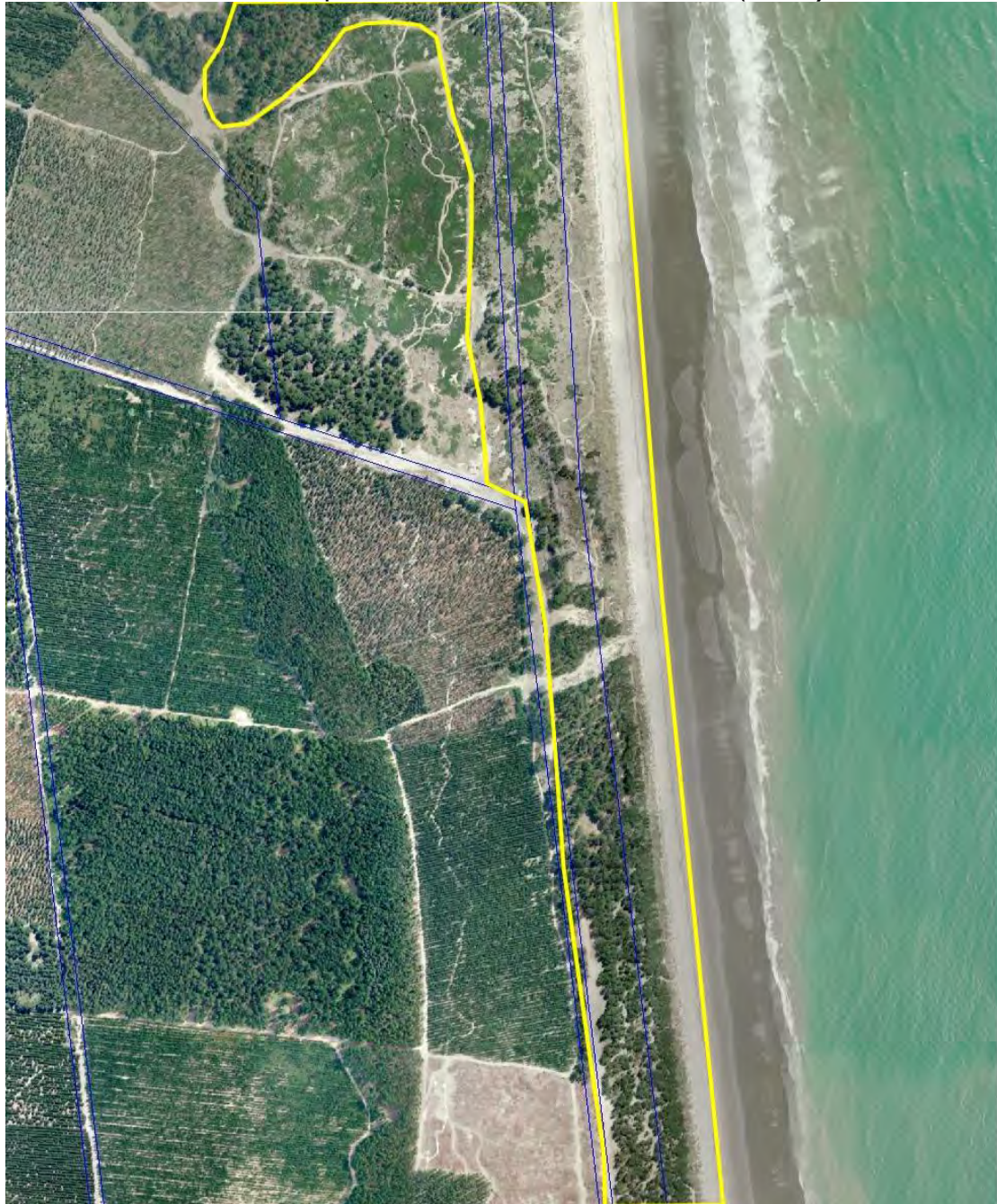




Christchurch Coastal Strip Area 2: Spencer Park Beach



Christchurch Coastal Strip Area 3: Bottle Lake Plantation (North)





Christchurch Coastal Strip Area 4: Bottle Lake Plantation (Central)



Christchurch Coastal Strip Area 5: Bottle Lake Plantation (South)





Christchurch Coastal Strip Area 6: Waimairi Beach





Christchurch Coastal Strip Area 8: New Brighton



Christchurch Coastal Strip Area 9: South New Brighton







Christchurch Coastal Strip Area 10: South Shore



Christchurch Coastal Strip Area 11: South shore Spit





## APPENDIX 2: Indigenous Vascular Forest and Shrub Species

List of native vascular forest and shrub-land species occurring on the coastal strip between Aston Drive and the South Shore spit recorded by the Project Ecologist in September 2014

<i>Austroderia richardii</i>	toetoe
<i>Carmichaelia robusta</i>	broom
<i>Cassinia leptophylla</i>	tahinu
<i>Coprosma acerosa</i>	sand coprosma
<i>Coprosma repens</i>	taupata
<i>Coprosma robusta</i>	karamu
<i>Cordyline australis</i>	cabage tree
<i>Corynocarpus laevigatus</i>	karaka
<i>Dodonaea viscosa</i>	akeake
<i>Griselinia littoralis</i>	broadleaf
<i>Hebe salicifolia</i>	korimiko
<i>Hebe stritssima</i>	hebe
<i>Hoheria angustifolia</i>	houhere
<i>Leptospermum scoparium</i>	manuka
<i>Muehlenbeckia astonii</i>	shrubby pohuehue
<i>Muehlenbeckia complexa</i>	pohuehue
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	matipo
<i>Olearia paniculata</i>	golden akeake
<i>Phormium tenax</i>	NZ flax
<i>Pittosporum eugenioides</i>	lemonwood
<i>Pittosporum tenuifolium</i>	kohuhu
<i>Plagianthus divaricatus</i>	marsh ribbonwood
<i>Plagianthus regius</i>	lowland ribbonwood
<i>Poa cita</i>	silver tussock
<i>Podocarpus totara</i>	totara
<i>Pseudopanax arboreus</i>	fivefinger



### APPENDIX 3: Fore-dune Restoration Sites

Fore-dune restoration sites along the Christchurch coastline between Heyders Road (Spencerville) to the South Shore spit (sites listed from north to south) recorded by the Project Ecologist in September 2014.

- 1) **Heyders Road to Spencer Park Surf Club**  
Spinifex (*Spinifex sericeus*)  
Pingao (*Ficinia spiralis*)  
Milk weed (*Euphorbia glauca*)  
Sea Sedge (*Carex litorosa*)  
Pohuehue (*Muehlenbeckia complexa*)  
Sand coprosma (*Coprosma acerosa*)
- 2) **End of 20<sup>th</sup> Avenue (Bottle Lake Plantation)**  
Spinifex (*Spinifex sericeus*)
- 3) **End of Flemming Street:**  
Sea Sedge (*Carex litorosa*)
- 4) **Between Cygnet Sreett & Leaver Terrace**  
Spinifex (*Spinifex sericeus*)  
Pingao (*Ficinia spiralis*)  
Milk weed (*Euphorbia glauca*)
- 5) **Bowhill Road to New Brighton Car Park**  
Pingao (*Ficinia spiralis*)  
Spinifex (*Spinifex sericeus*)
- 6) **Car Park South of Pier**  
Spinifex (*Spinifex sericeus*)  
Pingao (*Ficinia spiralis*)  
Milk weed (*Euphorbia glauca*)  
Sand coprosma (*Coprosma acerosa*)
- 7) **Between Bridge Street & Sturdee Street**  
Spinifex (*Spinifex sericeus*)
- 8) **End of Beatty Street**  
Spinifex (*Spinifex sericeus*)
- 9) **End of Caspian Street**  
Spinifex (*Spinifex sericeus*)
- 10) **Opposite end of Rockinghorse Road**  
Spinifex (*Spinifex sericeus*)
- 11) **End of South Shore Spit**  
Pingao (*Ficinia spiralis*)



#### **APPENDIX 4: *Euxoa ceropachoides***

Email correspondence

Hi Antony

Hope you are enjoying your adventure in Borneo. I envy you!

Please add the noctuid moth to Spencerville Dunes; *Euxoa ceropachoides* – used to be on DoC's threatened list as Data deficient, but I studied and moved off list. It is distributed from Marlborough to Kaitorete Spit, on dunes and has a flightless female that limits dispersal ability. It is an indigenous species of some significance that has managed to survive modification of our dunelands. Adults fly from July to September – a rather unusual flight period.

Cheers  
Brian

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**Brian Patrick** Senior Ecologist

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314

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Wellington, Christchurch, Dunedin

***Providing outstanding ecological services to sustain and improve our  
environments***

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Roto Kohatu Lakes  
**Site number:** SES/LP/7  
**Physical address of site:** 550 Sawyers Arms Road  
Harewood  
Christchurch 8051

#### Summary of Significance:

The Roto Kohatu Lakes SES provides breeding habitat and/or resources for a representative assemblage of indigenous bird species including two threatened species.

#### Site Map



### **Additional Site Information**

**Central point NZTM:** N5187686, E1565588

**Area of SES (ha):** 18.20 ha

### **Site Description**

The Roto Kohatu lakes SES consists of two former commercial shingle pits that were re-profiled and landscaped in the late 1990s-early 2000's. The September 4, 2010 earthquake caused bank slumping on the northern pond which resulted in a number of exotic trees being displaced approximately 10 – 15 m out from the shoreline, resulting in a valuable mammalian predator-free breeding/roosting habitat. These lakes and immediately surrounding areas are considered ecologically important in terms of their provision of core feeding and breeding habitat for indigenous wetland birds including threatened species, and are also an important stepping stone for bird migration along the Waimakariri River flyway.

### **Extent of Site of Ecological Significance**

The extent of the Roto Kohatu Lakes SES (refer map) includes the area of the open water-bodies, extending to include the area covered by the drip-line of the willows and other trees along the lake edges, and the areas of managed amenity turf at the eastern end of the lakes and boat ramp areas which are used as valuable roosting areas by waterbirds.

### **Assessment Summary**

The Roto Kohatu Lakes SES has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1) rarity/distinctiveness (criterion 4), and ecological context criteria (criteria 8 & 10).

### **Assessment against Significance Criteria**

#### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.



This site supports a high proportion of an association of indigenous bird species that are representative of “freshwater lakes and ponds species assemblages” for the Low Plains Ecological District. (Refer Crossland 2011; Crossland 2014b; Appendix 1).

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

Does not meet criterion

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

Does not meet criterion

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

This site serves as a feeding and breeding habitat for the Threatened/Nationally Vulnerable Southern Crested Grebe (*Podiceps cristatus australis*) (Robertson *et al.* 2013). This species is resident year-round with 2-8 birds usually present, comprising 1 breeding pair and immature birds (Appendix 2). This site also supports the nationally critical (Robertson *et al.* 2013) Black-billed Gull (*Larus bulleri*) as a regular seasonal visitor (Refer Crossland 2011; Crossland 2014b; Appendix 1 & 2).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

Does not meet criterion





## Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet criterion

## Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

The site is significant under this criterion.

Roto Kohatu Lakes area an important 'stepping stone' site in the migration routes of wetland birds moving along the Waimakariri Flyway between the upper Waimakariri catchment and the large coastal wetlands of eastern Christchurch. There is considerable bird traffic through the NW Christchurch area, including this site. Bird population data, including data documenting rapid turnover of birds at this site is given in Appendix 2). This site is a core site in a cluster of ponds and wetlands supporting indigenous wetland birds in NW Christchurch ((Refer Crossland 2011; Crossland 2014b; Appendix 1).

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

The site is significant under this criterion.

This site provides breeding and wintering habitat for indigenous waterbirds (Refer Crossland 2011; Crossland 2014b; Appendix 1)

## Site Management

### Existing Protection Status

- Site is wholly contained within a CCC reserve

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>• Disturbance to wildlife from motorised and non-motorised watercraft</li> </ul>	<ul style="list-style-type: none"> <li>• Designate no-go sanctuary zones.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Disturbance to Australasian Crested Grebe nesting from swimming and fishing</li> </ul>	<ul style="list-style-type: none"> <li>• Prohibit activities in these areas during nesting season.</li> <li>• Removal of constructed fishing platforms in vicinity of nesting areas</li> <li>• Ongoing restoration plantings in vicinity of nesting areas</li> <li>• SE and SW corners of the eastern lake are made permanent no-go zones because grebes and coots are present there year round and need safe areas on a permanent (not just breeding season) basis.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Removal of, or damage to, Australasian crested grebe nesting habitat</li> </ul>	<ul style="list-style-type: none"> <li>• Australasian crested grebes typically nest in or near willows. Maintaining this habitat is therefore important. Consider undertaking maintenance work in the on lake margins outside of the breeding season.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Disturbance to wildlife from humans and dogs</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure levels of human disturbance are minimised, for example by erecting temporary</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>

	<p>fencing and signage around nest sites.</p> <ul style="list-style-type: none"><li>• Ensure that dogs are under control or on a leash.</li></ul>	
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Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.

Crossland, A. (2011) *Lake Roto Kohatu Birdlife Assessment 2011*. Unpubl. report, Christchurch City Council, Christchurch, New Zealand. (TRIM Reference 11/69873).

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Crossland (2014b) *Lake Roto Kohatu bird monitoring 1996 to present. Unpublished Bird Monitoring Data*. (TRIM Reference 14/384850)

Robertson, H., Dowding, J., Elliott, G., Hitchmough, R., Miskelly, C. O'Donnell, C., Powlesland, R., Sagar, P., Scofield, P., Taylor, G. (2013) *Conservation status of New Zealand birds, 2012*. New Zealand Threat Classification Series 4, Departmentt of Conservation.

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 9th April 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 9th April 2014

**Statement updated by:**  
**Date:**

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



## Appendix 1: Wetland Bird Species

**Comparison of wetland bird species recorded in Lake Roto Kahatu compared to the Freshwater Lakes and Ponds Species Assemblage for Christchurch.** Species recorded at the study site are marked with a tick (✓); species considered to be breeding on site are underlined; species not recorded at site but part of the above assemblage are shown in grey font.

### COMMON RESIDENT

✓ Paradise Shelduck	<i>Tadorna variegata</i>
✓ Grey Teal	<i>Anas gracilis</i>
✓ New Zealand Shoveler	<i>Anas rhynchos</i>
✓ New Zealand Scaup	<i>Aythya novaeseelandiae</i>
✓ Pukeko	<i>Porphyrio porphyrio melanotus</i>
✓ Welcome Swallow	<i>Hirundo tahitica neoxena</i>

### LESS COMMON RESIDENT

✓ Black Cormorant	<i>Phalacrocorax carbo novaehollandiae</i>
✓ Little Cormorant	<i>Phalacrocorax melanoleucos brevirostris</i>
✓ White-faced Heron	<i>Ardea novaehollandiae novaehollandiae</i>
✓ Black Swan	<i>Cygnus atratus</i>
✓ Grey Duck	<i>Anas superciliosa superciliosa</i>
✓ Australasian Harrier	<i>Circus approximans</i>
✓ Australasian Coot	<i>Fulica atra australis</i>
Pied Stilt	<i>Himantopus himantopus leucocephalus</i>
✓ Spur-winged Plover	<i>Vanellus miles</i>
✓ New Zealand Kingfisher	<i>Halcyon sancta vagans</i>

### SCARCE RESIDENT

Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>
✓ Australasian Crested Grebe	<i>Podiceps cristatus australis</i>

### SEASONAL/REGULAR VISITOR

Australasian Bittern	<i>Botaurus poiciloptilus</i>
✓ Southern Black-backed Gull	<i>Larus dominicanus dominicanus</i>
✓ Red-billed Gull	<i>Larus novaehollandiae scopulinus</i>
✓ Black-billed Gull	<i>Larus bulleri</i>
Black-fronted Tern	<i>Sterna albobriata</i>
✓ New Zealand Pipit	<i>Anthus novaeseelandiae novaeseelandiae</i>

### IRREGULAR VISITOR

Australasian Little Grebe	<i>Tachybaptus novaehollandiae novaehollandiae</i>
White Heron	<i>Egretta alba modesta</i>
Cattle Egret	<i>Bubulcus ibis coromandus</i>
Royal Spoonbill	<i>Platalea regia</i>
Sth Isl Pied Oystercatcher	<i>Haematopus ostralegus finschi</i>
Banded Dotterel	<i>Charadrius bicinctus bicinctus</i>
Black-fronted Dotterel	<i>Charadrius melanops</i>
Caspian Tern	<i>Sterna caspia</i>

**Appendix 2: Bird Checklist**

**Bird Checklist for Lake Roto Kohatu (Crossland 2011)**

CHECKLIST to the BIRDS of LAKE ROTO KAHATU RESERVE

(1<sup>st</sup> update to February 2011)

Fifty bird species have been recorded at the Lake Roto Kahatu Reserve in recent times, including 30 native species. Some 28 species are classed as wetland birds in that they occur mainly in water, wetland or wet grassland environments. A further 22 species are non-wetland birds, occupying mainly woodland, grassland and open country environments.

**Table 1: Checklist to the Birds of the Lake Roto Kahatu Reserve**

Key Maximum numbers:	
****	over 500 (abundant)
***	over 200 (very common)
**	over 50 (common)
*	10 - 50 (less common)
#	< 10 (uncommon)
Status:	
R	= resident – present all year round
Rb	= resident and breeding
Rb?	= resident and suspected breeding
S	= seasonal or regular visitor
V	= vagrant or irregular visitor

**Wetland birds**

^ = denotes a native species

• <b>Australasian Little Grebe</b> <sup>^</sup> <i>Tachybaptus novaehollandiae</i>	V	#
• <b>Australasian Crested Grebe</b> <sup>^</sup> <i>Podiceps cristatus</i>	Rb	#
• <b>Black Cormorant</b> <sup>^</sup> <i>Phalacrocorax carbo</i>	S	#
• <b>Pied Cormorant</b> <sup>^</sup> <i>Phalacrocorax varius varius</i>	V	#
• <b>Little Cormorant</b> <sup>^</sup> <i>Phalacrocorax melanoleucos brevirostris</i>	S	#
• <b>White-faced Heron</b> <sup>^</sup> <i>Ardea novaehollandiae novaehollandiae</i>	S	#
• <b>Black Swan</b> <sup>^</sup> <i>Cygnus atratus</i>	Rb	#
• <b>Canada Goose</b> <i>Branta canadensis maxima</i>	S	**
• <b>Feral (Greylag) Goose</b> <i>Anser anser</i>	V	#
• <b>Paradise Shelduck</b> <sup>^</sup> <i>Tadorna variegata</i>	Sb	#
• <b>Mallard</b> <i>Anas platyrhynchos platyrhynchos</i>	Rb	**
• <b>Grey Duck</b> <sup>^</sup> <i>Anas superciliosa superciliosa</i>	S	#
• <b>Grey Teal</b> <sup>^</sup> <i>Anas gracilis</i>	S	*
• <b>New Zealand Shoveler</b> <sup>^</sup> <i>Anas rhynchos</i>	R	*

• <b>New Zealand Scaup</b> <sup>^</sup> <i>Aythya novaeseelandiae</i>	Rb	***
• <b>Harrier</b> <sup>^</sup> <i>Circus approximans</i>	S	#
• <b>Pukeko</b> <sup>^</sup> <i>Porphyrio porphyrio melanotus</i>	Rb	#
• <b>Australasian Coot</b> <sup>^</sup> <i>Fulica atra</i>	Rb	*
• <b>South Island Pied Oystercatcher</b> <sup>^</sup> <i>Haematopus finschi</i>	S	#
• <b>Pied Stilt</b> <sup>^</sup> <i>Himantopus himantopus leucocephalus</i>	V	#
• <b>Spur-winged Plover</b> <sup>^</sup> <i>Vanellus miles novaehollandiae</i>	Rb	#
• <b>Black-backed Gull</b> <sup>^</sup> <i>Larus dominicanus dominicanus</i>	S	#
• <b>Red-billed Gull</b> <sup>^</sup> <i>Larus novaehollandiae scopulinus</i>	V	#
• <b>Black-billed Gull</b> <sup>^</sup> <i>Larus bulleri</i>	S	#
• <b>White-fronted Tern</b> <sup>^</sup> <i>Sterna striata</i>	V	#
• <b>Black-fronted Tern</b> <sup>^</sup> <i>Sterna albobriata</i>	V	#
• <b>New Zealand Kingfisher</b> <sup>^</sup> <i>Halcyon sancta vagans</i>	S	#
• <b>Welcome Swallow</b> <sup>^</sup> <i>Hirundo tahitica neoxena</i>	R	**

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**Non-wetland birds**

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• <b>California Quail</b> <i>Callipepla californica brunnescens</i>	Rb	*
• <b>Ring-necked Pheasant</b> <i>Phasianus colchicu</i>	S	#
• <b>Rock Pigeon</b> <i>Columba livia</i>	R	*
• <b>Shining Cuckoo</b> <sup>^</sup> <i>Chrysococcyx lucidus lucidus</i>	Sb?	#
• <b>Little Owl</b> <i>Athene noctua</i>	Rb?	#
• <b>Skylark</b> <i>Alauda arvensis</i>	Rb	#
• <b>New Zealand Pipit</b> <sup>^</sup> <i>Anthus novaeseelandiae</i>	S	#
• <b>Dunnock</b> <i>Prunella modularis</i>	Rb	*
• <b>Blackbird</b> <i>Turdus merula</i>	Rb	*
• <b>Song Thrush</b> <i>Turdus philomelos</i>	Rb	*
• <b>Bellbird</b> <sup>^</sup> <i>Anthornis melanura</i>	S	#
• <b>Grey Warbler</b> <sup>^</sup> <i>Gerygone igata</i>	Rb	*
• <b>South Island Fantail</b> <sup>^</sup> <i>Rhipidura fuliginosa fuliginosa</i>	Rb	*
• <b>Silvereye</b> <sup>^</sup> <i>Zosterops lateralis lateralis</i>	Rb	***
• <b>Yellowhammer</b> <i>Emberiza citrinella</i>	Rb	*
• <b>Chaffinch</b> <i>Fringilla coelebs</i>	Rb	**
• <b>Greenfinch</b> <i>Carduelis chloris</i>	Rb	**
• <b>Goldfinch</b> <i>Carduelis carduelis</i>	Rb	**
• <b>Redpoll</b> <i>Carduelis flammea</i>	Rb	**
• <b>House Sparrow</b> <i>Passer domesticus</i>	Rb	**
• <b>Starling</b> <i>Sturnus vulgaris</i>	Rb	***



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Horseshoe Lake Reserve

**Site number:** SES/LP/8

**Physical address of site:** 92a Horseshoe Lake Road  
Burwood  
Christchurch 8061

#### Summary of Significance:

The Horseshoe Lake SES is significant because it contains a relatively large area of vegetation that is representative of the Low Plains Ecological District, and provides habitat for an At Risk plant species, and representative assemblages of indigenous birds including three threatened species.

#### Site Map





### Additional Site Information

Central point NZTM: N5184069, E1573651

Area of SES (ha): 28.40 ha

### Site Description

Horseshoe Lake Reserve SES includes a number of habitats including an open freshwater lake flanked by *Carex secta* and raupo dominated wetlands, and riparian willow woodlands that support planted and self-regenerating lowland podocarp forest species. The site was listed as a Primary Conservation Evaluation 'Category A' site by Meurk *et al.* (1993) on account of its high biodiversity values (more than 50 native plant species), and reasonably high scores for representativeness, area, unusualness, naturalness, accessibility and long-term viability.

### Extent of Site of Ecological Significance

The area of the SES for Horseshoe Lake Reserve covers 1) the extent of the open water body, 2) permanent and ephemeral wetlands, 3) planted and regenerating native forest and shrub-land communities within the site, 4) mown grass verges between the formed carriageway of Lake Terrace Road and the main water body, and 5) the wet grazed paddocks between the willow woodland and Residential Red Zone on the south side of Horseshoe Lake.

**Note:** The SES for Horseshoe Lake Reserve does not include those areas occupied by public car parks, public facilities, the dog exercise area, and those areas occupied by formed paths, driveways and other hard surfaced areas.

## Assessment Summary

The Horseshoe Lake Reserve SES has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 & 2), rarity/distinctiveness (criteria 3 & 4), and ecological context criteria (criterion 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Horseshoe Lake Reserve contains degraded areas of remnant indigenous vegetation which are some of the best remaining examples of their type in the Low Plains Ecological District. Horseshoe Lake Reserve was described by Crossland (2003) as being the seventh most important wetland area in Christchurch after 1) the Avon-Heathcote Estuary/Bromley oxidation ponds complex, 2) Brooklands Lagoon/Waimakariri River Mouth, 3) Travis Wetland, 4) Styx Mill Basin, 5) Peacock Springs and 6) The Groynes.

The SES contains at least 29 species of locally indigenous trees and shrubs, 19 monocot herbs, 9 dicot herbs and 6 ferns (Appendix 1), and although many/most tree and shrub species have been planted as part of ongoing ecological restoration activities, the reserve area has a similar tree species assemblage to that of Riccarton Bush. Unassisted natural regeneration of native sedges, trees, shrubs, ferns and climbing plants is occurring in the understorey of the willow woodland area (as observed by the Project Ecologist and CCC Regional parks field delivery staff in July 2014).

The Horseshoe Lake SES provides habitat for a large percentage of native bird species that are considered representative of 1) freshwater lakes and ponds, 2) freshwater wetlands (swamps), and 3) willow woodland assemblages in the Low Plains Ecological District (Refer Appendix 2):

<b>Freshwater Lakes &amp; Ponds</b>	19 / 23 potential species (82.60%)
<b>Freshwater Wetlands (Swamps)</b>	22 / 27 potential species (81.50%)
<b>Riparian Willow Woodlands</b>	19 / 22 potential species (86.40%)

Forty-five species of bird have been recorded at Horseshoe Lake Reserve including 24 native species, 20 introduced species and one Asian/Australasian visitor (Oriental cuckoo) (Crossland 2003). Appendix 2 contains lists of respective avifauna assemblages recorded at Horseshoe Lake (See also Crossland 2014).



**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

Mixed age planted and regenerating local indigenous vegetation within the reserve covers an area of approximately 15 hectares, and is therefore a relatively large example (Crossland 2003) of its type in the Low Plains Ecological District. The wetland area (17.30 ha) accounts for approximately one-sixth of the total area of freshwater wetland (approximately 108 ha) in Christchurch City (McCombs 1993).

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

This site comprises freshwater swampland which has been reduced to less than 10% of its original extent in Christchurch and the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The Horseshoe Lake Reserve SES contains the at-risk plant species *Urtica linearifolia* (climbing nettle) along the margins of the lake (recorded by the Project Ecologist and CCC Regional Parks field delivery staff in July 2014). This species is considered to have a large national population (>100,000 mature individuals), but with a predicted 10 – 70% decline (de Lange *et al.* 2013).

Horseshoe lake also supports the Threatened/Nationally Critical Grey Duck (*Anas supercilliosa*), the Threatened/Nationally Critical Black-billed Gull (*Larus bulleri*) and the At Risk/Naturally Uncommon Black Cormorant (*Phalacrocorax carbo novaehollandiae*) (Refer Crossland 2014; Robertson *et al.* 2012).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion



6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Site not assessed under this criterion

### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet criterion

### Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Site not assessed under this criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Site not assessed under this criterion

10. ***Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

This site provides a refuge from recreational hunting/shooting and a core breeding habitat for indigenous swamp birds and waterfowl, including the following breeding species (Source Crossland 2004; Appendix 2):

Little Cormorant	<i>Phalacrocorax melanoleucos brevirostris</i>
Paradise Shelduck	<i>Tadorna variegata</i>
Grey Duck	<i>Anas superciliosa superciliosa</i>
New Zealand Shoveler	<i>Anas rhynchos</i>
New Zealand Scaup	<i>Aythya novaeseelandiae</i>
Spur-winged Plover	<i>Vanellus miles novaehollandiae</i>
Shining Cuckoo	<i>Chrysococcyx lucidus lucidus</i>
Welcome Swallow	<i>Hirundo tahitica neoxena</i>
Grey Warbler	<i>Gerygone igata</i>
South Island Fantail	<i>Rhipidura fuliginosa fuliginosa</i>
Silvereye	<i>Zosterops lateralis lateralis</i>



Also, on a site visit by the Project Ecologist and CCC Regional Parks Staff (including CCC ornithologist Andrew Crossland) in July 2014, Black Swans (*Cygnus aratus*) were present with young.

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## Site Management

### Existing Protection Status

- Land in public ownership (CCC)

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor pest plant infestations and implement control as required.</li> <li>• Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li>• Information packages for neighbouring properties (e.g. 'Plant Me Instead')</li> </ul>
<ul style="list-style-type: none"> <li>• Animal pest incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring of possible animal pest incursions and trapping as necessary</li> </ul>	<ul style="list-style-type: none"> <li>• Provide advice and guidance on pest animal monitoring</li> <li>• Supply traps and related training as necessary</li> </ul>
<ul style="list-style-type: none"> <li>• Anthropogenic change to water regime</li> </ul>	<ul style="list-style-type: none"> <li>• Any action relating to changes in the water regime need to be assessed in relation to impacts upon ecological state and functioning of wetlands.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Natural process of change</li> </ul>	<ul style="list-style-type: none"> <li>• If natural changes in wetland ecology, composition or functioning are determined to be detrimental to the ongoing viability of the values of the site, a recovery action plan should be initiated.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Unknown future disturbances from surrounding new land uses</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure any future developments do not compromise the ecological functioning of the Horseshoe Lake ecosystem</li> </ul>	<ul style="list-style-type: none"> <li>• Education and interpretation material on potential risks/treats to natural values</li> <li>• Expansion and buffering of forest area through encouraging use of local indigenous plant species in surrounding landscape.</li> </ul>

<ul style="list-style-type: none"> <li>• Destruction of cormorant nesting trees</li> </ul>	<ul style="list-style-type: none"> <li>• Waterway maintenance should avoid pruning or felling trees used by cormorants for nesting, and trees adjacent (which provide wind shelter and offer habitat for colony expansion)</li> <li>• Maintenance activities on the water or bank should avoid the vicinity of the cormorant colonies during the breeding season (approach no closer than 50m).</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Disturbance of birds by humans and dogs.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure levels of human disturbance are minimised, for example by erecting temporary fencing and signage around nest sites.</li> <li>• Ensure that dogs are under control or on a leash.</li> </ul>	<p>N/A</p>

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## References

Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.

Crossland, A. (2003) *Horseshoe Lake; wildlife management recommendations*. Parks and Waterways Unit, Christchurch City Council, Christchurch, New Zealand.

Crossland, A. (2014) *Association of indigenous species; all species that are residents or regular visitors to a given habitat type in Christchurch/Banks Peninsula*. Parks and Waterways Unit, Christchurch City Council, Christchurch, New Zealand.

De Lange, P. J., Rolfe, J. R., Champion, P. D., Courtney, S. P., Heenan, P. B., Barkla, J. W., Cameron, E. K., Norton, D. A., and Hitchmough, R. A. (2013). *Conservation status of New Zealand indigenous vascular plants, 2012*. Department of Conservation, Wellington, New Zealand.

McCombs, K. (1993) *vegetation of Horseshoe Lake Reserve*. Parks and Waterways Unit, Christchurch City Council, Christchurch, New Zealand.

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Molloy, B. (1995) *Records of native conifers and flowering plants*. In Molloy, B. (Ed) *Riccarton Bush: Putaringamotu*. Riccarton Bush Trust, Christchurch, New Zealand. Pp 116 – 143.

Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.

**Assessment completed by:** Antony Shadbolt

**Date:** 4<sup>th</sup> March 2014

**Statement completed by:** Antony Shadbolt

**Date:** 4<sup>th</sup> March 2014

**Statement updated by:** XXX

**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.





## Appendix 1: Native Flowering Plants and Conifers

List of native conifers, flowering plants and ferns recorded within the Horseshoe Lake Reserve based on McCombs (1993) and updated to include species identified from the site in March 2014. Species marked with an asterisk (\*) are considered non-local native species.

### TREES & SHRUBS

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Aristotelia serrata</i>	wineberry/makomako
<i>Cassinia leptophylla</i>	
<i>Coprosma areolata</i>	thin leaved coprosma
<i>Coprosma propinqua</i>	mingimingi
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round leaved coprosma
<i>Coprosma propinqua</i> x <i>C. robusta</i>	hybrid coprosma
<i>Cordyline australis</i>	cabbage tree/ti kouka
<i>Dacrycarpus dacrydioides</i>	kahikatea/white pine
<i>Dodonaea viscosa</i> 'Purpurea'*	purple akeake
<i>Elaeocarpus dentatus</i>	hinau
<i>Elaeocarpus hookerianus</i>	pokaka
<i>Griselinia littoralis</i>	broadleaf/kapuka
<i>Hebe salicifolia</i>	koromiko
<i>Hebe strictissima</i>	hebe
<i>Hoheria angustifolia</i>	narrow leaved lacebark/houhere
<i>Hoheria sextylosa</i> *	North Island Lacebark
<i>Kunzea ericoides</i>	white tea tree
<i>Melicytus ramiflorus</i>	mahoe
<i>Muehlenbeckia astonii</i>	shrubby pohuehue
<i>Muehlenbeckia complexa</i>	scrub puhuehue
<i>Myrsine australis</i>	red matipo
<i>Olearia avicenniifolia</i>	tree daisy
<i>Pittosporum eugenioides</i>	lemonwood/tarata
<i>Pittosporum tenuifolium</i>	kohuhu/black matipo
<i>Plagianthus regius</i>	ribbonwood/manatu
<i>Podocarpus totara</i>	totara
<i>Pseudopanax arboreus</i>	five-finger/pauhou
<i>Pseudopanax crassifolius</i>	lancewood/horoeka
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	South Island kowhai

### CLIMBERS

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Muehlenbeckia australis</i>	pohuehue
<i>Urtica linearifolia</i>	climbing nettle

### MONOCOT HERBS

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Anemanthele lessoniana</i>	hunangamoho/NZ wind grass
<i>Astelia fragrans</i>	bush flax/kahaka
<i>Austroderia richardii</i>	toetoe
<i>Carex geminata</i>	giant sedge
<i>Carex lessoniana</i>	giant sedge
<i>Carex maorica</i>	



<i>Carex secta</i>	sedge/purei
<i>Carex sinclairii</i>	
<i>Carex virgata</i>	swamp sedge
<i>Cyperus eragrostis</i>	umbrella sedge
<i>Elaeocharis acuta</i>	sharp spike sedge
<i>Isolepis distigmata</i>	
<i>Juncus gregiflorus</i>	rush
<i>Juncus pallidus</i>	
<i>Leptocarpus similis</i>	jointed wire rush
<i>Phormium tenax</i>	NZ flax/harakeke
<i>Poa cita</i>	silver tussock
<i>Typha orientalis</i>	raupo
<i>Uncinia spp.</i>	hook sedge
<b>DICOT HERBS</b>	
<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Acaena anserinifolia</i>	piripiri
<i>Cotula australis</i>	
<i>Epilobium ciliatum</i>	willowherb
<i>Epilobium brunnescens.</i>	willowherb
<i>Hydrocotyle novae-zealandiae</i>	NZ waxweed
<i>Senecio glomeratus</i>	fireweed
<i>Senecio minimus</i>	fireweed
<i>Senecio scaberulus</i>	fireweed
<i>Elatine gratioides</i>	waterwort
<b>FERNS</b>	
<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Blechnum minus</i>	swamp kiokio
<i>Blechnum penna-marina</i>	little hard fern
<i>Histopteris incisa</i>	water fern
<i>Polysdtichum richardii</i>	common shield fern
<i>Polysdtichum vestitum</i>	prickly shield fern
<i>Pteridium esculentum</i>	bracken
<b>AQUATIC</b>	
<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Lemna minor</i>	duckweed



## Appendix 2: Associations of Indigenous Bird Species

Lists of associations of indigenous bird species that are resident or regular visitors to three habitat types (freshwater lakes & ponds, freshwater wetlands (swamps), and willow woodlands) within the Horseshoe lake SES (Crossland 2014). Species shown in black font are those species recorded from Horseshoe Lake SES, while those in gray/faded font have not been recorded, however are considered resident or seasonal visitors to other comparable habitats in the Low Plains Ecological District.

### **Freshwater Lakes and Ponds**

- **Australasian Crested Grebe** *Podiceps cristatus australis*
- **Black Cormorant** *Phalacrocorax carbo novaehollandiae*
- **Little Cormorant** *Phalacrocorax melanoleucos brevirostris*
- **Little Black Cormorant** *Phalacrocorax sulcirostris*
- **White Heron** *Egretta alba modesta*
- **White-faced Heron** *Ardea novaehollandiae novaehollandiae*
- **Australasian Bittern** *Botaurus poiciloptilus*
- **Black Swan** *Cygnus atratus*
- **Paradise Shelduck** *Tadorna variegata*
- **Grey Duck** *Anas superciliosa superciliosa*
- **Grey Teal** *Anas gracilis*
- **New Zealand Shoveler** *Anas rhynchotis*
- **New Zealand Scaup** *Aythya novaeseelandiae*
- **Australasian Harrier** *Circus approximans*
- **Pukeko** *Porphyrio porphyrio melanotus*
- **Australasian Coot** *Fulica atra australis*
- **Pied Stilt** *Himantopus himantopus leucocephalus*
- **Spur-winged Plover** *Vanellus miles*
- **Southern Black-backed Gull** *Larus dominicanus dominicanus*
- **Red-billed Gull** *Larus novaehollandiae scopulinus*
- **Black-billed Gull** *Larus bulleri*
- **New Zealand Kingfisher** *Halcyon sancta vagans*
- **Welcome Swallow** *Hirundo tahitica neoxena*

### **Freshwater Wetlands (swamps)**

- **Black Cormorant** *Phalacrocorax carbo novaehollandiae*
- **Little Cormorant** *Phalacrocorax melanoleucos brevirostris*
- **White Heron** *Egretta alba modesta*
- **White-faced Heron** *Ardea novaehollandiae novaehollandiae*
- **Australasian Bittern** *Botaurus poiciloptilus*
- **Black Swan** *Cygnus atratus*
- **Paradise Shelduck** *Tadorna variegata*
- **Grey Duck** *Anas superciliosa superciliosa*
- **New Zealand Shoveler** *Anas rhynchotis*
- **New Zealand Scaup** *Aythya novaeseelandiae*
- **Grey Teal** *Anas gracilis*
- **Harrier** *Circus approximans*
- **Pukeko** *Porphyrio porphyrio melanotus*
- **Marsh Crake** *Porzana pusilla affinis*
- **Spotless Crake** *Porzana tabuensis plumbea*
- **Spur-winged Plover** *Vanellus miles*
- **Pied Stilt** *Himantopus himantopus leucocephalus*



- **Southern Black-backed Gull** *Larus dominicanus dominicanus*
- **Red-billed Gull** *Larus novaehollandiae scopulinus*
- **Black-billed Gull** *Larus bulleri*
- **Shining Cuckoo** *Chrysococcyx lucidus*
- **Bellbird** *Anthornis melanura melanura*
- **Grey Warbler** *Gerygone igata*
- **South Island Fantail** *Rhipidura fuliginosa fuliginosa*
- **Silvereye** *Zosterops lateralis lateralis*
- **New Zealand Kingfisher** *Halcyon sancta vagans*
- **Welcome Swallow** *Hirundo tahitica neoxena*

**Willow Woodlands**

- **Black Cormorant** *Phalacrocorax carbo novaehollandiae*
- **Little Cormorant** *Phalacrocorax melanoleucos brevirostris*
- **White-faced Heron** *Ardea novaehollandiae novaehollandiae*
- **Australasian Bittern** *Botaurus poiciloptilus*
- **Black Swan** *Cygnus atratus*
- **Paradise Shelduck** *Tadorna variegata*
- **Grey Duck** *Anas superciliosa superciliosa*
- **New Zealand Shoveler** *Anas rhynchotis*
- **New Zealand Scaup** *Aythya novaeseelandiae*
- **Grey Teal** *Anas gracilis*
- **Harrier** *Circus approximans*
- **Pukeko** *Porphyrio porphyrio melanotus*
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- **South Island Fantail** *Rhipidura fuliginosa fuliginosa*
- **Silvereye** *Zosterops lateralis lateralis*
- **New Zealand Kingfisher** *Halcyon sancta vagans*
- **Welcome Swallow** *Hirundo tahitica neoxena*

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Jellie Park Pond  
**Site number:** SES/LP/9  
**Physical address of site:** 140 Greers Road  
Burnside  
Christchurch 8053

#### Summary of Significance:

The Jellie Park Pond SES is significant because it provides an important day and night-time roosting site for the Nationally Critically Endangered Black-billed Gull.

#### Site Map



### **Additional Site Information**

**Central point NZTM:** N5182711, E1566192

**Area of SES (ha):** 0.69 ha

### **Site Description**

The Jellie Park Pond SES is a human-created ornamental pond with islands. The shoreline is a mix of bare ground, short grass turf and native plants. The pond covers 4505 m<sup>2</sup>. The SES includes the pond banks and covers c.6940 m<sup>2</sup>. Although small, this SES is important as it is one of very few open water-bodies in western Christchurch, and as such functions as a congregation site and night roost for wetland birds, particularly the Nationally Critically Endangered Black-billed Gull (*Larus bulleri*).

### **Extent of Site of Ecological Significance**

The SES covers the pond waters and islands, and mown grass berms back as far as the first ring of constructed paths which surround the pond and covers the principal extent of the site used by wetland birds. The SES is therefore fully bounded by constructed paths as shown in the location diagram.

### **Assessment Summary**

The Jellie Park Pond Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the rarity/distinctiveness (criterion 4) and ecological context criterion (criterion 10).



## Assessment against Significance Criteria

### Representativeness

1. *Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.*

Site not assessed under this criterion

2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

Site not assessed under this criterion

### Rarity/Distinctiveness

3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

Site not assessed under this criterion

4. ***Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.***

The site is significant under this criterion.

This site serves both as a day and night roosting site for the Threatened/Nationally Critical Black-billed Gull. This endemic species is highly threatened nationally (Robertson *et. al* 2013) and internationally (Bamford *et. al* 2008). Numbers present vary depending on time of day and season, but typically range from 20 to 100 birds, making it one of the most important sites for this species in Christchurch. Recent count data (Crossland 2014) for this species is provided in Appendix 1.

5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion



6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet criterion

### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet criterion

### Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Does not meet criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet criterion

- 10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

This site serves both as a day and night roosting site for the Threatened/Nationally Critical Black-billed Gull. This endemic species is highly threatened nationally (Robertson *et. al* 2013) and internationally (Bamford *et. al* 2008). Numbers present vary depending on time of day and season, but typically range from 20 to 100 birds, making it one of the most important sites for this species in Christchurch. Recent count data (Crossland 2014) for this species is provided in Appendix 1.



## Site Management

### Existing Protection Status

- Land in public ownership (CCC)

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>• Disturbance to roost site by humans and dogs</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure ongoing suitability of roosting habitat is retained by ensuring open, flat areas are not smothered by vegetation.</li> <li>• Ensure levels of human disturbance are minimised, for example by erecting temporary fencing and signage around nest sites.</li> <li>• Ensure that dogs are under control or on a leash.</li> <li>• Remove trees from island and modify island to improve value and attractiveness to Black-billed Gulls</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Lack of public awareness of importance of site to an endangered species</li> </ul>	<ul style="list-style-type: none"> <li>• Install signage to educate park users on the bird's presence and conservation status and to minimise disturbance to roosting birds on islands.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>

## References

Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.

Bamford, M., Watkins, D., Bancroft, W., Tischler, G., and Wahl, J. (2008) *Migratory Shorebirds of the East Asian-Australasian Flyway: Population Estimates and Internationally Important Sites*. Wetlands International – Oceania, Canberra, Australia.

Crossland, A. C. (2014) *Jellie Park bird monitoring; 1993 to present*. Unpublished Christchurch City Council datasheet. [TRIM Reference 14/414226]

Robertson, H., Dowding, J., Elliott, G., Hitchmough, R., Miskelly, C. O'Donnell, C., Powlesland, R., Sagar, P., Scofield, P., Taylor, G. (2013) *Conservation status of New Zealand birds, 2012*. New Zealand Threat Classification Series 4, Dep.t of Conservation.

**Assessment completed by:** Andrew Crossland  
**Date:** 18 March 2014

**Statement completed by:** Andrew Crossland  
**Date:** 18 March 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



## Appendix 1: Black-billed Gull Monitoring

**Source:** Andrew Crossland (Crossland 2014), Regional Parks Team, Christchurch City Council

**TRIM Reference:** 14/414226

<b>Date</b>	<b>Number</b>
05/11/2002	= 0
05/08/2003	= 64
05/02/2004	= 41
30/04/2004	= 94
29/03/2005	= 8
27/05/2005	=44
30/03/2006	= 0
20/02/2013	= 34
11/02/2014	= 39

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Westlake Reserve Ponds

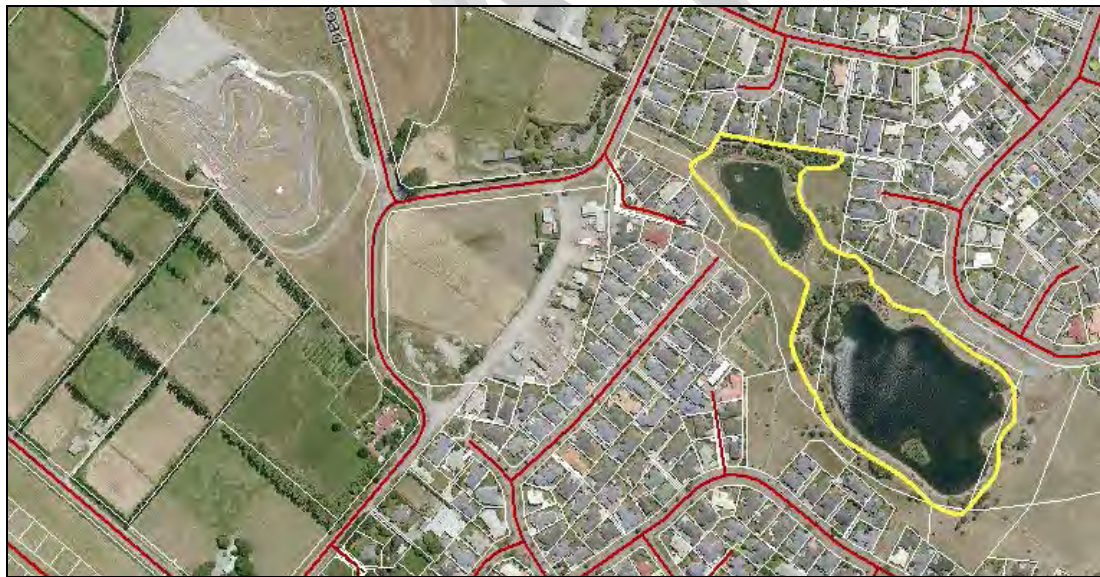
**Site number:** SES/LP/10

**Physical address of site:** 50 Westlake Drive  
Halswell  
Christchurch 8025

#### Summary of Significance:

The Westlake Reserve Ponds SES is significant because it support a representative assemblage of indigenous birds associated with freshwater lakes and ponds, and supports the Nationally critically endangered Black-billed Gull.

#### Site Map



### **Additional Site Information**

<b>Ecological District</b>	Low Plains
<b>Central point NZTM:</b>	N5175795, E1563956
<b>Area of SES (ha):</b>	4.12 ha

### **Site Description**

This SES consists of two former commercial shingle pits that were re-profiled and landscaped in the mid 1990s to form ponds that cover 19,890 m<sup>2</sup> and 3780 m<sup>2</sup> respectively. These ponds are part of the cluster of other small water bodies in the southwest Christchurch area, and regularly serve as a feeding habitat and roosting site for the Nationally Critically Endangered Black-billed Gull (*Larus bulleri*) and other wetland birds.

### **Extent of Site of Ecological Significance**

The SES comprises the ponds, adjacent planted native forest and shrubland restoration plantings, and short turf bank areas which are contained within the formed paths that encircle the two ponds as shown on the location diagram above. These plantings and turf areas provide screening/buffering of the ponds from disturbances, and roosting areas respectively.

### **Assessment Summary**

The Westlake Reserve Ponds Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1), rarity/distinctiveness (criterion 4), and ecological context criteria (criteria 8 & 10).



## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

This site supports a high proportion of an association of indigenous bird species that are representative of the “freshwater lakes and ponds species assemblage” for Christchurch (refer Crossland 2014b; Appendix 1).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

Site not assessed under this criterion

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

Does not meet criterion

- 4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

This site regularly serves as a feeding habitat and roosting site for the Nationally Critically Endangered Black-billed gull (*Larus bulleri*). Black-billed gulls were present on 95% of full site inventories between 1998 and 2014 (Crossland 2014b; Appendix 2). Numbers vary with time of day and season between 2 and 85 (average 26) individuals. This endemic species is highly threatened nationally (Robertson *et. al* 2013) and internationally (Bamford *et. al* 2008). This site also regularly supports the Nationally Vulnerable Red-billed Gull (*Larus novaehollandiae scopulinus*).



5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet criterion

### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet criterion

### Ecological Context

8. ***Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

This site is an important “stepping stone site” in the migration and local movement routes of wetland birds flying between Lake Ellesmere (to the south) and the large coastal wetlands in NE Christchurch.

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet criterion

10. ***Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion. This site provides important core breeding, feeding, and resting habitat in the cluster of wetland habitats in south west and south Christchurch. It also provides an important winter habitat for native wetland birds, notably Black-billed Gull and New Zealand Scaup (Refer Crossland 2014b; Appendix 2).

## Site Management

### Existing Protection Status

Land in public ownership (CCC)

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>Disturbance to wildlife from humans and dogs</li> </ul>	<ul style="list-style-type: none"> <li>Ensure levels of human disturbance are minimised, for example by erecting signage highlighting impact of uncontrolled dogs on wildlife values</li> <li>Ensure that dogs are under control or on a leash.</li> <li>Increased ranger patrolling (including the option of enlisting honorary rangers) to increase public awareness and to deter unlawful catching of ducks, destruction of nests, etc</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Garden-style management of riparian and forest planting areas</li> </ul>	<ul style="list-style-type: none"> <li>Plant locally sourced indigenous emergent wetland riparian vegetation (in conjunction with terrestrial riparian vegetation) to enhance habitat for indigenous birds.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Roosting islands/refuges completely submerged</li> </ul>	<ul style="list-style-type: none"> <li>Reinstate roosting islands at appropriate level</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Overpopulated by Mallard ducks, feral (Gray Lag) geese , and Canada Geese</li> </ul>	<ul style="list-style-type: none"> <li>Erect signage discouraging duck feeding by the public</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>





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**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 31st March 2013

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 31st March 2013

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



## Appendix 1: Indigenous Wetland Bird Species

Comparison of wetland bird species recorded at Westlake compared to the Freshwater lake and Ponds Species Assemblage for Christchurch (Source: Crossland 2014a).

Species recorded at the study site are marked with a tick (✓); species considered to be breeding on site are underlined; species not recorded at site but part of the above assemblage are shown in grey font.

### Common Resident

✓ <u>Paradise Shelduck</u>	<i>Tadorna variegata</i>
✓ <u>Grey Teal</u>	<i>Anas gracilis</i>
✓ <u>New Zealand Shoveler</u>	<i>Anas rhynchotis</i>
✓ <u>New Zealand Scaup</u>	<i>Aythya novaeseelandiae</i>
Pukeko	<i>Porphyrio porphyrio melanotus</i>
✓ Welcome Swallow	<i>Hirundo tahitica neoxena</i>

### Less Common Resident

✓ Black Cormorant	<i>Phalacrocorax carbo novaehollandiae</i>
✓ Little Cormorant	<i>Phalacrocorax melanoleucos brevirostris</i>
✓ White-faced Heron	<i>Ardea novaehollandiae novaehollandiae</i>
✓ <u>Black Swan</u>	<i>Cygnus atratus</i>
✓ Grey Duck	<i>Anas superciliosa superciliosa</i>
✓ Australasian Harrier	<i>Circus approximans</i>
✓ <u>Australasian Coot</u>	<i>Fulica atra australis</i>
✓ Pied Stilt	<i>Himantopus himantopus leucocephalus</i>
✓ Spur-winged Plover	<i>Vanellus miles</i>
✓ New Zealand Kingfisher	<i>Halcyon sancta vagans</i>

### Scarce Resident

✓ Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>
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### Seasonal/Regular Visitor

✓ Australasian Bittern	<i>Botaurus poiciloptilus</i>
✓ Southern Black-backed Gull	<i>Larus dominicanus dominicanus</i>
✓ Red-billed Gull	<i>Larus novaehollandiae scopulinus</i>
✓ Black-billed Gull	<i>Larus bulleri</i>
Black-fronted Tern	<i>Sterna albobriata</i>
✓ New Zealand Pipit	<i>Anthus novaeseelandiae novaeseelandiae</i>

### Irregular visitor

✓ Australasian Crested Grebe	<i>Podiceps cristatus australis</i>
Australasian Little Grebe	<i>Tachybaptus novaehollandiae novaehollandiae</i>
White Heron	<i>Egretta alba modesta</i>
Cattle Egret	<i>Bubulcus ibis coromandus</i>
✓ Royal Spoonbill	<i>Platalea regia</i>
✓ Sth Island Pied Oystercatcher	<i>Haematopus ostralegus finschi</i>
Banded Dotterel	<i>Charadrius bicinctus bicinctus</i>
Black-fronted Dotterel	<i>Charadrius melanops</i>
✓ Caspian Tern	<i>Sterna caspia</i>

**Appendix 2: Black-billed Gull Monitoring**

**Black-billed Gull Monitoring Data from Westlake Reserve Ponds, 1990 – 2014**  
(Source: Crossland 2014b).

Date	Count	Date	Count
18/02/1998	6	12/08/2004	4
18/05/1998	12	4/09/2004	2
25/02/1999	20	25/09/2004	0
7/05/1999	10	28/10/2004	0
21/05/1999	41	2/02/2005	52
27/05/2000	28	26/02/2005	53
29/12/2002	4	25/03/2005	34
7/03/2003	49	23/04/2005	85
5/08/2003	30	28/05/2005	29
25/01/2004	17	25/06/2005	57
12/02/2004	14	6/08/2005	16
17/03/2004	44	13/08/2005	9
24/03/2004	19	1/09/2005	5
27/03/2004	27	13/12/2005	3
30/03/2004	48	19/01/2006	31
8/04/2004	14	5/08/2006	52
1/05/2004	24	21/09/2006	2
8/01/2004	23	20/12/2006	0
14/05/2004	10	9/07/2013	7
18/05/2004	31	3/10/2013	3
27/05/2004	14	20/01/2014	18
17/06/2004	40	9/02/2014	74

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

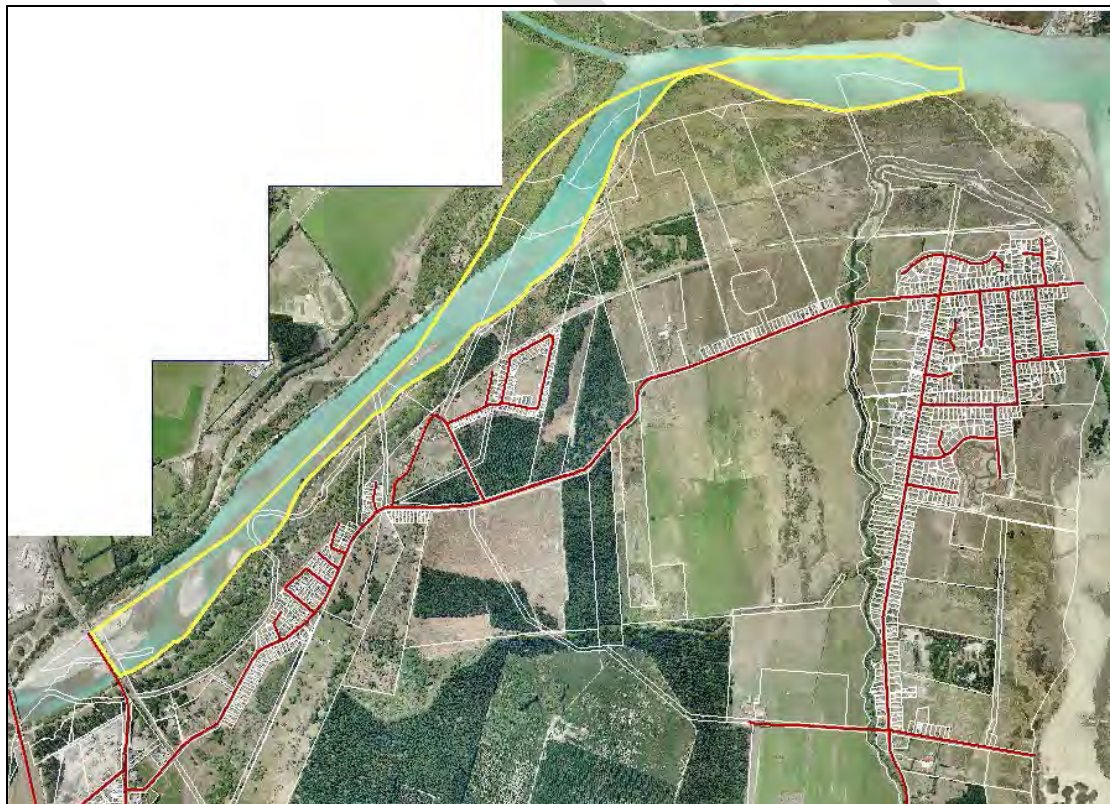
**Site name:** Lower Waimakariri Tidal Reaches

**Site number:** SES/LP/11

#### Summary of Significance:

The Lower Waimakariri River Tidal Reaches SES is significant because it contains a large habitat that supports a representative assemblage of indigenous braided river and estuarine/coastal birds including several threatened and/or at risk species.

#### Site Map



### **Additional Site Information**

**Central point:** N5195492, E1573954

**Area of SES (ha):** 76.10 ha

### **Site Description**

This site comprises 1) shingle and mud-/sandflat islands in the upper reaches which are largely flooded at high tide and exposed at low tide, 2) a narrow band of inter-tidal mud and sand along the middle and lower reaches, and 3) marginal vegetation comprising raupo, carex, three-square and exotic grasses. This single channel, tidal-influenced and mixed salinity section of the Waimakariri River as indicated on the map above comprises an environment distinct from the river systems both above and below this section.

This section of the Waimakariri River is the largest, and one of the best examples of tidal river habitat for indigenous bird species in Canterbury. It supports a high diversity of indigenous taxa, including at least nine species of bird that are listed as either 'nationally critical', 'nationally endangered' or 'nationally vulnerable'. It provides an important feeding habitat for a range of river and estuarine birds, and serves as a transit zone and post-breeding, feeding and roosting area for birds from the braided sections of the Waimakariri River as they move through the site towards Brooklands Lagoon and the coast

### **Extent of Site of Ecological Significance**

This SES is made up of the section of tidal river downstream of the Old Waimakariri Bridge where the braided river environment of the river terminates, to the point immediately upstream of bar-built estuary (Brooklands Lagoon/Waimakariri Rivermouth). The width of the SES is defined by the CCC territorial boundary on the northern side of the river, and the riparian margin of the river on the south side, including the marginal vegetation described above. Although likely to be still significant, this SES excludes those areas outside of the CCC territorial boundary.



## Assessment Summary

The Lower Waimakariri Tidal Reaches Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 & 2), rarity/distinctiveness (criterion 4), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 & 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

This site is the largest and one of the best examples of tidal river habitat for indigenous bird species in Christchurch and Canterbury (See Crossland 2003). And the Low Plains Ecological District. Specifically, this site supports a substantial proportion of the “estuarine/coastal” and “braided river” species assemblages for Christchurch. (Crossland 2014; Appendix 1). Bird population count data is provided in Appendix 2

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

This site is the largest example of a tidal river (habitat of indigenous fauna) in Christchurch (and the Low Plains Ecological District). Other examples such as the lower Avon River, lower Heathcote River are substantially smaller.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

Site not assessed under this criterion



**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

This site supports feeding and roosting habitat for several threatened, at risk, and uncommon bird species as classified by Robertson *et al.* (2012), including the following (Crossland 2013, 2014):

<b>Species</b>	<b>Threat Status</b>
Grey Duck	Threatened/Nationally Critical
Black-billed Gull	Threatened/Nationally Critical
Australasian Bittern	Threatened/Nationally Endangered
Black-fronted Tern	Threatened/Nationally Endangered
Wrybill	Threatened/Nationally Vulnerable
Banded Dotterel	Threatened/Nationally Vulnerable
Caspian Tern	Threatened/Nationally Vulnerable
Red-billed Gull	Threatened/Nationally Vulnerable
Pied Cormorant	Threatened/Nationally Vulnerable

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

Site not assessed under this criterion

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

This site contains “a high diversity of indigenous taxa”. Specifically, it supports a wide range of estuarine/coastal birds, and braided river birds (Refer Appendix 1 & 2).



## Ecological Context

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

This site is a “habitat of indigenous fauna that provides or contributes to an important ecological linkage or network”. Specifically, it serves as a transit zone and post-breeding, feeding and roosting area for birds from the braided sections of the Waimakariri River as they move through the site towards Brooklands Lagoon and the coast (See Crossland 2003).

- 9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

Does not meet criterion

- 10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

This site is an important feeding habitat for a range of river and estuarine birds, particularly for Black-billed Gulls and White-fronted Terns breeding on the Waimakariri River. In all years there are small numbers of wetland birds breeding within the site, particularly on islands. In some years colonial nesting of White-fronted Tern and Black-billed gull occurs (See Crossland 2003; 2014).



**Site Management**

**Existing Protection Status**

- In public ownership

Threats and risks	Management recommendations	Support package options N/A
Weed invasion	<ul style="list-style-type: none"> <li>• Ongoing monitoring and eradication of biodiversity pest plants.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
Animal pest incursion	<ul style="list-style-type: none"> <li>• Monitoring of possible animal pest incursions and trapping as necessary</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
Disturbance to roosting and nesting sites	<ul style="list-style-type: none"> <li>• Interpretation highlighting the impacts disturbances can have on wildlife values</li> <li>• Use temporary fencing to seasonally exclude public entry from any bird nesting areas (especially colonial nesting species) and during Jan-July and the key bird roosting areas.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
Destruction of islands and mudflat areas as a result of gravel extraction	<ul style="list-style-type: none"> <li>• Strategic management of gravel extraction activities</li> <li>• Construction of roosting/nesting islands</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>



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**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 8<sup>th</sup> April 2014

**Statement completed by:** Antony Shadbolt  
**Date:** 8<sup>th</sup> April 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Indigenous Avifauna

Comparison of wetland bird species recorded in the Lower Waimakariri Tidal reaches compared to the Estuarine/Coastal Wetland Assemblage for Christchurch (Crossland 2014).

Species recorded at the study site are marked with a tick (✓); species considered to be breeding on site are underlined; species not recorded at site but part of the above assemblage are shown in grey font.

### **COMMON RESIDENT**

✓ Black Cormorant	<i>Phalacrocorax carbo novaehollandiae</i>
✓ Pied Cormorant	<i>Phalacrocorax varius varius</i>
✓ Little Cormorant	<i>Phalacrocorax melanoleucos brevirostris</i>
✓ <u>White-faced Heron</u>	<i>Ardea novaehollandiae novaehollandiae</i>
✓ Royal Spoonbill	<i>Platalea regia</i>
✓ <u>Black Swan</u>	<i>Cygnus atratus</i>
✓ <u>Paradise Shelduck</u>	<i>Tadorna variegata</i>
✓ <u>Grey Teal</u>	<i>Anas gracilis</i>
✓ New Zealand Shoveler	<i>Anas rhynchotis</i>
✓ <u>Pukeko</u>	<i>Porphyrio porphyrio melanotus</i>
✓ Variable Oystercatcher	<i>Haematopus unicolor</i>
✓ Sth Island Pied Oystercatcher	<i>Haematopus ostralegus finschi</i>
✓ <u>Pied Stilt</u>	<i>Himantopus himantopus leucocephalus</i>
✓ Banded Dotterel	<i>Charadrius bicinctus bicinctus</i>
✓ <u>Spur-winged Plover</u>	<i>Vanellus miles</i>
✓ Southern Black-backed Gull	<i>Larus dominicanus dominicanus</i>
✓ Red-billed Gull	<i>Larus novaehollandiae scopulinus</i>
✓ <u>Black-billed Gull</u>	<i>Larus bulleri</i>
✓ Caspian Tern	<i>Sterna caspia</i>
✓ <u>White-fronted Tern</u>	<i>Sterna striata</i>
✓ <u>Pied Stilt</u>	<i>Himantopus himantopus leucocephalus</i>
✓ <u>Spur-winged Plover</u>	<i>Vanellus miles</i>
✓ Banded Dotterel	<i>Charadrius bicinctus bicinctus</i>
✓ Southern Black-backed Gull	<i>Larus dominicanus dominicanus</i>
✓ <u>Black-billed Gull</u>	<i>Larus bulleri</i>

### **LESS COMMON RESIDENT**

✓ <u>Australasian Harrier</u>	<i>Circus approximans</i>
✓ New Zealand Scaup	<i>Aythya novaeseelandiae</i>
✓ <u>Marsh Crake</u>	<i>Porzana pusilla affinis</i>
✓ <u>New Zealand Kingfisher</u>	<i>Halcyon sancta vagans</i>
✓ <u>White-faced Heron</u>	<i>Ardea novaehollandiae novaehollandiae</i>
✓ <u>Paradise Shelduck</u>	<i>Tadorna variegata</i>
✓ <u>Grey Teal</u>	<i>Anas gracilis</i>
✓ <u>Australian Harrier</u>	<i>Circus approximans</i>
✓ Sth Island Pied Oystercatcher	<i>Haematopus ostralegus finschi</i>
✓ Wrybill	<i>Anarhynchus frontalis</i>
✓ Black-fronted Tern	<i>Sterna albostrata</i>
✓ Caspian	Tern <i>Sterna caspia</i>
✓ <u>White-fronted Tern</u>	<i>Sterna striata</i>
✓ Welcome Swallow	<i>Hirundo tahitica neoxena</i>
✓ <u>New Zealand Kingfisher</u>	<i>Halcyon sancta vagans</i>
✓ New Zealand Pipit	<i>Anthus novaeseelandiae novaeseelandiae</i>



**SCARCE RESIDENT**

✓ Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>
✓ Australasian Bittern	<i>Botaurus poiciloptilus</i>
✓ Grey Duck	<i>Anas superciliosa superciliosa</i>
✓ Spotless Crake	<i>Porzana tabuensis plumbea</i>
✓ Grey Duck	<i>Anas superciliosa superciliosa</i>
✓ New Zealand Shoveler	<i>Anas rhynchotis</i>
✓ New Zealand Scaup	<i>Aythya novaeseelandiae</i>

**SEASONAL/REGULAR VISITOR**

Australasian Gannet	<i>Morus serrator</i>
✓ Spotted Shag	<i>Stictocarbo punctatus</i>
✓ White Heron	<i>Egretta alba modesta</i>
✓ Wrybill	<i>Anarhynchus frontalis</i>
Turnstone	<i>Arenaria interpres</i>
Red Knot	<i>Calidris canutus canutus</i>
✓ Eastern Bar-tailed Godwit	<i>Limosa lapponica baueri</i>
✓ Arctic Skua	<i>Stercorarius parasiticus</i>
✓ Black-fronted Tern	<i>Sterna albobriata</i>
White-winged Black Tern	<i>Chlidonias leucopterus</i>
✓ New Zealand Pipit	<i>Anthus novaeseelandiae novaeseelandiae</i>
✓ Black Cormorant	<i>Phalacrocorax carbo novaehollandiae</i>
✓ Little Cormorant	<i>Phalacrocorax melanoleucos brevirostris</i>

**IRREGULAR VISITOR**

Reef Heron	<i>Egretta sacra sacra</i>
Cattle Egret	<i>Bubulcus ibis coromandus</i>
Little Egret	<i>Egretta garzetta</i>
Far-Eastern Curlew	<i>Numenius madagascariensis</i>
Asiatic Whimbrel	<i>Numenius phaeopus variegatus</i>
Asiatic Black-tailed Godwit	<i>Limosa limosa melanuroides</i>
Hudsonian Godwit	<i>Limosa haemastica</i>
Alaskan Tattler	<i>Tringa incana</i>
Siberian Tattler	<i>Tringa brevipes</i>
Black-fronted Dotterel	<i>Charadrius melanops</i>
Pacific Golden Plover	<i>Pluvialis fulva</i>
Sanderling	<i>Calidris alba</i>
Curlew Sandpiper	<i>Calidris ferruginea</i>
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>
Pectoral Sandpiper	<i>Calidris melanotos</i>
Red-necked Stint	<i>Calidris rufficollis</i>
Pomarine Skua	<i>Stercorarius pomarinus</i>
✓ Gull-billed Tern	<i>Gelochelidon nilotica</i>
✓ Eastern Little Tern	<i>Sterna albifrons sinensis</i>
✓ Pied Cormorant	<i>Phalacrocorax varius varius</i>
Black Stilt	<i>Himantopus novaezelandiae</i>
Black-fronted Dotterel	<i>Charadrius melanops</i>
Turnstone	<i>Arenaria interpres</i>
✓ Red-billed Gull	<i>Larus novaehollandiae scopulinus</i>
White-winged Black Tern	<i>Chlidonias leucopterus</i>



**Appendix 2: Lower Waimakariri River (Tidal Reaches) Bird Counts**

**Table 1:** Lower Waimakariri River tidal reached bird count data 2003 – 2005. Source: Crossland (2014)

Species	15/01/03	23/04/03	2/10/03	15/10/03	22/11/03	23/01/04	25/11/04	3/09/05
Black Cormorant	0	0	0				0	
Pied Cormorant	5	10	1		7			2
Little Cormorant	0	3	3					0
Little Black Cormorant	0	0	0					0
Spotted Shag	0	0	0					0
White Heron	0	0	0					0
White Faced Heron	0	0	1					0
Aust Bittern	0	0	0					0
Royal Spoonbill	0	0	0					0
Black Swan	0	0	0					0
Canada Goose	0	0	1					0
Paradise Shelduck	0	0	0					0
Mallard/Grey	0	0	0					0
Grey Teal	0	0	4					0
NZ Scaup	0	0	0					0
NZ Shoveler	0	0	0	5				0
Pukeko	0	0	0					0
Harrier	0	0	0					0
SI Pied								
Oystercatcher Variable	0	0	0					0
Oystercatcher	0	0	0					0
Pied Stilt	2	0	0					0
Banded Dotterel	0	0	0					0
Spur Winged Plover	43	0	2		120			0
Eastern Bar Tailed Godwit	0	0	0					0
Caspian Tern	0	0	3					1
Black-fronted Tern	2	0	0	4				19
White-fronted Tern	1	0	0		12	20		8
Black-backed Gull	1	0	0					0
Black-billed Gull	7	0	0		14			10
Red-billed Gull	0	0	0		6			0
Welcome Swallow	0	0	0					0
<b>TOTAL</b>	<b>61</b>	<b>13</b>	<b>15</b>				<b>23</b>	

**Table 2:** Lower Waimakariri River tidal reached bird count data 2013 – 2014. Source: Crossland (2014)



Species	22/06/13	3/12/13	16/01/14	5/02/14	6/02/14	25/02/14
Black Cormorant	0	0	0	0	0	0
Pied Cormorant	5	4	4	6	1	4
Little Cormorant	0	1	3	1	1	4
Little Black Cormorant	0	0	0	0	0	0
Spotted Shag	0	0	0	2	1	0
White Heron	0	0	0	0	0	0
White Faced Heron	0	1	3	2	1	0
Aust Bittern	0	0	0	0	0	0
Royal Spoonbill	0	0	0	0	0	0
Black Swan	0	0	0	0	0	0
Canada Goose	0	0	0	0	0	0
Paradise Shelduck	0	0	0	0	0	0
Mallard/Grey	0	4	0	0	0	0
Grey Teal	0	0	0	0	0	0
NZ Scaup	0	0	0	0	0	0
NZ Shoveler	0	0	0	0	0	0
Pukeko	0	0	0	0	0	0
Harrier	0	0	0	0	0	0
SI Pied Oystercatcher	0	2	0	0	0	0
Variable Oystercatcher	0	0	0	0	0	0
Pied Stilt	0	1	0	0	0	0
Banded Dotterel	0	0	42	54	56	97
Spur Winged Plover	0	10	2	0	0	0
Eastern Bar Tailed Godwit	0	0	0	0	0	0
Caspian Tern	0	0	0	0	0	1
Black-fronted Tern	0	5	23	6	3	10
White-fronted Tern	0	5	9	16	10	3
Black-backed Gull	0	1	3	9	2	6
Black-billed Gull	0	36	95	36	28	40
Red-billed Gull	0	0	0	0	0	0
Welcome Swallow	0	0	0	4	0	12

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Sanctuary Wetland

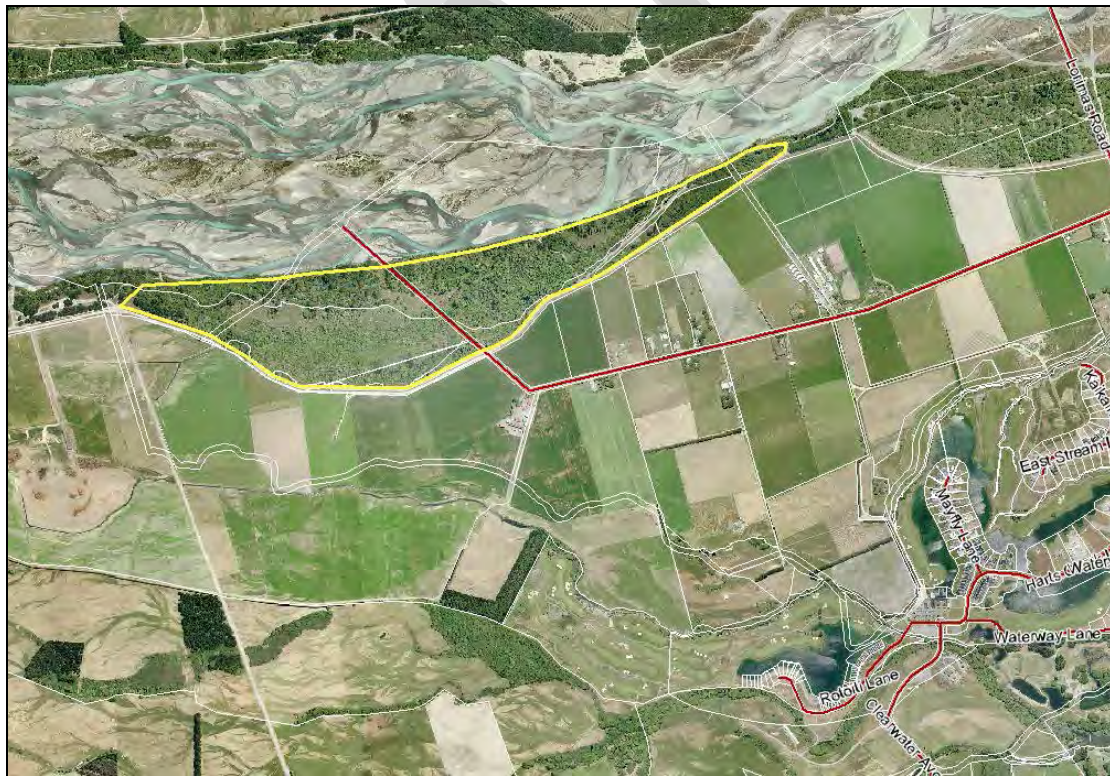
**Site number:** SES/LP/12

**Physical address of site:** 402, 404 & 600 Coutts Island Road  
Belfast  
Christchurch

#### Summary of Significance:

The Sanctuary Wetland SES is significant because it contains a large area of indigenous vegetation that is representative of the Low Plains Ecological District and provides habitat for a representative assemblage of native avifauna, including a number of threatened species.

#### Site Map



### **Additional Site Information**

<b>Ecological District</b>	Low Plains
<b>Central point NZTM:</b>	N5190311, E1565488
<b>Area of SES (ha):</b>	55.50 ha

### **Site Description**

The Sanctuary Wetland SES is a riparian freshwater wetland on the south (true right) bank of the Waimakariri River dominated by an exotic willow canopy with scattered native trees and shrubs, and an under storey comprising a mix of native wetland plants (refer Appendix 1) and exotic weed species. The site contains spring-fed seepages and small areas of open water. This is one of the largest patches of freshwater swampland in Christchurch and is similar to habitats found at Coutts Island Wetland, Horseshoe Lake, Otukaikino Wetland and parts of Travis Wetland and Styx Mill Conservation Reserve, all of which have been listed as Sites of Ecological Significance.

### **Extent of Site of Ecological Significance**

The SES is contained within the bounds of the base of the stop bank on the southern side of the SES and the unsealed road along the true right bank of the Waimakariri River. The eastern limit of the SES is the stop bank access ramp located approximately 175 m east of the unformed legal road at 396 Coutts Island Road. From here the SES extends westward for approximately 2.40 kilometres to the main haul/gravel extraction road that links the Waimakariri River with Roto Kohatu Reserve to the South, to cover a total area of approximately 55.50 ha as shown on the location diagram above.

### **Assessment Summary**

The Sanctuary Wetland Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 & 2), rarity/distinctiveness (criteria 3, 4 & 6), and ecological context criteria (criteria 8 & 10).

### **Assessment against Significance Criteria**

#### **Representativeness**





- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

Although degraded by weed infestations, this site is one of the best remaining examples of formerly widespread freshwater swamp habitats (Grove 2006) in Christchurch. The indigenous avifauna diversity of the wetland is considered representative in that it is known to support 22 out of 25 (88%) bird species identified by Crossland (2014) that are expected to occupy such habitats in Christchurch (Refer Appendix 1).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

Sanctuary Wetland is the largest remaining freshwater wetland complex on the lower Waimakariri River (Grove 2006), and at 55.50 ha in area, this site is one of the largest freshwater swampland habitats remaining in Christchurch.

#### **Rarity/Distinctiveness**

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

This site comprises indigenous vegetation (refer Appendix 1) and freshwater swampland which has been reduced to much less than 20% of its original extent in Christchurch and the Low Canterbury Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).



**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

This site regularly supports small numbers of threatened, at risk, and uncommon bird species for the Low Plain Ecological District as classified by Robertson *et al.* (2012), Birdlife International (2014), and Wetlands International (2014) including the following (Crossland 2014):

<b>Species</b>	<b>Threat Status</b>
Grey Duck	Threatened/Nationally Critical
Australasian Bittern	Threatened/Nationally Endangered
Marsh Crake	At Risk/Relict
Spotless Crake	At Risk/Relict

Audio data loggers have recently confirmed the presence of Australasian Bittern at the site (Philip Grove *pers comms* 2014)<sup>1</sup>.

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

This site supports a high proportion of an “association of indigenous species that is distinctive” and of “restricted occurrence”. Specifically, this site supports a high proportion (88%) of the “freshwater wetlands species assemblage” for the Low Plains Ecological District (Refer Appendix 2; Crossland 2014).

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

Site not assessed under this criterion

<sup>1</sup> Conversation with Philip Grove, Land Resources Scientist (terrestrial ecology), Environment Canterbury.



## Ecological Context

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

This site is one of the largest habitat patches in a network of freshwater and tidal wetlands that line the lower Waimakariri River. This network collectively provides habitat for a metapopulation of swamp birds including Australasian Bittern, Marsh Crake and Spotless Crake.

- 9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

Site not assessed under this criterion

- 10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

This site provides a refuge from recreational hunting/shooting and core breeding habitat for indigenous swamp birds and waterfowl including the following species:

Australasian Bittern  
Marsh Crake  
Spotless Crake  
Pukeko  
Paradise Shelduck  
Grey Duck  
Grey Teal  
New Zealand Shoveler

## Site Management

### Existing Protection Status

- Land in public ownership (CCC)

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>• Pest plant incursion (Refer also Grove 2006)</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor pest plant infestations and implement control as required.</li> <li>• Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Animal pest incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring of possible animal pest incursions and trapping as necessary</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Disturbance to feeding and nesting sites</li> </ul>	<ul style="list-style-type: none"> <li>• Interpretation highlighting the impacts disturbances can have on wildlife values</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Construction of duck shooting hides (including vegetation clearance and access tracks)</li> </ul>	<ul style="list-style-type: none"> <li>• Removal of hides as they are detected</li> <li>• 'No Shooting' signage and enforcement</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Lowered water table resulting from stream channelling by river/drainage engineers</li> </ul>	<ul style="list-style-type: none"> <li>• Close liaison between biodiversity managers and river/drainage engineers</li> <li>• Appropriate management of stream at SW end to ensure appropriate water levels are maintained within the wetland</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>

## References

Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.

Birdlife International (2014) *IUCN Red List for birds*. Downloaded from <http://www.birdlife.org> on 1/04/2014.

Crossland, A. (2014) *Association of indigenous species; full species assemblages expected on given habitat types in 2014*. Christchurch City Council Internal Report, Christchurch City Council.

Grove, P. (2006) *Biodiversity management plan for the Sanctuary Swamp, Lower Waimakariri Regional Park*. Environment Canterbury, Christchurch, New Zealand

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Robertson, H., Dowding, J., Elliott, G., Hitchmough, R., Miskelly, C. O'Donnell, C., Powlesland, R., Sagar, P., Scofield, P., Taylor, G. 2013. *Conservation status of New Zealand birds, 2012*. New Zealand Threat Classification Series 4, Department of Conservation.

Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.

Wetlands International (2014) *Waterbird Population Estimates 5*. Downloaded from <http://www.wpe.wetlands.org> on 1/4/2014

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 2nd April 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 2nd April 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Indigenous Vascular Plant Species

List of indigenous vascular plant species recorded at Sanctuary Wetland by Meurk *et al.* (1993), and Grove (2006). Records recorded by Grove (2006) are marked with an asterisk (\*).

*Acaena vovae-zelandiae*  
*Asplenium gracillimum\**  
*Asplenium terrestre\**  
*Asplenium terrestre*  
*Austroderia richardii*  
*Blechnum chambersii*  
*Blechnum fluviatile\**  
*Blechnum minus*  
*Blechnum novaezelandiae\**  
*Blechnum penna-marina*  
*Carex geminate*  
*Carex secta*  
*Coprosma propinqua x robusta\**  
*Coprosma robusta*  
*Cordylina australis*  
*Coriaria arborea*  
*Epilobium pedunculare\**  
*Gnaphalium involucratum\**  
*Hydrocotyle heteromeria*  
*Hypolepis ambigua*  
*Juncus gregifolius*  
*Juncus planifolius\**  
*Phormium tenax*  
*Phymatosorus diversifolius*  
*Phymatosorus pustulatus\**  
*Pittosporum tenuifolium*  
*Polystichum vestitum*  
*Pseudognaphalium luteoalbum*  
*Pteridium escuentum*  
*Ranunculus reflexus\**  
*Sophora microphylla*  
*Typha orientalis*



## Appendix 2: Indigenous Wetland Bird Species

Comparison of native wetland bird species recorded in Sanctuary Swamp compared to the 'Freshwater Wetlands (tall swamp + open water) Bird Assemblage for Christchurch' (Crossland 2014).

Species recorded at the study site are marked with a tick (✓); species considered to be breeding on site are underlined; species not recorded at site but part of the above assemblage are shown in grey font.

### COMMON RESIDENT

✓ Pukeko *Porphyrio porphyrio melanotus*

### LESS COMMON RESIDENT

✓ Paradise Shelduck *Tadorna variegata*  
 ✓ New Zealand Shoveler *Anas rhynchos*  
 ✓ New Zealand Scaup *Aythya novaeseelandiae*  
 ✓ Grey Teal *Anas gracilis*  
 ✓ Harrier *Circus approximans*  
 ✓ Marsh Crake *Porzana pusilla affinis*  
 Pied Stilt *Himantopus himantopus leucocephalus*  
 ✓ New Zealand Kingfisher *Halcyon sancta vagans*  
 ✓ Grey Warbler *Gerygone igata*  
 ✓ South Island Fantail *Rhipidura fuliginosa fuliginosa*  
 ✓ Silvereye *Zosterops lateralis lateralis*

### SCARCE RESIDENT

✓ Australasian Bittern *Botaurus poiciloptilus*  
 ✓ Grey Duck *Anas superciliosa superciliosa*  
 ✓ Spotless Crake *Porzana tabuensis plumbea*

### SEASONAL/REGULAR VISITOR

✓ Black Cormorant *Phalacrocorax carbo novaehollandiae* Little  
 ✓ Cormorant *Phalacrocorax melanoleucos brevirostris*  
 ✓ White-faced Heron *Ardea novaehollandiae novaehollandiae*  
 Black Swan *Cygnus atratus*  
 ✓ Southern Black-backed Gull *Larus dominicanus dominicanus*  
 Red-billed Gull *Larus novaehollandiae scopulinus*  
 ✓ Black-billed Gull *Larus bulleri*  
 ✓ Welcome Swallow *Hirundo tahitica neoxena*  
 ✓ Bellbird *Anthornis melanura melanura*  
 ✓ Shining Cuckoo *Chrysococcyx lucidus*

### IRREGULAR VISITOR

White Heron *Egretta alba modesta*  
 Tui *Prothemadera novaeseelandiae novaeseelandiae*



## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

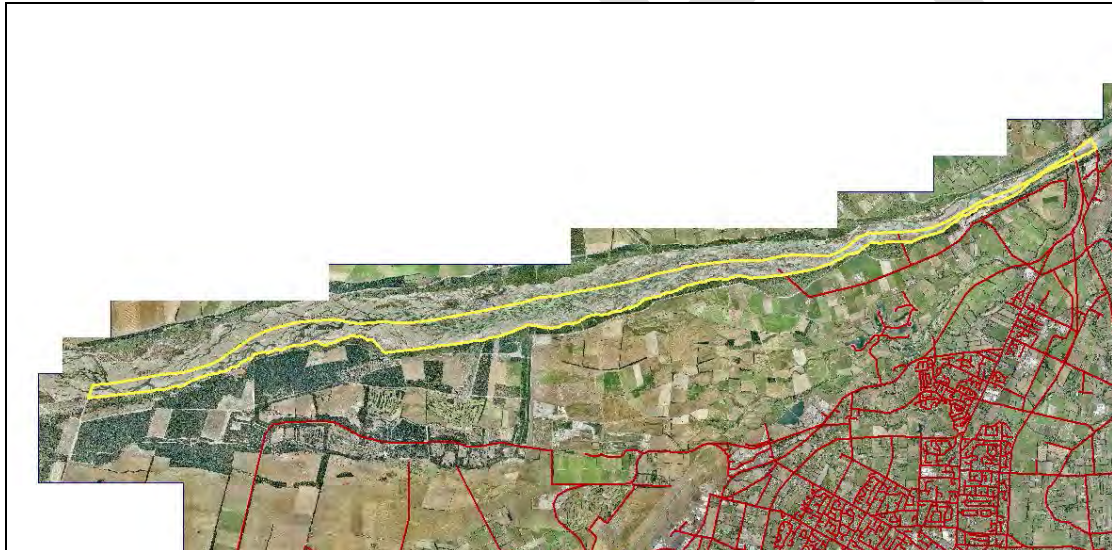
**Site name:** Waimakariri River (Braided River Section)

**Site number:** SES/LP/13

#### **Summary of Significance:**

The Waimakariri River Braided River SES contains a large originally rare ecosystem that supports a representative assemblage of indigenous braided river birds including several threatened and/or at risk species.

#### **Site Map**





### **Additional Site Information**

**Central point:** N5190010, E1562039

**Area of SES (ha):** 450 ha

### **Site Description**

This section of the Waimakariri River is the largest, and one of the best examples of braided river habitat for indigenous bird species in the Low Plains Ecological District and wider Canterbury. It supports a high diversity of indigenous taxa, including at least 12 species of bird that are listed as 'nationally critical', 'nationally endangered', 'nationally vulnerable', naturally uncommon or 'at risk' (Crossland 2003; Crossland 2014).

The river is classified as being part of "Biodiversity Type 1 Water body of Significant National Value for Biodiversity", meaning that the whole river system is nationally important for biodiversity (Ministry for the Environment 2014). Although often regarded as species-depauperate 'ecological deserts', braided rivers, including the Waimakariri and its floodplain reaches are spatially complex, temporally dynamic systems with high landscape and reach-scale biodiversity values. Living within and around this mosaic of aquatic habitats are a range of often rare and little-understood flora and fauna (Gray and Harding 2007).

### **Extent of Site of Ecological Significance**

This SES is made up of the section of braided riverbed downstream from the northern end of Weedons Ross Road (the Christchurch City Council territorial boundary) to the Old Waimakariri Bridge where the tidal river environment begins. The width of the SES is defined by the CCC territorial boundary on the northern side, to the defined edge/bank on the south side. Note that this SES is restricted to the braided river environment, and does not extend to include marginal vegetation, river protection forestry or other non-braided river vegetation and/or habitat.



## Assessment Summary

The Waimakariri River Braided River Section Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 & 2), rarity/distinctiveness (criteria 4, 6 & 7), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 & 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

#### **Assessment:**

The site is significant under this criterion.

The Waimakariri is one of the best examples of a longitudinally braided river in New Zealand. Braided rivers are particularly notable because they support a unique assemblage of specially adapted fauna (Crossland 2003).

This site supports a substantial proportion of the braided river species assemblages for Christchurch and the Low Plains Ecological District (Crossland 2014; Appendices 1 & 2).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

The Waimakariri is by far the largest river in the Christchurch area and large for the Low Plains Ecological District (Crossland 2003).



**Rarity/Distinctiveness**

3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

Does not meet criterion

4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.*

The site is significant under this criterion.

This site supports feeding and roosting habitat for several threatened, at risk, and uncommon bird species as classified by Robertson *et al.* (2012), including the following (Crossland 2003; Crossland 2014; Appendix 1 & 2):

<b>Species</b>	<b>Threat Status</b>
Grey Duck	Threatened/Nationally Critical
Black-billed Gull	Threatened/Nationally Critical
Black-fronted Tern	Threatened/Nationally Endangered
Wrybill	Threatened/Nationally Vulnerable
Banded Dotterel	Threatened/Nationally Vulnerable
Caspian Tern	Threatened/Nationally Vulnerable
White Fronted Tern	At Risk/Declining
SI Pied Oystercatcher	At Risk/Declining
Pied Stilt	At Risk/Declining
New Zealand Pipit	At Risk/Declining
Black Cormorant	At Risk/Naturally Uncommon

5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

The site is significant under this criterion.

Braided riverbeds are classified by Williams *et al.* (2007) as originally rare ecosystems.



## Diversity and Pattern

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

The Waimakariri River and its floodplain reaches are spatially complex and temporally dynamic systems with high landscape and reach-scale biodiversity values. As a result of the temporal dynamics, habitats in different successional stages are maintained, resulting in a highly diverse mosaic of floodplain habitats, each with their own distinct biological community (Gray and Harding 2007). This site also contains a high diversity of indigenous taxa. Specifically, it supports a wide range of braided river birds (Crossland 2014; Refer Appendix 1 & 2).

## Ecological Context

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is significant under this criterion.

This site is a “habitat of indigenous fauna that provides or contributes to an important ecological linkage or network”. Specifically, it serves as a transit zone and breeding, feeding and roosting area for birds from the upstream braided sections of the Waimakariri River as they move through the site towards the coast.

- 9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

Does not meet criterion

- 10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

This site is an important breeding and feeding habitat for a range of river and birds (See Appendix 2), particularly for Black-billed Gulls and White-fronted Terns. In all years there are small numbers of wetland birds breeding within the site, particularly on islands. In some years colonial nesting of White-fronted Tern and Black-billed gull occurs.



For Wrybill, Black-billed Gull, Black-fronted Tern and Caspian Tern, the Waimakariri River represents the only nesting grounds in Christchurch, and for an additional five species (South Island Pied Oystercatcher, Pied Stilt, Banded Dotterel, Black-backed Gull and White-fronted Tern) the river is likely to support >50% of the Christchurch breeding population (Crossland 2003)

In terms of invertebrate fauna, the presence of an extensive mosaic of habitats within the channels and floodplains provides both refuge and internal sources for re-colonists (Gray and Harding 2007). Thus the proposed SES is likely to play an important role in the wider metapopulation dynamics of invertebrate communities in the Waimakariri River.

DRAFT

## Site Management

### Existing Protection Status

- No special protection of wildlife other than Wildlife Act and ECAN bylaw provisions.

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>• Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor pest plant infestations and implement control as required.</li> <li>• Assess new pest plant incursions and implement control as required</li> </ul>	
<ul style="list-style-type: none"> <li>• Predation by avian predators</li> </ul>	<ul style="list-style-type: none"> <li>• Careful selective control of avian predators (e.g. Black-backed Gull, Magpie, Harrier, etc) using best practise methods and avoidance of harming non-target species (both through direct killing and through undue disturbance to breeding non-target birds).</li> </ul>	
<ul style="list-style-type: none"> <li>• Animal pest incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring of possible animal pest incursions and trapping as necessary</li> </ul>	
<ul style="list-style-type: none"> <li>• Disturbance to roosting and nesting sites</li> </ul>	<ul style="list-style-type: none"> <li>• Interpretation highlighting the impacts disturbances can have on wildlife values</li> <li>• Ensure weed control activities are not undertaken during the breeding season and cause undue disturbance to nesting birds.</li> </ul>	
<ul style="list-style-type: none"> <li>• Destruction of islands, sandy areas, backwater pools and riffles, as a result of gravel extraction</li> </ul>	<ul style="list-style-type: none"> <li>• Strategic management of gravel extraction activities including protocols that minimise disturbance to breeding riverbed birds</li> </ul>	

	<ul style="list-style-type: none"><li>• Construction of nesting islands where appropriate.</li></ul>	
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**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 8<sup>th</sup> April 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 8<sup>th</sup> April 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.





## Appendix 1: Indigenous Wetland Bird Species

Comparison of wetland bird species recorded on the Waimakariri River braided river reaches compared to the Braided River Assemblage for Christchurch. Species recorded at the study site are marked with a tick (✓); species not recorded at site but part of the above assemblage are shown in grey font (Source Crossland 2014).

### COMMON RESIDENT

✓	Pied Stilt	<i>Himantopus himantopus leucocephalus</i>
✓	Spur-winged Plover	<i>Vanellus miles</i>
✓	Banded Dotterel	<i>Charadrius bicinctus bicinctus</i>
✓	Southern Black-backed Gull	<i>Larus dominicanus dominicanus</i>
✓	Black-billed Gull	<i>Larus bulleri</i>

### LESS COMMON RESIDENT

✓	White-faced Heron	<i>Ardea novaehollandiae novaehollandiae</i>
✓	Paradise Shelduck	<i>Tadorna variegata</i>
✓	Grey Teal	<i>Anas gracilis</i>
✓	Australian Harrier	<i>Circus approximans</i>
✓	Sth Island Pied Oystercatcher	<i>Haematopus ostralegus finschi</i>
✓	Wrybill	<i>Anarhynchus frontalis</i>
✓	Black-fronted Tern	<i>Sterna albobriata</i>
✓	Caspian Tern	<i>Sterna caspia</i>
✓	White-fronted Tern	<i>Sterna striata</i>
✓	Welcome Swallow	<i>Hirundo tahitica neoxena</i>
✓	New Zealand Kingfisher	<i>Halcyon sancta vagans</i>
✓	New Zealand Pipit	<i>Anthus novaeseelandiae novaeseelandiae</i>

### SCARCE RESIDENT

✓	Grey Duck	<i>Anas superciliosa superciliosa</i>
✓	New Zealand Shoveler	<i>Anas rhynchotis</i>
✓	New Zealand Scaup	<i>Aythya novaeseelandiae</i>

### SEASONAL/REGULAR VISITOR

✓	Black Cormorant	<i>Phalacrocorax carbo novaehollandiae</i>
✓	Little Cormorant	<i>Phalacrocorax melanoleucos brevirostris</i>

### IRREGULAR VISITOR

	Pied Cormorant	<i>Phalacrocorax varius varius</i>
	Black Stilt	<i>Himantopus novaezealandiae</i>
	Black-fronted Dotterel	<i>Charadrius melanops</i>
	Turnstone	<i>Arenaria interpres</i>
	Red-billed Gull	<i>Larus novaehollandiae scopulinus</i>
	White-winged Black Tern	<i>Chlidonias leucopterus</i>



## Appendix 2: Notable Bird Species above Wrights Cut

### Notable bird species nesting and/or feeding on the Waimakariri Riverbed above Wrights Cut.

Species marked with a # nest on the riverbed (Source Crossland 2003).

Common Name	Scientific Name	DOC Threat Status
Black Cormorant	( <i>Phalacrocorax carbo</i> )	Naturally Uncommon
Little Cormorant	( <i>Phalacrocorax melanoleucos</i> )	Not Threatened
White-faced Heron	( <i>Egretta novaehollandiae</i> )	Not Threatened
Canada Goose	( <i>Branta canadensis</i> ) #	Introduced
Paradise Shelduck	( <i>Tadorna variegata</i> ) #	Not Threatened
Mallard	( <i>Anas platyrhynchos</i> ) #	Introduced
Grey Duck	( <i>Anas superciliosa</i> ) #	Nationally Critical
Grey Teal	( <i>Anas gracilis</i> ) #	Not a
Harrier	( <i>Circus approximans</i> )	Not Threatened
SI Pied Oystercatcher	( <i>Haematopus finschi</i> ) #	At Risk
Spur-winged Plover	( <i>Vanellus miles</i> ) #	Not Threatened
Pied Stilt	( <i>Himantopus himantopus</i> ) #	At Risk
Banded Dotterel	( <i>Charadrius bicinctus</i> ) #	Nationally Vulnerable
Wrybill	( <i>Anarhynchus frontalis</i> ) #	Nationally Vulnerable
Black-backed Gull	( <i>Larus dominicanus</i> )	Not Threatened
Black-billed Gull	( <i>Larus bulleri</i> ) #	Nationally Critical
Caspian Tern	( <i>Hydroprogne caspia</i> ) #	Nationally Vulnerable
White-fronted Tern	( <i>Sterna striata striata</i> ) #	At Risk
Black-fronted Tern	( <i>Sterna albobriata</i> ) #	Nationally Endangered
NZ Kingfisher	( <i>Halcyon sancta</i> )	Not Threatened
Welcome Swallow	( <i>Hirundo tahitica</i> )	Not Threatened
New Zealand Pipit	( <i>Anthus novaeseelandiae</i> ) #	At Risk

also, occasionally arctic migrants such as;

Mongolian Dotterel	( <i>Charadrius mongolus</i> )	Vagrant
Ruddy Turnstone	( <i>Arenaria interpres</i> )	Non-resident Native
E Bar-tailed Godwit	( <i>Limosa lapponica</i> )	At Risk



## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

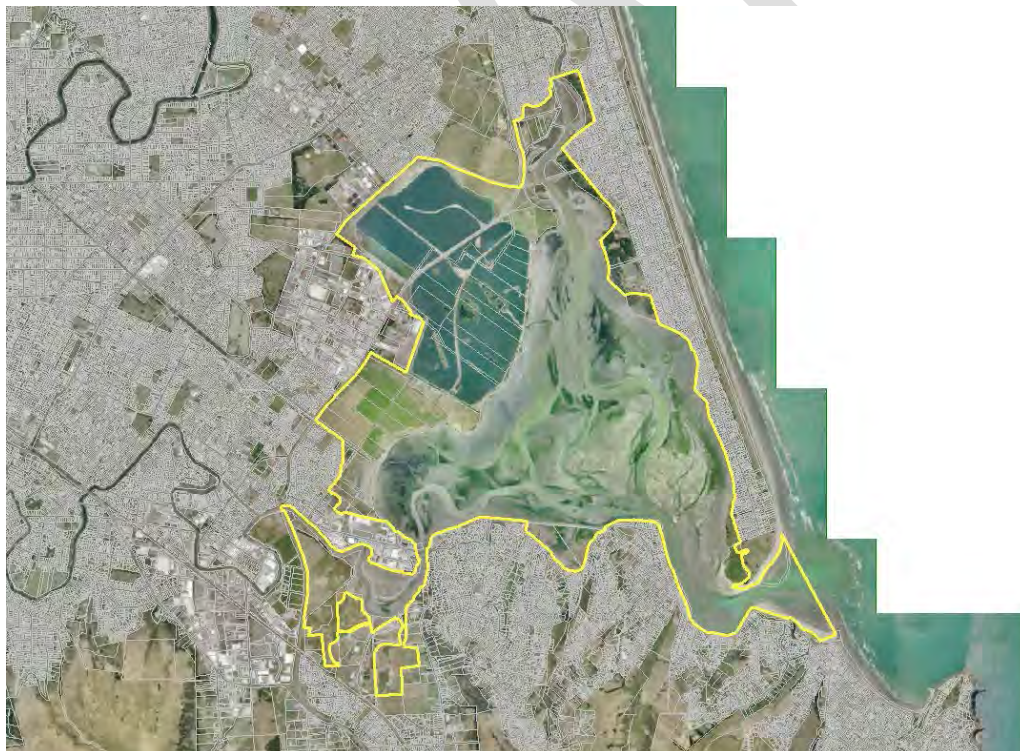
**Site name:** Avon Heathcote Estuary/Ihutai & Environs

**Site number:** SES/LP/14

#### **Summary of Significance:**

The Avon Heathcote Estuary/Ihutai is an originally rare ecosystem that contains indigenous vegetation communities that have been greatly reduced within the Low Plains Ecological District, and is also of local, national and international importance in terms of it supporting a representative assemblage of indigenous and migratory birdlife, including 23 threatened species.

#### **Site Maps**





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*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

### **Additional Site Information**

**Central point:** 2487783, 5740761

**Area of SES (ha):** XXX

### **Site Description**

The Avon-Heathcote Estuary/Ihutai is located on the eastern fringes of Christchurch City, in central Canterbury, New Zealand. The site is separated from the Pacific Ocean by a 4.5 km long sand spit and comprises c.880 ha of inter-tidal flats and peripheral salt marsh. The estuary is roughly triangular in shape and fed by 3 small rivers (Avon River, Heathcote River and Linwood Avenue Canal) which collectively drain a largely urbanised catchment of 188 km<sup>2</sup>. Tides are semi-diurnal with a range of 2.1 m for spring tides and 1.1 m for neap tides.

The Avon-Heathcote Estuary/Ihutai and its surrounding associated features comprise a mosaic of coastal environments, ecological units and vegetation types including salt marsh, and turf saltmeadow on riparian terraces, and planted shrubland and coastal bush. In addition to extensive areas of mudflat and peripheral salt marsh, the greater Avon-Heathcote area also includes the c.275 ha Bromley Oxidation Ponds/Te Huingi Manu Wildlife Refuge, c.100 ha of lowland wet grassland (Linwood Paddocks), and a combined area of c.40 ha of human-created tidal wetlands located around the margins of the estuary (Charlesworth, Bexley and Ferrymead wetland reserves, respectively). In total, c.1300 ha of habitat is available for wetland birds and at peak times these combined habitats support upwards of 30,000 birds (Crossland 1993, 2010, 2013a).

### **Extent of Site of Ecological Significance**

The Avon-Heathcote Estuary/Ihutai and Environs SES includes the tidal extent of the estuary basin and shoreline, the lower Avon and Heathcote Rivers, Jellicoe Marsh, Bexley Wetland, McCormacks Bay (including the sports fields at the western end of the bay), the extent of the Bromley oxidation ponds, coastal paddocks between the oxidation ponds and the Avon Rivermouth, Linwood paddocks north of Linwood Avenue/east of Dyers Road, Charlesworth reserve, the portion of the Southshore spit south of the existing residential area, and large areas of grazed pasture, salt meadow and constructed wetlands within Ferrymead Park and on adjacent privately owned land as shown on the location maps. Note that the SES excludes the golf course area within Ferrymead Park, as indicated on the location map.

### **Assessment Summary**

The Avon Heathcote Estuary/Ihutai and Environs SES has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist



Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 & 2), rarity/distinctiveness (criteria 3, 4, 5 & 6), diversity and pattern (criterion 7), and ecological context criteria (criteria 9 & 10).

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## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The Avon-Heathcote Estuary/Ihutai and immediate surroundings has had 144 bird species recorded between 1840 and 2014, including 54 resident species, 20 seasonal visitors, 61 vagrants and nine species which are now locally extinct. Of these, 47 native and migratory species (Appendix 1) are described as either being a) resident all year round, b) resident and breeding, c) resident with seasonal population influxes, or d) seasonal or regular visitors (Crossland 2013a).

Thirty-four species of fish representative of both marine and freshwater habitats have been recorded at the Avon Heathcote Estuary/Ihutai (Cromarty and Scott 1996). Sixteen species of fish were recorded during a 2011 survey of the Estuary, and sampling found no evidence for large scale changes in fish communities that could be associated with the 2011 earthquakes (Unwin and Hawke 2012).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

The Avon-Heathcote Estuary/Ihutai is the largest, semi-enclosed shallow estuary in Canterbury, and remains one of the Low Plains Ecological District's and New Zealand's most important coastal wetlands, despite being almost totally surrounded by the residential housing suburbs to the east of Christchurch City (Crossland 2009, Mac Farlane 2012; Cromarty and Scott 1996).

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

Site contains wetland vegetation that has been reduced to less than 20% of its former extent in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013; Harris 1992).



**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site supports 23 avian species that are identified by Robertson et al. (2012) as either Threatened, Nationally Endangered, Nationally Vulnerable, At Risk, Relict, Naturally Uncommon or Recovering (refer Crossland 2009; Crossland 2013a).

The site supports the At Risk/Naturally Uncommon horses mane lakeweed (*Ruppia megacarpa*) (CCC Natural Areas Database).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

The Avon Heathcote Estuary/Ihutai is the southern limit of national and global range for Little Black Cormorant (*Phalacrocorax sulcirostris*) (Crossland 2013b).

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

Estuaries are listed by Williams *et al.* (2007) as historically rare ecosystems, and as such the associations of indigenous species that occur within the Avon Heathcote Estuary are significant under this criterion.

### **Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

The wider site contains a high diversity of ecological units, including: mud flats, ribbonwood-rush shrub saltmarsh, reed-rush/turf saltmarsh, turf saltmeadow, exotic turf saltmeadow, raupo swamp, raupo/NZ flax/reed/rush/sedge tussock swamp, freshwater aquatic ecosystems, pine/NZ tree planted coastal bush, and exotic grazed pasture that supports indigenous migratory waders and waterfowl.





## Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Does not meet this criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

The site is significant under this criterion.

The estuary is a semi-enclosed basin with a surface area of over 800 ha, within which the combined flows of the Avon and Heathcote Rivers meet and mix with seawater during each tidal cycle. It functions as a trap for sediments transported down the beds of the two inflowing rivers. The extensive mudflats support an abundant and diverse invertebrate community which forms much of the food source for a wide variety of fish species, as well as resident and migratory waterfowl (Cromarty and Scott 1996).

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

The site is significant under this criterion.

The Avon Heathcote Estuary/Ihutai complex regularly support peak numbers of 30,000-35,000 wetland birds including peak numbers of waterfowl and 3000 individuals of other species (including cormorants, gulls, terns, swallows, spoonbills, herons, kingfisher, coot and pukeko). Of the 15,000 waterfowl, only 2000 of these were reported to be introduced species (mallard ducks and Canada geese) (Crossland 2005).

The highest counts are in late summer/autumn with c.36,637 birds in Jan 2010, followed by 34,292 birds in Feb 2010 and 31,743 birds in Mar 2010. More than 20,000 wetland birds were present during each of the 5 months from Dec to Apr 2010. This is the annual peak period when the area supports a considerable influx as part of the moulting, post-breeding flocking and migration strategies of many bird species (Crossland 1993, 2010). Lowest numbers occurred in Sep 2009 which coincides with many native species being away on inland breeding grounds and was immediately prior to the arrival of migratory bar-tailed godwits. The 7871 total recorded in Sep 2009 excludes cormorants and gulls. Based on counts in other years (unpubl. data), Sept estimates for gulls (3000+) and cormorants (400+) would give an estimated annual low population of c.11,000 – 12,000 wetland birds (Crossland 2013a).

Twelve species were recorded with populations exceeding 1000 individuals. These included New Zealand shoveler (7046), grey teal (5881), New Zealand scaup (5739), South Island pied oystercatcher (4844), paradise shelduck (3092), Canada goose (*Branta Canadensis*) (2871), mallard/grey duck hybrid (*Anas*

*platyrhynchos* x *A. superciliosa*) (2617), black-backed gull (*Larus dominicanus*) (2344), bar-tailed godwit (2110) and black swan (*Cygnus atratus*) (1104). In addition, both red-billed gull and black-billed gull (with a combined peak count of 6214) had peak populations estimated at 5000+ and 1000+, respectively. Another 8 species were recorded with numbers exceeding 100 individuals in at least one month: pukeko (881), pied cormorant (427), white-fronted tern (*Sterna striata*) (319), pied stilt (*Himantopus himantopus leucocephalus*) (312), little cormorant (*Phalacrocorax melanoleucos brevirostris*) (142), spur-winged plover (*Vanellus miles novaehollandiae*) (116), variable oystercatcher (109) and royal spoonbill (*Platalea regia*) (102). Three additional species had peak counts slightly under 100 during the 2009-2010 study but in other years each of these has regularly exceeded 100 in number: black cormorant (*Phalacrocorax carbo novaehollandiae*) (93), banded dotterel (*Charadrius bicinctus bicinctus*) (86), and white-faced heron (*Egretta novaehollandiae*) (85) (Crossland 2013a).

The Bromley oxidation ponds regularly support peak numbers of more than 15,000 waterfowl and 3000 individuals of other species (including cormorants, gulls, terns, swallows, spoonbills, herons, kingfisher, coot and pukeko). Of the 15,000 waterfowl, only 2000 of these were reported to be introduced species (mallard ducks and Canada geese) (Crossland 2005). The Bromley oxidation ponds area is also a critical moulting site for NZ Scaup, NZ Shoveler, Paradise Shelduck, Grey Teal and Grey Duck. Oxidation Ponds area an important national/international breeding site for NZ Scaup, and regional importance for four cormorant species Crossland (2009).

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## Site Management

### Existing Protection Status

To be completed

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitor pest plant infestations and implement control as required.</li> <li>Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Animal pest incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of possible animal pest incursions and trapping as necessary</li> <li>Utilise moat and island concept in wetland restoration/creation around edges of estuary to deter access to sensitive breeding areas and roosting areas.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Reclamation, habitat loss and modification of the estuary margins (Grove and Parker 2013)</li> </ul>	<ul style="list-style-type: none"> <li>Consider improving the condition of the saltmarsh habitat on the margins of the estuary by ensuring that further degradation and habitat loss does not occur through the establishment of an appropriate buffer between the estuary and grazed pasture.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Disturbance of birds by humans and dogs.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure levels of human disturbance are minimised, for example by erecting temporary fencing and signage around nest sites.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

	<ul style="list-style-type: none"> <li>• Ensure that dogs are under control or on a leash and prohibit dogs within core wetland areas of SES area</li> <li>• Interpretation highlighting the impacts dogs can have on wildlife values</li> <li>• Restrict access to the estuary shoreline adjacent to the oxidation ponds.</li> </ul>	
<ul style="list-style-type: none"> <li>• Human disturbance to pied and little shag breeding colonies and royal spoonbill roost site</li> </ul>	<ul style="list-style-type: none"> <li>• Restrict access to the vicinity of the nesting colony (specifically to anglers and staff undertaking maintenance of restoration plantings) during the breeding season.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>

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**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 14<sup>th</sup> January 2015

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 14<sup>th</sup> January 2015

**Statement updated by:** XXX  
**Date:** XXX

## Appendix 1: Indigenous Bird Checklist

White-flipped Penguin ( <i>Eudyptula minor albosignata</i> )	w Rb *
Australasian Gannet ( <i>Morus serrator</i> )	w S #
Black Cormorant ( <i>Phalacrocorax carbo novaehollandiae</i> )	w Rb **
Pied Cormorant ( <i>Phalacrocorax varius varius</i> )	w Rb ***
Little Cormorant ( <i>Phalacrocorax melanoleucos brevirostris</i> )	w Rb **
Spotted Shag ( <i>Stictocarbo punctatus punctatus</i> )	w Rb ****
Little Black Cormorant ( <i>Phalacrocorax sulcirostris</i> )	w Rb #
White-faced Heron ( <i>Ardea n. novahollandiae</i> )	w RbS **
White Heron ( <i>Egretta alba modesta</i> )	w S #
Australasian Bittern ( <i>Botarus poiciloptilus</i> )	w S #
Royal Spoonbill ( <i>Platalea regia</i> )	w RS **
Black Swan ( <i>Cygnus atratus</i> )	w RbS ****
Paradise Shelduck ( <i>Tadorna variegata</i> )	w RbS *****
Grey Duck ( <i>Anas s. superciliosa</i> )	w RbS *
Grey Teal ( <i>Anas gracilis</i> )	w RbS *****
New Zealand Shoveler ( <i>Anas rhynchotis</i> )	w RbS *****
New Zealand Scaup ( <i>Aythya novaseelandiae</i> )	w RbS *****
Australasian Harrier ( <i>Circus approximans</i> )	w RbS *
New Zealand Falcon ( <i>Falco novaeseelandiae</i> )	t S #
Marsh Crake ( <i>Porzana pusilla affinis</i> )	w S *
Pukeko ( <i>Porphyrio porphyrio melanotus</i> )	w RbS ****
Australasian Coot ( <i>Fulica atra australis</i> )	w S *
South Island Pied Oystercatcher ( <i>Haematopus ostralegus</i> )	w RS *****
Variable Oystercatcher ( <i>Haematopus unicolor</i> )	w RS **
Pied Stilt ( <i>Himantopus himantopus</i> )	w RbS ***
Wrybill ( <i>Anarhynchus frontalis</i> )	w S #
Banded Dotterel ( <i>Charadrius bicinctus</i> )	w RbS **
Spur-winged Plover ( <i>Vanellus miles</i> )	w RbS **
Turnstone ( <i>Arenaria interpres</i> )	w S #
Red Knot ( <i>Calidris canutus canutus</i> )	w S #
Eastern Bar-tailed Godwit ( <i>Limosa lapponica baueri</i> )	w RS *****
Arctic Skua ( <i>Stercorarius parasiticus</i> )	w S #
Pomarine Skua ( <i>Stercorarius pomarinus</i> )	w S #
Black-backed Gull ( <i>Larus dominicanus</i> )	w RbS *****
Red-billed Gull ( <i>Larus novaehollandiae</i> )	w RbS *****
Black-billed Gull ( <i>Larus bulleri</i> )	w RbS ***
White-fronted Tern ( <i>Sterna striata</i> )	w RbS ****
Black-fronted Tern ( <i>Sterna albobristata</i> )	w S **
Caspian Tern ( <i>Sterna caspia</i> )	w RS **
New Zealand Pigeon ( <i>Hemiphaga novaeseelandiae</i> )	t S #
Shining Cuckoo ( <i>Chrysococcyx lucidus</i> )	t Sb *
New Zealand Kingfisher ( <i>Halcyon sancta</i> )	w RbS **
New Zealand Pipit ( <i>Anthus novaeseelandiae</i> )	t S *
Welcome Swallow ( <i>Hirundo tahitica</i> )	w RbS ***
Grey Warbler ( <i>Gerygone igata</i> )	t RbS *
South Island Fantail ( <i>Rhipidura fuliginosa</i> )	t RbS *
Silvereye ( <i>Zosterops lateralis</i> )	t RbS ****
Bellbird ( <i>Anthornis melanura</i> )	t RbS *

Definition of terms .... To be completed.



## Appendix 2: Fish Taxa

Fish taxa recorded from the Avon-Heathcote estuary during five fish surveys reported by Unwin and Hawke (2012) between 2005 and 2011.

<b>Common name</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2010</b>	<b>2011</b>
Chinook salmon	y	y			
Clingfish	y		y		y
Common Bully					y
Common smelt	y	y	y	y	y
Common sole	y	y	y	y	y
Estuary stargazer	y	y	y	y	
Giant bully	y		y		y
Globefish	y	y			
Inanga			y		y
Kahawai	y	y	y		y
Sand flounder	y	y	y	y	y
Shortfin eel	y	y	y	y	y
Slender sprat	y				y
Slender stargazer	y	y	y	y	y
Speckled sole		y			
Spotted stargazer	y	y	y	y	y
Spotty	y	y	y		
Stout sprat	y	y	y	y	y
Triplefins	y	y	y	y	y
Yellowbelly flounder	y	y	y	y	y
Yelloweye mullet	y	y	y	y	y
<b>Number of species</b>	<b>21</b>	<b>16</b>	<b>16</b>	<b>11</b>	<b>16</b>



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Templeton Golf Course & Ruapuna Speedway

**Site number:** SES/LP/15

**Physical address of site:** 273 Pound Road & 79 Hasketts Road  
Templeton  
RD 6  
Christchurch 7676

#### Summary of Significance:

The Templeton Golf Course SES is significant because it contains vegetation representative of the Low Plains Ecological District including threatened and/or locally uncommon plant and invertebrate species.

#### Site Map



### Additional Site Information

Central point NZTM: N5179505, E1558785

Area of SES (ha): 61.41 ha

### Site Description

Remnant dryland grassland communities exist on the Templeton Golf Course together with sparse woodland of both kowhai (*Sophora microphylla*) and prostrate kowhai (*S. prostrata*). Due to the management techniques of the golf course the existing indigenous communities are small and isolated. It is nevertheless a site with high biodiversity values and is valuable for the assemblages of plants on original soils and landforms (community/ecosystem values) (Biodiversity Offsetting Stakeholder Group 2013).

### Extent of Site of Ecological Significance

The Templeton Golf Course and Ruapuna Speedway SES covers the entire legal property parcel of the 270 Pound Road site, but excludes those areas occupied by driveways, car parks, buildings, fairways and associated facilities (refer location map). The SES also extends to include the dry grasslands area in the south east corner of Ruapuna Speedway containing large and healthy specimens of South Island kowhai and the creeping subshrub *Muehlenbeckia axillaris*. As with the adjacent golf course, the SES excludes those areas occupied by driveways, car parks, buildings, car remote-controlled racing tracks, associated facilities and Hasketts Road.



## Assessment Summary

The Templeton Golf Course and Ruapuna Speedway Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013a) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1 & 2), and rarity/distinctiveness criteria (criteria 3 & 4).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Although the site is fragmented and modified, it is nonetheless valuable for the assemblages of plants on original soils and landforms (community/ecosystem values) (Biodiversity Offsetting Stakeholder Group 2013). Despite being ecologically degraded, the site contains vegetation that is representative of the natural diversity of the Low Plains Ecological District, and combined with landforms comprises an area that is most similar in composition and structure to those communities that existed in 1840.

Sixteen vascular plant species are recorded at the site by Boffa Miskell (2013) and Patrick (2014) including the following:

- *Carex breviculmis*
- *Carex resectans*
- *Carmichaelia corrugata*
- *Cheilanthes sieberi*
- *Dichondra repens*
- *Hypoxis hookeri*
- *Geranium retrosum*
- *Leucopogon fraseri*
- *Microtis unifolia*
- *Muehlenbeckia axillaris*
- *Muehlenbeckia axillaris x ephedroides*
- *Ophioglossum coriaceum*
- *Rytidosperma exiguum*
- *Sophora microphylla*
- *Sophora prostrata*
- *Zoysia minima*



Habitat suggests that indigenous fungi, mycorrhizae, and cryptograms (mosses & lichens) also occur within this site, and some moss species are described by Patrick (2014) as dominating small areas.

Indigenous insects, in line with the sparse nature of the semi-natural communities, are not numerous or species rich in comparison to other sites west of Christchurch (Patrick 2014). However, although degraded the assemblage of insects at this site remains one of the best examples in the Low Plains Ecological District. Indigenous insect species noted by Patrick (2012) and Patrick (2014) were:

- *Kiwaia thyraula* (gelechiid moth)
- *Orocrambus corruptus* (day-flying grassmoth)
- *Eudonia leptalea*, (sod webworm moth)
- *Pterophorus innotatalis* (plume moth)
- *Monomorium antarcticum* (native ant)
- *Nysius huttoni* (ground bugs)
- *Wiseana copularis* (dryland porina species)
- *Tingena ombrodoca* (small grey moth)
- *Aciptilia innotatalis* (small plume moth)
- *Capua semifera* (common leaf roller)
- *Eudonia sabulosella* (sod webworm species)
- *Eudonia philerga*
- *Orocrambus corruptus* (day-flying moth species)
- *Orocrambus ramosellus* (grass moth)
- *Orocrambus vittellus*
- *Scoparia exilis*
- *Udea flavidalis* (small orange moth)
- *Epyaxa rosearia* (widespread geometrid moth)
- *Helastia corcularia*
- *Homodotis megaspilata*
- *Pseudocoremia suavis*
- *Pseudocoremia leucelaea*
- *Graphania mutans*
- *Graphania plena*
- *Aletia moderata*
- *Leioproctus* spp. (indigenous bee)

The un-described boulder copper butterfly (Canterbury boulder copper of Patrick & Patrick, 2012) is also present in small numbers at the site (Patrick 2012; Patrick 2014).



The kowhai (*Sophora microphylla*) and prostrate kowhai (*S. prostrata*) trees/shrubs scattered across the golf course (Patrick 2012b) support a range of insects including the typical moths that depend solely on these hosts. Moths occur at the Templeton Golf Club in much larger population numbers commensurate with the sheltered site and many more kowhai trees compared to the Christchurch Gun Club site on Chattertons Road (Patrick 2012; Patrick 2014), and include:

- *Stathmopoda aposema*
- *Meterana decorata*
- *Pseudocoremia ochrea*
- *Uresiphita maorialis* (kowhai moth)
- *Stigmella sophorae*
- *Tingena melinella*
- *Catamacta gavisana*

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

Indigenous dryland vegetation on the Canterbury Plains comprises only fragments of what was previously present, and although there are other tiny dryland fragments nearby to the site, none still contain native plants (Partridge 2007). Although degraded, at 61.41 hectares this site is considered to comprise a relatively large example of this type of vegetation in the Low Plains Ecological District.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

This site contains vegetation that has been reduced to less than 20% of its former area in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).



**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site contains 13 indigenous plant species that are threatened, considered locally rare or of limited distribution or occurrence in the ecological region (Boffa Miskell 2013), including:

- *Carmichaelia corrugata* At Risk/Declining
- *Geranium retrorsum* Threatened/Nationally Vulnerable

Boffa Miskell (2013) note that in winter and spring 2013 the turnip-rooted geranium *Geranium retrorsum* was observed (often in patches) scattered in many parts of the golf course.

Furthermore, populations of *Zoysia minima*, *Carex breviculmis*, *C. resectans*, *Rytidosperma exiguum*, within this site also significant under this criterion as they are considered locally rare, with very few populations remaining in the savannah grasslands (Patrick 2014; Environment Canterbury 2013b).

The tiny moth *Kiwaia thyraula* which also occurs at the site is considered locally uncommon in the Low Plains Ecological District (Patrick 2014).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

Site not assessed under this criterion

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

Does not meet criterion



**Ecological Context**

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Does not meet criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion

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## Site Management

### Existing Protection Status

In public ownership

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitor pest plant infestations and implement weed control as required.</li> <li>Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Further species loss</li> </ul>	<ul style="list-style-type: none"> <li>Identify and mark existing native plant populations</li> <li>Re-introduce recently locally extinct species</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Changes to soil structure &amp; fertility as a result of changes in land management that threaten existing ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>Develop and implement a management plan to inform and direct future land management within this unusual land use context</li> <li>Assess any attempts to change the irrigation or fertiliser application regime as part of the land management change process.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Inappropriate planting</li> </ul>	<ul style="list-style-type: none"> <li>Ensure any planting (e.g. amenity, restoration plantings) do not compromise existing ecological values.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Inappropriate impacts of land use by land managers</li> </ul>	<ul style="list-style-type: none"> <li>Consult with land managers on a regular basis to ensure that they understand the ecological values and significance of plant and animal communities on the site.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>





## References

- Biodiversity Offsetting Stakeholder Group (2013) *Notes from biodiversity offsetting stakeholder group meeting 1. Fulton Hogan: Pound Road quarry/Templeton Golf Course (TGC) proposal*. Unpublished minutes of meeting held at Miners Road Quarry office, 18<sup>th</sup> June 2013. (TRIM 14/1441293).
- Boffa Miskell (2013) *Draft field methodology for vegetation at Fulton Hogan Templeton Golf Course and potential offset sites*. Internal memorandum, Boffa Miskel Ltd, Christchurch, New Zealand (TRIM 14/1441478).
- De Lange, P. J., Rolfe, J. R., Champion, P. D., Courtney, S. P., Heenan, P. B., Barkla, J. W., Cameron, E. K., Norton, D. A., and Hitchmough, R. A. (2013) *Conservation status of New Zealand indigenous vascular plants, 2012*. Department of Conservation, Wellington, New Zealand.
- Environment Canterbury (2013a) *Canterbury Regional Policy Statement 2013*. Environment Canterbury.
- Environment Canterbury (2013b) *Ecological inspection of conservation areas on the West Melton Reserves, March – September 2012*. Unpublished Report. Environment Canterbury (TRIM 14/1404370).
- Lloyd, K., McClellan, R., Hutchison, M., Patrick, B., and Shaw, W. (2013) *Guidelines for the application of ecological significance criteria for indigenous vegetation and habitats of indigenous fauna in Canterbury region*. Report prepared for Environment Canterbury by Wildlands Consultants, Rotorua, New Zealand.
- Partridge, T. R. (2015) *Kowhai savannah grasslands at Ruapuna Raceway*. Unpublished report, Christchurch City Council (TRIM 15/156084).
- Patrick, B. H. (2012) *Ecology and conservation of the insects at the Templeton Golf Course*. Unpublished Report, Wildlands Ltd, Christchurch, New Zealand.
- Patrick, B. H. (2014) *Christchurch's savannah grasslands (Draft 27<sup>th</sup> August 2014)*. Unpublished Report for Christchurch City Council (TRIM 14/1419474).
- Patrick, B. H. & Patrick, H. J. H. (2012) *Butterflies of the South Pacific*. University of Otago Press. 250 pages.
- Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.



**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 1<sup>st</sup> January 2015

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 1<sup>st</sup> January 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Conservators Road Dry Plains Grassland

**Site number:** SES/LP/16

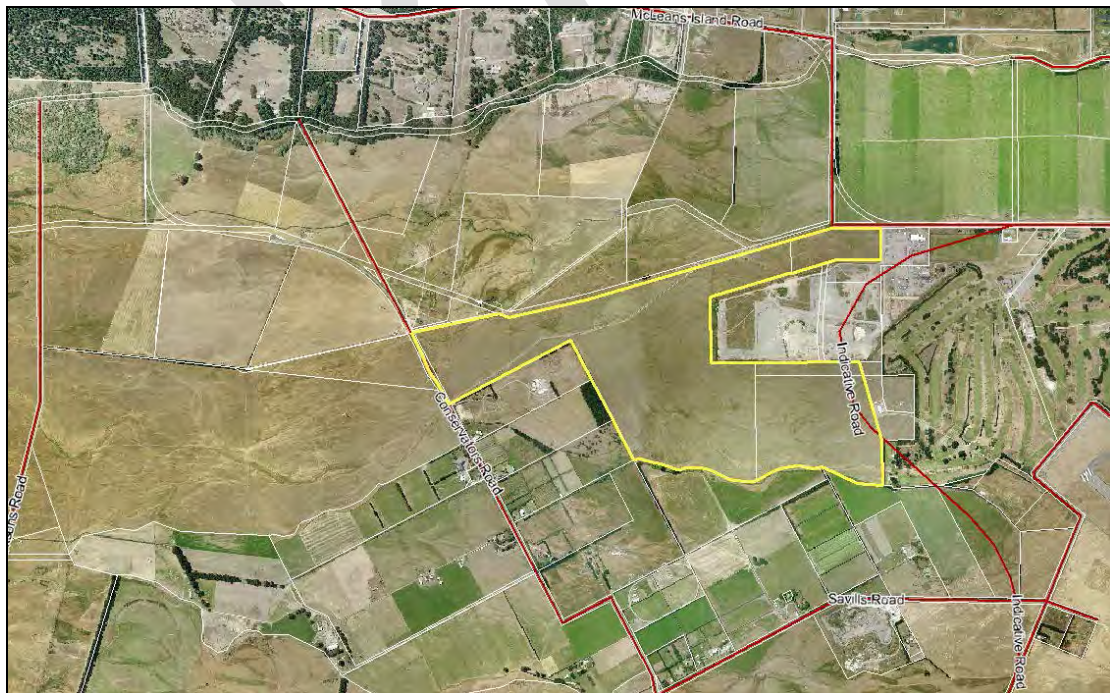
**Physical address of site:** (1) 151 Conservators Road  
Harewood

(2) 891 Pound Road  
Harewood

#### Summary of Significance:

The Conservators Road Dry Grasslands site is significant because it contains a relatively large area of vegetation that is representative of the Low Plains Ecological District including threatened plant and invertebrate species.

#### Site Map



**Additional Site Information**

**Central point NZTM:** N5185629, E1560041

**Area of SES (ha):** 69.90 ha

**Site Description**

The dry plains grasslands in this area of Christchurch represent what is left of once extensive areas of former stony Waimakariri River bed and river terraces. The sheep-grazed semi-natural grasslands contain a range of significant communities supporting populations of indigenous plants and insects. The site is different from most of the other savannah grasslands in that the soils are deeper so it is more completely vegetated than other old river channels and terrace sites.

**Extent of Site of Ecological Significance**

This SES extends eastward from the edge of the carriageway on Conservators Road (i.e. including the grass verge within the road reserve) and includes the entire CCC owned parcel of land, and extends into the Christchurch International Airport owned land as shown on the location map.

**Assessment Summary**

The Conservators Road Dry Plains Grasslands Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1 & 2), and rarity/distinctiveness criteria (criteria 3 & 4).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

Despite being degraded, this site contains vegetation that is representative of the natural diversity of the Low Plains Ecological District, and combined with landforms comprises an area that is most similar in composition and structure to those communities that existed in 1840.

Vascular plant species observed at the site during a rapid survey in September 2014 include the following<sup>1</sup>:

- |                                    |                     |
|------------------------------------|---------------------|
| • <i>Carex breviculmis</i>         | sedge               |
| • <i>Carex resectans</i>           | sedge               |
| • <i>Carmichaelia australis</i>    | broom               |
| • <i>Carmichaelia corrugate</i>    | prostrate broom     |
| • <i>Connochloa tenuis</i>         |                     |
| • <i>Crassula colligata</i>        |                     |
| • <i>Dichondra brevifolia</i>      | dichondra           |
| • <i>Dichondra repens</i>          | dichondra           |
| • <i>Discaria toumatu</i>          | matagouri           |
| • <i>Leptinella serrulata</i>      | leptinella          |
| • <i>Leucopogon fraseri</i>        |                     |
| • <i>Melicytus alpinus</i>         | porcupine shrub     |
| • <i>Microtis unifolia</i>         | orchid              |
| • <i>Muehlenbeckia axillaris</i>   | pohuehue            |
| • <i>Muehlenbeckia ephedroides</i> | poehuehue           |
| • <i>Oxalis exilis</i>             | oxalis              |
| • <i>Olearia adenocarpa</i>        | plains olearia      |
| • <i>Poa maniatoto</i>             | a grass             |
| • <i>Raoulia monroi</i>            | raoulia             |
| • <i>Scleranthus uniflorus</i>     | cushion plant       |
| • <i>Sophora microphylla</i>       | South Island kowhai |
| • <i>Wahlenbergia gracilis</i>     |                     |

<sup>1</sup> Site visit and rapid survey of site undertaken by Dr Antony Shadbolt (CCC Project Ecologist), Brian Patrick (Wildlands Consultants) and Arthur Adcock (CCC Ranger Services) in August 2014 (See also Patrick 2014).



Thirteen species of indigenous bryophytes and lichens were recorded by Meurk *et al.* (1993) from within the site, and although not surveyed as part of this assessment are also considered likely to still occur within this site.

- *Barbula crinita*
- *Cladia aggregata*
- *Cladonia spp.*
- *Hypnum cupressiforme*
- *Neofuscelia spp.*
- *Peltigera spuria*
- *Polytrichum juniperinum*
- *Pseudocyphellaria coeruleascens*
- *Racomitrium lanuginosum*
- *Tortula princeps*
- *Triquetrella papillata*
- *Weissia controcorsa*
- *Xanthoparmelia tasmanica*

Indigenous invertebrate species present within this site include wolf spiders, the undescribed boulder copper butterfly (Canterbury boulder copper of Patrick & Patrick, 2012), and the following species recorded by Patrick (2014).

- *Arctesthes catapyrrha* (geometrid)
- *Capua semiferana*
- *Conocephalius semivittatus* (grassland katydid)
- *Eudonia submarginalis*
- *Eudonia manganeutis*
- *Eurythecta robusta* (tortricid moth)
- *Monomorium antarcticum* (native ant)
- *Nysius huttoni* (small bug)
- *Orocrambus corruptus*
- *Orocrambus cyclopicus*
- *Orocrambus ordishi* (with flightless female)
- *Phaulacridium marginale* (small grasshopper)
- *Pteronemobius bigelowi* (field cricket)
- *Pterophorus innotatalis* (plume moth).
- *Scoparia exilis*

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

Indigenous dryland vegetation on the Canterbury Plains comprises only fragments of what was previously present, and although there are other tiny dryland fragments nearby to the site, none still contain native plants (Partridge 2007). At 69.90 hectares, this site is considered to comprise a relatively large example of this type of vegetation in the Low Plains Ecological District.



**Rarity/Distinctiveness**

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

This site contains vegetation that has been reduced to less than 20% of its former area in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

- 4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site contains populations of threatened plant species listed in de Lange *et al.* (2013) including:

- |                                    |                                |
|------------------------------------|--------------------------------|
| • <i>Carmichaelia corrugata</i>    | At Risk/Declining              |
| • <i>Leptinella serrulata</i>      | At Risk/Naturally Uncommon     |
| • <i>Muehlenbeckia ephedroides</i> | At Risk/Declining              |
| • <i>Olearia anenocarpa</i>        | Threatened/Nationally Critical |
| • <i>Raoulia monroi</i>            | At Risk/Declining              |

Furthermore, populations of *Melicytus alpinus* and *Carmichaelia australis* within this site are also significant under this criterion as they are considered locally rare, with very few populations remaining in the savannah grasslands (Patrick 2014)

The site hosts populations of the At Risk/Naturally Uncommon tortricid moth (*Eurythecta robusta*) (Patrick 2014).

- 5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion

- 6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

Does not meet criterion



### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet criterion

### Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

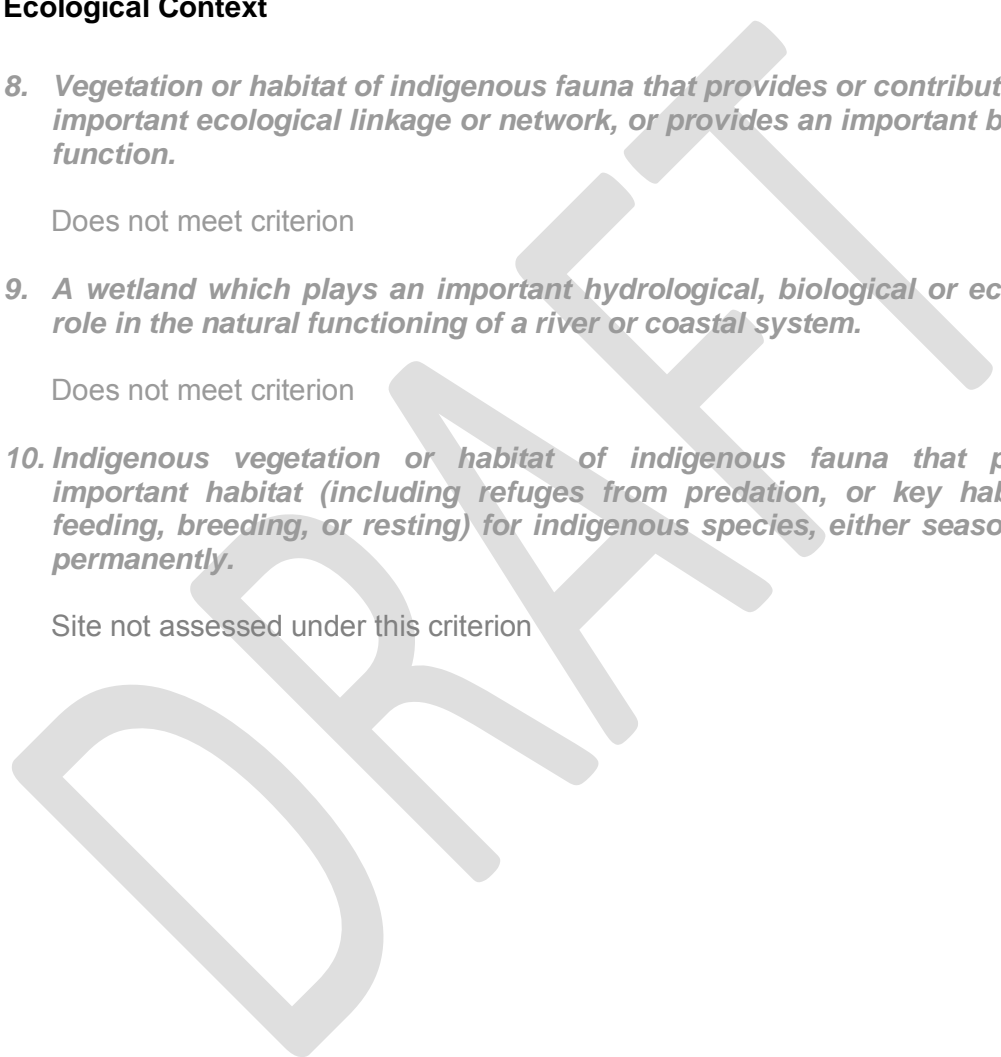
Does not meet criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion





## Site Management

### Existing Protection Status

In public ownership

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitor pest plant infestations and implement weed control as required.</li> <li>Assess new pest plant incursions and implement control as required</li> <li>Assess potential for pest plants on adjacent land parcels to spread into the SES and consult with neighbouring property owners/managers regarding control.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Further species loss</li> </ul>	<ul style="list-style-type: none"> <li>Identify and mark existing native plant populations</li> <li>Re-introduce recently locally extinct species</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Changes to soil structure &amp; fertility as a result of changes in land management that threaten existing ecosystem function</li> </ul>	<ul style="list-style-type: none"> <li>Implement a land management change process so that inappropriate actions do not occur</li> <li>Assess any attempts to change the irrigation or fertiliser application regime as part of the land management change process.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

<ul style="list-style-type: none"> <li>Undesirable impacts of grazing</li> </ul>	<ul style="list-style-type: none"> <li>Develop a stock grazing programme that will allow continued use of the land for grazing purposes whilst preserving the existing ecological values.</li> <li>Promote research and monitoring to determine most appropriate stock management regime(s).</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Browsing damage to plants</li> </ul>	<ul style="list-style-type: none"> <li>Consider installation of rabbit proof fencing where appropriate within the SES (including individual plant patches) and eradicate pest animals from within fenced area(s)</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Fire damage through excessive grass growth</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that fire risk is kept low without compromising existing ecological values</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Inappropriate planting</li> </ul>	<ul style="list-style-type: none"> <li>Ensure any planting (e.g. farm shelter, restoration plantings) do not compromise existing ecological values.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

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## References

De Lange, P. J., Rolfe, J. R., Champion, P. D., Courtney, S. P., Heenan, P. B., Barkla, J. W., Cameron, E. K., Norton, D. A., and Hitchmough, R. A. (2013) *Conservation status of New Zealand indigenous vascular plants, 2012*. Department of Conservation, Wellington, New Zealand.

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Meurk, C. D., Ward, J. C., and O'Connor, K. F. (1993) *Natural areas of Christchurch: evaluation and recommendations for management as heritage*. Christchurch City Council, Christchurch, New Zealand.

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Patrick, B.H. & Patrick, H.J.H. 2012: *Butterflies of the South Pacific*. University of Otago Press. 250 pages

Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 26<sup>th</sup> November 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 26<sup>th</sup> November 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Chattertons Road Dry Plains Grasslands

**Site number:** SES/LP/17

**Physical address of site:** 290 Chattertons Road  
Yaldhurst  
Christchurch 7676

#### Summary of Significance:

The Chattertons Road Dry Plains Grasslands SES is significant because it contains a large area of vegetation that is representative of the Low Plains Ecological District including a threatened plant species.

#### Site Map



**Additional Site Information**

<b>Ecological District:</b>	Low Plains
<b>Central point NZTM:</b>	N5185080, E1554328
<b>Area of SES (ha):</b>	10.20 ha

**Site Description**

The Chattertons Road Dry Plains Grasslands SES contains important semi-natural grasslands occupying old river terraces and riverbeds. Vegetation within the SES is mostly exotic grassland. Native moss is common in the groundcover but associated groundcover species are exotic.

**Extent of Site of Ecological Significance**

The SES is a triangular area of land on the east side of Chattertons Road. It is defined by a stock fence along its northern boundary, and by a drainage ditch that runs diagonally through the paddock along its south-eastern boundary as shown on the location map.

**Assessment Summary**

The Chattertons Road site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013a) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1 & 2), and rarity/distinctiveness criteria (criteria 3 & 4).



## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

Despite being degraded, this site contains vegetation that is representative of the natural diversity of the Low Plains Ecological District, and combined with landforms comprises an area that is most similar in composition and structure to those communities that existed in 1840.

Vegetation within the site is mostly exotic grassland. Native moss is common in the groundcover but associated groundcover species are mostly exotic. (Environment Canterbury 2013b). Small populations of *Carmichaelia corrugata* occur across the site (Recorded by the Project Ecologist during a site visit in August 2014).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

Indigenous dryland vegetation on the Canterbury Plains comprises only fragments of what was previously present (Partridge 2007). At 10.20 hectares, this site is considered to comprise a relatively large example of this type of vegetation in the Low Plains Ecological District.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

This site contains vegetation that has been reduced to less than 20% of its former area in the low Canterbury Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).



- 4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

This site contains the At Risk/Declining (de Lange *et al.* 2013) *Carmichaelia corrugata*, recorded by the Project Ecologist during a site visit in August 2014.

- 5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion

- 6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

Site not assessed under this criterion

### **Diversity and Pattern**

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

Does not meet criterion

### **Ecological Context**

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

Does not meet criterion

- 9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

Does not meet criterion

- 10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

Site not assessed under this criterion

## Site Management

### Existing Protection Status

Land in public ownership

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitor pest plant infestations and implement weed control as required.</li> <li>Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Further species loss</li> </ul>	<ul style="list-style-type: none"> <li>Identify and mark existing native plant populations</li> <li>Re-introduce recently locally extinct species</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Changes to soil structure &amp; fertility as a result of changes in land management that threaten existing ecosystem function</li> </ul>	<ul style="list-style-type: none"> <li>Implement a land management change process so that inappropriate actions do not occur</li> <li>Assess any attempts to change the irrigation or fertiliser application regime as part of the land management change process.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Undesirable impacts of grazing</li> </ul>	<ul style="list-style-type: none"> <li>Develop a stock grazing programme that will allow continued use of the land for grazing purposes whilst preserving the existing ecological values.</li> <li>Promote research and monitoring to determine most appropriate stock management regime(s).</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>



<ul style="list-style-type: none"> <li>Browsing damage to plants</li> </ul>	<ul style="list-style-type: none"> <li>Consider installation of rabbit proof fencing where appropriate within the SES (including individual plant patches) and eradicate pest animals from within fenced area(s)</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Fire damage through excessive grass growth</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that fire risk is kept low without compromising existing ecological values</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Inappropriate planting</li> </ul>	<ul style="list-style-type: none"> <li>Ensure any planting (e.g. farm shelter, restoration plantings) do not compromise existing ecological values.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

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## References

De Lange, P. J., Rolfe, J. R., Champion, P. D., Courtney, S. P., Heenan, P. B., Barkla, J. W., Cameron, E. K., Norton, D. A., and Hitchmough, R. A. (2013) *Conservation status of New Zealand indigenous vascular plants, 2012*. Department of Conservation, Wellington, New Zealand.

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Lloyd, K., McClellan, R., Hutchison, M., Patrick, B., and Shaw, W. (2013) *Guidelines for the application of ecological significance criteria for indigenous vegetation and habitats of indigenous fauna in Canterbury region*. Report prepared for Environment Canterbury by Wildlands Consultants, Rotorua, New Zealand.

Partridge, T. R. (2007) *Vegetation changes and management options for reserve at corner of Wilmers and Springs Road (EHS 15.06)*. CCCECO 07/07, Christchurch City Council, Christchurch, New Zealand.

Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 28<sup>th</sup> November 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 28<sup>th</sup> November 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** School Road Dry Plains Grasslands

**Site number:** SES/LP/18

**Physical address of site:** 33 Guys Road  
Yaldhurst  
Christchurch 7676

#### Summary of Significance:

The School Road Dry Plains Grasslands site is significant because it contains vegetation and invertebrate communities representative of the Low Plains Ecological District including several threatened plant species.

#### Site Map



**Additional Site Information**

**Central point:** N5183141, E1557736

**Area of SES (ha):** 42.93 ha

**Site Description**

The School Road Dry Plains Grassland SES contains important semi-natural grasslands occupying old river terraces and riverbeds. A unique feature of this site is its extensive seasonally damp mossfields that provide a matrix for a range of indigenous plants and insects to live in. Mat plants such as *Muehlenbeckia axillaris* thrive in these sites as does *Oxalis exilis* and the orchid *Microtis unifolia*. But much of the site is semi-natural dry grasslands with several exotic species dominating but indigenous *Rytidosperma species*, *Leucopogon fraseri* and matagouri also locally prominent (Patrick 2014).

**Extent of Site of Ecological Significance**

The SES covers both sides of School Road immediately beyond the deer fence gate at the western end of the formed section of School Road. This lies between the unformed legal road (School Road) and the private property boundaries to the south, and extends approximately 210 m northward of the unformed legal road to include an additional 16.5 ha as shown on the location map.



## Assessment Summary

The School Road Dry Plains Grasslands site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1 & 2), and rarity/distinctiveness criteria (criteria 3 & 4).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

Despite being degraded, this site contains vegetation that is representative of the natural diversity of the Low Plains Ecological District, having 17 species of indigenous vascular plant, and two indigenous moss species recorded by Jensen 2012 (refer Appendix 2). This diversity, combined with the site's landforms comprise an area that is most similar in composition and structure to those communities that existed in 1840.

Indigenous invertebrates are both diverse and common at this site with grasshoppers, crickets and katydid numerous. The undescribed boulder copper (*Lycaena nsp.*) is common here (Patrick & Patrick, 2012), particularly where its larval hostplant *Muehlenbeckia axillaris* grows in stony or damp ground. A day-flying moth *Arctesthes catapyrrha* has one of its few populations in the Christchurch area here, possibly related to the abundance of herbfield in the damper sites. Other moths typical of these drylands are found here too including *Capua semifera*, *Eudonia sabulosella*, *E. leptalea*, *Orocrambus vittellus* and the plume moth *Pterophorus innotalis* (larvae on *Dichondra brevifolia*) (Patrick 2014).

Wolf spiders, the metallic green chafer *Pyronota festiva*, small grasshopper *Phaulacridium marginale*, grassland katydid *Conocephalius semivittatus* and field cricket *Pteronemobius bigelowi* are also present here in abundance (Patrick 2014).

Common skink (*Oligosoma polychroma*) is also recorded within this site (Patrick 2014).



**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

Indigenous dryland vegetation on the Canterbury Plains comprises only fragments of what was previously present (Partridge 2007). At >42 hectares, this site is considered to comprise a relatively large example of this type of vegetation in the Low Plains Ecological District.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

This site contains vegetation that has been reduced to less than 20% of its former area in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

This site contains four plant species listed by de Lange *et al.* (2013) as either Threatened or At Risk, and one species described by Patrick (2014) as locally uncommon:

- *Carmichaelia corrugata* (dwarf broom) (At Risk/Declining)
- *Convolvulus waitaha* (convolvulus) (Locally Uncommon)
- *Geranium retrorsum* (geranium) (Threatened/Nationally Vulnerable)
- *Leptinella serrulata* (leptinella) (At Risk/naturally Uncommon)
- *Raulia monroi* (a cushion plant) (At Risk/Declining)

Common skink (*Oligosoma polychroma*) have been recorded from the SES (Patrick 2014). Although Hitchmough *et al.* (2013) list this species as Not Threatened under the NZ Threat Classification System, the common skink is a cryptic species complex, and this classification refers to one described clade only (*O. polychroma* Clade 1). Of the four un-described clades, Clade 4 and Clade 5 occur in the Low Canterbury Plains Ecological District (see Liggins *et al.* 2008), and are both described by Hitchmough *et al.* (2013) as being At Risk, where their total area of occupancy is estimated to be in excess of 10,000 ha, but with a predicted decline of 10-70% across their range



5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Site not assessed under this criterion

### **Diversity and Pattern**

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet criterion

### **Ecological Context**

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Does not meet criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion

## Site Management

### Existing Protection Status

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitor pest plant infestations and implement weed control as required.</li> <li>Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Further species loss</li> </ul>	<ul style="list-style-type: none"> <li>Identify and mark existing native plant populations</li> <li>Re-introduce recently locally extinct species</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Changes to soil structure &amp; fertility as a result of changes in land management that threaten existing ecosystem function</li> </ul>	<ul style="list-style-type: none"> <li>Implement a land management change process so that inappropriate actions do not occur</li> <li>Assess any attempts to change the irrigation or fertiliser application regime as part of the land management change process.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Undesirable impacts of grazing</li> </ul>	<ul style="list-style-type: none"> <li>Develop a stock grazing programme that will allow continued use of the land for grazing purposes whilst preserving the existing ecological values.</li> <li>Promote research and monitoring to determine most appropriate stock management regime(s).</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Browsing damage to plants</li> </ul>	<ul style="list-style-type: none"> <li>Consider installation of rabbit proof fencing where appropriate within the SES (including individual plant</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>



	patches) and eradicate pest animals from within fenced area(s)	
<ul style="list-style-type: none"> <li>• Fire damage through excessive grass growth</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure that fire risk is kept low without compromising existing ecological values</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Inappropriate planting</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure any planting (e.g. farm shelter, restoration plantings) do not compromise existing ecological values.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

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## References

- De Lange, P. J., Rolfe, J. R., Champion, P. D., Courtney, S. P., Heenan, P. B., Barkla, J. W., Cameron, E. K., Norton, D. A., and Hitchmough, R. A. (2013) *Conservation status of New Zealand indigenous vascular plants, 2012*. Department of Conservation, Wellington, New Zealand.
- Patrick, B. (2014) *Christchurch's Savannah Grasslands*. Unpublished Report. (TRIM 14/1419474)
- Patrick, B. H. and Patrick, H.J. H. (2012) *Butterflies of the South Pacific*. University of Otago Press. 250 pages.
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- Liggins, L., Chapple, D. G., Daugherty, C. H., and Ritchie, P. A. (2008) *A SINE of restricted gene flow across the Alpine Fault: phylogeography of the New Zealand common skink (*Oligosoma nigriplantare polychroma*)*. *Molecular Ecology* 17: Pp 2668 – 3683.
- Lloyd, K., McClellan, R., Hutchison, M., Patrick, B., and Shaw, W. (2013) *Guidelines for the application of ecological significance criteria for indigenous vegetation and habitats of indigenous fauna in Canterbury region*. Report prepared for Environment Canterbury by Wildlands Consultants, Rotorua, New Zealand.
- Partridge, T. R. (2007) *Vegetation changes and management options for reserve at corner of Wilmers and Springs Road (EHS 15.06)*. CCCECO 07/07, Christchurch City Council, Christchurch, New Zealand.
- Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.



**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 20<sup>th</sup> November 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 20<sup>th</sup> November 2014

**Statement updated by:** XXX  
**Date:** XXX

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*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



**Appendix 1: Occurrence of Indigenous Plant species recorded within SES by Jensen (2012)**

<b>Species present</b>	<b>Dunnet Lease Ecological Heritage site (EHS 6.44) (South of School Rd)</b>	<b>Dunnet Lease Conservation Area (North of School Road)</b>
<i>Carex resectans</i>	X	
<i>Carmichaelia corrugata</i>	X	X
<i>Convolvulus waitaha</i>	X	X
<i>Crassula colligata subsp colligata</i>	X	X
<i>Dichondra brevifolia</i>	X	
<i>Dichondra repens</i>	X	X
<i>Geranium retrorsum</i>	X	
<i>Leptinella serrulata</i>		X
<i>Leucopogon fraseri</i>	X	X
<i>Melicytus alpinus</i>	X	X
<i>Microtis uniflora</i>	X	X
<i>Muehlenbeckia axillaris</i>	X	X
<i>Ophioglossum coriaceum</i>	X	
<i>Oxalis exilis</i>	X	X
<i>Raoulia monroi</i>	X	X
<i>Sophora prostrata</i>	X	
<i>Thelymitra sp</i>	X	
<b>Mosses</b>		
<i>Racomitrium lanuginosum</i>	X	
<i>Politrichum juniperinum</i>		X

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Dickeys Road Wetland

**Site number:** SES/LP/19

**Physical address of site:** 66 & 80 Dickeys Road  
Belfast  
Christchurch 7670

#### Summary of Significance:

The Dickeys Road Wetland SES is significant because it contains a large area of indigenous vegetation that is representative of the Low Plains Ecological District.

#### Site Map





### **Additional Site Information**

**Central point NZTM:** N5191633, E1569854

**Area of SES (ha):** 13.34 ha

### **Site Description**

The site consists of a remnant dune-slack wetland that supports remnant native vegetation (approx 0.5 ha), restored waterways (> 660 m) that support a representative sample of wetland bird species, and large areas of locally sourced restoration plantings.

### **Extent of Site of Ecological Significance**

The SES covers the wetland area within the two land parcels, and extends to the edge of the drip-line of the willow woodland that dominates the edge of the wetland. The SES does not include the two large areas of open pasture contained within the Christchurch City Council's 66 Dickeys Road property, nor the grazed paddock on the north east side of the Department of Conservation's 80 Dickeys Road property.

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## Assessment Summary

The Dickeys Road Wetland Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 & 2), rarity/distinctiveness criteria (criterion 3).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Although degraded through historic land management and grazing, the area of remnant wetland vegetation within the SES is representative and characteristic of the natural diversity of swamp kiokio (*Carex secta*) dominated wetlands in the Low Plains Ecological District and is one of the best remaining examples of its type locally.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

At 13.34 hectare, the Dickeys Road wetland is a large example of a swamp kiokio (*Carex secta*) dominated freshwater wetland in the Low Plains Ecological District.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

The site contains wetland vegetation that has been reduced to less than 20% of its former extent in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).



4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.*

Site not assessed under this criterion

5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Site not assessed under this criterion

#### **Diversity and Pattern**

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet criterion

#### **Ecological Context**

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Does not meet criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion



## Site Management

### Existing Protection Status

- Site is wholly contained within a CCC reserve

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor pest plant infestations and implement control as required.</li> <li>• Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li>• Information packages for neighbouring properties (e.g. 'Plant Me Instead')</li> </ul>
<ul style="list-style-type: none"> <li>• Animal pest incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring of possible animal pest incursions and trapping as necessary</li> </ul>	<ul style="list-style-type: none"> <li>• Provide advice and guidance on pest animal monitoring to neighbouring property owners.</li> <li>• Supply traps and related training as necessary</li> </ul>
<ul style="list-style-type: none"> <li>• Anthropogenic change to water regime</li> </ul>	<ul style="list-style-type: none"> <li>• Any action relating to changes in the water regime need to be assessed in relation to impacts upon ecological state and functioning of wetlands.</li> </ul>	N/A
<ul style="list-style-type: none"> <li>• Natural process of change</li> </ul>	<ul style="list-style-type: none"> <li>• If natural changes in wetland ecology, composition or functioning are determined to be detrimental to the ongoing viability of the values of the site, a recovery action plan should be initiated.</li> </ul>	N/A
<ul style="list-style-type: none"> <li>• Browsing by horses and livestock</li> </ul>	<ul style="list-style-type: none"> <li>• Enforce closed access to horses and other livestock within core area of reserve</li> <li>• Consider moving stock fences back as wetland vegetation within excluded area</li> </ul>	N/A

	recovers and spreads outward.	
<ul style="list-style-type: none"> <li>Disturbance to wildlife from hunting</li> </ul>	<ul style="list-style-type: none"> <li>Prohibit hunting on CCC parts of reserve (hunting is permitted on Fish and game portion of site)</li> </ul>	N/A
<ul style="list-style-type: none"> <li>Disturbance to wildlife from dogs</li> </ul>	<ul style="list-style-type: none"> <li>Prohibit dogs within core wetland areas of SES area</li> <li>Interpretation highlighting the impacts dogs can have on wildlife values</li> </ul>	N/A
Fire	<ul style="list-style-type: none"> <li>Establish buffer of low flammability native tree and shrub species</li> </ul>	Information packages for neighbouring properties on low flammability species

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## References

Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.

Lloyd, K., McClellan, R., Hutchison, M., Patrick, B., and Shaw, W. (2013) *Guidelines for the application of ecological significance criteria for indigenous vegetation and habitats of indigenous fauna in Canterbury region*. Report prepared for Environment Canterbury by Wildlands Consultants, Rotorua, New Zealand.

Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.

**Assessment completed by:** Antony Shadbolt

**Date:** 24th June 2014

**Statement completed by:** Antony Shadbolt

**Date:** 24th June 2014

**Statement updated by:** XXX

**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



**Appendix 1:**

List of native flora recorded within the Dickeys Road Wetland SES during 2002 botanical survey (Source: CCC Natural Areas Database).

*TREES & SHRUBS*

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Coprosma propinqua</i>	mingimingi
<i>Coprosma propinqua x robusta</i>	
<i>Coprosma robusta</i>	karamu
<i>Cordyline australis</i>	cabbage tree/ti kouka
<i>Pittosporum tenuifolium</i>	kohuhu/black matipo

*MONOCOT HERBS*

<i>Carax coriacea</i>	sedge/rautahi
<i>Carex secta</i>	sedge/purei
<i>Carex sp.</i>	
<i>Eleocharis acuta</i>	sharp spike sedge
<i>Juncus gregiflorus</i>	rush
<i>Phormium tenax</i>	NZ flax/harakeke
<i>Typha orientalis</i>	raupo

*DICOT HERBS*

<i>Cotula coronopifolia</i>	batchelors button
<i>Galium propinquum</i>	bedstraw
<i>Hydrocotyle novae zeelandiae</i>	NZ pennywort
<i>Lemna minor</i>	duck weed
<i>Myriophyllum propinquum</i>	water milfoil
<i>Senecio minimus</i>	fireweed, NZ groundsel

*FERNS & ALLIES*

<i>Asplenium terrestre</i>	ground spleenwort
<i>Azolla filiculoides</i>	retoreto
<i>Blechnum minus</i>	swamp kiokio
<i>Blechnum novae-zelandiae</i>	kiokio
<i>Histiopteris incisa</i>	mata/water fern
<i>Polystichum vestitum</i>	prickly shield fern
<i>Pteridium esculentum</i>	bracken

*MOSSES, LICHENS & LIVERWORTS*

<i>Bryum billardierei</i>	
Lichens	
<i>Marchantia berteroana</i>	

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Styx River Mouth Wetlands

**Site number:** SES/LP/20

**Physical address of site:**  
399 Kainga Road, and 1109 Lower Styx Road  
Brooklands  
Christchurch 8083

#### Summary of Significance:

The Styx River Mouth Wetlands SES is significant because it contains a large area of wetland habitat vegetation that is representative of the Low Plains Ecological which provides important habitat for several threatened species.

#### Site Map



### **Additional Site Information**

**Central point:** N5195374, E1574913

**Area of SES (ha):** 97.5 ha

### **Site Description**

The Styx River Mouth Wetlands are an integral part of the wider Brooklands Lagoon wetland complex and comprise a mosaic of tidal saltmarsh, ephemeral ponds and freshwater wetland habitats that support extensive, diverse and regionally significant examples of native wetland vegetation. Wildlife values are high, and support notable populations of threatened bird species and nesting waterfowl.

### **Extent of Site of Ecological Significance**

The Styx River Mouth Wetlands SES extends west from the mouth of the Styx River where it enters Brooklands Lagoon for a distance of approximately 2 kilometres, and is bounded in the north by the true right bank (TRB) of the Waimakariri River, and in the south by the base of the main river flood protection stop banks as shown on the location map.

### **Assessment Summary**

The Styx River Mouth Wetlands Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 & 2), rarity/distinctiveness (criteria 3 & 4), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 & 10).



## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

Fifty species of indigenous vascular plants (Appendix 1) were recorded from the Styx River Mouth Wetlands between 1992 and 2002 (CCC Natural Areas Database; Appendix 1), including 8 trees and shrubs, 25 monocot herbs, 16 dicot herbs and one fern. These wetlands therefore contain regionally significant examples of native wetland vegetation (Grove 2009).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

The complex of tidal saltmarshes, saltmeadows, ephemeral ponds and freshwater wetlands around the mouth of the Styx River comprise the largest continuous area of wetland habitat remaining in Christchurch and are one of the best examples of tidal saltmarsh in Canterbury (Crossland 2008). At more than 97 hectares, the Styx River Mouth Wetlands complement a wider wetland complex (that includes Brooklands Lagoon) that in Canterbury is second only in area to those wetlands along the margins of Lake Ellesmere/Te Waihora (Meurk 1992). Therefore in this context the Styx River Mouth Wetlands are a relatively large example of their type in the Low Plains Ecological District.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The site contains wetland vegetation that has been reduced to less than 20% of its former extent in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).



**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site supports several bird species listed as threatened under the Department of Conservation threat classifications system (Robertson et al. 2013) as listed by Grove (2009) and as recorded by the Project Ecologist (Antony Shadbolt) and CCC Ornithologist Andrew Crossland, including:

- |                        |                                  |
|------------------------|----------------------------------|
| • White Heron          | Threatened/Nationally Critical   |
| • Australasian Bittern | Threatened/Nationally Endangered |
| • Marsh Crake          | At Risk/Relic                    |
| • Spotless Crake       | At Risk/Relic                    |
| • Black Cormorant      | At Risk/Naturally Uncommon       |
| • Royal Spoonbill      | At Risk/Naturally Uncommon       |

The tidal section of the Styx River between the floodgates and Brooklands Lagoon is an important migratory pathway for the At Risk (Declining) inanga (*Galaxias maculatus*) (see Grove 2009).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

Site not assessed under this criterion

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

The Styx River Mouth Wetland area contains a diverse range of habitat types that are associated with tidal saltmarsh, ephemeral ponding, shrubland and freshwater wetlands, and Grove (2014) records 14 mapped vegetation types within the site (Appendix 2), including six native, five exotic and two native-exotic types.





## Ecological Context

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

**Assessment:**

The site is significant under this criterion.

The tidal section of the Styx River between the floodgates and Brooklands Lagoon is an important migratory pathway for the At Risk (Declining) inanga (*Galaxias maculatus*) and other fish species (see Grove 2009).

- 9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

Site not assessed under this criterion

- 10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

Large stands of Raupo at the centre of the site were identified by Grove (2009) as critical breeding habitat for Australasian Bittern. These areas of raupo have since expanded significantly as a result of changes following the 2010/2011 earthquakes, thus increasing the significance of this area for this threatened species.

## Site Management

### Existing Protection Status

- Site is wholly contained within a CCC reserve

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>• Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor pest plant infestations and implement control as required.</li> <li>• Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Animal pest incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring of possible animal pest incursions and trapping as necessary</li> <li>• Trap for incursions by feral cats, ferrets, stoats and other wild mammalian predators</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Disturbance to wildlife from dogs</li> </ul>	<ul style="list-style-type: none"> <li>• Prohibit dogs within core wetland areas of SES area</li> <li>• Interpretation highlighting the impacts dogs can have on wildlife values</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Predation on wildlife by domestic cats</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain efficacy of “moating” on all sides of the core part of the site (ie; Waimakariri River on the north side, Brooklands Lagoon on the east, Styx River and drainage channels on the south, swampy habitat on the west with areas of surface water,</li> <li>• Avoid bridges across the Styx River downstream of the floodgates and paths and</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>

	<ul style="list-style-type: none"> <li>trails into the heart of the wetland</li> <li>Consider completing the “moating” along the southern stopbank by extending the existing drains running east from the floodgates and west from the Styx boat ramp so that they meet and block access to the southern central part of the SES site</li> </ul>	
<ul style="list-style-type: none"> <li>Management decisions may partly be based pre-earthquake vegetation patterns</li> </ul>	<ul style="list-style-type: none"> <li>Re-survey and map post earthquake vegetation communities and patterns</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Human disturbance</li> </ul>	<ul style="list-style-type: none"> <li>Maintain low impact/passive recreation activities</li> <li>Avoid bridges across the Styx River downstream of the floodgates and paths and trails into the heart of the wetland as these would greatly increase human disturbance levels and also create pathways into the core of the wetland for domestic and wild mammalian predators</li> <li>Do not re-instate the pre-earthquake gravel roadway on the northern side of the site (along the south bank of the Waimakariri River) as this will cause increased human disturbance and destroy valuable high quality bird habitat (ie; wetland vegetation, pools and channels) that have developed as a consequence of earthquake-generated landform changes.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

**NOTE:** Threats, risks and mitigation options are discussed in detail in Grove (2009), and readers of this Site Significance Statement should consult this report for a full breakdown of recommended site management options.



## References

- Crossland, A. C. (2008) *Brooklands Lagoon wetland complex: an overview of the site's importance to birdlife with habitat management recommendations*. Christchurch City Council.
- Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.
- Grove, P. (2009) *Biodiversity values and management recommendations for the Styx River mouth reserve. Lower Waimakariri Regional Park*. Environment Canterbury, Christchurch, New Zealand.
- Lloyd, K., McClellan, R., Hutchison, M., Patrick, B., and Shaw, W. (2013) *Guidelines for the application of ecological significance criteria for indigenous vegetation and habitats of indigenous fauna in Canterbury region*. Report prepared for Environment Canterbury by Wildlands Consultants, Rotorua, New Zealand.
- Meurk, C. D. (1992) *Assessment of botanical values and management options for wetlands at the Styx River Mouth*. DSIR Land Resources, Christchurch, New Zealand
- Robertson, H., Dowding, J., Elliott, G., Hitchmough, R., Miskelly, C. O'Donnell, C., Powlesland, R., Sagar, P., Scofield, P., Taylor, G. (2013) *Conservation status of New Zealand birds, 2012*. New Zealand Threat Classification Series 4, Department of Conservation.
- Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.



**Assessment completed by:** Antony Shadbolt  
**Date:** 3<sup>rd</sup> September 2014

**Statement completed by:** Antony Shadbolt  
**Date:** 3<sup>rd</sup> September 2014

**Statement updated by:** XXX  
**Date:** XXX

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*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



**Appendix 1:**

List of native flora recorded within the Styx River Mouth SES during 2002 botanical survey (Source: CCC Natural Areas Database)

*TREES & SHRUBS*

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Cordyline australis</i>	ti kouka, cabbage tree
<i>Cortaderia richardii</i>	toetoe
<i>Dodonaea viscosa</i>	akeake
<i>Plagianthus divaricatus</i>	marsh ribbonwood
<i>Ozothamnus leptophyllus</i>	tauhinu, cottonwood
<i>Leptospermum scoparium</i>	manuka
<i>Phormium tenax</i>	harakeke, NZ flax
<i>Suaeda novae-zelandiae</i>	sea blite

*MONOCOT HERBS*

<i>Bolboschoenus caldwellii</i>	kopungawha
<i>Carex buechananii</i>	Buchanan's sedge
<i>Carex coriacea</i>	cutty grass
<i>Carex litorosa</i>	sea sedge
<i>Carex pumila</i>	sand sedge
<i>Carex virgata</i>	pukio, swamp sedge
<i>Rytidosperma clavatum</i>	danthonia
<i>Desmoschoenus spiralis</i>	pingao
<i>Deyeuxia billardierei</i>	perehia, sand wind grass
<i>Isolepis cernua</i>	slender clubrush
<i>Juncus caespiticus</i>	grass-leaved rush
<i>Juncus distegus</i>	leafless rush
<i>Juncus gregiflorus</i>	wi
<i>Juncus kraussii subsp. australiensis</i>	sea rush
<i>Juncus pallidus</i>	wi, giant rush
<i>Juncus planifolius</i>	wi
<i>Leptocarpus similis</i>	oioi, jointed wire rush
<i>Poa cita</i>	silver tussock, wii
<i>Puccinellia stricta</i>	salt grass
<i>Schoenoplectus pungens</i>	three-square
<i>Triglochin striatum</i>	arrow grass
<i>Typha orientalis</i>	raupo
<i>Zostera novozelandica</i>	seagrass, eelgrass
<i>Schoenus concinnus</i>	
<i>Scirpoides nodosa</i>	knobby clubrush

*DICOT HERBS*

<i>Acaena anserinifolia</i>	piripiri, bidibid
<i>Apium prostratum</i>	shore parsley
<i>Epilobium billardiereanum</i>	willowherb
<i>Cotula coronopifolia</i>	batchelors button
<i>Calystegia soldanella</i>	shore convolvulus
<i>Chenopodium glaucum</i>	glaucous goosefoot
<i>Cotula coronopifolia</i>	batchelors button
<i>Leptinella dioica</i>	shore cotula
<i>Lilaeopsis novae-zelandiae</i>	
<i>Mimulus repens</i>	native musk



*Pseudognaphalium luteo-album*  
*Samolus repens*  
*Sarcocornia quinqueflora*  
*Selliera radicans*  
*Senecio glomeratus*  
*Spergularia media*

jersey cudweed  
sea primrose, maakoako  
ureure, glasswort  
remuremu, selliera  
NZ groundsel  
sea spurrey

*FERNS & ALLIES*

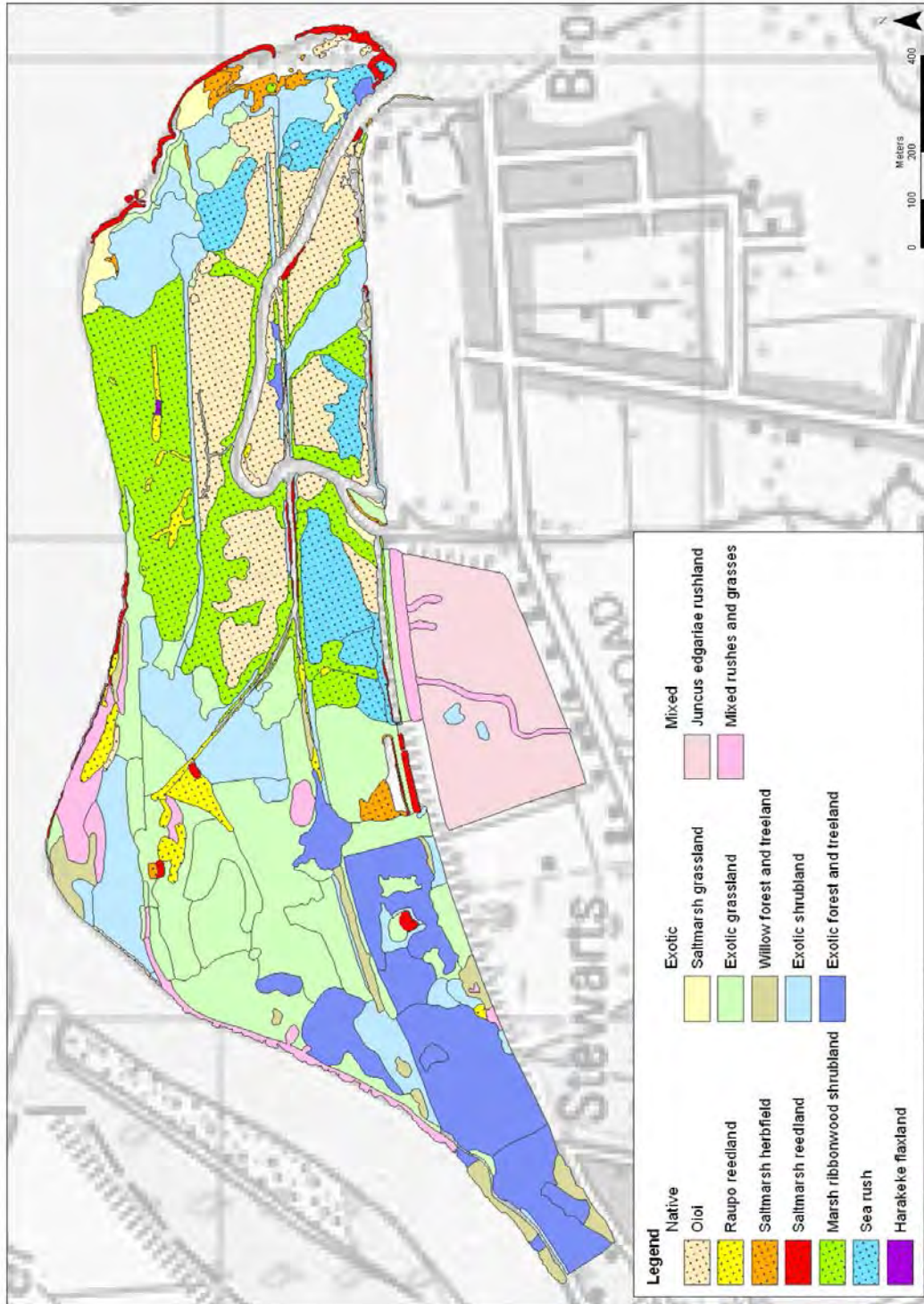
*Pteridium esculentum*

bracken

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**Appendix 2:**

Vegetation map of the Styx River Mouth Reserve showing location of six native, five exotic and two native-exotic vegetation types described for the area (Source Grove 2009).







## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Otukaikino Reserve Wetland

**Site number:** SES/LP/21

**Physical address of site:** 985 Main North Road  
Chaney's  
Christchurch

#### Summary of Significance:

Otukaikino Wetland is significant because it contains a large area of representative remnant native vegetation and planted native plant communities.

#### Site Map



### **Additional Site Information**

**Central point:** N5191009, E1571173

**Area of SES (ha):** 7.92 ha

### **Site Description**

The site is a 7.92 ha freshwater wetland that contains remnant native vegetation that is currently in the process of being restored through the reintroduction/restoration of genetically sourced local native plant species. This Department of Conservation Reserve has been the subject of a major restoration planting undertaken in conjunction with Lamb and Hayward Funeral Directors. The site is now more commonly known as Otukaikino. This restoration planting has involved restoring the hydrological regime and has been undertaken using sound ecological principles, and as a result the swamp now represents one of the best examples in Christchurch. The willow that once dominated is being progressively removed as each part of the restoration proceeds and will eventually be completely gone (Partridge 2007).

### **Extent of Site of Ecological Significance**

Then SES covers the extent of remnant wetland and planted forest and shrubland communities, and also extends to include the areal extent of the willow canopy along the eastern side of the site.

### **Assessment Summary**

The Otukaikino Reserve Wetland Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1), and rarity/distinctiveness (criterion 3).

### **Assessment against Significance Criteria**

#### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.



Thirty-six species of indigenous vascular plants were recorded from the Otukaikino Wetland Reserve between 1992 and 2002 (CCC Natural Areas Database), including 7 trees and shrubs, 11 monocot herbs, 8 dicot herbs, 9 ferns and one orchid. An additional 16 species of indigenous tree and shrub species and one monocot herb were recorded by the Project Ecologist during a site survey in October 2014 (Refer Appendix 1).

Although degraded, the wetland is described by the Department of Conservation as one of the few remaining original wetlands that were once common around Christchurch<sup>1</sup>.

**2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

Site not assessed under this criterion

**Rarity/Distinctiveness**

**3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

The site contains wetland vegetation that has been reduced to less than 20% of its former extent in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

**4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.***

Site not assessed under this criterion

**5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.***

Site not assessed under this criterion

**6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

Site not assessed under this criterion

<sup>1</sup> <http://www.doc.govt.nz/parks-and-recreation/places-to-visit/canterbury/christchurch-and-banks-peninsula/otukaikino/>. Sourced 2014-08-26



### **Diversity and Pattern**

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Site does not meet this criterion

### **Ecological Context**

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

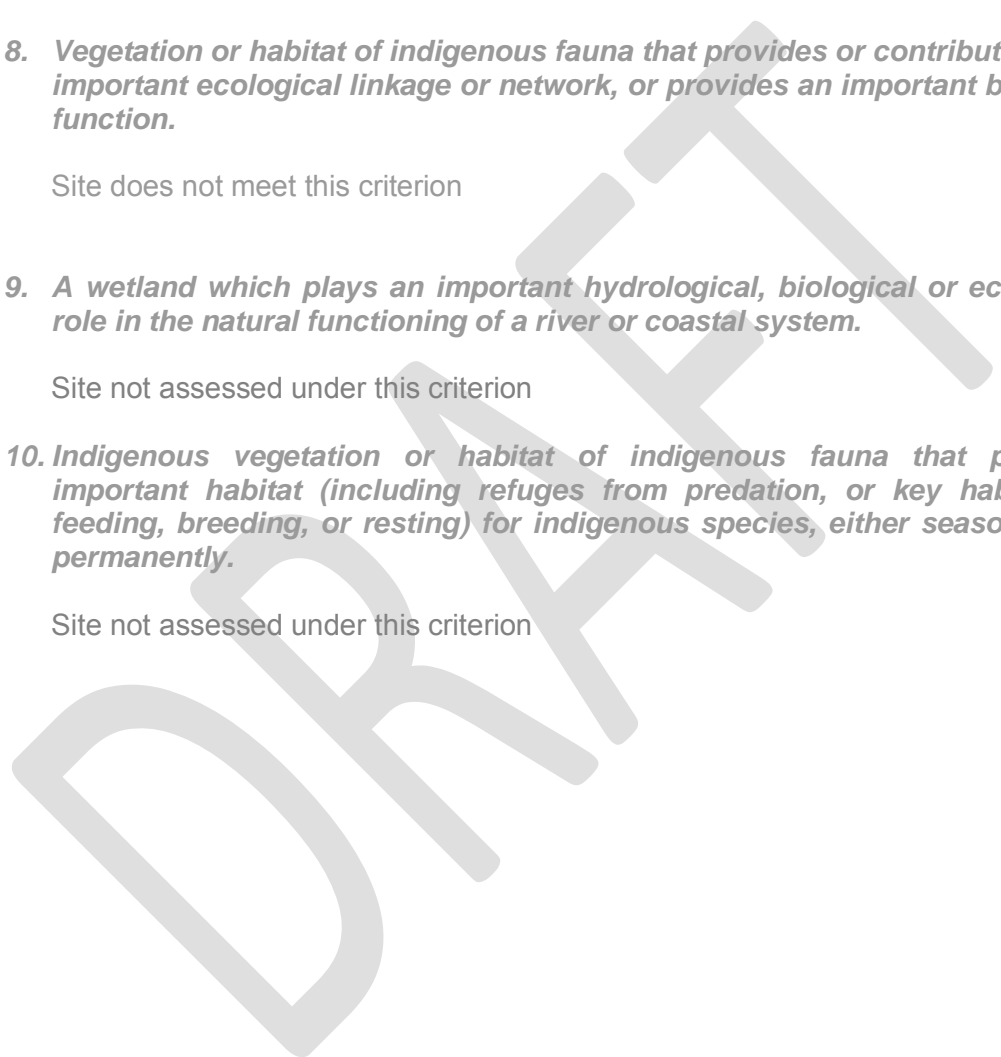
Site does not meet this criterion

- 9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Site not assessed under this criterion

- 10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion



## Site Management

### Existing Protection Status

- Land in public ownership (DOC)

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>• Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor pest plant infestations and implement control as required.</li> <li>• Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Animal pest incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring of possible animal pest incursions and trapping as necessary</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Disturbance to wildlife from dogs</li> </ul>	<ul style="list-style-type: none"> <li>• Prohibit dogs within core wetland areas of SES area</li> <li>• Interpretation highlighting the impacts dogs can have on wildlife values</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Anthropogenic change to water regime</li> </ul>	<ul style="list-style-type: none"> <li>• Any action relating to changes in the water regime need to be assessed in relation to impacts upon ecological state and functioning of wetlands.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Natural process of change</li> </ul>	<ul style="list-style-type: none"> <li>• If natural changes in wetland ecology, composition or functioning are determined to be detrimental to the ongoing viability of the values of the site, a recovery action plan should be initiated.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>



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- Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.
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- Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.

**Assessment completed by:** Antony Shadbolt  
**Date:** 24th June 2014

**Statement completed by:** Antony Shadbolt  
**Date:** 24th June 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1:

List of native flora recorded within the Otukaikino Wetland SES during 2002 botanical survey (Source: CCC Natural Area Database). Species shown with an asterisk (\*) indicate species not recorded as being present during the original 2002 survey, but present at the time of SES assessment in October 2014

### TREES & SHRUBS

BOTANICAL NAME	COMMON NAME(S)
<i>Coprosma linarifolia</i> *	narrow leaved coprosma
<i>Coprosma propinqua</i> *	mikimiki
<i>Coprosma propinqua x robusta</i> *	hybrid coprosma
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i> *	round leaved coprosma
<i>Coprosma rubra</i> *	red stemmed coprosma
<i>Cordyline australis</i>	ti kouka, cabbage tree
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Griselinia littoralis</i> *	broadleaf
<i>Hoheria angustifolia</i> *	South Island lacebark
<i>Kunzea ericoides</i>	kanuka
<i>Leptospermum scoparium</i> *	manuka
<i>Lophomyrtus obcordata</i> *	rohutu
<i>Myrsine divaricata</i> *	weeping maupo
<i>Pittoeoporum eugenioides</i> *	lemonwood
<i>Pittosporum tenuifolium</i>	kohuhu
<i>Plagianthus regius</i>	manatu, lowland ribbonwood
<i>Podocarpus totara</i> *	totara
<i>Prumnopitys taxifolia</i> *	matai
<i>Pseudopanax arboreus</i> *	five finger
<i>Pseudopanax crassifolius</i> *	lancewood
<i>Sophora microphylla</i> *	South Island kowhai

### MONOCOT HERBS

<i>Anemanthele lessoniana</i> *	wind grass
<i>Austroderia richardii</i>	toe toe
<i>Carex coriacea</i>	cutty grass
<i>Carex flagellifera</i>	Glen Murray tussock
<i>Carex lambertiana</i>	
<i>Carex maorica</i>	Maori sedge
<i>Carex secta</i>	pukio
<i>Carex virgata</i>	pukio, swamp sedge
<i>Eleocharis acuta</i>	sharp spike sedge
<i>Juncus australis</i>	leafless rush
<i>Juncus gregiflorus</i>	wi
<i>Phormium tenax</i>	harakeke, NZ flax
<i>Typha orientalis</i>	raupo



*DICOT HERBS*

<i>Euchiton audax</i>	cudweed
<i>Hydrocotyle heteromeria</i>	NZ pennywort
<i>Lemna minor</i>	duck weed
<i>Myriophyllum triphyllum</i>	water milfoil
<i>Potamogeton cheesemanii</i>	red pondweed, manihi
<i>Senecio glomeratus</i>	NZ groundsel
<i>Senecio minimus</i>	fireweed, NZ groundsel
<i>Galium propinquum</i>	bedstraw

*FERNS & ALLIES*

<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Azolla filiculoides</i>	retoreto
<i>Blechnum minus</i>	swamp kiokio
<i>Blechnum novae-zelandiae</i>	kiokio
<i>Blechnum penna-marina</i>	little hard-fern
<i>Hypolepis ambigua</i>	pig fern
<i>Marchantia berteroana</i>	liverwort
<i>Polystichum vestitum</i>	prickly shield fern
<i>Pteridium esculentum</i>	bracken

*ORCHIDS*

<i>Microtis unifolia</i>	onion orchid
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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Wilmers Road Dry Grasslands

**Site number:** SES/LP/22

**Physical address of site:** 275 Springs Road  
Hornby  
Christchurch 8441

#### Summary of Significance:

The Wilmers Road Dry Grasslands SES is significant because it contains vegetation representative of the Low Plains Ecological District including the nationally vulnerable turnip-rooted geranium.

#### Site Map:



**Site Information**

<b>Ecological District:</b>	Low Plains
<b>Central point NZTM:</b>	N5176815, E1562006
<b>Area of SES (ha):</b>	2.24 ha

**Site Description**

This dry grassland site contains two ecological units including: 1) danthonia-stipa bunch grassland, and 2) browntop turf grassland on undulating outwash plains. Successive botanical surveys of this site since 1993 have documented the decline of dry land species at this site (Partridge 2007), however the site still contains at least two native vascular plant species, including the Nationally Vulnerable (de Lange *et al.* 2013) turnip-rooted geranium (*Geranium retrorsum*) and several cryptogams (mosses and lichens).

**Extent of Site of Ecological Significance**

The SES includes the area of land contained within the existing fence lines in this location, as shown on the location map

**Assessment Summary**

The Wilmers Road Dry Grasslands site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is assessed as being ecologically significant because it meets the representativeness (criterion 1 & 2), and rarity/distinctiveness criteria (criteria 3 & 4).



## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

Despite being degraded, this site contains vegetation that is representative of the natural diversity of the Low Plains Ecological District, and combined with landforms comprises an area that is most similar in composition and structure to those communities that existed in 1840.

Native vascular plant species occurring on the site include:

- *Muehlenbeckia axillaris* (pohuehue)
- *Geranium retrosum* (geranium)

Conditions at the site are also suitable for Indigenous fungi, microrhizae, and cryptogams (mosses & lichens).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

Indigenous dryland vegetation on the Canterbury Plains comprises only fragments of what was previously present, and although there are other tiny dryland fragments nearby to the site, none still contain native plants (Partridge 2007). At 2.24 hectares, this site is considered to comprise a relatively large example of this type of vegetation in the Low Plains Ecological District.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

This site contains dry grassland vegetation that has been reduced to less than 20% of its former area in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).



**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site contains occurrences of the Nationally Vulnerable (de Lange *et al.* 2013) turnip-rooted geranium (*Geranium retrorsum*).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Does not meet criterion

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

Does not meet criterion

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

Does not meet criterion

**Ecological Context**

**8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

Does not meet criterion

**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

Does not meet criterion



10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Does not meet criterion

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## Site Management

### Existing Protection Status

Land in public ownership

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitor pest plant infestations and implement weed control as required.</li> <li>Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Further species loss</li> </ul>	<ul style="list-style-type: none"> <li>Identify and mark existing native plant populations</li> <li>Re-introduce recently locally extinct species</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Changes to soil structure &amp; fertility as a result of changes in land management that threaten existing ecosystem function</li> </ul>	<ul style="list-style-type: none"> <li>Implement a land management change process so that inappropriate actions do not occur</li> <li>Assess any attempts to change the irrigation or fertiliser application regime as part of the land management change process.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Undesirable impacts of grazing</li> </ul>	<ul style="list-style-type: none"> <li>Develop a stock grazing programme that will allow continued use of the land for grazing purposes whilst preserving the existing ecological values.</li> <li>Promote research and monitoring to determine most appropriate stock management regime(s).</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

<ul style="list-style-type: none"> <li>Browsing damage to plants</li> </ul>	<ul style="list-style-type: none"> <li>Consider installation of rabbit proof fencing where appropriate within the SES (including individual plant patches) and eradicate pest animals from within fenced area(s)</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Fire damage through excessive grass growth</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that fire risk is kept low without compromising existing ecological values</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Inappropriate planting</li> </ul>	<ul style="list-style-type: none"> <li>Ensure any planting (e.g. farm shelter, amenity, and restoration plantings) do not compromise existing ecological values.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

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## References

De Lange, P. J., Rolfe, J. R., Champion, P. D., Courtney, S. P., Heenan, P. B., Barkla, J. W., Cameron, E. K., Norton, D. A., and Hitchmough, R. A. (2013). *Conservation status of New Zealand indigenous vascular plants, 2012*. Department of Conservation, Wellington, New Zealand.

Lloyd, K., McClellan, R., Hutchison, M., Patrick, B., and Shaw, W. (2013) *Guidelines for the application of ecological significance criteria for indigenous vegetation and habitats of indigenous fauna in Canterbury region*. Report prepared for Environment Canterbury by Wildlands Consultants, Rotorua, New Zealand.

Partridge, T. R. (2007) *Vegetation changes and management options for reserve at corner of Wilmers and Springs Road (EHS 15.06)*. CCCECO 07/07, Christchurch City Council, Christchurch, New Zealand.

Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.

**Assessment completed by:** Antony Shadbolt  
**Date:** 15<sup>th</sup> September 2014

**Statement completed by:** Antony Shadbolt  
**Date:** 15<sup>th</sup> September 2014

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.





## Appendix 1

### Native Plant Species Recorded on Five Sampling Occasions

**Table 1:** Comparisons the current and previous records clearly shows that in terms of numbers of native species, the site is in decline (Source: Partridge 2007). Note that the 2014 column is based on 2014 survey by CCC botanist Trevor Partridge. All species are listed by de Lange (2013) as Not Threatened, with the exception of the Threatened/Nationally Vulnerable *Geranium retrosum*.

Name	1999	2002	2004	2007	2014
<i>Carmichaelia corrugata</i>	+				
<i>Crassula sieberiana</i>	+				
<i>Euchiton sphaericus</i>		+			
<i>Geranium retrosum</i>	+	+	+	+	+
<i>Leucopogon fraseri</i>	+				
<i>Microtis unifolia</i>	+				
<i>Muehlenbeckia axillaris</i>	+		+	+	+
<i>Muehlenbeckia axillaris x ephedroides</i>	+	+			
<i>Muehlenbeckia complexa</i>		+		+	
<i>Muehlenbeckia ephedroides</i>		+	+	+	
<i>Oxalis exilis</i>	+	+		+	
<b>Total Species</b>	<b>8</b>	<b>6</b>	<b>3</b>	<b>5</b>	<b>2</b>

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

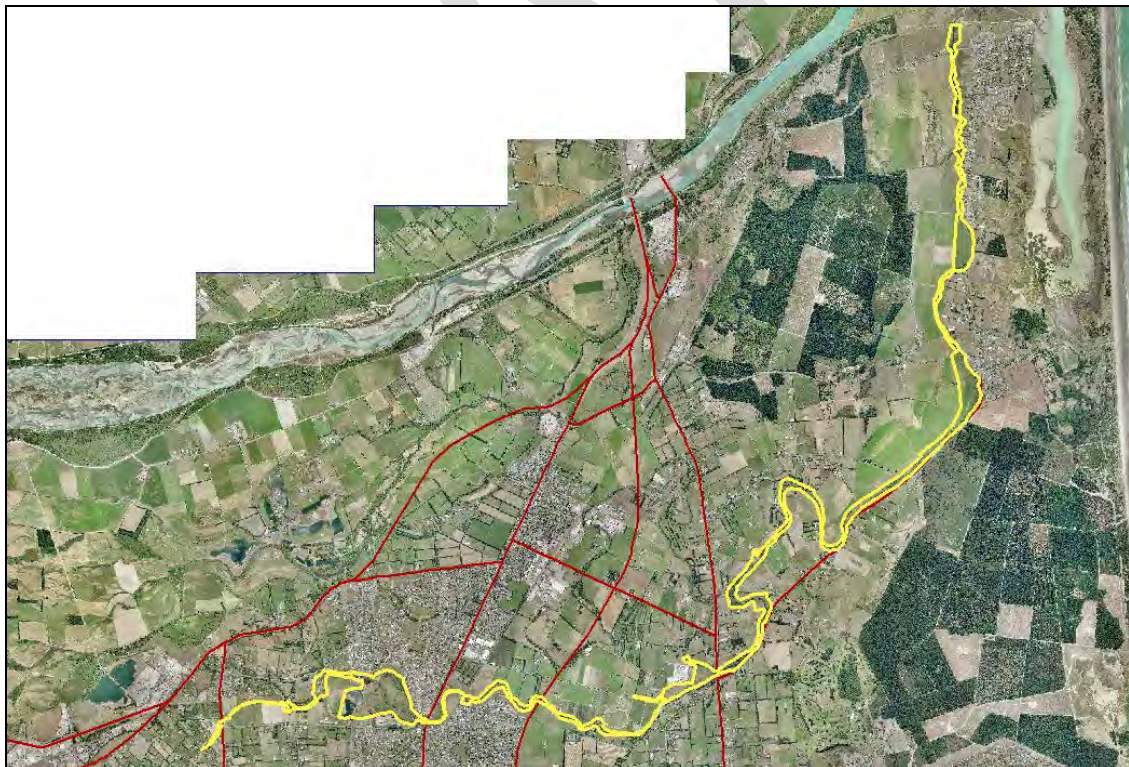
**Site Name:** Styx River

**Site Number:** SES/LP/23

#### **Summary of Significance:**

The site contains remnant wetland vegetation that is representative of the natural diversity of the Low Plains Ecological District, and supports the At Risk longfin eel.

#### **Site Map: (Refer Appendix 1 for Detailed SES Areas)**



## Additional Site Information

**Central point NZTM:** N5187839, E1572409

## Site Description

The Styx River SES covers a range of ecosystems including sequences of freshwater aquatic, remnant riparian vegetation, freshwater wetlands, riparian willow woodlands with native under-storey, ephemeral ponding and marsh areas, and planted lowland mixed podocarp forest modelled on local species assemblages including those historically occurring at Riccarton Bush. Although young, the planted lowland mixed podocarp component of the wider site (> 20 ha) is a relatively large and species rich area for the Low Plains Ecological District. The series of planted forest patches across the length of the SES contribute to an important link to a wider landscape-scale forest patch configuration and waterway corridor network throughout the Styx River catchment/northern Christchurch area.

Two extensive areas of ephemerally flooded exotic pasture (formerly natural wetland vegetation) are located along the true left bank of the Styx River opposite the end of Heyders Road in Spencerville, and immediately upstream from Earham Street respectively. The site is used extensively by native waterfowl and waders for nesting, feeding and high-tide roosting.

## Extent of Site of Ecological Significance

The Styx River SES spans from the western property boundary of the CCC tree nursery at 145a Claridges Road (accessed from 239 Gardiners Road) to the floodgates near the mouth of the Styx River at Brooklands. The SES covers the width of stream bed, flowing water, and extends to at least top-of-bank along both sides of the river to include the associated marginal riparian vegetation. However along most of the rivers length the width of the SES extends back from top-of-bank (Refer Appendix 1) to incorporate areas of indigenous vegetation and/or habitat features that are assessed as being ecologically significant under the criteria listed in this significance statement. The extent of specific areas within the Styx River SES are described in further detail below:

**Styx Mill Conservation Reserve:** At Styx Mill Conservation Reserve the SES covers the areal extent of the remnant wetland vegetation, constructed waterbodies and restored mixed-age forest and riparian plantings, and extends to include the pest proof fence and associated clear-zone/setback which is measured to 4.5 m out from the alignment of the physical structure of the fence. The inclusion of this clear zone/setback within the SES is important as it forms an essential component of the functioning and integrity of the site, with the fence as the appropriate management and maintenance of this zone preventing domestic, community and feral cats from entering the protected refuge.

**Styx River Reserve No. 2 (Boyds Farm):** The area of the SES for Boyds Farm covers a) the extent of planted native forest and shrubland communities within the CCC reserve areas, b) riparian planting along Radcliffe Rd Drain which extends approximately 220 m west from the CCC reserve boundary along the frontages of 275 and 283 Radcliffe Road, c) the extent of open constructed water-bodies within



the 303 Radcliffe Road site, and d) both the planted and un-planted margins of Kaputone Stream containing remnant native riparian vegetation.

**Riparian Willow Woodlands:** The extensive willow dominated riparian woodlands that provide habitat for indigenous avifauna downstream from the railway corridor to Brooklands are included within this SES, and are largely defined by the areal extent of their canopy, unless otherwise indicated on the maps in Appendix 1.

**Spencerville Styx Marsh:** The site at this point is approximately 850 m in length, running roughly parallel with the arc of the true left bank of the Styx River. The site is approximately 156 m wide at its widest point and tapers to approximately 20 m wide at the two ends as shown on the location diagram. The eastern edge of the SES is defined by the areal extent of the riparian willow woodland and/or native woody/shrub/reed-land riparian vegetation.

**Earlham Street Marsh:** The site extends southward from the Earlham Street bridge for a distance of 630 m, and extends west from the true left bank of the Styx River to the existing fence line to encompass a site that is approximately 190 m wide at its widest point as shown on the location diagram.

**Zonta site:** The site extends northward of Harbour Road to the Floodgates near the mouth of the Styx River, and extends to include the extent of remnant and restored native plant communities (including planted coastal forest and shrubland communities) along both banks of the river.

The SES area does not include areas of drive and road carriageway, lawn, and/or amenity planting within the SES.

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## Assessment Summary

The Styx River site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3 and 4), diversity and pattern (criterion 7), and ecological context criteria (criteria 8 and 10).

## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

**Styx Mill Conservation Reserve:** Vegetation in the vicinity of Styx Mill Conservation Reserve in 1856 is shown on the 'Black Map' (refer <http://resources.ccc.govt.nz/files/blackmap-environmentecology.pdf>) to comprise marshy land and swamp surrounded by grassland, fern, raupo, NZ flax/harakeke and toetoe. Very little of these original ecosystems exist locally, however some of these original features still remain in the diverse landforms within the area of the SES that support remnant native plant and animal communities (see Fagan and Meurk 2005).

Within the area of the SES, Fagan and Meurk (2004) record the presence of 63 native plant species that are considered to be representative of the original flora of the site. This amounts to approximately 22% of the predicted 289 species, based on historic and extrapolated potentials. Therefore, although degraded the SES contains some of the best remaining examples of the indigenous biodiversity in the area.

Styx Mill Conservation Reserve also supports a representative assemblage of indigenous bird species (30 indigenous species recorded between 1992 and 2013; Crossland 2013).

**Styx River Reserve No. 2 (Boyd's Farm):** Young riparian, forest and shrubland plantings within Boyd's Farm contain 84 species of locally sourced indigenous flowering plants and ferns identified by the Project Ecologist (Appendix 2), including 38 of the 50 local tree and shrub species recorded from Riccarton Bush (see Molloy 1995), as well as a range of other native tree and shrub species identified as likely to have naturally occurred locally by Lucas Associates (1995). Therefore although young the restoration plantings within this reserve are



considered to be representative of local indigenous forest vegetation in the Low Plains Ecological District.

**Earlham Street Marsh:** This area provides winter and high tide feeding and roosting area for a representative assemblage of native waterfowl and waders (Refer Crossland 2014a).

**Lower Styx River:** James (2013) reports a high Quantitative Macroinvertebrate Community Index (QMCI) for the section of the Styx River immediately upstream from the Kainga Road/Harbour Road bridge in Brooklands.

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

**Styx River Reserve No. 2 (Boyds Farm):** The extent of locally sourced and planted indigenous forest and riparian areas within the proposed Boyds Farm SES cover an area of approximately 6.90 hectares, and is larger than the area of Riccarton Bush (the largest natural forest patch of its type in the Low Canterbury Plains Ecological District). The site is therefore a relatively large example of its type in the region.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013). Lloyd *et al.* (2013) identify that “any indigenous vegetation on the Canterbury Plains” meets this Rarity/Distinctiveness criterion. Therefore indigenous vegetation within the SES meets this criterion.

**Styx Mill Conservation Reserve:** The Threatened Environment Classification System identifies the Low Canterbury Plains Ecological District as an ‘Acutely Threatened’ environment where less than 10% of the land area is under some form of indigenous vegetation cover (see Walker *et al.* 2007).

In the Low Plains Ecological District, freshwater wetlands such as those that occur within Styx Mill Conservation Reserve were once relatively extensive on the eastern parts of the plains (Harding 2009). While it is difficult to estimate the original extent of inland wetlands, it is assumed that these would once have occupied 1 - 5% of the Low Plains Ecological District, but are now represented by less than 1% of that area. Therefore it is likely that wetland vegetation is now reduced to less than 20% of its former extent in this Ecological District.



**Styx River Reserve No. 2 (Boyds Farm):** The site is significant under this criterion. Within the Boyds Farm part of the SES more than 6.5 hectares of kahikatea (*Dacrycarpus dacrydioides*), matai (*Prumnopitys taxifolia*) and totara (*Podocarpus totara*) dominated forest have been planted; communities that once accounted for between 2 and 10% of the Low Plains Ecological District, but now combined are represented by less than 1% of the District (Harding 2009). These podocarp forest communities have been reduced to less than 20% of their former extent

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site supports longfin eel (*Anguilla dieffenbachia*) (James 2013) which is classified as At Risk/Declining (Allibone *et al.* 2010). Longfin eels were recorded at four sites within the Styx Mill Conservation Reserve, and in the Styx River as far upstream as the City Council's Harewood Nursery (145A Claridges Road) by James (2013). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of the Styx River downstream of the sampled locations is included as part of this SES.

James (2013) also sampled the Threatened/Nationally Vulnerable (Allibone *et al.* 2010) lamprey (*Geotria australis*) at one site in Styx Mill Conservation Reserve, and the At Risk/Declining (Grainger *et al.* 2014) koura (*Paranephrops zealandicus*) at three sites in Styx Mill Conservation Reserve.

**Styx Mill Conservation Reserve:** Within the SES, Fagan and Meurk (2005) record eight uncommon or regionally rare indigenous plant species, including the only record of sphagnum moss on the Canterbury east coast (See also Partridge 2007). Uncommon or regionally rare indigenous plant species include the following:

Starwort	<i>Callitriche petriei</i>
Mania	<i>Carex flagelifera</i>
Purei	<i>Carex flaviformis</i>
Purei	<i>Carex maorica</i>
Purei	<i>Carex sinclairii</i>
Flat-leaved Rush	<i>Juncus planifolius</i>
Swamp Tussock	<i>Schoenus pauciflorus</i>
Sphagnum moss	<i>Sphagnum cristatum</i>

The SES has recently been determined to possess a wetland type known as a fen, at the western end of the wetland. This is the largest fen in Christchurch and has plants found nowhere else in the city, such as ladies tresses orchid *Spiranthes sinensis*. As above, this fen also hosts the only known wild population of *Sphagnum* moss in the city (Partridge 2007).

Two locally uncommon Dipteran (fly) species have been collected within the SES (Macfarlane 2007):

A Saltmarsh Fly	<i>Hydriellia acutipennis</i>
	<i>Certomerus crassinervis</i>



Two species of skink have been recorded from the SES; common skink (*Oligosoma polychroma*) and McCanns skink (*O. maccanni*) (McClure 2010). Although Hitchmough *et al.* (2013) list both species as Not Threatened under the NZ Threat Classification System, the common skink is a cryptic species complex, and this classification refers to one described clade only (*O. polychroma* Clade 1). Of the four un-described clades, Clade 4 and Clade 5 occur in the Low Plains Ecological District (see Liggins *et al.* 2008), and are both described by Hitchmough *et al.* (2013) as being At Risk, where their total area of occupancy is estimated to be in excess of 10,000 ha, but with a predicted decline of 10-70% across their range.

Styx Mill Conservation Reserve supports small but increasing populations of several threatened or at risk bird species (see Robertson *et al.* 2013; Crossland 2013; Appendix 2), including:

- Grey Duck                      Threatened/Nationally Critical
- Black Billed Gull            Threatened/Nationally Critical
- Red Billed Gull              Threatened/Nationally Vulnerable
- Pied Stilt                      At Risk/Declining
- Black Cormorant              At Risk/Naturally Uncommon

**Styx River Reserve No. 2 (Boyds Farm):** The Boyds Farm part of the SES contains the At Risk/Declining risk plant *Urtica linearifolia* (climbing nettle) along the margins of Kaputone Stream as recorded by the Project Ecologist. This species is considered to have a large population (>100,000 mature individuals), but with a predicted 10 – 70% decline (de Lange *et al.* 2013), and is abundant within this part of the SES.

The Boyds Farm ponds and adjacent waterways support the Threatened/Nationally Critical Grey Duck (*Anas supercilliosa*), and the At Risk/Naturally Uncommon Black Cormorant (*Phalacrocorax carbo novaehollandiae*) (Refer Crossland 2014b; Robertson *et al.* 2012).

Common skink (refer above) were recorded by the Project Ecologist and CCC Ranger staff within this site in November 2014, and also immediately downstream within the SES at Janet Stewart Reserve by McClure (2010).

**Spencerville Styx Marsh:** This site provides a significant nesting site for At Risk/Declining (Robertson *et al.* 2013) Pied Stilts (*Himantopus himantopus leucocephalus*) At Risk/Declining South island Pied Oystercatcher (*Haematopus finschi*) (Crossland 2014c; Appendix 1).

**Earlham Street Marsh:** This site provides a significant nesting site for At Risk/Declining (Robertson *et al.* 2013) Pied Stilts (*Himantopus himantopus leucocephalus*) (Refer Crossland 2014a)





**Riparian Willow Woodlands:** The willow woodland areas between Marshland Road and Spencerville support the Threatened/Nationally Critical (Robertson *et al.* 2013) Grey Duck (*Anas supercilliosa*). Grey Duck were photographed by the project ecologist within this area using Reconyx PC900 camera traps in 2012 and 2013.

The Styx River downstream from Mashland Road supports populations of the At Risk/Declining plant *Urtica linearifolia* (climbing nettle) along the margins of the willow woodland as recorded by the Project Ecologist. This species is considered to have a large population (>100,000 mature individuals), but with a predicted 10 – 70% decline (de Lange *et al.* 2013).

5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet this criterion

#### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

The site is significant under this criterion.

**Styx Mill Conservation Reserve:** The SES contains a high diversity of invertebrate fauna. Excluding Lepidoptera (moths), at least 354 insect species (possibly as many as 386) and at least 27 spiders were recorded by Macfarlane (2007), who estimates that the total number of resident species could be 800 – 1000 given that Diptera (flies) account for only 20% of New Zealand's insect species. Of these Macfarlane estimates that approximately 80% of species occurring within the SES are endemic, and if moth species were identified, more beetle species collected, and the occurrence of uncollected localised uncommon to rare were taken into account, this percentage could increase to as much as 88 – 95% (however without further investigation these latter estimates cannot be confirmed).



## Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

The site is significant under this criterion.

**Styx River Reserve No. 2 (Boyds Farm):** Dense plantings provide a buffering function for natural values in the Styx River, Kaputone Stream, Radcliffe Road Drain and Mundy's Road Drain which pass through the site. This part of the SES contributes to an important ecological linkage and network throughout the Styx River catchment, and is linked to other areas of ecological significance by the river corridors and associated riparian vegetation (including willow dominated riparian woodlands with regenerating and/or remnant native under-storey). At 6.9 hectares in area, the riparian and forest plantings within the Boyds Farm part of the SES also make a significant contribution towards the landscape-scale forest patch configuration in terms of providing a core wildlife sanctuary (refer Meurk and Hall 2006).

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Site not assessed under this criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

The site is significant under this criterion.

**Styx Mill Conservation Reserve:** The construction of a cat and dog exclusion fence along the northern and eastern boundary of Styx Mill Conservation Reserve provides a degree of protection from large mammals (including domestic cats, dogs and to some degree people), providing an area of relatively undisturbed refuge for indigenous species within the eastern end of the SES.

**Riparian Willow Woodlands:** Camera trapping inventory work carried out by the Project Ecologist in 2013 have shown the riparian willow woodlands along the lower Styx River between Marshland Road and Spencerville to provide a core refuge and breeding site for several species of waterfowl including Grey Teal, Black Swan, Australasian Shoveler and Pukeko, New Zealand Scaup and possibly also for Grey Duck.



**Earlham Street Marsh:** This site provides important winter and high tide feeding and roosting area for wading birds, including (Crossland 2014a):

- Black Cormorant
- White Faced Heron
- Paradise Shelduck
- Pukeko
- Pied Stilt
- Spur Winged Plover

**Zonta Site:** Swampbird habitat (utilised by Marsh Crake, Pukeko, possibly Bittern and potentially several reintroduced species) exists in the Zonta revegetation project area downstream of the Harbour Road Bridge as well as upstream for the first 200 metres on the true right bank (Crossland 2008).

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## Site Management

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitor pest plant infestations and implement control as required.</li> <li>Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li>Information packages for neighbouring properties (e.g. 'Plant Me Instead')</li> </ul>
<ul style="list-style-type: none"> <li>Animal pest incursion into pest free areas</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of possible animal pest incursions and trapping as necessary</li> <li>Regular inspection and maintenance of pest proof fence</li> <li>Maintenance of an effective clear zone around perimeter of pest proof fence to prevent animals jumping fence</li> </ul>	<ul style="list-style-type: none"> <li>Provide advice and guidance on pest animal monitoring</li> <li>Supply traps and related training as necessary to private land owners adjoining the SES</li> </ul>
<ul style="list-style-type: none"> <li>Disturbance to wildlife from dogs</li> </ul>	<ul style="list-style-type: none"> <li>Prohibit dogs within core wetland areas of the SES</li> <li>Interpretation highlighting the impacts dogs can have on wildlife values</li> <li>Plan for future relocation of Styx Mill Conservation Reserve dog park to new site nearby</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Potential removal of the threatened climbing nettle (<i>Urtica linarifolia</i>) as a result</li> </ul>	<ul style="list-style-type: none"> <li>Highlight presence of plants to maintenance contractors</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

of stream bank maintenance	<ul style="list-style-type: none"> <li>• Interpretation signage on-site</li> </ul>	
<ul style="list-style-type: none"> <li>• Draining of ponded areas at Spencerville and South of Earham Street</li> </ul>	<ul style="list-style-type: none"> <li>• Discourage draining, filling and/or cultivation of the ephemeral ponding areas</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Disturbance of nesting sites by livestock and uncontrolled dogs</li> </ul>	<ul style="list-style-type: none"> <li>• Suggest de-stocking during Pied Stilt nesting season, and ensure dogs do not enter area during this period</li> </ul>	<ul style="list-style-type: none"> <li>• Education and interpretation plan for the area</li> </ul>
<ul style="list-style-type: none"> <li>• Loss of indigenous waterfowl habitat through removal of riparian willow woodland</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure no net loss in riparian willow woodland area through re-planting any controlled willow with appropriate local native tree species</li> <li>• Phase removal of willows to ensure continuity of habitat (ie; tall riparian woodland) for bird species dependent on woodland habitat structure.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Anthropogenic change to water regime</li> </ul>	<ul style="list-style-type: none"> <li>• Any action relating to changes in the water regime need to be assessed in relation to impacts upon ecological state and functioning of wetlands.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Natural process of change</li> </ul>	<ul style="list-style-type: none"> <li>• If natural changes in wetland ecology, composition or functioning are determined to be detrimental to the ongoing viability of the values of the site, a recovery action plan should be initiated.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

<ul style="list-style-type: none"> <li>Inappropriate management of natural remnant low-nutrient wetlands (Styx Mill Conservation Reserve fen)</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the area occupied by the fen receives only rain water and that no stream, ground or surface water overflow enters that area</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Artificial riverbank retaining, substrates and/or other structures that adversely affect ecological function of waterways</li> </ul>	<ul style="list-style-type: none"> <li>Naturalise banks (i.e. remove retaining and create sloping banks with appropriate native vegetation) during bank maintenance works and through capital projects</li> <li>Prevent construction of fish barriers (e.g. weirs) and remediate current barriers</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Deficiency of high-quality riparian margins, resulting in a lack of habitat, high water temperatures due to a lack of shading, no buffer/filtering from urban impacts and affects on the functioning of ecological corridors (i.e. species movement)</li> </ul>	<ul style="list-style-type: none"> <li>Supplement riparian margins with dense, native and locally-sourced vegetation of varying heights (i.e. include tall trees to provide shading to the waterway)</li> <li>Focus on planting areas of unstable ground, to reduce erosion and sediment discharges</li> <li>To maintain the riparian margin and ecological corridors, ensure waterway setbacks are maintained (i.e. resource consent is required to build, fill or excavate) and closed fences are not built adjacent to waterways</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Discharge of contaminants</li> </ul>	<ul style="list-style-type: none"> <li>Treatment of stormwater to a high level prior to discharge into waterways</li> <li>Reduction in occurrence of wastewater</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

	<p>overflows to waterways</p> <ul style="list-style-type: none"> <li>• Prevent non-stormwater discharges (e.g. trade-waste and agricultural runoff) from entering stormwater network or waterways</li> <li>• Effective sediment control mitigation measures during construction</li> <li>• Removal of instream sediment (and therefore other contaminants attached to sediment)</li> </ul>	
<ul style="list-style-type: none"> <li>• Excessive amount of leaf-fall from deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li>• Plant indigenous locally-sourced evergreen species in riparian margins instead of deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Artificial light impacting on freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>• Minimise light-spill onto waterway</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Lack of instream habitat for freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain or enhance species-specific habitat</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Pathogen input from waterfowl and dog faeces affecting water quality</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce ability for waterfowl to enter waterways, by densely planting riparian margins with appropriate native species</li> <li>• Encourage community not to feed the ducks</li> <li>• Encourage the community to pick up dog faeces</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>



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**Assessment completed by:** Dr Antony Shadbolt

**Date:** 17<sup>th</sup> November 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 17<sup>th</sup> November 2014

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.

Appendix 1



Figure 1: Styx River - Harewood Park to Styx Mill Conservation Reserve



Figure 2: Styx River – Styx Mill Conservation Reserve (Upper)

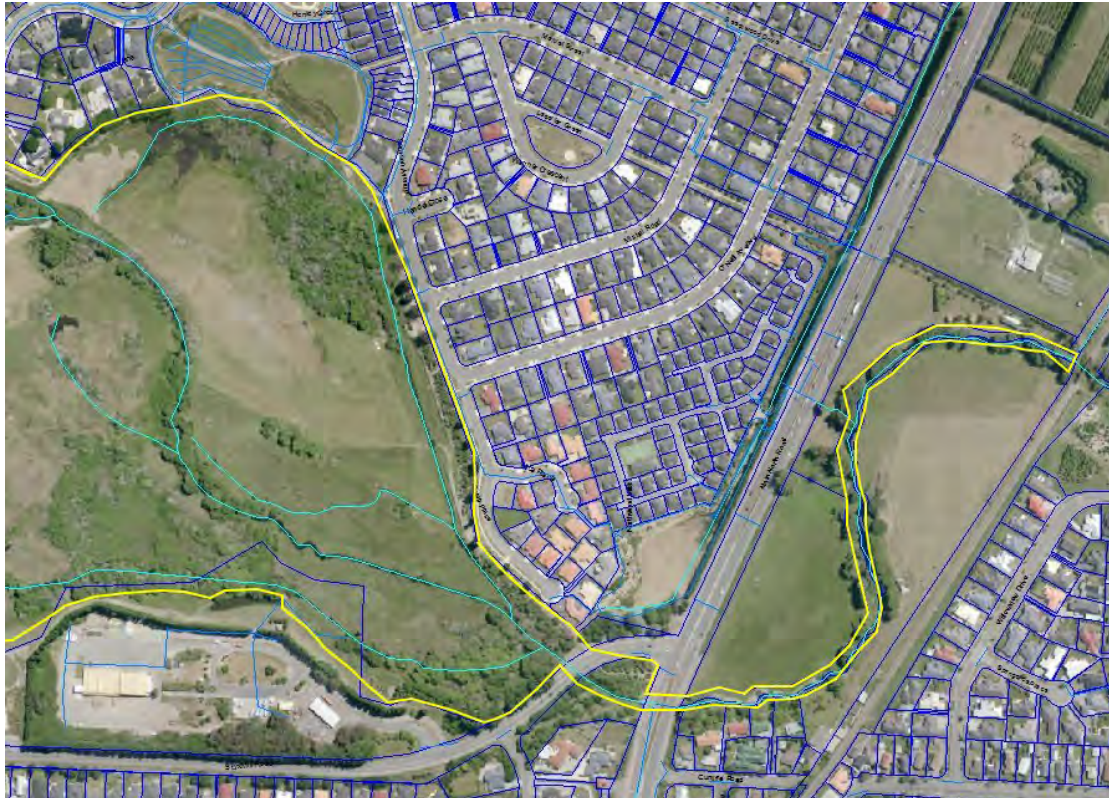


Figure 3: Styx River – Styx Mill Conservation Reserve (Lower) to Redwood Springs



Figure 4: Styx River – Redwood Springs



Figure 5: Styx River – Redwood Springs to Selkirk Place (Highfield)



Figure 6: Styx River – Selkirk Place to Boyds Farm Reserve



Figure 7: Styx River – Boyds Farm Reserve



Figure 8: Styx River – Janet Stewart Reserve Living Laboratory Precinct



**Figure 9:** Styx River – Styx Living Laboratory Precinct to Lower Styx Conservation Reserve



**Figure 10:** Styx River – Lower Styx Conservation Reserve to S-bend



Figure 11: Styx River – Lower Styx Road (Upper)



Figure 12: Styx River – Lower Styx Road (Middle)





Figure 13: Styx River – Lower Styx Road (Lower)

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Figure 14: Styx River - Spencerville



Figure 15: Styx River – Spencerville to Earham Street (Brooklands)

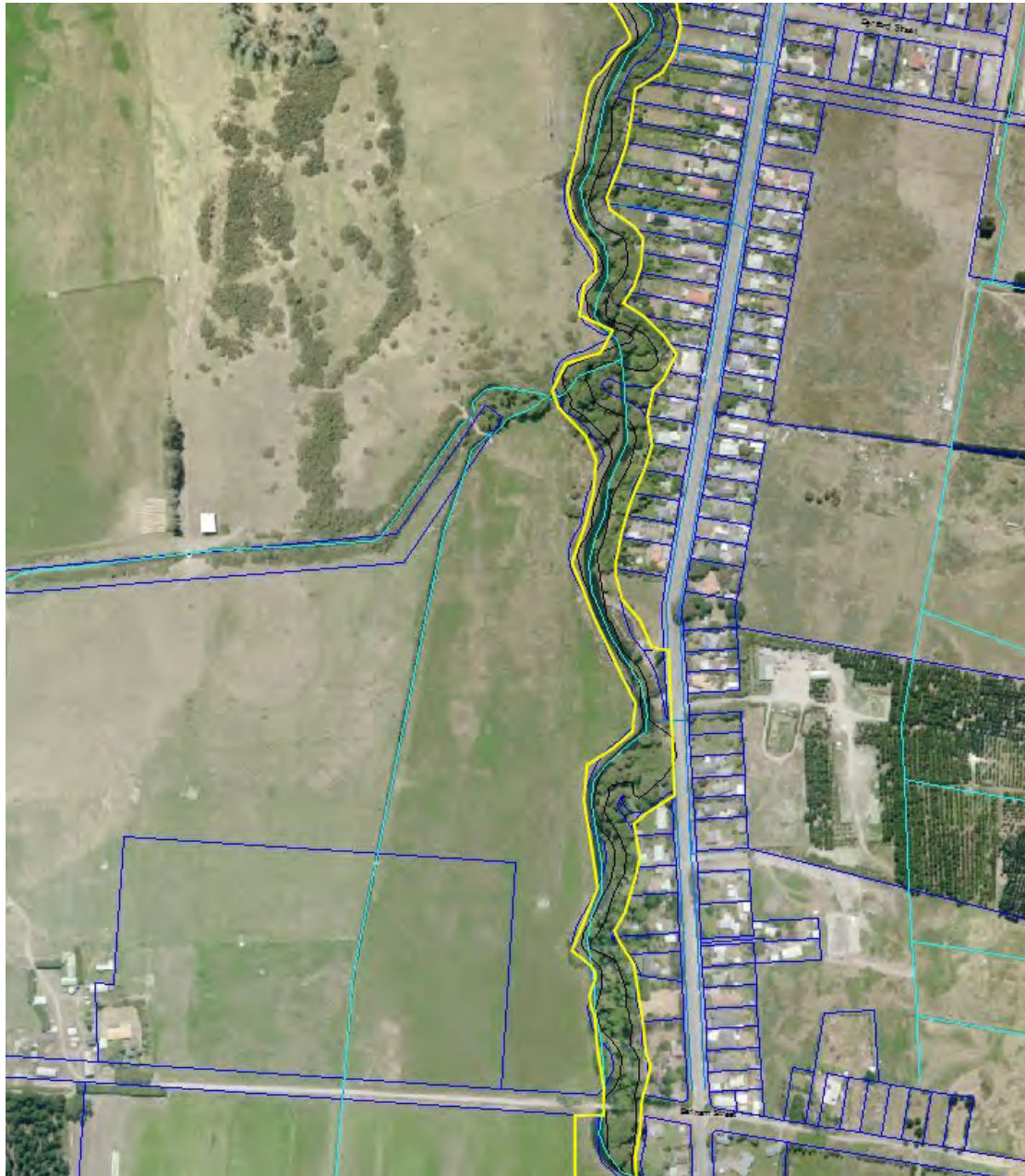


Figure 16: Styx River – Earlham Street to Dartford Street (Brooklands)



Figure 17: Styx River – Dartford Street to Floodgates (Brooklands)



## Appendix 2: Native Flowering Plants & Conifers

### List of native conifers, flowering plants and ferns recorded within the Boyds Farm Reserve.

Species marked with asterisks (\*\*) indicate species considered local to the area, but not listed as ever being present in Riccarton Bush. Species underlined represent local species now extinct in Riccarton Bush. Species in gray font indicate species recorded from Riccarton Bush, but not occurring at Boyds Farm (Refer Lovis 1995, and Molloy 1995).

#### TREES & SHRUBS

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Alectryon excelsus</i>	titoki/NZ ash
<i>Aristotelia serrata</i>	wineberry/makomako
<u><i>Carmichaelia robusta</i></u>	NZ broom/makaka
<i>Carpodetus serratus</i>	marbleleaf/putaputaweta
<i>Cassinia leptophylla</i> **	tahinu
<i>Coprosma areolata</i>	thin leaved coprosma
<i>Coprosma crassifolia</i>	stiff-stemmed coprosma
<i>Coprosma linarifolia</i> **	
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi
<i>Coprosma propinqua</i> x <i>C. robusta</i>	hybrid coprosma
<i>Coprosma repens</i> **	
<i>Coprosma rhamnoides</i> **	
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round leaved coprosma
<i>Coprosma rubra</i> **	
<i>Coprosma virescens</i> **	
<i>Cordyline australis</i>	cabbage tree/ti kouka
<i>Coriaria sementosa</i>	tutu
<u><i>Corokia cotoneaster</i></u>	korokio
<i>Dacrycarpus dacrydioides</i>	kahikatea/white pine
<i>Discaria toumatu</i> **	matagauri
<i>Dodonaea viscosa</i> **	akeake
<i>Elaeocarpus dentatus</i>	hinau
<i>Elaeocarpus hookerianus</i>	pokaka
<i>Elaeocarpus dentatus</i> x <i>E. hookerianus</i>	hybrid
<u><i>Fuchsia excorticata</i></u>	tree fuchsia/kotukutuku
<i>Fuchsia excorticata</i> x <i>F. perscandens</i>	hybrid fuchsia
<i>Griselinia littoralis</i>	broadleaf/kapuka
<u><i>Hebe salicifolia</i></u>	koromiko
<i>Hebe strictissima</i> **	
<i>Hoheria angustifolia</i>	narrow leaved lacebark/houhere
<u><i>Kunzea ericoides</i></u>	white tea tree
<i>Leptospermum scoparium</i> **	<i>manuka</i>
<i>Lophomyrtus obcordata</i>	NZ myrtle/rohutu
<i>Melicope simplex</i>	poataniwha
<u><i>Melicytus micranthus</i></u>	manakura/shrubby whiteywood
<i>Melicytus ramiflorus</i>	mahoe/whiteywood
<i>Melicytus micranthus</i> x <i>M. ramiflorus</i>	hybrid whiteywood
<i>Muehlenbeckia astonii</i> **	shrubby pohuehue
<u><i>Myoporum laetum</i></u>	ngaio



<i>Myrsine australis</i>	red matipo
<i>Myrsine divaricata</i> **	weeping maupo
<i>Neomyrtus pedunculata</i>	NZ myrtle/rohutu
<i>Olearia avicenniaefolia</i> **	tree daisy
<i>Olearia paniculata</i> **	golden akeake
<i>Pennantia corymbosa</i>	kaikomako
<i>Pittosporum eugenioides</i>	lemonwood/tarata
<i>Pittosporum tenuifolium</i>	kohuhu/black matipo
<i>Plagianthus regius</i>	ribbonwood/manatu
<i>Podocarpus totara</i>	totara
<i>Prumnopitys ferruginea</i>	miro/brown pine
<i>Prumnopitys taxifolia</i>	matai/black pine
<i>Pseudopanax arboreus</i>	five-finger/pauhou
<i>Pseudopanax crassifolius</i>	lancewood/horoeka
<i>Pseudowintera colorata</i>	pepper tree/horopito
<i>Schefflera digitata</i>	seven-finger/pate
<i>Solanum aviculare</i>	poroporo
<i>Sophora microphylla</i>	South Island kowhai
<i>Streblus heterophyllus</i>	milk tree/turepo
<i>Urtica ferox</i>	tree nettle/ongaonga

#### CLIMBING PLANTS

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Calystegia turguriorum</i>	NZ bindweed/powhiwhi
<i>Clematis paniculata</i>	NZ clematis/puawananga
<i>Clematis fosteri</i>	yellow clematis
<i>Fuchsia perscandens</i>	climbing fuchsia
<i>Metrosideros diffusa</i>	white rata/climbing rata
<i>Muehlenbeckia australis</i>	pohuehue/Maori vine
<i>Muehlenbeckia axillaris</i> **	pohuehue
<i>Muehlenbeckia complexa</i>	shrubby puhue
<i>Muehlenbeckia australis</i> x <i>M. complexa</i>	hybrid puhue
<i>Parsonsia capsularis</i>	NZ jasmine/kaiwhiria
<i>Parsonsia heterophylla</i>	NZ jasmine/kaiwhiria
<i>Passiflora tetandra</i>	Kohia/NZ passion flower
<i>Ripogonum scandens</i>	supplejack/kareao
<i>Rubus australis</i>	bush lawyer/taramoa
<i>Rubus schmidelioides</i>	bush lawyer/taramoa
<i>Rubus squarrosus</i>	bush lawyer/taramoa
<i>Rubus australis</i> x <i>R. squarrosus</i>	hybrid lawyer
<i>Rubus australis</i> x <i>R. schmidelioides</i>	hybrid lawyer
<i>Rubus schmidelioides</i> x <i>R. squarrosus</i>	hybrid lawyer
<i>Urtica linearifolia</i> **	climbing nettle

#### MISTLETOES

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Ileostylus micranthus</i>	common mistletoe
<i>Korthalsella lindsayi</i>	dwarf mistletoe
<i>Tuperia Antarctica</i>	white mistletoe/pirita

#### MONOCOT HERBS

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Anemanthele lessoniana</i>	hunangamoho/NZ wind grass
<i>Astelia fragrans</i>	bush flax/kahaka
<i>Astelia grandis</i>	bush flax/kahaka



<i>Astelia nervosa</i>	bush flax/kahaka
<i>Austroderia richardii</i>	toetoe
<i>Carax coriacea</i>	sedge/rautahi
<i>Carex flagelifera</i>	shining sedge/mania
<i>Carex geminata**</i>	
<i>Carex lambertiana</i>	sedge
<i>Carex maorica**</i>	
<i>Carex raoulii</i>	sedge
<i>Carex secta</i>	sedge/purei
<i>Carex solandri</i>	sedge
<i>Carex virgata</i>	swamp sedge
<i>Carex lambertiana</i> x <i>C. solandri</i>	sedge
<i>Cyperus ustulatus**</i>	
<i>Dianella nigra**</i>	
<i>Elaeocharis acuta**</i>	
<i>Gahnia xanthocarpa</i>	giant gahnia
<i>Hierochloa redolens</i>	holy grass/karetu
<i>Juncus distegus</i>	rush
<i>Juncus gregiflorus</i>	rush
<i>Juncus pallidis**</i>	rush
<i>Libertia ixioides</i>	NZ iris/mikoikoi
<i>Liuzula picta</i> var. <i>limosa</i>	woodrush
<i>Luzula rufa</i>	woodrush
<i>Microlaena avenacea</i>	bush rice grass
<i>Phormium tenax</i>	NZ flax/harakeke
<i>Poa cita**</i>	silver tussock
<i>Poa imbecilla</i>	weak poa
<i>Rytidosperma gracile</i>	danthonia/bush danthonia
<i>Uncinia leptostachya</i>	hooked sedge/matau
<i>Uncinia uncinata</i>	hooked sedge/kamu

**DICOT HERBS**

**BOTANICAL NAME**

*Acaena anserinifolia*  
*Cardamine debilis*  
*Epilobium billardieraenum*  
*Epilobium komarovianum*  
*Epilobium macropus*  
*Epilobium nummulariifolium*  
*Epilobium pallidiflorum*  
*Epilobium pictum*  
*Epilobium rotundifolium*  
*Geranium solenderi*  
*Gnaphalium involucreatum*  
*Hydrocotyle heteromeria*  
*Hydrocotyle moschata*  
*Microseris scapigera*  
*Oxalis corniculata*  
*Nertera depressa*  
*Parietaria debilis*  
*Pseudognaphalium luteoalbum*  
*Ranunculus glabifolius*  
*Ranunculus reflexus*  
*Rumex flexuosus*

**COMMON NAME(S)**

piripiri/bidibidi  
*NZ cress/panapana*  
*willowherb*  
*willowherb*  
*willowherb*  
*willowherb*  
*willowherb*  
*willowherb*  
*willowherb*  
*cranesbill/cut-leaved geranium*  
*creeping cudweed*  
*NZ waxweed/hydrocotyle*  
*hydrocotyle/marsh pennywort*  
 -  
*creeping oxalis*  
*nertera*  
*NZ pellitory*  
*common cudweed*  
*NZ buttercup*  
*NZ buttercup*  
*Maori dock/nuna*





*Scenecio minimus*  
*Stellaria parviflora*  
*Urtica incisa*  
*Wahlenbergia gracilis*

*fireweed*  
*NZ stichwort*  
*dwarf nettle/forest nettle*  
*NZ harebell*

**FERNS**

**BOTANICAL NAME**

*Asplenium flabellifolium*  
*Asplenium gracillimum*  
*Asplenium hookerianum*  
*Asplenium terrestre*  
***Azola filiculoides*\*\***  
*Blechnum discolor*  
***Blechnum fluviatile***  
***Blechnum minus***  
***Blechnum penna-marina***  
*Dicksonia squarrosa*  
*Histiopteris incise*  
*Hypolepis ambigua*  
*Hypolepis rufobarbata*  
*Leptopteris hymenophylloides*  
*Pallaea rotundifolia*  
*Phymatosorus pustulatus*  
*Pneumatopteris pennigera*  
*Polystichum richardii*  
*Polystichum vestitum*  
*Pteridium esculentum*  
*Pyrrhosia eleagnifolia*

**COMMON NAME(S)**

necklace fern  
graceful spleenwort  
Hooker's spleenwort  
ground spleenwort  
**water fern**  
crown fern/piupiu  
creek fern/kiwakiwa  
swamp kiokio  
little hard fern  
rough tree fern/wheki  
water fern/mata  
rough pig fern  
sticky pig fern  
cape fern/heruheru  
button fern/tarawera  
hounds tongue fern/kowaowao  
feather fern/pakau-roharoha  
black shield fern/tutoke  
prickly shield fern/puniu  
bracken/rahurahu  
leather leaf fern





## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site Name:** Avon River/Otakaro and Tributaries

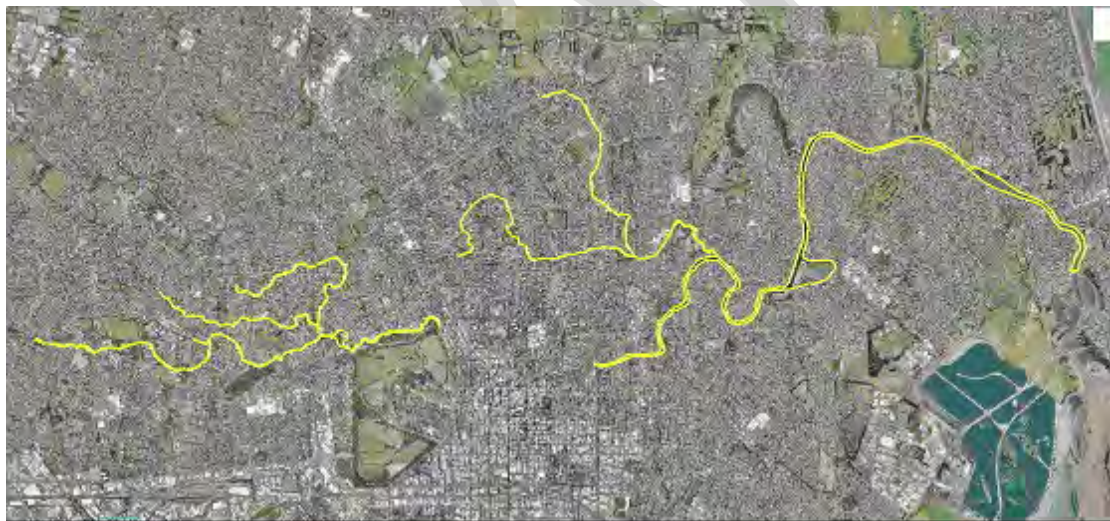
**Site Number:** SES/LP/24a

**Physical Address of Site:** Multiple Addresses

#### **Summary of Significance:**

The Avon River and Tributaries SES supports at-risk fish species including their migration routes, and supports indigenous vegetation and avi-fauna that is representative of the Low Plains Ecological District.

#### **Site Map: (Refer Appendix 1 for Detailed SES Areas)**



### Additional Site Information

**Central point NZTM:** N5180849, E1571416

**Area of SES (ha):** TBA

### Site Description

The Avon River and Tributaries SES is a freshwater spring-fed river system that supports at-risk fish species including their migration routes, and supports indigenous vegetation and avi-fauna that is representative of the Low Plains Ecological District. Within the SES, a highly modified stretch of the Avon River in Avondale (at the approximate location of the tidal wedge) supports vegetation dominated by sward forming exotic herbs and tall fescue grasses, with scattered native sedge (*Carex secta*) that provide a significant spawning site for inanga.

### Extent of Site of Ecological Significance

The Avon River and Tributaries SES covers six natural waterways, extending from the most upstream locations where longfin eels have been recently sampled, to their confluences with the Avon River, or Avon Heathcote Estuary in the case of the Avon River itself. The upstream extent of the six respective waterways are listed below, and illustrated in Appendix 1:

- Avon River at Corfe Reserve (Appendix 1, Figure 1)
- Okeover Stream upstream from Clyde Rd (Appendix 1, Figure 16)
- Waimairi Stream at Barlowe St (Appendix 1, Figure 17)
- Wiararapa Stream upstream from Glandovey Rd (Appendix 1, Figure 22)
- Dudley Creek upstream of Jameson Ave (Appendix 1, Figure 27)
- St Albans Creek downstream from Abberfield Ln (Appendix 1, Figure 37)

The SES covers the width of steam beds, flowing water, and extends to at least top-of-bank along both sides of the streams to include the associated marginal riparian vegetation. However at some locations along the streams lengths the width of the SES extends back from top-of-bank (Refer Appendix 1) to incorporate areas of indigenous vegetation and/or habitat features that are assessed as being ecologically significant under the criteria listed in this significance statement, including provision of important buffering of in-stream ecological values.

At Cockayne Reserve the SES extends to cover the area of wetland between the river-side base of the New Brighton Road stop bank and the bank of the Avon River from opposite the end of Bower Ave, down stream to opposite the end of Baker Street. Note that here the SES is limited to the extent of native dominated wetland plant communities and water bodies, and does not include area(s) of managed amenity turf, paths or boardwalks within or adjacent to the site. Throughout the wider SES area, the SES does not include areas of drive and road carriageway, lawn, and/or amenity planting beyond the top of banks.

The Avondale inanga spawning site extends along both banks of the Avon River for a distance of approximately 1165 metres, from Sharlick Street to the intersection of Mervyn and Avonside Drives. This reach of the SES includes the stream reach itself and the area of marginal vegetation inundated on spring tides.

Note that the section of the Avon River between Deans Avenue and Fitzgerald Avenue is contained within the Avon River/Otakaro (Central City) SES (SES/LP24b), and as such this SES should be considered in context with the Avon River/Otakaro (Central City) SES.

## Assessment Summary

The Avon River and Tributaries site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below). Under these criteria the site is ecologically significant because it meets representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3 and 4), and ecological context criteria (criteria 8 and 10).

## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

At Cockayne Reserve on the lower Avon River, although degraded through invasive weed incursion including willow, gorse, yellow flag iris, purple loosestrife, tall fescue and blackberry (Crossland 2005), vegetation within this part of the SES is representative and characteristic of the natural diversity of brackish riparian wetlands in the Low Canterbury Plains Ecological District. It the largest remaining fragment of riparian wetland vegetation that once covered an extensive area in the lower Avon catchment as reported by early settlers and botanists (refer Black Maps, 1856; McIntyre 1980) and is the largest remaining of its type locally.

57 species of indigenous vascular plants have been recorded from Cockayne Reserve (CCC Natural Areas Database 2), including 14 trees and shrubs, 21 monocot herbs, 15 dicot herbs, 4 ferns, one orchid and two species of climbers. In September 2014, CCC Botanist Dr Trevor Partridge recorded 45 species present at Cockayne Reserve (Refer Appendix 3)

A representative sample of indigenous birds (23 species; Crossland 2005 and Crossland 2014) have been recorded at Cockayne Reserve (refer Appendix 2).



**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

Cockayne Reserve is the largest remaining fragment of riparian wetland vegetation that once covered an extensive area in the lower Avon catchment as reported by early settlers and botanists (refer Black Maps, 1856; McIntyre 1980) and is the largest remaining of its type locally.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

Cockayne Reserve contains wetland vegetation that has been reduced to less than 20% of its former extent in the Low Canterbury Plains Ecological District. The Threatened Environment Classification System identifies the Low Canterbury Plains Ecological District as an 'Acutely Threatened' environment where less than 10% of the land area is under some form of indigenous vegetation cover (see Walker *et al.* 2007). Lloyd *et al.* (2013) identify that "any indigenous vegetation on the Canterbury Plains" meet this Rarity/Distinctiveness criterion.

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site supports longfin eel (*Anguilla dieffenbachia*), bluegill bully (*Gobiomorphus hubbsi*) (Blakely 2014), and inanga (*Galaxias maculatus*) (McMurtrie 2014). All three species are listed by Allibone *et al.* (2010) as At Risk/Declining.

Blakely (2014) recorded longfin eels in several tributary waterways of the Avon River, including the following locations which are the most upstream sampled locations for this species for the respective waterways

- Avon River at Corfe Reserve
- Okeover Stream upstream from Clyde Road
- Wiararapa Stream upstream from Glandovey Road
- Waimairi Stream at Barlowe Street
- Dudley Creek upstream of Jameson Avenue
- St Albans Creek at Abberly Park downstream from Abberfield Lane



Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of the Avon River and tributaries downstream of the sampled locations is included as part of this SES.

Blakely (2014) recorded bluegill bully on the Avon River immediately downstream from the Mona Vale Weir.

McMurtrie (2014) recorded inanga at three sites on the Avon river: 1) downstream from Clyde Road, 2) upstream of the band rotunda on Cambridge Terrace near the CBD, and 3) in the Avondale spawning site on the lower Avon River. The lower Avon inanga spawning site is one of the major spawning grounds for inanga within Christchurch Rivers, where spawning grounds are limited overall. Blakely (2014) also recorded inanga in Dudley Creek immediately downstream of North Parade

Eight species listed as either being 'Nationally Critical', 'Nationally Vulnerable', 'At Risk', or 'Naturally Uncommon' (refer Robertson et al. 2013) have been recorded from Cockayne Reserve by Crossland (2005) including:

- |                          |                                  |
|--------------------------|----------------------------------|
| • Black Cormorant        | At Risk/Naturally Uncommon       |
| • Pied Cormorant         | Threatened/Nationally Vulnerable |
| • Little Black Cormorant | At Risk/Naturally Uncommon       |
| • White Heron            | Threatened/Nationally Critical   |
| • Pied Stilt             | At Risk/Declining                |
| • Red Billed Gull        | Threatened/Nationally Vulnerable |
| • Black Billed Gull      | Threatened/Nationally Critical   |
| • Caspian Tern           | Threatened/Nationally Vulnerable |

**5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.***

Site not assessed under this criterion

**6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

Does not meet this criterion

**Diversity and Pattern**

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

Site not assessed under this criterion



## Ecological Context

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion. The Avon River and Tributaries SES supports longfin eel (*Anguilla dieffenbachia*). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of the listed waterways downstream of their most upstream sampled locations to their confluences with the Avon River and Avon-Heathcote Estuary are included as part of this SES.

- 9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

Does not meet this criterion

- 10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion. Inanga is the adult life stage of the most common species of whitebait. It spawns amongst tidally inundated vegetation in the lower reaches of the city rivers. This SES consists of a major inanga spawning site within Christchurch's rivers. Inanga spawning sites are necessary to ensure recruitment of inanga throughout Christchurch's rivers, and nationally for the sustainability of the population as a whole.

## Site Management

### Existing Protection Status

XXX

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitor pest plant infestations and implement control as required.</li> <li>Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li>Information packages for neighbouring properties (e.g. 'Plant Me Instead')</li> </ul>
<ul style="list-style-type: none"> <li>Animal pest incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of possible animal pest incursions and trapping as necessary</li> <li>Maintenance of an effective clear zone around perimeter of pest proof fence</li> </ul>	<ul style="list-style-type: none"> <li>Provide advice and guidance on pest animal monitoring</li> <li>Supply traps and related training as necessary</li> </ul>
<ul style="list-style-type: none"> <li>Anthropogenic change to water regime</li> </ul>	<ul style="list-style-type: none"> <li>Any action relating to changes in the water regime need to be assessed in relation to impacts upon ecological state and functioning of wetlands</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Natural process of change</li> </ul>	<ul style="list-style-type: none"> <li>If natural changes in wetland ecology, composition or functioning are determined to be detrimental to the ongoing viability of the values of the site, a recovery action plan should be initiated.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>



<ul style="list-style-type: none"> <li>Loss of remnant native aquatic plant components at Mona Vale, Lower Avon and other remnant sites</li> </ul>	<ul style="list-style-type: none"> <li>Monitor sites of conservation value and take remedial action if further deterioration is detected.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Disturbance to wildlife from dogs</li> </ul>	<ul style="list-style-type: none"> <li>Prohibit dogs within core wetland areas of Cockayne Reserve and within any newly created core reserve areas as part of red zone rebuild.</li> <li>Interpretation highlighting the impacts dogs can have on wildlife values</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Fire</li> </ul>	<ul style="list-style-type: none"> <li>Establish buffer of low flammability native tree and shrub species</li> </ul>	<ul style="list-style-type: none"> <li>Information packages for neighbouring properties on low flammability species</li> </ul>
<ul style="list-style-type: none"> <li>Effects on inanga spawning</li> </ul>	<ul style="list-style-type: none"> <li>Effective sediment control mitigation measures during construction to prevent siltation of spawning habitat and eggs</li> <li>Invasion of weed plant species into marginal vegetation, such as yellow flag iris (<i>Iris pseudacorus</i>) and reed canary grass), which are detrimental to inanga spawning microhabitat by shading out the sward forming soft herbs and grasses (Taylor &amp; Chapman 2007).</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Loss of riparian habitat for birdlife through unsympathetic management.</li> </ul>	<ul style="list-style-type: none"> <li>Berm management should leave native vegetation (eg; sedges, flax, raupo, etc) intact and grass along the water's edge should be left uncut.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Artificial riverbank retaining, substrates</li> </ul>	<ul style="list-style-type: none"> <li>Naturalise banks (i.e. remove retaining</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

<p>and/or other structures that adversely affect ecological function of waterways</p>	<p>and create sloping banks with appropriate native vegetation) during bank maintenance works and through capital projects</p> <ul style="list-style-type: none"> <li>• Prevent construction of fish barriers (e.g. weirs) and remediate current barriers</li> </ul>	
<ul style="list-style-type: none"> <li>• Deficiency of high-quality riparian margins, resulting in a lack of habitat, high water temperatures due to a lack of shading, no buffer/filtering from urban impacts and affects on the functioning of ecological corridors (i.e. species movement)</li> </ul>	<ul style="list-style-type: none"> <li>• Supplement riparian margins with dense, native and locally-sourced vegetation of varying heights (i.e. include tall trees to provide shading to the waterway)</li> <li>• Focus on planting areas of unstable ground, to reduce erosion and sediment discharges</li> <li>• To maintain the riparian margin and ecological corridors, ensure waterway setbacks are maintained (i.e. resource consent is required to build, fill or excavate) and closed fences are not built adjacent to waterways</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Discharge of contaminants</li> </ul>	<ul style="list-style-type: none"> <li>• Treatment of stormwater to a high level prior to discharge into waterways</li> <li>• Reduction in occurrence of wastewater overflows to waterways</li> <li>• Prevent non-stormwater discharges (e.g. trade-waste) from entering stormwater network or waterways</li> <li>• Effective sediment control mitigation measures during construction</li> <li>• Removal of instream sediment (and</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>

	therefore other contaminants attached to sediment)	
<ul style="list-style-type: none"> <li>Excessive amount of leaf-fall from deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li>Plant indigenous locally-sourced evergreen species in riparian margins instead of deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Artificial light impacting on freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Minimise light-spill onto waterway</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Lack of instream habitat for freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Maintain or enhance species-specific habitat, e.g. riffle areas for bluegill bullies</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Pathogen input from waterfowl and dog faeces affecting water quality</li> </ul>	<ul style="list-style-type: none"> <li>Reduce ability for waterfowl to enter waterways, by densely planting riparian margins with appropriate native species</li> <li>Encourage community not to feed the ducks</li> <li>Encourage the community to pick up dog faeces</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Overfishing of inanga in lower reaches of Avon River</li> </ul>	<ul style="list-style-type: none"> <li>Management of these waterways should take account of potential for overfishing</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>



## References

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- Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.



**Assessment completed by:** Dr Antony Shadbolt

**Date:** 17<sup>th</sup> November 2014

**Statement completed by:** Dr Antony Shadbolt

**Date:** 17<sup>th</sup> November 2014

**Statement updated by:** XXX

**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.

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Appendix 1: Location Plans



Figure 1: Avon River at Corfe Reserve



Figure 2: Avon River at Waimairi Road



Figure 3: Avon River at Ilam Road

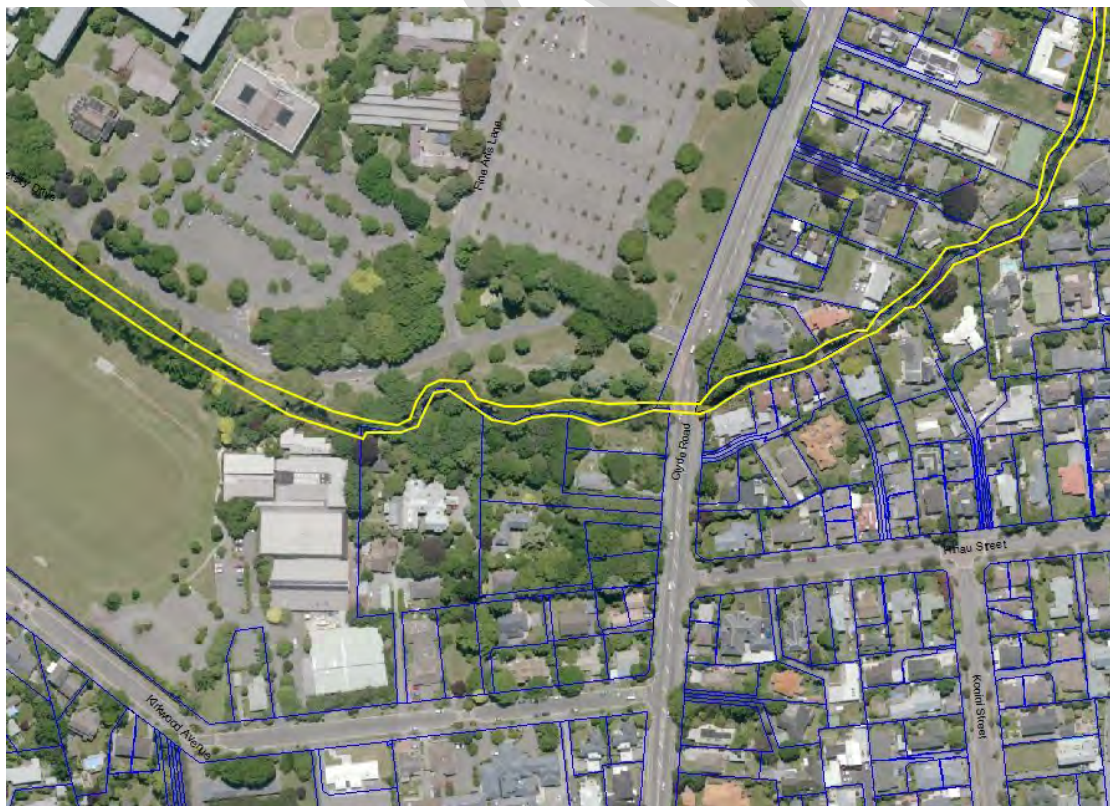


Figure 4: Avon River at Clyde Road

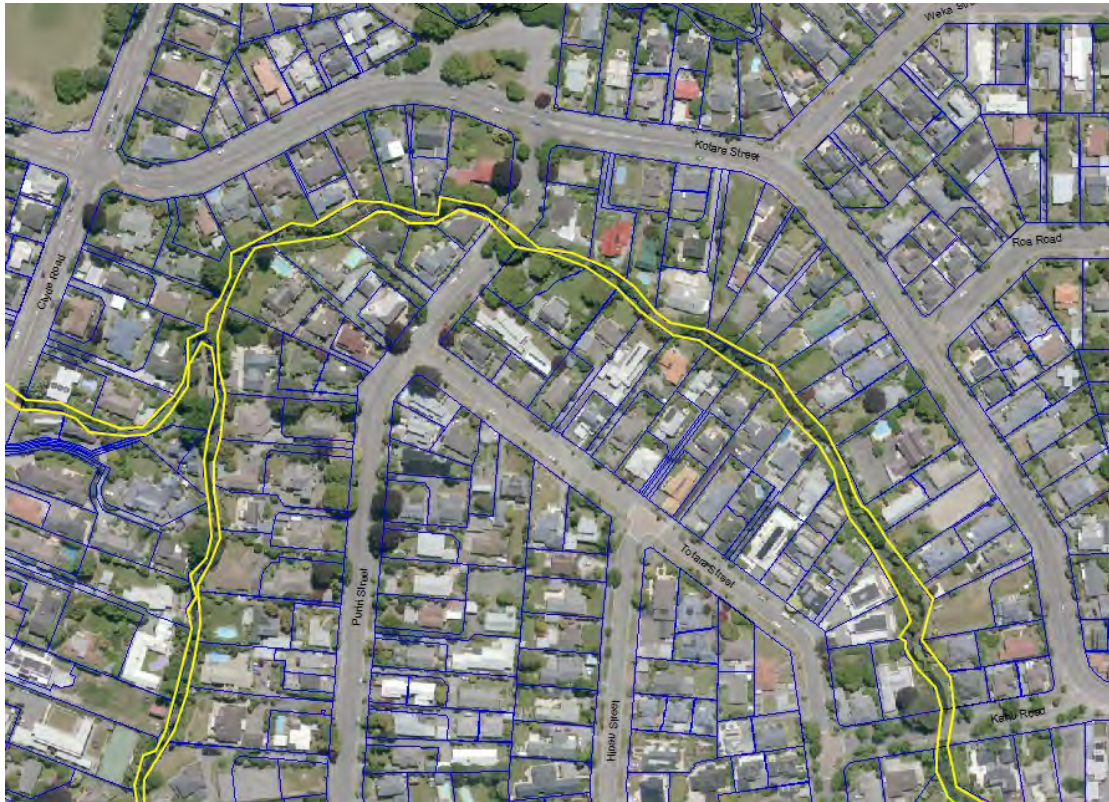


Figure 5: Avon River Downstream from Clyde Road



Figure 6: Avon River at Riccarton Bush



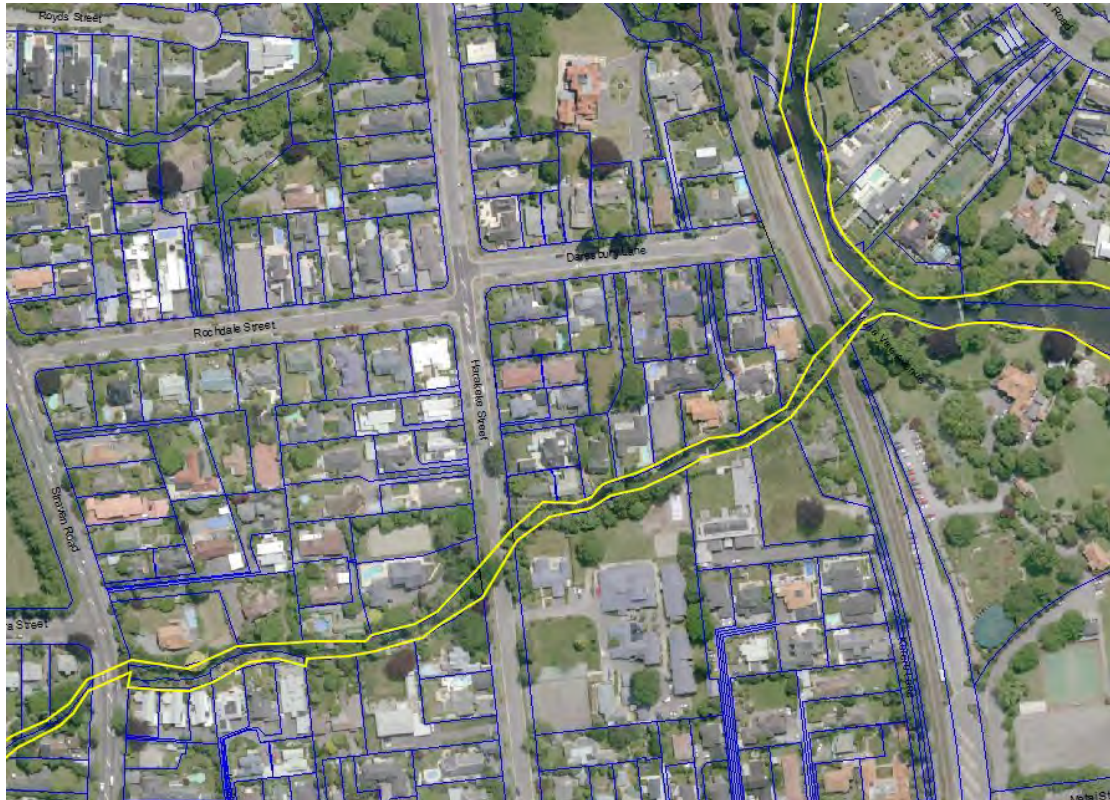


Figure 7: Avon River Upstream from Mona Vale



Figure 8: Avon River at Fendalton Road



Figure 9: Avon River at Little Hagley Park



Figure 10: Avon River at Park Terrace



Figure 11: Avon River East of CBD

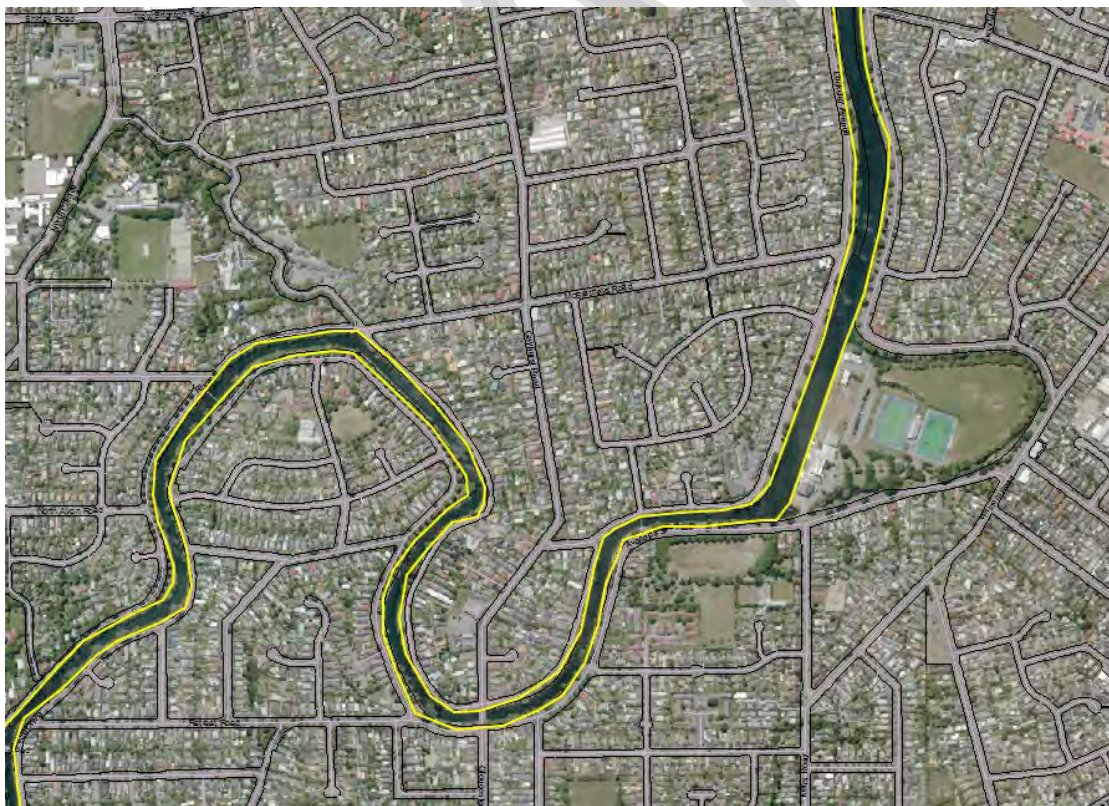


Figure 12: Avon River at Avonside



Figure 13: Avon River Upstream from ANZAC Drive



Figure 14: Avon River Downstream to Estuary



Figure 15: Okeover Stream



Figure 16: Waimairi Stream Downstream from Barlow Street



Figure 17: Waimairi Stream at Clyde Road

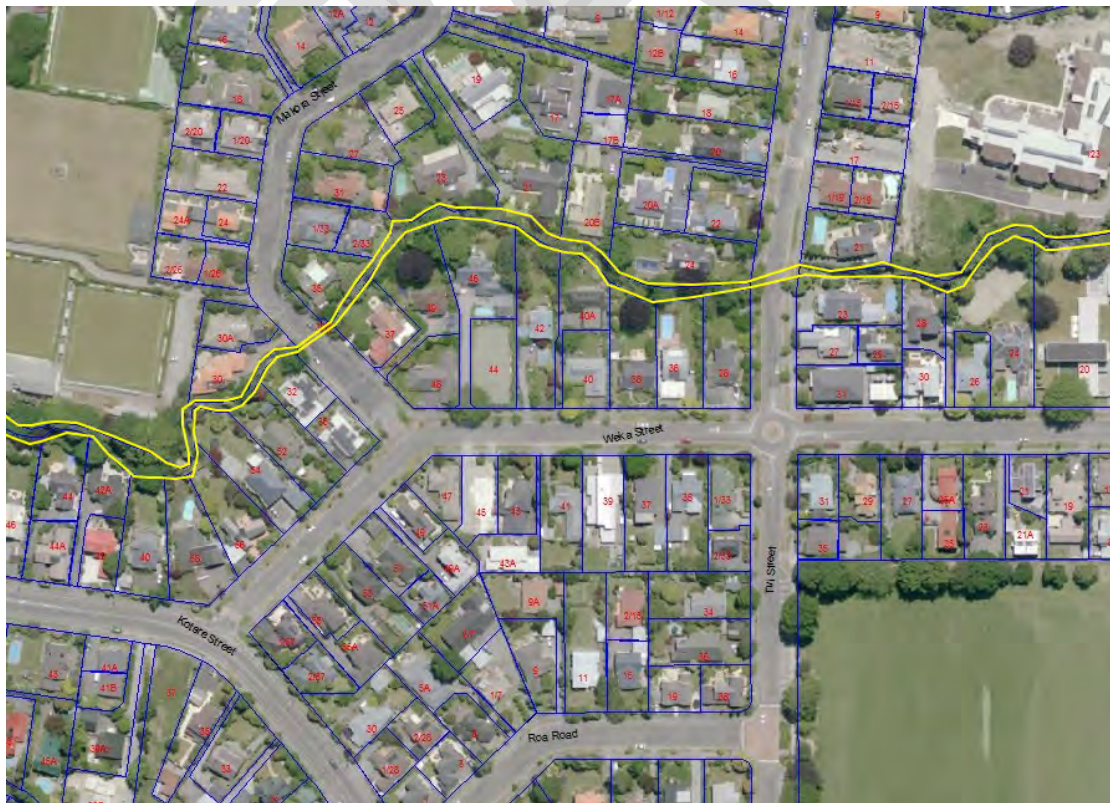


Figure 18: Waimairi Stream at Tui Street



Figure 19: Waimairi Stream at Straven Road



Figure 19: Waimairi Stream Upstream from Mona Vale



**Figure 20: Wairarapa Stream at Glandovey Road**



**Figure 21: Wairarapa Stream at Bradnor Road**





Figure 22: Wairarapa Stream at Railway

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Figure 23: Wairarapa Stream at Rosell Street



Figure 24: Wairarapa Stream Downstream to Mona Vale



Figure 25: Dudley Creek at Jameson Avenue



Figure 26: Dudley Creek Downstream from Kellys Road



Figure 27: Dudley Creek Parallel with Hills Road (North)



Figure 29: Dudley Creek Parallel with Hills Road (South)



Figure 28: Dudley Creek Upstream from Alysford Street



Figure 29: Dudley Creek at Shirley Road

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Figure 30: Dudley Creek at Stapletons Road



Figure 31: Dudley Creek at North Parade



Figure 32: Dudley Creek at Banks Avenue



Figure 33: Dudley Creek to Avon River

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Figure 34: St Albans Creek at Abberly Park



Figure 35: St Albans Creek at Westminster Street

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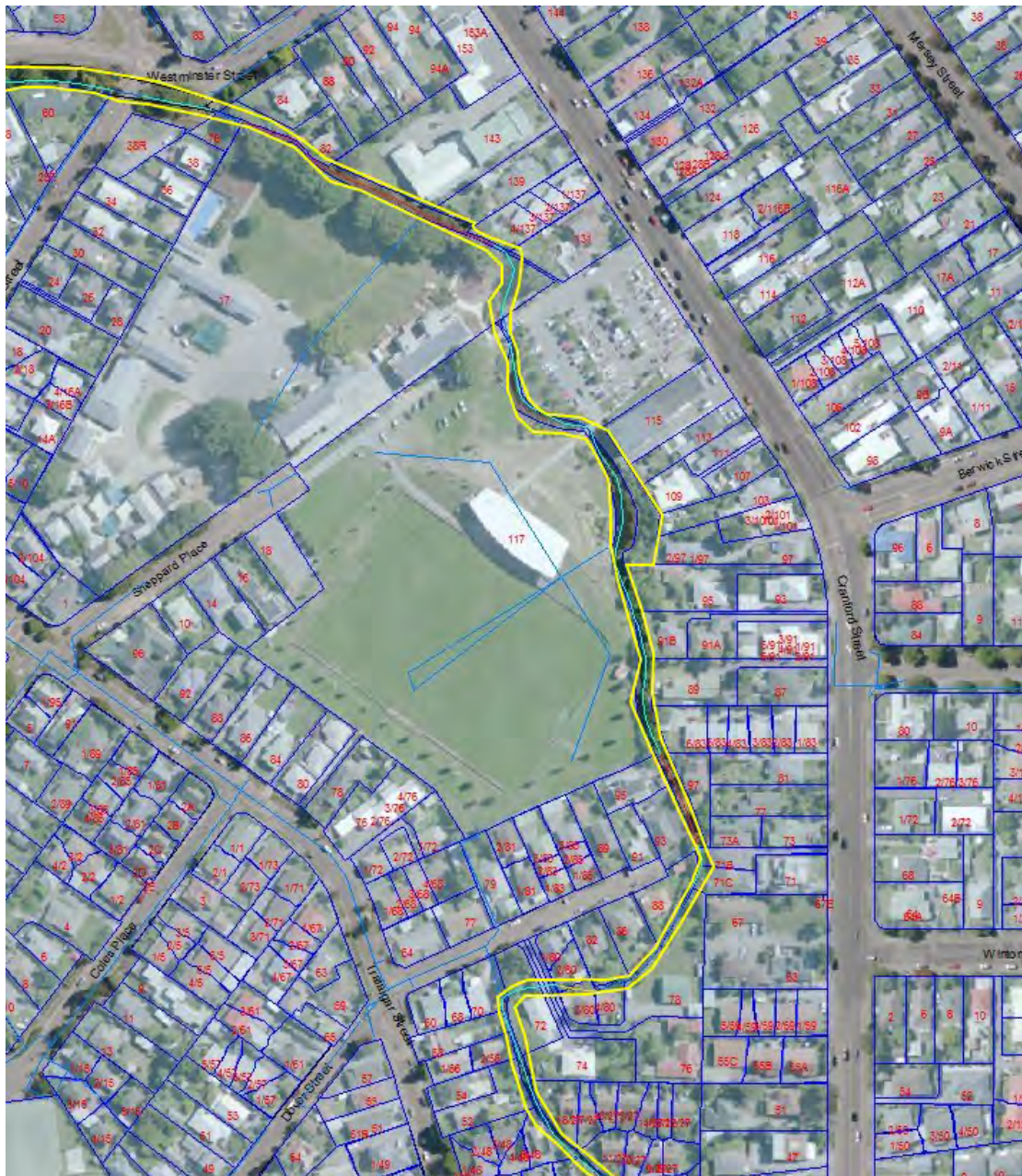


Figure 36: St Albans Creek at Cranford Street



Figure 39: St Albans Creek Upstream of Edgeware Road (West)



**Figure 37: St Albans Creek Upstream of Barbados Street**



**Figure 38: St Albans Creek Upstream of Hills Road**





Figure 39: St Albans Creek to Dudley Creek

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**Appendix 2: Indigenous flora of Cockayne Reserve**

List of indigenous flora recorded within the Cockayne Reserve SES by CCC Botanist Trevor Partridge in September 2014.

<b>Current Name</b>	<b>Former Name</b>
<i>Apium prostratum</i>	<i>Apium filiforme</i>
<i>Apodasmia similis</i>	<i>Leptocarpus similis</i>
<i>Austroderia richardii</i>	<i>Cortaderia richardii</i>
<i>Blechnum minus</i>	<i>Blechnum procerum</i>
<i>Bolboschoenus caldwellii</i>	
<i>Carex coriacea</i>	
<i>Carex secta</i>	
<i>Carex virgata</i>	
<i>Coprosma linariifolia</i>	
<i>Coprosma propinqua</i>	
<i>Coprosma x cunninghamii</i>	<i>Coprosma prpinqua x robusta</i>
<i>Cordyline australis</i>	
<i>Cotula coronopifolia</i>	
<i>Dodonaea viscosa</i>	
<i>Epilobium pallidiflorum</i>	
<i>Fuchsia sp.</i>	
<i>Hypolepis millefolium</i>	
<i>Isolepis cernua</i>	
<i>Juncus australis</i>	
<i>Juncus edgariae</i>	
<i>Juncus krausii subsp. australiensis</i>	
<i>Juncus pallidus</i>	
<i>Kunzea robusta</i>	
<i>Leptinella dioica subsp. dioica</i>	<i>Cotula dioica</i>
<i>Lilaeopsis novae-zelandiae</i>	
<i>Limosella lineata</i>	
<i>Machaerina rubiginosa</i>	<i>Baumea rubiginosa</i>
<i>Muehlenbeckia australis</i>	
<i>Muehlenbeckia complexa</i>	
<i>Myoporum laetum</i>	
<i>Phormium tenax</i>	
<i>Pittosporum eugenioides</i>	
<i>Pittosporum tenuifolium</i>	
<i>Plagianthus divaricatus</i>	
<i>Poa cita</i>	
<i>Pseudognaphalium luteoalbum</i>	
<i>Pteridium esculentum</i>	
<i>Ranunculus glabrifolius</i>	
<i>Schoenoplectus pungens</i>	<i>Scirpus pungens</i>
<i>Schoenoplectus tabernaemontani</i>	<i>Schoenoplectus validus</i>
<i>Schoenus concinnus</i>	
<i>Senecio glomeratus</i>	
<i>Thyridia repens</i>	
<i>Triglochin striata</i>	
<i>Typha orientalis</i>	



### Appendix 3: Indigenous birds recorded at Cockayne Reserve

Indigenous bird species occurring at Cockayne Reserve and adjacent Avon River bank (Crossland 2005)

<b>Common Name</b>	<b>Scientific Name</b>
Black Cormorant	<i>Phalacrocorax carbo</i>
Pied Cormorant	<i>Phalacrocorax varius</i>
Little Cormorant	<i>Phalacrocorax melanoleucos</i>
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>
Spotted Shag	<i>Stictocarbo punctatus</i>
White Heron	<i>Egretta alba</i>
White-faced Heron	<i>Ardea novaehollandiae</i>
Black Swan	<i>Cygnus atratus</i>
New Zealand Shoveler	<i>Anas rhynchos</i>
Paradise Shelduck	<i>Tadorna variegata</i>
New Zealand Scaup	<i>Aythya novaeseelandiae</i>
Pukeko	<i>Porphyrio porphyrio</i>
Pied Stilt	<i>Himantopus himantopus</i>
Spur-winged Plover	<i>Vanellus miles</i>
Black-backed Gull	<i>Larus dominicanus</i>
Red-billed Gull	<i>Larus novaehollandiae</i>
Black-billed Gull	<i>Larus bulleri</i>
Caspian Tern	<i>Sterna caspia</i>
New Zealand Kingfisher	<i>Halycon sancta</i>
Welcome Swallow	<i>Hirundo tahitica</i>
Grey Warbler	<i>Gerygone igata</i>
Silvereye	<i>Zosterops lateralis</i>
South Island Fantail	<i>Rhipidura fuliginosa</i>

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.



## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

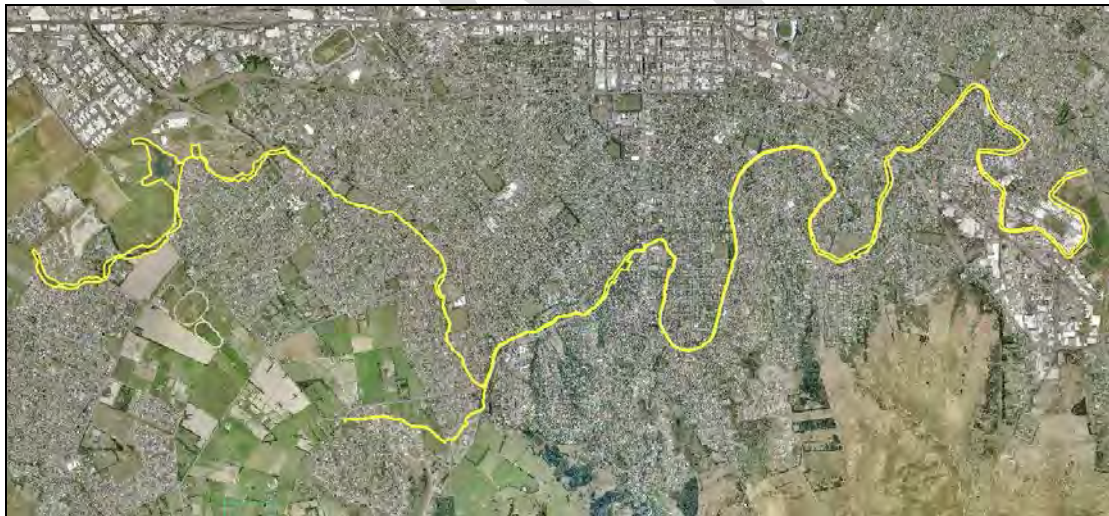
**Site Name:** Heathcote River and Tributaries

**Site Number:** SES/LP/25

#### **Summary of Significance:**

The Heathcote River and Tributaries SES supports representative assemblages of indigenous flora and fauna including several at-risk species, and contributes to an important ecological network/linkage and migration route for migratory species.

#### **Site Map: (Refer Appendix 1 for Detailed SES Areas)**





### Additional Site Information

<b>Ecological District:</b>	Low Plains
<b>Central point NZTM:</b>	N5177182, E1571519
<b>Area of SES (ha):</b>	61.90 ha

### Site Description

The Heathcote River and its tributaries area natural waterways that have been heavily modified and degraded, having lost much of their original riparian vegetation through land clearance, grazing and urban development. However the waterway corridor has retained some significant features including small areas of remnant plant communities, and several areas of native forest, shrubland and riparian restoration plantings. The Heathcote River and Cashmere Stream are also important habitat and migration corridor for longfin eel which require access from their upstream distribution limit to the sea via the Avon-Heathcote Estuary.

Within the corridor are several sites that are described in further detail below:

**Upper Heathcote/Wigram East Retention Pond:** The Upper Heathcote River part of the SES includes predominantly planted native riparian forest, shrubland and wetland communities buffering the river and around the pond area. This vegetation is considered semi-mature, and includes an assemblage of tree and shrub species that is representative of once naturally occurring plant communities.

**Ernle Clarke Reserve:** Ernle Clark Reserve is an urban reserve on the flood plain of the Heathcote River. It is a mix of exotic and native trees with an often tangled understorey of plants, where large areas are dominated by native seedling regeneration.

**390 Riverlaw Terrace:** The restoration planting on Riverlaw Terrace on the Lower Heathcote River a range of restored ecosystems including sequences of riparian sedgeland, planted shrubland and lowland mixed podocarp forest modelled on local species assemblages including those historically occurring at Riccarton Bush. The site also contains plantings of hinau (*Elaeocarpus dentatus*) which reaches its southern limit in the Christchurch area, and the Nationally Vulnerable wind grass (*Anemanthele lesssoniana*) both of which are managed as part of the ecological restoration project for their biodiversity values.

### Extent of Site of Ecological Significance

The Heathcote River and Tributaries SES spans from the Southern Motorway on the Heathcote River, and from the Corner of Cashmere Road and Hendersons Road on Cashmere Stream to the Tunnel Road Bridge at which point the SES joins with the proposed Avon-Heathcote Estuary SES (Refer location map and Appendix 1)

The SES covers the width of stream bed, flowing water, and extends to at least top-of-bank along both sides of the Heathcote River and Cashmere Stream to include the associated marginal riparian vegetation. However along some parts length the width of the SES extends back from top-of-bank (Refer Appendix 1) to incorporate areas of indigenous vegetation and/or habitat features that are assessed as being ecologically significant under the criteria listed in this significance statement. The extent of

specific areas within the Heathcote River and Tributaries SES are described in further detail below:

**Upper Heathcote River/Wigram East Retention Pond:** This part of the site includes the extent of remnant and planted native shrubland, forest and wetland communities along the Heathcote River within Nga Puna Wai Reserve (true left bank) and the Heathcote Esplanade Reserve (true right bank) between the Christchurch Southern Motorway and Curletts Road. This part of the SES also includes the area of the extent of permanent open water in the Wigram retention basin wet-pond, vegetated margins, islands, and the planted extent of Paparua Stream to approximately 375 m upstream of where it discharges into the pond. The site also extends to include the areas of native planted riparian areas along the south boundary of Hogben School (15 Nash Street) and the St John of God Hospital (26 Nash Street), and also the riparian reserve areas (Nash Reserve) between Aidanfield Drive and the Southern Motorway, including small areas of remnant wetland plant communities (Refer Appendix 1, Figures 1 & 2).

**Ernie Clarke Reserve:** This restoration site includes the area of mixed exotic/native woodland along the true right bank of the Heathcote River (Figure 7, Appendix 1), and extends to include the wet margins of the ponds and Couling Stream that support remnant indigenous wet turf species.

**390 Riverlaw Terrace:** This part of the SES covers a) the extent of planted native forest and shrubland communities within the CCC reserve areas (including both 390 Riverlaw Terrace and 297 Centaurus Road properties), and b) the riparian planting along the true right margin of the Heathcote River immediately adjacent 390 Riverlaw Terrace (Refer Figure 10, Appendix 1).

The SES area does not include areas of drive and road carriageway, lawn, and/or amenity planting within the SES.

## **Assessment Summary**

The Heathcote River and Tributaries site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 5), and ecological context criteria (criterion 8).

## **Assessment of Significance Criteria**



## Representativeness

1. **Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

**Upper Heathcote River/Wigram Retention Pond:** Riparian forest and shrubland plantings along the Heathcote River within this part of the SES contain 56 species of local native flowering plant (see Appendix 2), including 33 of the 50 local tree and shrub species recorded from Riccarton Bush (see Molloy 1995), as well as a range of other native tree and shrub species identified as likely to have naturally occurred locally by Lucas associates (1995), including:

<i>Dodonaea viscosa</i>	(akeake)
<i>Coprosma rubra</i>	(red stemmed coprosma)
<i>Coprosma virescens</i>	(pale green coprosma)
<i>Leptospermum scoparium</i>	(manuka)
<i>Sophora prostrata</i>	(prostrate kowhai)

The Wigram East Retention Basin Pond supports 20 out of 24 bird species (Refer Crossland 2014a) identified by Crossland (2014b) as being representative of freshwater lakes and ponds in the Low Plains Ecological District (Refer Appendix 3).

**Ernie Clarke Reserve:** The site contains naturally occurring native turf species around the margins of ponds associated with Couling Stream that are representative of the natural diversity of the Low Plains Ecological District including:

*Centella uniflora*  
*Dichondra repens*  
*Eleocharis acuta*  
*Hydrocotyle novae-zelandia*  
*Hydrocotyle moschata*  
*Lobelia angulata*  
*Oxalis exilis*

The also contains other naturally occurring local native plant throughout the reserve area, including:

<i>Blechnum minus</i>	swamp kiokio
<i>Carex cockayniana</i>	sedge
<i>Carex secta</i>	sedge
<i>Hypolepis ambigua</i>	
<i>Muehlenbeckia australis</i>	pohuehue
<i>Senecio minimus</i>	

**390 Riverlaw Terrace:** Although planted, this site contains kahikatea-dominated forest that has been modelled on species assemblages occurring at Riccarton



Bush, and is therefore considered to be representative, typical and characteristic of the natural diversity of the Low Plains Ecological District (Refer Appendix 4 & 5).

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

**Upper Heathcote River/Wigram Retention Pond:** At more than six hectares, semi-mature riparian forest and shrubland plantings along the Heathcote River in this area represent one of the largest continuous areas of native restoration plantings of this type in the Low Plains Ecological District.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013). Lloyd *et al.* (2013) identify that “any indigenous vegetation on the Canterbury Plains” meet this Rarity/Distinctiveness criterion.

**390 Riverlaw Terrace:** Within the SES, kahikatea (*Dacrycarpus dacrydioides*), matai (*Prumnopitys taxifolia*) and totara (*Podocarpus totara*) dominated forest have been planted; communities that once accounted for between 2 and 10% of the Low Plains Ecological District, but now combined are represented by less than 1% of the District (Harding 2009). These podocarp forest communities have therefore been reduced to less than 20% of their former extent.

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site supports longfin eel (*Anguilla dieffenbachia*) (McMurtrie 2012; Taylor 2011; Taylor and Blair 2012) which is classified as At Risk/Declining (Goodman *et al.* 2014). Longfin eels were recorded at several sites on the Heathcote River as far upstream as Lincoln Road, and as far upstream as Cashmere Road on Cashmere Stream (Taylor and Blair 2012). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of the Heathcote River and Cashmere Stream downstream of the sampled locations is included as part of this SES.





On the Heathcote River, Taylor and Blair (2012) also recorded koura (*Paranephrops zealandicus*) in the vicinity of Colombo Street, bluegill bully (*Gobiomorphus hubbsi*) at Tennyson Street, Colombo Street and Centennial Park, and inanga (*Galaxias maculatus*) as far upstream as Centennial Park. All three species are listed by Grainger *et al.* (2014) and Goodman *et al.* (2014) as At Risk/Declining. McMurtrie (2012) also recorded inanga in the Heathcote River immediately downstream from Opawa Road.

Giant bully (*Gobiomorphus gobioides*) were recorded at Tennyson Street, and are described by Taylor and Blair (2012) as uncommon in the Low Plains Ecological District

On Cashmere Stream, Taylor and Blair (2012) recorded both koura and longfin eel at Worsleys Road, and also sampled longfin eel, koura and inanga as far upstream as the Cashmere Road bridge near the intersection with Hendersons Road.

**Upper Heathcote River/Wigram Retention Pond:** This site supports feeding and roosting habitat for several threatened, at risk, and uncommon bird species as classified by Robertson *et al.* (2012), including the following (Crossland 2014a; Appendix 3):

<b>Species</b>	<b>Threat Status</b>
Grey Duck	Threatened/Nationally Critical
Black-billed Gull	Threatened/Nationally Critical
Australasian Bittern	Threatened/Nationally Endangered
Red-billed Gull	Nationally Vulnerable
Pied Stilt	At Risk/Declining
Black Cormorant	At Risk/Naturally Uncommon

**390 Riverlaw Terrace:** The site was listed by Taylor (2004) as a high quality inanga (*Galaxias maculatus*) spawning site. The conservation status of inanga is described as 'declining' by Allibone *et al.* (2010), and At Risk/Declining by Goodman *et al.* (2014).

Although planted as part of wider restoration plantings, the site contains the nationally threatened plant species *Anemanthele lessoniana* (wind grass) (see de Lange *et al.* 2013).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion:

Although planted as part of an ecological restoration site, the 390 Riverlaw Terrace site contains hinau (*Elaeocarpus dentatus*) which reaches its southern distribution limit at Riccarton Bush in Christchurch (Lloyd *et al.* 2013). Because trees planted within the SES were sourced from the nearest local natural seed source, the hinau that are established at this site are an important sub population of Riccarton Bush population.



6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet this criterion

### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Site not assessed under this criterion

### Ecological Context

8. ***Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

Site supports longfin eel (*Anguilla dieffenbachia*) (James 2013). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of Heathcote River and Cashmere Stream downstream of the sampled locations to their confluences with the Avon-Heathcote Estuary are included as part of this SES. Note that the Avon-Heathcote Estuary downstream of the Heathcote River is contained within another proposed SES, facilitating a continuous ecological linkage to the sea.

Planted riparian forest and shrubland communities flanking the Heathcote River in various locations within this site (e.g. Upper Heathcote River, Centennial Park, Ernie Clarke Reserve, Riverlaw Terrace Restoration plantings, and Worsleys Road) provide a good degree of buffering of the river from livestock, shade, recreational activities, human disturbance, wind, light, agricultural spray drift, residential land uses and movement of coarse sediments.

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet this criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion

## Site Management

### Existing Protection Status

In public ownership

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Weed invasion</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing monitoring and eradication of biodiversity pest plants.</li> </ul>	<ul style="list-style-type: none"> <li>Information packages for neighbouring properties (e.g. 'Plant Me Instead')</li> </ul>
<ul style="list-style-type: none"> <li>Animal pest incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of possible animal pest incursions and trapping as necessary</li> <li>Regular inspection and maintenance of pest proof fence</li> <li>Maintenance of an effective clear zone around perimeter of pest proof fence</li> </ul>	<ul style="list-style-type: none"> <li>Provide advice and guidance on pest animal monitoring</li> <li>Supply traps and related training as necessary</li> </ul>
<ul style="list-style-type: none"> <li>Disturbance to wildlife by dogs</li> </ul>	<ul style="list-style-type: none"> <li>Prohibit dogs within core wetland area of Wigram Retention basin</li> <li>Interpretation highlighting the impacts dogs can have on wildlife values</li> </ul>	<ul style="list-style-type: none"> <li>Awareness raising about the impacts on biodiversity of dogs.</li> </ul>
<ul style="list-style-type: none"> <li>Artificial riverbank retaining, substrates and/or other structures that adversely affect ecological function of waterways</li> </ul>	<ul style="list-style-type: none"> <li>Naturalise banks (i.e. remove retaining and create sloping banks with appropriate native vegetation) during bank maintenance works and through capital projects</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

	<ul style="list-style-type: none"> <li>Prevent construction of fish barriers (e.g. weirs) and remediate current barriers</li> </ul>	
<ul style="list-style-type: none"> <li>Deficiency of high-quality riparian margins, resulting in a lack of habitat, high water temperatures due to a lack of shading, no buffer/filtering from urban impacts and affects on the functioning of ecological corridors (i.e. species movement)</li> </ul>	<ul style="list-style-type: none"> <li>Supplement riparian margins with dense, native and locally-sourced vegetation of varying heights (i.e. include tall trees to provide shading to the waterway)</li> <li>Focus on planting areas of unstable ground, to reduce erosion and sediment discharges</li> <li>To maintain the riparian margin and ecological corridors, ensure waterway setbacks are maintained (i.e. resource consent is required to build, fill or excavate) and closed fences are not built adjacent to waterways</li> </ul>	<ul style="list-style-type: none"> <li>Provide advice and guidance to landowners / adjacent landowners about the benefits to biodiversity of planting appropriate vegetation.</li> </ul>
<ul style="list-style-type: none"> <li>Discharge of contaminants</li> </ul>	<ul style="list-style-type: none"> <li>Treatment of stormwater to a high level prior to discharge into waterways</li> <li>Reduction in occurrence of wastewater overflows to waterways</li> <li>Prevent non-stormwater discharges (e.g. trade-waste) from entering stormwater network or waterways</li> <li>Effective sediment control mitigation measures during construction</li> <li>Removal of instream sediment (and therefore other contaminants attached to sediment)</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Excessive amount of leaf-fall from</li> </ul>	<ul style="list-style-type: none"> <li>Plant indigenous locally-sourced evergreen species in riparian margins instead of</li> </ul>	<ul style="list-style-type: none"> <li>Provide advice and guidance to landowners / adjacent landowners about</li> </ul>

deciduous trees	deciduous trees	the benefits to biodiversity of planting appropriate vegetation.
<ul style="list-style-type: none"> <li>Artificial light impacting on freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Minimise light-spill onto waterway</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Lack of instream habitat for freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Maintain or enhance species-specific habitat, e.g. riffle areas for bluegill bullies</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Pathogen input from waterfowl and dog faeces affecting water quality</li> </ul>	<ul style="list-style-type: none"> <li>Reduce ability for waterfowl to enter waterways, by densely planting riparian margins with appropriate native species</li> <li>Encourage community not to feed the ducks</li> <li>Encourage the community to pick up dog faeces</li> </ul>	<ul style="list-style-type: none"> <li>Awareness raising about the impacts on biodiversity of animal faeces.</li> </ul>
<ul style="list-style-type: none"> <li>Overfishing of inanga in lower reaches of Heathcote River</li> </ul>	<ul style="list-style-type: none"> <li>Management of these waterways should take account of potential for overfishing</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Effects on inanga spawning</li> </ul>	<ul style="list-style-type: none"> <li>Effective sediment control mitigation measures during construction to prevent siltation of spawning habitat and eggs</li> <li>Invasion of weed plant species into marginal vegetation, such as yellow flag iris (<i>Iris pseudacorus</i>) and reed canary grass, which are detrimental to inanga spawning microhabitat by shading out the sward forming soft herbs and grasses (Taylor &amp; Chapman 2007).</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>



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**Assessment completed by:** Dr Antony Shadbolt

**Date:** 17<sup>th</sup> November 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 17<sup>th</sup> November 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

**Appendix 1: Site Maps**



**Figure 1: Heathcote River Downstream from Southern Motorway**



**Figure 2: Heathcote River at Canterbury Park/Wigram East Retention Pond**





Figure 3: Heathcote River Downstream from Curletts Road

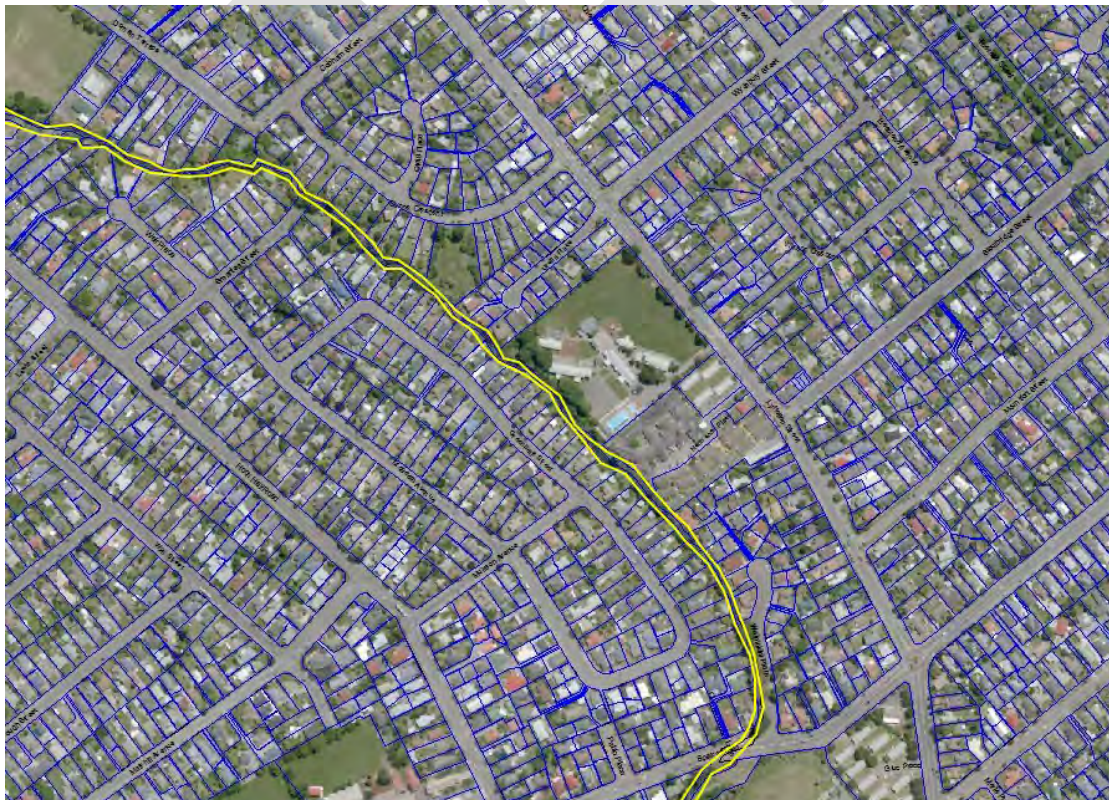


Figure 4: Heathcote River Upstream From Centennial Park



Figure 5: Heathcote River Downstream from Centennial Park

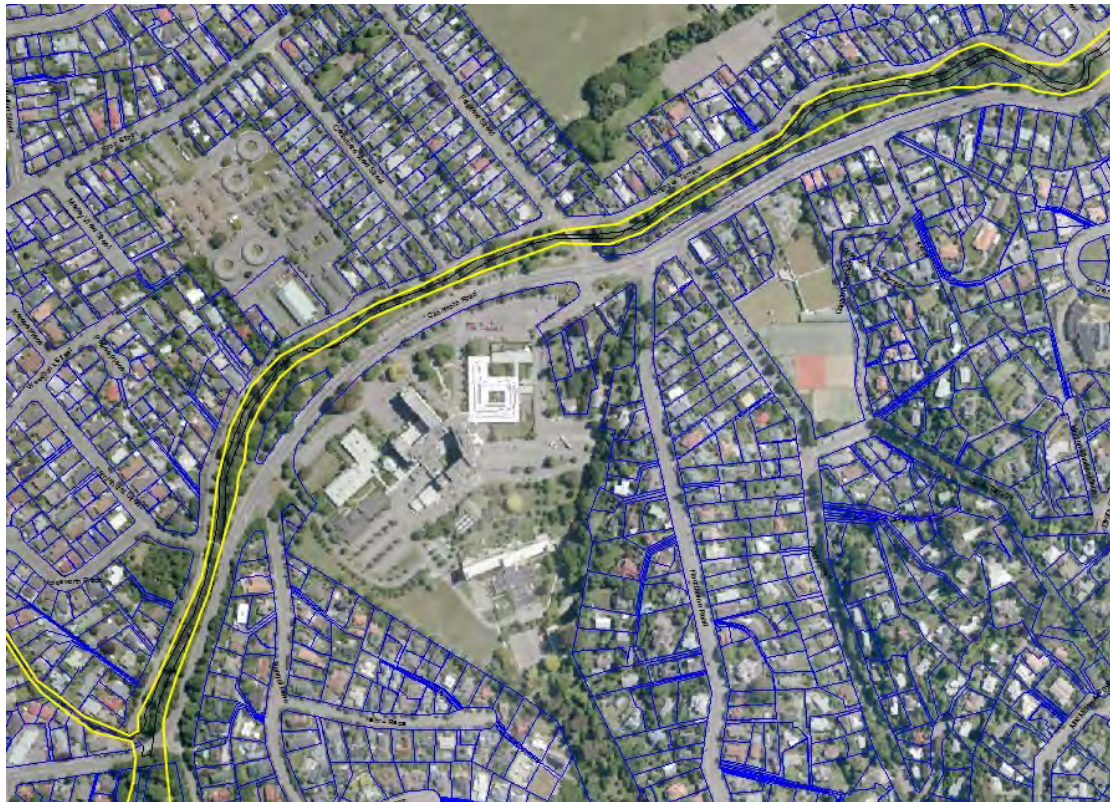


Figure 6: Heathcote River Downstream from Cashmere Stream

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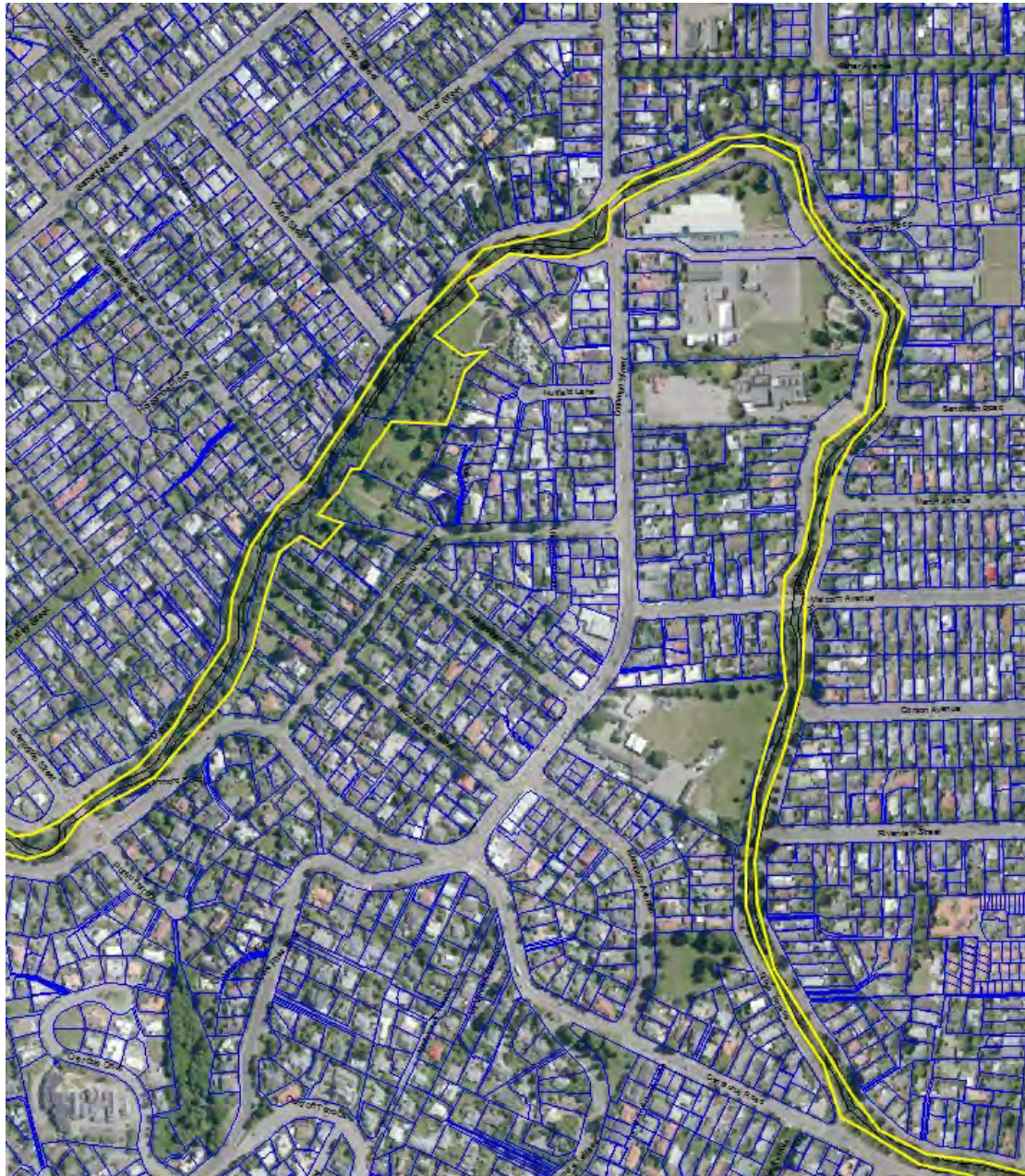


Figure 7: Heathcote River at Colombo Street

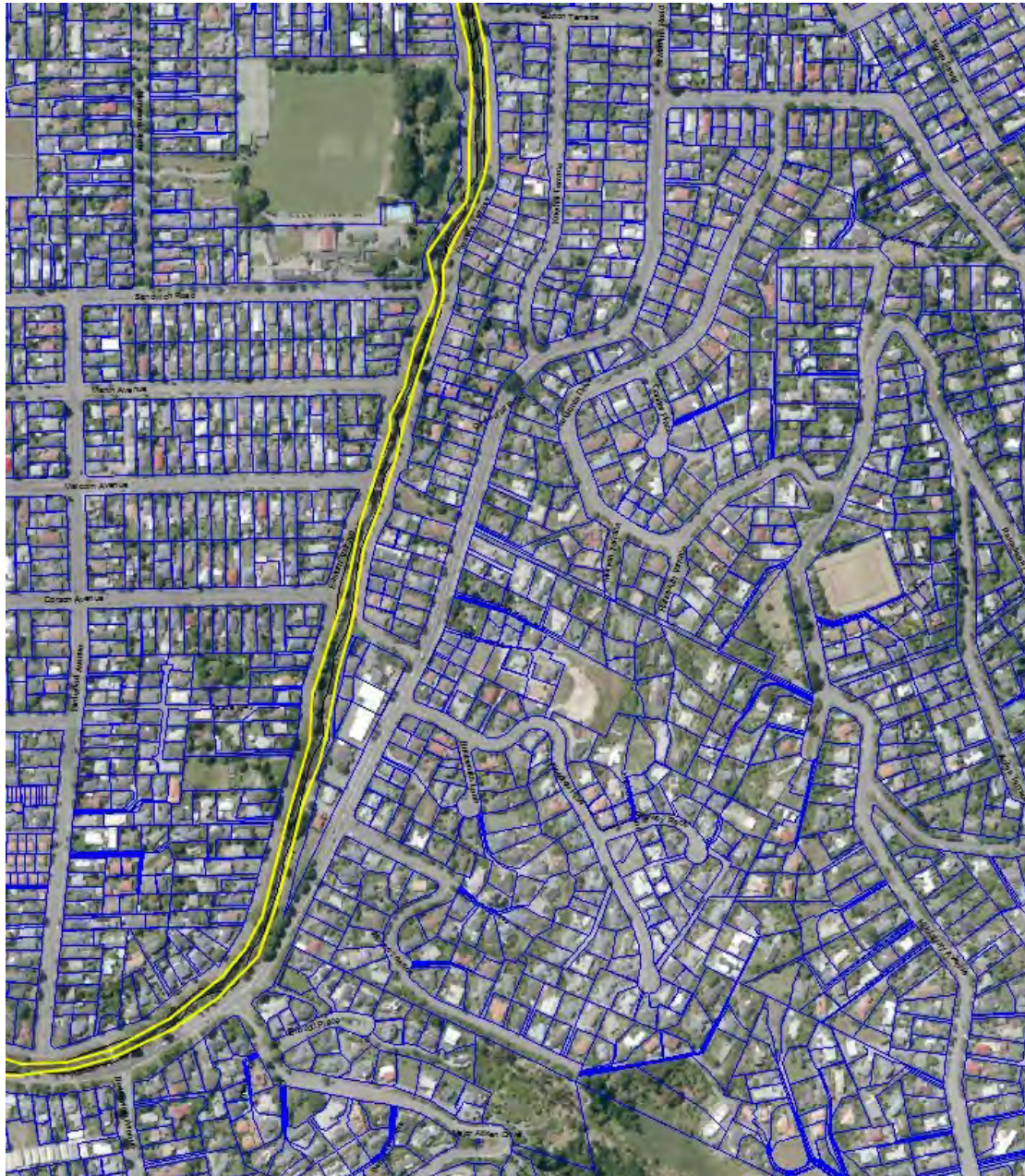


Figure 8: Heathcote River at Birdwood Terrace

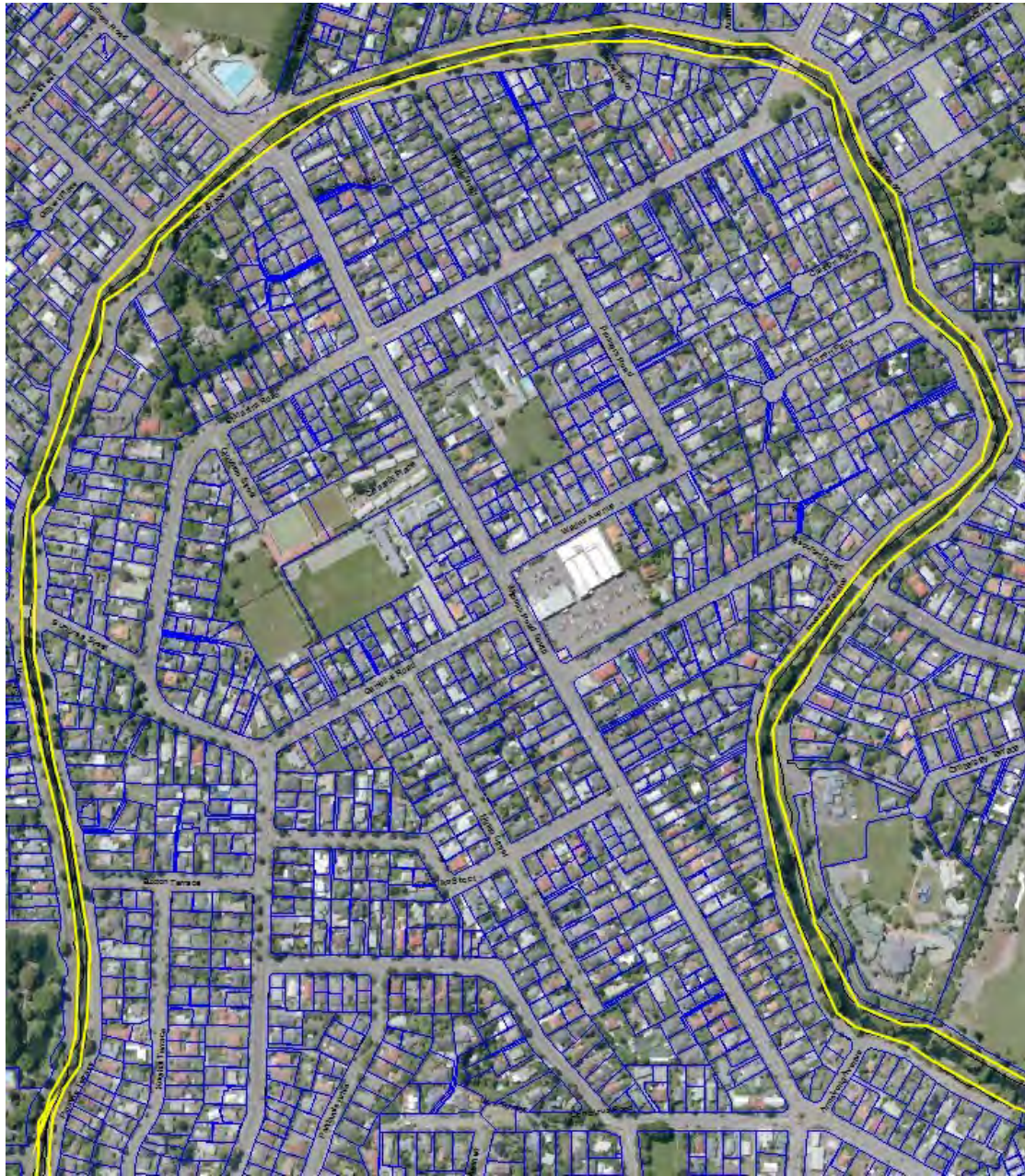


Figure 9: Heathcote River at Wilsons Road

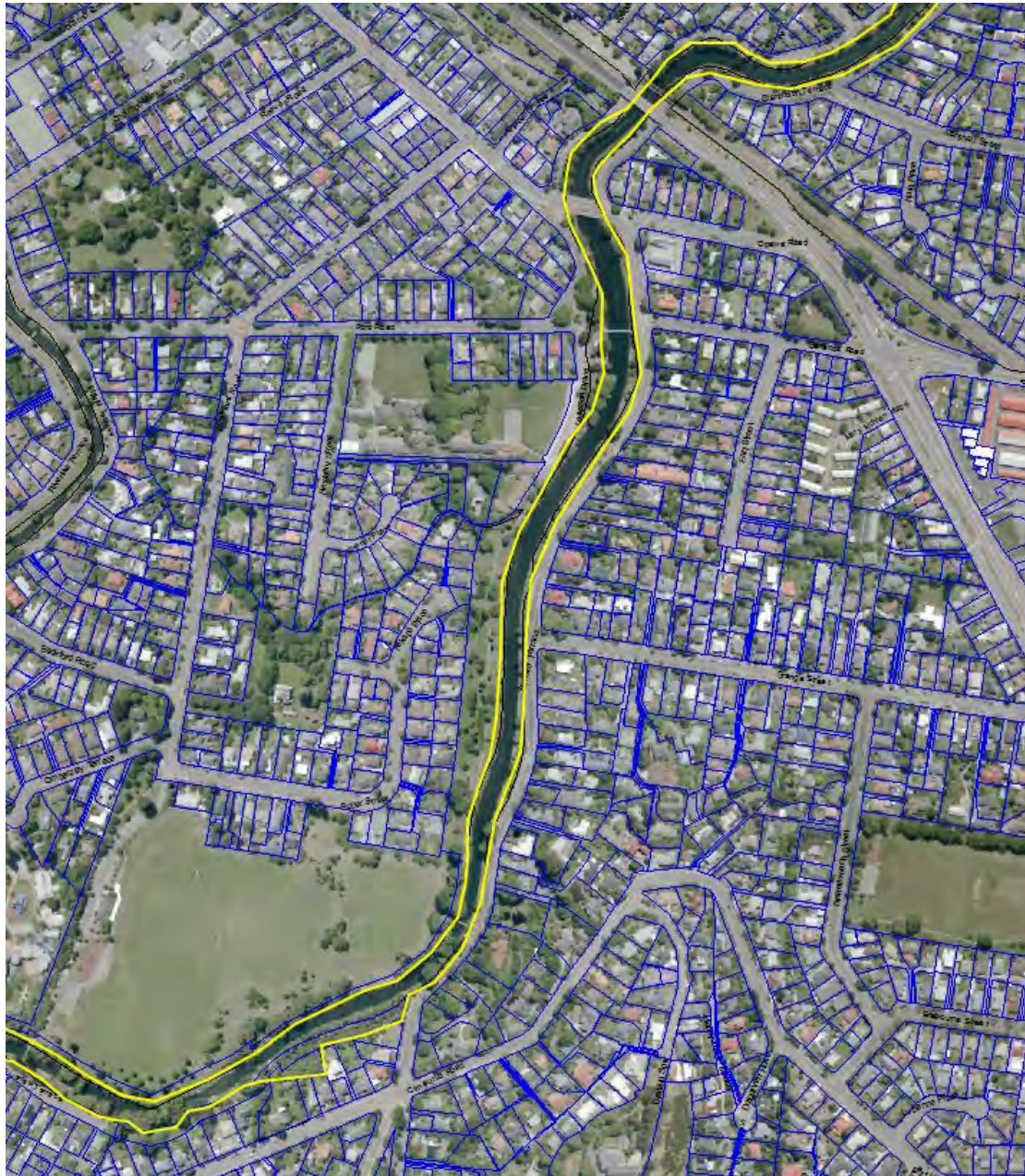


Figure 10: Heathcote River at Aynsley Terrace



Figure 11: Heathcote River at Radley Street

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Figure 12: Heathcote River at Garlands Road



Figure 13: Heathcote River to Avon-Heathcote Estuary



Figure 14: Cahsmere Stream (upper)



Figure 15: Cashmere Stream (lower) to Heathcote River



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## Appendix 2: Native Flowering Plants & Conifers

List of native conifers and flowering plants recorded by the Project Ecologist from the Upper Heathcote River and Wigram East Retention Basin in July 2014. Species marked with an asterisk (\*) are native species planted outside of their natural ranges.

### TREES & SHRUBS

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Agathis australis</i> *	kauri
<i>Aristotelia serrata</i>	wineberry/makomako
<i>Carpodetus serratus</i>	marbleleaf/putaputaweta
<i>Cassinia leptophylla</i>	tauhinu
<i>Coprosma crassifolia</i>	stiff-stemmed coprosma
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round leaved coprosma
<i>Coprosma propinqua</i> x <i>C. robusta</i>	hybrid coprosma
<i>Corrosma rubra</i>	red stemmed coprosma
<i>Coprosma virescens</i>	pale green coprosma
<i>Cordyline australis</i>	cabbage tree/ti kouka
<i>Corokia cotoneaster</i>	korokio
<i>Corynocarpus laevigatus</i> *	karaka
<i>Dacrycarpus dacrydioides</i>	kahikatea/white pine
<i>Dacrydium cupressinum</i> *	rimu
<i>Dodonaea viscosa</i>	akeake
<i>Elaeocarpus dentatus</i>	hinau
<i>Elaeocarpus hookerianus</i>	pokaka
<i>Fuchsia excorticata</i>	tree fuchsia/kotukutuku
<i>Griselinia littoralis</i>	broadleaf/kapuka
<i>Hebe salicifolia</i>	koromiko
<i>Hebe strictissima</i> *	
<i>Hoheria angustifolia</i>	narrow leaved lacebark/houhere
<i>Hoheria sextylosa</i> *	North Island lacebark
<i>Kunzea ericoides</i>	white tea tree
<i>Leptospermum scoparium</i>	manuka
<i>Libocedrus bidwillii</i> *	NZ cedar
<i>Lophomyrtus obcordata</i>	NZ myrtle/rohutu
<i>Melicytus ramiflorus</i>	mahoe/whiteywood
<i>Myrsine australis</i>	red matipo
<i>Nothofagus fusca</i> *	red beech
<i>Nothofagus solandri</i> ver <i>cliffortioides</i> *	mountain beech
<i>Olearia lineata</i> *	
<i>Olearia macrodonta</i> *	
<i>Pennantia corymbosa</i>	kaikomako
<i>Pittosporum crassifolius</i> *	karo
<i>Pittosporum eugenioides</i>	lemonwood/tarata
<i>Pittosporum tenuifolium</i>	kohuhu/black matipo
<i>Plagianthus regius</i>	ribbonwood/manatu
<i>Podocarpus totara</i>	totara
<i>Prumnopitys ferruginea</i>	miro/brown pine
<i>Prumnopitys taxifolia</i>	matai/black pine
<i>Pseudopanax arboreus</i>	five-finger/pauhou

<i>Pseudopanax crassifolius</i>	lancewood/horoeka
<i>Pseudopanax ferox</i> *	fierce lancewood
<i>Solanum aviculare</i>	poroporo
<i>Sophora microphylla</i>	South Island kowhai
<i>Sophora prostrata</i>	prostrate kopwhai
<i>Sophora tetraptera</i> *	North Island kowhai
<i>Urtica ferox</i>	tree nettle/ongaonga

CLIMBING PLANTS

BOTANICAL NAME	COMMON NAME(S)
<i>Muehlenbeckia australis</i>	pohuehue/Maori vine

MONOCOT HERBS

BOTANICAL NAME	COMMON NAME(S)
<i>Anemanthele lessoniana</i>	hunangamoho/NZ wind grass
<i>Astelia fragrans</i>	bush flax/kahaka
<i>Carex secta</i>	sedge/purei
<i>Cortaderia richardii</i>	toetoe
<i>Cyperus ustulatus</i>	umbrella sedge
<i>Juncus gregiflorus</i>	rush
<i>Juncus pallidis</i>	rush
<i>Phormium cookianum</i> *	mountain flax
<i>Phormium tenax</i>	NZ flax/harakeke
<i>Schoenoplectus vallidus</i>	
<i>Typha orientalis</i>	raupo

FERNS

BOTANICAL NAME	COMMON NAME(S)
<i>Blechnum discolor</i>	crown fern
<i>Blechnum minus</i>	swamk kiokio
<i>Blechnum penna-marina</i>	
<i>Dicksonia squarossa</i>	
<i>Polystichum vestitum</i>	ponga



### Appendix 3: Associations of Indigenous Birds - Wigram Retention Pond

Association of indigenous bird species representative of freshwater lakes and ponds in the Low Plains Ecological District. Species in black font are those species recorded by Crossland (2014) occurring at the Wigram East retention basin pond.

Australasian Crested Grebe	<i>Podiceps cristatus australis</i>
<b>Black Cormorant</b>	<i>Phalacrocorax carbo novaehollandiae</i>
<b>Little Cormorant</b>	<i>Phalacrocorax melanoleucos brevirostris</i>
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>
White Heron	<i>Egretta alba modesta</i>
<b>White-faced Heron</b>	<i>Ardea novaehollandiae novaehollandiae</i>
<b>Australasian Bittern</b>	<i>Botaurus poiciloptilus</i>
<b>Black Swan</b>	<i>Cygnus atratus</i>
<b>Paradise Shelduck</b>	<i>Tadorna variegata</i>
<b>Grey Duck</b>	<i>Anas superciliosa superciliosa</i>
<b>Grey Teal</b>	<i>Anas gracilis</i>
<b>New Zealand Shoveler</b>	<i>Anas rhynchos</i>
<b>New Zealand Scaup</b>	<i>Aythya novaeseelandiae</i>
<b>Australasian Harrier</b>	<i>Circus approximans</i>
<b>Pukeko</b>	<i>Porphyrio porphyrio melanotus</i>
<b>Australasian Coot</b>	<i>Fulica atra australis</i>
Marsh Crake	<i>Porzana pusilla affinis</i>
<b>Pied Stilt</b>	<i>Himantopus himantopus leucocephalus</i>
<b>Spur-winged Plover</b>	<i>Vanellus miles</i>
<b>Southern Black-backed Gull</b>	<i>Larus dominicanus dominicanus</i>
<b>Red-billed Gull</b>	<i>Larus novaehollandiae scopulinus</i>
<b>Black-billed Gull</b>	<i>Larus bulleri</i>
<b>New Zealand Kingfisher</b>	<i>Halcyon sancta vagans</i>
<b>Welcome Swallow</b>	<i>Hirundo tahitica neoxena</i>



## Appendix 4

List of native flora recorded within the 390 Riverlaw Terrace SES during the 2002 botanical survey (Source: CCC Natural Areas Database), and re-confirmed by the Project Ecologist in September 2012.

### TREES & SHRUBS

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Alectryon excelsus</i>	titoki
<i>Aristotelia serrata</i>	wineberry, makomako
<i>Carpodetus serratus</i>	putaputaweta, marble leaf
<i>Coprosma aff. parviflora</i>	mikimiki
<i>Coprosma areolata</i>	thin-leaved coprosma
<i>Coprosma linariifolia</i>	mikimiki, yellow wood
<i>Coprosma lucida</i>	shining karamu
<i>Coprosma propinqua</i>	mikimiki
<i>Coprosma rhamnoides</i>	
<i>Coprosma robusta</i>	karamu
<i>Cordyline australis</i>	ti kouka, cabbage tree
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dodonaea viscosa</i>	akeake
<i>Elaeocarpus dentatus</i>	hinau
<i>Elaeocarpus hookerianus</i>	pokaka
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Griselinia littoralis</i>	broadleaf
<i>Hebe salicifolia</i>	koromiko
<i>Hoheria angustifolia</i>	houhere, narrow-leaved lacebark
<i>Kunzea ericoides</i>	kanuka
<i>Leptospermum scoparium</i>	manuka
<i>Lophomyrtus obcordata</i>	rohutu
<i>Macropiper excelsum</i>	kawakawa, pepper tree
<i>Melicope simplex</i>	poataniwha
<i>Melicytus ramiflorus</i>	mahoe
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	mapou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Pennantia corymbosa</i>	kaikomako
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohuhu
<i>Plagianthus regius</i>	manatu, lowland ribbonwood
<i>Podocarpus totara</i>	totara
<i>Prumnopitys taxifolia</i>	matai
<i>Pseudopanax arboreus</i>	five-finger
<i>Pseudopanax crassifolius</i>	horoeka, lancewood
<i>Pseudopanax ferrox</i>	toothed lancewood
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai

### MONOCOT HERBS

<i>Phormium tenax</i>	harakeke, NZ flax
<i>Juncus gregiflorus</i>	wi
<i>Anemanthele lessoniana</i>	wind grass
<i>Carex geminata</i>	toe toe rautahi





*Carex secta*  
*Carex solandri*  
*Cortaderia richardii*

pukio  
toetoe

*DICOT HERBS*

*Polygonum salicifolium*  
*Cotula coronopifolia*  
*Limosella lineata*

swamp willow weed  
batchelors button  
mudwort

*FERNS & ALLIES*

*Azolla filiculoides*  
*Blechnum minus*  
*Blechnum procerum*  
*Pteridium esculentum*

retoreto  
swamp kiokio  
small kiokio  
bracken

*VINES/CLIMBERS*

*Muehlenbeckia australis*

pohuehue

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## Appendix 5

Site Photographs: 390 Riverlaw Terrace



**Figure 16:** Kahikatea (*Dacrydium dacrydioides*) dominated forest at the 390 Riverlaw Terrace (Photograph: A. Shadbolt, 2014).



**Figure 2:** Pukio (*Carex secta*) dominated wetland at the 390 Riverlaw Terrace (Photograph: A. Shadbolt, 2014).



Figure 3: Looking upstream along path at 390 Riverlaw Terrace (Photograph: A. Shadbolt, 2014).



Figure 4: Pokaka (*Elaeocarpus hookerianus*) fruiting at the 390 Riverlaw Terrace (Photograph: A. Shadbolt, 2014).



Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

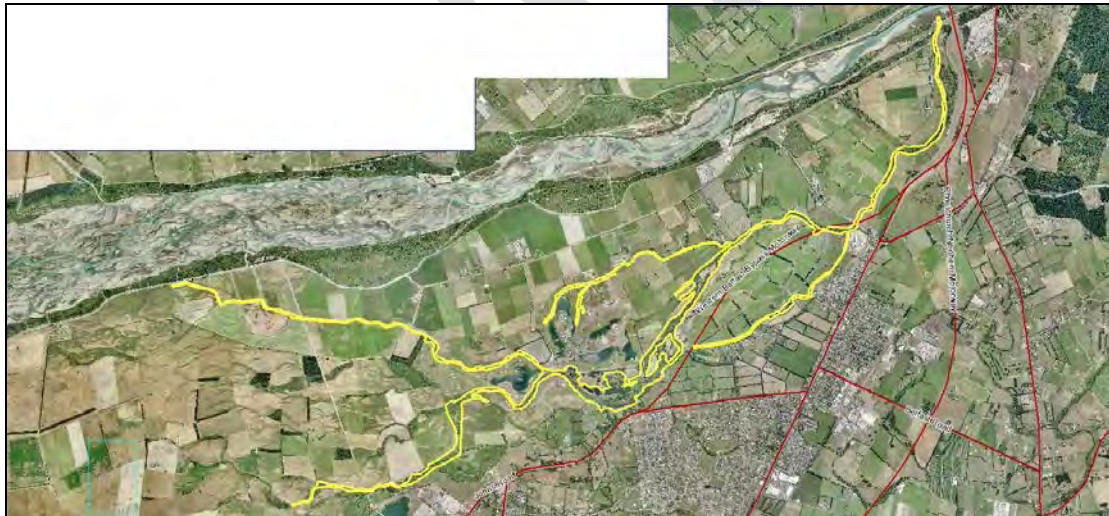
**Site Name:** Otukaikino River and Tributary Waterways

**Site Number:** SES/LP/26

#### **Summary of Significance:**

Otukaikino River and Tributary Waterways SES supports representative assemblages of indigenous flora and fauna including several at-risk species, and contributes to an important ecological network/linkage and migration route for migratory species.

#### **Site Map (Refer Appendix 1):**



### **Additional Site Information**

**Central point NZTM:** N5190356, E1568970

**Area of SES (ha):** TBA

### **Site Description**

The Otukaikino River (South Branch Waimakariri River) is a natural waterway that has been modified and degraded, having lost much of its original riparian vegetation through land clearance and grazing. However the stream corridor has retained some significant features including small areas of remnant plant communities, and several significant areas of native forest, shrubland and riparian restoration plantings dating back to the 1970s. The smaller tributary waterways (Kaikanui Stream, North Boundary Stream and Shingle Pit Stream) have also lost much of their original vegetation through land clearance and grazing, however along with the Otukaikino River are important habitats and dispersal/migration routes for threatened indigenous native fish species.

### **Extent of Site of Ecological Significance**

The Otukaikino and Tributaries SES extends downstream from the most upstream locations where longfin eel have been recently recorded on the Otukaikino River, Kaikanui Stream, North Boundary Stream Shingle Pit Stream and Darroch Street Drain, as shown on the location maps (Appendix 1).

Throughout most of its length the width of the SES is defined by the width of the stream between the top of banks to include the area of flowing water and marginal vegetation. In places the width of the SES widens to include specific significant features including restoration plantings including those at The Groynes Reserve and/or remnant wetland (and/or other) indigenous vegetation (refer Appendix 1).

### **Assessment Summary**

The Otukaikino River and Tributary Waterways site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets representativeness (criteria 1 and 2), rarity/distinctiveness (criterion 4) and ecological context criteria (criterion 8).



## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

Extensive riparian forest and shrubland plantings along the Otukaikino River and tributaries dating from the 1970s within this site contain populations of 52 species of locally sourced indigenous trees and shrubs, including 38 of the 50 local tree and shrub species recorded from Riccarton Bush (see Molloy 1995).

Thirty species of native bird have been recorded at The Groynes, including representative assemblages of birds associated with freshwater lakes and ponds, and freshwater rivers and streams in the Low Plains Ecological District (See Crosland 2007, Crossland 2014a, and Crossland 2014b).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

The extent of locally sourced and planted indigenous forest and riparian areas within the Otukaikino River section of SES dating from the 1970s cover an area exceeds 20 hectares, and is therefore larger than the area of Riccarton Bush (the largest natural forest patch of its type in the Low Canterbury Plains Ecological District). The site is therefore a relatively large example of its type in the region.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The Otukaikino River, Kaikanui Stream, Shingle Pit Creek, North Boundary Stream, Lower North Boundary Stream and Stop Bank Creek all support longfin eel (*Anguilla dieffenbachia*) (Taylor and Blair 2013) which is classified as At Risk/Declining (Allibone *et al.* 2010). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of these waterways downstream of the sampled locations, and the Otukaikino River to its confluence with the Waimakariri River SES is included as part of this SES.

Taylor and Blair (2013) also sampled the Threatened/Nationally Vulnerable (Allibone *et al.* 2010) lamprey (*Geotria australis*) at one site in Kaikanui Stream (south fork).

Locally rare plants occur in several locations throughout the SES area. In 'Paddock 2' near the true left bank of the Otukaikino River (Refer Figure 1; von Tippelskirch 2004), three locally rare plants occur, including *Juncus caespiticus*, *Carex flaviformis* and *C. buchannani*.

In 'Paddock 4', (Refer Figure 1; von Tippelskirch 2004) the locally rare *Gratiola sexdentata* occurs amongst moss in a two-to-three metre wide strip along the true right bank of the Otukaikino River upstream from the former Belfast oxidation ponds. This species has also been recorded historically and recently by CCC Park Rangers from a small fen wetland located between the southern fishing lake and the Otukaikino River within the SES.



**Figure 1:** Location of botanical assessment areas referred to in von Tippelskirch (2004)





The large inline ponding area of the Otukaikino River between the two pedestrian bridges and adjacent amenity turf/picnic areas within The Groynes Reserve serves both as a day and night roosting site for the Threatened/Nationally Critical Black-billed Gull. This endemic species is highly threatened nationally (Robertson *et. al* 2013) and internationally (Bamford *et. al* 2008). Numbers present vary depending on time of day and season, but as many as 122 birds have been recorded at this site by Crossland (2014), making it one of the most important sites for this species in Christchurch and important for this species in the Low Plains Ecological District.

**5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.***

Site not assessed under this criterion

**6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

Site not assessed under this criterion

**Diversity and Pattern**

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

Site not assessed under this criterion

**Ecological Context**

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The site supports longfin eel (*Anguilla dieffenbachia*) (James 2013). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of the various waterways downstream of the sampled locations for this species to its confluence with the Waimakariri River SES are included as part of this SES. Note that the Waimakariri River downstream of the Otukaikino River is contained within another SES, facilitating a continuous ecological linkage to the sea.



9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet this criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion

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## Site Management

### Existing Protection Status

To be completed

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitor pest plant infestations and implement control as required.</li> <li>Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li>Information packages for neighbouring properties (e.g. 'Plant Me Instead')</li> </ul>
<ul style="list-style-type: none"> <li>Animal pest incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of possible animal pest incursions and trapping as necessary</li> <li>Regular inspection and maintenance of pest proof fence</li> <li>Maintenance of an effective clear zone around perimeter of pest proof fence</li> </ul>	<ul style="list-style-type: none"> <li>Provide advice and guidance on pest animal monitoring</li> <li>Supply traps and related training as necessary to private land owners adjoining the SES</li> </ul>
<ul style="list-style-type: none"> <li>Disturbance to wildlife from dogs</li> </ul>	<ul style="list-style-type: none"> <li>Prohibit dogs within core wetland areas of SES area</li> <li>Interpretation highlighting the impacts dogs can have on wildlife values</li> </ul>	<ul style="list-style-type: none"> <li>Raise awareness amongst dog owners about impact of dogs upon biodiversity.</li> </ul>
<ul style="list-style-type: none"> <li>Anthropogenic change to water regime</li> </ul>	<ul style="list-style-type: none"> <li>Any action relating to changes in the water regime need to be assessed in relation to impacts upon ecological state and functioning of wetlands</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

<ul style="list-style-type: none"> <li>Natural process of change</li> </ul>	<ul style="list-style-type: none"> <li>If natural changes in wetland ecology, composition or functioning are determined to be detrimental to the ongoing viability of the values of the site, a recovery action plan should be initiated.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Inappropriate management of natural remnant low-nutrient wetlands (Groynes fens)</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the area occupied by the fens receive only rain water and that no stream, ground or surface water overflow enters that area</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Loss of indigenous waterfowl habitat through removal of riparian willow woodland</li> </ul>	<ul style="list-style-type: none"> <li>Ensure no net loss in riparian willow woodland area through re-planting with appropriate local native tree species</li> <li>Phase removal of willows to ensure continuity of habitat (ie; tall riparian woodland) for bird species dependent on woodland habitat structure.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Artificial riverbank retaining, substrates and/or other structures that adversely affect ecological function of waterways</li> </ul>	<ul style="list-style-type: none"> <li>Naturalise banks (i.e. remove retaining and create sloping banks with appropriate native vegetation) during bank maintenance works and through capital projects</li> <li>Prevent construction of fish barriers (e.g. weirs) and remediate current barriers</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Deficiency of high-quality riparian margins, resulting in a lack of habitat, high water temperatures due to a lack of shading, no buffer/filtering from urban impacts and affects on the functioning of ecological corridors (i.e. species movement)</li> </ul>	<ul style="list-style-type: none"> <li>Supplement riparian margins with dense, native and locally-sourced vegetation of varying heights (i.e. include tall trees to provide shading to the waterway)</li> <li>Focus on planting areas of unstable ground, to reduce erosion and sediment</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about benefits to biodiversity of planting suitable vegetation.</li> </ul>

	<p>discharges</p> <ul style="list-style-type: none"> <li>To maintain the riparian margin and ecological corridors, ensure waterway setbacks are maintained (i.e. resource consent is required to build, fill or excavate) and closed fences are not built adjacent to waterways</li> </ul>	
<ul style="list-style-type: none"> <li>Discharge of contaminants</li> </ul>	<ul style="list-style-type: none"> <li>Treatment of stormwater to a high level prior to discharge into waterways</li> <li>Reduction in occurrence of wastewater overflows to waterways</li> <li>Prevent non-stormwater discharges (e.g. trade-waste and agricultural run-off) from entering stormwater network or waterways</li> <li>Effective sediment control mitigation measures during construction</li> <li>Removal of instream sediment (and therefore other contaminants attached to sediment)</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Excessive amount of leaf-fall from deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li>Plant indigenous locally-sourced evergreen species in riparian margins instead of deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about benefits to biodiversity of planting suitable vegetation.</li> </ul>
<ul style="list-style-type: none"> <li>Artificial light impacting on freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Minimise light-spill onto waterway</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Lack of instream habitat for freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Maintain or enhance species-specific habitat</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Pathogen input from waterfowl and dog faeces</li> </ul>	<ul style="list-style-type: none"> <li>Reduce ability for waterfowl to enter waterways, by densely planting riparian</li> </ul>	<ul style="list-style-type: none"> <li>Awareness raising / interpretation to explain the impacts of animal faeces upon</li> </ul>

affecting water quality	margins with appropriate native species <ul style="list-style-type: none"> <li>• Encourage community not to feed the ducks</li> <li>• Encourage the community to pick up dog faeces</li> </ul>	biodiversity.
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**Assessment completed by:** Dr Antony Shadbolt

**Date:** 9th December 2014

**Statement completed by:** Dr Antony Shadbolt

**Date:** 9<sup>th</sup> December 2014

**Statement updated by:** XXX

**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.





## Appendix 1: Location Diagrams (Otukaikino River)





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### Appendix 2: Location Diagrams (Kaikenui Stream)





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**Appendix 1: Location Diagrams (North Boundary Stream)**







## Appendix 2: Native Flowering Plants & Conifers

### List of native conifers, flowering plants and ferns recorded within The Groyne Reserve/Otukaikino River.

Species marked with asterisks (\*\*) indicate species considered local to the area, but not listed as ever being present in Riccarton Bush. Species underlined represent local species now extinct in Riccarton Bush. Species in gray font indicate species recorded from Riccarton Bush, but not occurring at The Groyne (Refer Lovis 1995, and Molloy 1995).

#### TREES & SHRUBS

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Alectryon excelsus</i>	titoki/NZ ash
<i>Aristolelia serrata</i>	wineberry/makomako
<u><i>Carmichaelia robusta</i></u>	NZ broom/makaka
<i>Carpodetus serratus</i>	marbleleaf/putaputaweta
<i>Cassinia leptophylla</i> **	tahinu
<i>Coprosma crassifolia</i>	stiff-stemmed coprosma
<i>Coprosma linarifolia</i> **	
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi
<i>Coprosma propinqua</i> x <i>C. robusta</i>	hybrid coprosma
<i>Coprosma repens</i> **	
<i>Coprosma rhamnoides</i> **	
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round leaved coprosma
<i>Coprosma rubra</i> **	
<i>Coprosma virescens</i> **	
<i>Cordyline australis</i>	cabbage tree/ti kouka
<i>Coriaria sementosa</i>	tutu
<u><i>Corokia cotoneaster</i></u>	korokio
<i>Dacrycarpus dacrydioides</i>	kahikatea/white pine
<i>Discaria toumatu</i> **	matagauri
<i>Dodonaea viscosa</i> **	akeake
<i>Elaeocarpus dentatus</i>	hinau
<i>Elaeocarpus hookerianus</i>	pokaka
<i>Elaeocarpus dentatus</i> x <i>E. hookerianus</i>	hybrid
<u><i>Fuchsia excorticata</i></u>	tree fuchsia/kotukutuku
<i>Fuchsia excorticata</i> x <i>F. perscandens</i>	hybrid fuchsia
<i>Griselinia littoralis</i>	broadleaf/kapuka
<u><i>Hebe salicifolia</i></u>	koromiko
<i>Hebe strictissima</i> **	
<i>Hoheria angustifolia</i>	narrow leaved lacebark/houhere
<u><i>Kunzea ericoides</i></u>	white tea tree
<i>Leptospermum scoparium</i> **	manuka
<i>Lophomyrtus obcordata</i>	NZ myrtle/rohutu
<i>Melicope simplex</i>	poataniwha
<u><i>Melicytus micranthus</i></u>	manakura/shrubby whiteywood
<i>Melicytus ramiflorus</i>	mahoe/whiteywood
<i>Melicytus micranthus</i> x <i>M. ramiflorus</i>	hybrid whiteywood
<i>Muehlenbeckia astonii</i> **	shrubby pohuehue
<u><i>Myoporum laetum</i></u>	ngaio
<i>Myrsine australis</i>	red matipo



<i>Myrsine divaricata</i> **	weeping maupo
<i>Neomyrtus pedunculata</i>	NZ myrtle/rohutu
<i>Olearia avicenniaefolia</i> **	tree daisy
<i>Olearia paniculata</i> **	golden akeake
<i>Pennantia corymbosa</i>	kaikomako
<i>Pittosporum eugenioides</i>	lemonwood/tarata
<i>Pittosporum tenuifolium</i>	kohuhu/black matipo
<i>Plagianthus regius</i>	ribbonwood/manatu
<i>Podocarpus totara</i>	totara
<i>Prumnopitys ferruginea</i>	miro/brown pine
<i>Prumnopitys taxifolia</i>	matai/black pine
<i>Pseudopanax arboreus</i>	five-finger/pauhau
<i>Pseudopanax crassifolius</i>	lancewood/horoeka
<i>Pseudowintera colorata</i>	pepper tree/horopito
<i>Schefflera digitata</i>	seven-finger/pate
<i>Solanum aviculare</i>	poroporo
<i>Sophora microphylla</i>	South Island kowhai
<i>Streblus heterophyllus</i>	milk tree/turepo
<i>Urtica ferox</i>	tree nettle/ongaonga

CLIMBING PLANTS

BOTANICAL NAME	COMMON NAME(S)
<i>Calystegia turguriorum</i>	NZ bindweed/powhiwhi
<i>Clematis paniculata</i>	NZ clematis/puawananga
<i>Clematis fosteri</i>	yellow clematis
<i>Fuchsia perscandens</i>	climbing fuchsia
<i>Metrosideros diffusa</i>	white rata/climbing rata
<i>Muehlenbeckia australis</i>	pohuehue/Maori vine
<i>Muehlenbeckia complexa</i>	shrubby puhue
<i>Muehlenbeckia australis</i> x <i>M. complexa</i>	hybrid puhue
<i>Parsonsia capsularis</i>	NZ jasmine/kaiwhiria
<i>Parsonsia heterophylla</i>	NZ jasmine/kaiwhiria
<i>Passiflora tetandra</i>	Kohia/NZ passion flower
<i>Ripogonum scandens</i>	supplejack/kareao
<i>Rubus australis</i>	bush lawyer/taramoa
<i>Rubus schmidelioides</i>	bush lawyer/taramoa
<i>Rubus squarrosus</i>	bush lawyer/taramoa
<i>Rubus australis</i> x <i>R. squarrosus</i>	hybrid lawyer
<i>Rubus australis</i> x <i>R. schmidelioides</i>	hybrid lawyer
<i>Rubus schmidelioides</i> x <i>R. squarrosus</i>	hybrid lawyer

MONOCOT HERBS

BOTANICAL NAME	COMMON NAME(S)
<i>Anemanthele lessoniana</i>	hunangamoho/NZ wind grass
<i>Astelia fragrans</i>	bush flax/kahaka
<i>Astelia grandis</i>	bush flax/kahaka
<i>Astelia nervosa</i>	bush flax/kahaka
<i>Austroderia richardii</i>	toetoe
<i>Carex buchannani</i> **	sedge
<i>Carax coriacea</i>	sedge/rautahi
<i>Carex flagelifera</i>	shining sedge/mania
<i>Carex geminata</i> **	
<i>Carex lambertiana</i>	sedge
<i>Carex maorica</i> **	





<i>Carex raoulii</i>	sedge
<i>Carex secta</i>	sedge/purei
<i>Carex solandri</i>	sedge
<i>Carex virgata</i>	swamp sedge
<i>Carex lambertiana</i> x <i>C. solandri</i>	sedge
<i>Cyperus ustulatus</i> **	
<i>Dianella nigra</i> **	
<i>Elaeocharis acuta</i> **	
<i>Gahnia xanthocarpa</i>	giant gahnia
<i>Hierochloa redolens</i>	holy grass/karetu
<i>Juncus distegus</i>	rush
<i>Juncus gregiflorus</i>	rush
<i>Juncus pallidis</i> **	rush
<i>Libertia ixioides</i>	NZ iris/mikoikoi
<i>Liuzula picta</i> var. <i>limosa</i>	woodrush
<i>Luzula rufa</i>	woodrush
<i>Microlaena avenacea</i>	bush rice grass
<i>Phormium tenax</i>	NZ flax/harakeke
<i>Poa cita</i> **	silver tussock
<i>Poa imbecilla</i>	weak poa
<i>Rytidosperma gracile</i>	danthonia/bush danthonia
<i>Typha orientalis</i> **	raupo
<i>Uncinia leptostachya</i>	hooked sedge/matau
<i>Uncinia uncinata</i>	hooked sedge/kamu

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site Name:** Smacks Creek

**Site Number:** SES/LP/27

**Physical Address of Site:** 336 Gardiners Road  
Belfast  
Christchurch 8051

#### Summary of Significance:

The Smacks Creek SES contains remnant wetland vegetation that is representative of the natural diversity of the Low Plains Ecological District and supports the At Risk longfin eel.

#### Site Map:



### **Additional Site Information**

**Central point NZTM:** N5187662, E1567276

**Area of SES (ha):** 2.15 ha

### **Site Description**

The Smacks Creek site includes the section upstream natural waterway, a remnant fen wetland and its associated vegetation and areas of young and semi-mature eco-sourced restoration plantings that provide a buffer between adjacent land uses and the Smacks Creek environment that supports At Risk longfin eel.

### **Extent of Site of Ecological Significance**

The site extends from the road reserve boundary at Wilkinsons Road in the west, to the confluence of the Styx River in the east. It includes 1) the area of public reserve at 30R Wilkinsons Road, 2) the area determined by the width of the creek including both banks and marginal vegetation downstream from the reserve to Gardiners Road; 3) the public reserve at 336 Gardiners Rd, and the area determined by the width of the creek including both banks and marginal vegetation downstream from the reserve to the confluence with the Styx River as shown on the location map

The SES area does not include areas of drive and road carriageway, lawn, and/or amenity planting within the SES.

### **Assessment Summary**

The Smacks Creek site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets representativeness (criterion 1), rarity/distinctiveness (criteria 3 and 4).



## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

The site contains one of the last remaining degraded examples remnant wetland (fen) vegetation that is representative and characteristic of the natural diversity of the Low Plains Ecological District. This small fen site lay hidden under dense willows in a peaty site adjacent to Smacks Creek and was only discovered in recent years when the willows were cleared for a walkway. Smacks Creek itself carries a good cover of native fern *Blechnum minus* with some *B. penna-marina*. The fen occurs close by and contains a number of native species including the small buttercup *Ranunculus glabrifolius* which was thought to have disappeared from Christchurch, and the unusual sedge *Isolepis reticularis* which is very rare in Christchurch (Partridge 2007).

Locally sourced native forest, shrubland and riparian restoration plantings of various ages dominate the wide site, and include a representative sample (40 species) of the natural diversity of the Low Plains Ecological District. Indigenous vascular plant species occurring within the SES, recorded by the Project Ecologist in November 2014 are listed in Appendix 1.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

Does not meet this criterion

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The site contains remnant wetland vegetation that has been reduced to less than 20% of its former extent in the Low Plains Ecological District (see Appendix 1). The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).



**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site supports longfin eel (*Anguilla dieffenbachia*) (James 2013) which is classified as At Risk/Declining (Allibone *et al.* 2010). Longfin eels were recorded in Smacks Creek less than 25 m downstream from the 336 Gardiners Rd reserve by James (2013) and 215 m upstream of Gardiners Road (Taylor & main 2011). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of Smacks Creek downstream of the sampled locations to its confluence with the Styx River SES is included as part of this SES.

The fen (refer above) contains a number of native species including the small buttercup *Ranunculus glabrifolius* which was thought to have disappeared from Christchurch, and the unusual sedge *Isolepis reticularis* which is very rare in Christchurch and the wider Low Plains Ecological District (Partridge 2007).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

Site not assessed under this criterion

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

Does not meet this criterion

**Ecological Context**

**8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

Site not assessed under this criterion



9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet this criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion

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## Site Management

### Existing Protection Status

Land in public ownership

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitor pest plant infestations and implement control as required.</li> <li>Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowners about pest plan monitoring and control.</li> <li>Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Local extinction of locally rare buttercup and sedge species</li> </ul>	<ul style="list-style-type: none"> <li>Regular monitoring of locally rare plant populations</li> <li>Propagation of locally rare plants and reintroduction to other suitable sites</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowners about identification and management of locally rare plant populations.</li> <li>Assistance where appropriate</li> </ul>
<ul style="list-style-type: none"> <li>Inappropriate management of riparian margins by Council operations team</li> </ul>	<ul style="list-style-type: none"> <li>Develop stream side management templates to guide operations staff and contractors</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Sedimentation (including sawdust) and run-off from City Firewood yard on Gardiners Road.</li> </ul>	<ul style="list-style-type: none"> <li>Establish and bolster riparian planting buffers along Smacks Creek in this location.</li> <li>Work with land owners/managers to relocate firewood, logs and other material further back from stream margins.</li> </ul>	<ul style="list-style-type: none"> <li>Discussions with landowners about benefits of relocation materials away from stream margins.</li> </ul>

<ul style="list-style-type: none"><li>• Potentially excessive nutrient and sediment inputs</li></ul>	<ul style="list-style-type: none"><li>• Encourage adoption of good waterways and riparian management principles by property owners and managers to reduce detrimental effects on in-stream ecology and water quality</li></ul>	<ul style="list-style-type: none"><li>• Awareness raising and interpretation for landowners about impacts on biodiversity of nutrient and sediment run off.</li></ul>
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## References

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**Assessment completed by:** Dr Antony Shadbolt

**Date:** 17<sup>th</sup> November 2014

**Statement completed by:** Dr Antony Shadbolt

**Date:** 17<sup>th</sup> November 2014

**Statement updated by:** XXX

**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.



## Appendix 1

List of native conifers, flowering plants and ferns recorded within the Smacks Creek SES by the Project Ecologist (November 2014).

### TREES & SHRUBS

BOTANICAL NAME	COMMON NAME(S)
<i>Aristotelia serrata</i>	wineberry/makomako
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round leaved coprosma
<i>Cordyline australis</i>	cabbage tree/ti kouka
<i>Dacrycarpus dacrydioides</i>	kahikatea/white pine
<i>Dodonaea viscosa</i>	akeake
<i>Griselinia littoralis</i>	broadleaf/kapuka
<i>Hebe salicifolia</i>	koromiko
<i>Hebe strictissima</i>	
<i>Hoheria angustifolia</i>	narrow leaved lacebark/houhere
<i>Kunzea ericoides</i>	white tea tree
<i>Leptospermum scoparium</i>	manuka
<i>Pittosporum eugenoides</i>	lemonwood/tarata
<i>Pittosporum tenuifolium</i>	kohuhu/black matipo
<i>Plagianthus regius</i>	ribbonwood/manatu
<i>Podocarpus totara</i>	totara
<i>Prumnopitys taxifolia</i>	matai/black pine
<i>Pseudopanax arboreus</i>	five-finger/pauhou
<i>Pseudopanax crassifolius</i>	lancewood/horoeka

### CLIMBING PLANTS

BOTANICAL NAME	COMMON NAME(S)
<i>Muehlenbeckia australis</i>	pohuehue
<i>Muehlenbeckia complexa</i>	shrubby puhue

### MONOCOT HERBS

BOTANICAL NAME	COMMON NAME(S)
<i>Astelia fragrans</i>	bush flax/kahaka
<i>Astelia nervosa</i>	bush flax/kahaka
<i>Carex flagelifera</i>	shining sedge/mania
<i>Carex geminata</i>	
<i>Carex secta</i>	sedge/purei
<i>Cyperus ustulatus</i>	
<i>Dianella nigra</i>	
<i>Isolepis reticularis</i>	sedge
<i>Juncus gregiflorus</i>	rush
<i>Juncus pallidis</i>	rush
<i>Phormium tenax</i>	NZ flax/harakeke
<i>Typha orientalis</i>	Raupo

### DICOT HERBS



**BOTANICAL NAME**

*Lemna minor*

*Ranunculus glabifolius*

**COMMON NAME(S)**

NZ buttercup

*FERNS*

**BOTANICAL NAME**

*Blechnum minus*

*Blechnum penna-marina*

*Pteridium esculentum*

**COMMON NAME(S)**

swamp kiokio

little hard fern

bracken/rahurahu

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

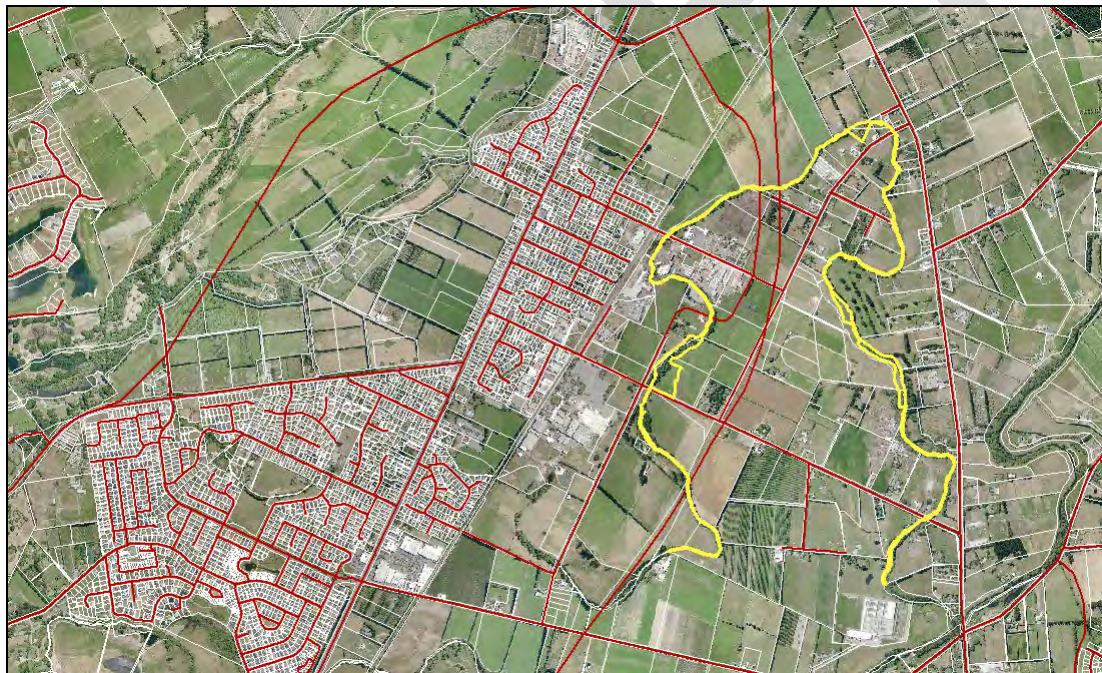
**Site Name:** Kaputone Creek

**Site Number:** SES/LP/28

#### **Summary of Significance:**

The Kaputone Creek SES supports representative assemblages of indigenous flora and fauna including several at-risk species, and contributes to an important ecological network/linkage and migration route for migratory species.

#### **Site Map (refer Appendix 1 for more detail):**



### **Additional Site Information**

**Central point NZTM:** N5189063, E1570966

**Area of SES (ha):** 8.12ha

### **Site Description**

Kaputone Creek is a natural waterway that has been heavily modified and degraded, having lost much of its original riparian vegetation through land clearance and grazing. However the stream corridor has retained some significant features including small areas of remnant plant communities, ephemeral ponding areas that are used by a representative assemblage of native waterfowl, and several areas of native forest, shrubland and riparian restoration plantings. Kaputone Creek is also an important habitat and migration corridor for longfin eel which require access from their upstream distribution limit to the sea via the Styx River and Brooklands Lagoon.

### **Extent of Site of Ecological Significance**

The Kaputone Creek SES extends downstream from the eastern boundary of 169 Radcliffe Road to the northern boundary of the CCC Reserve at 565R Marshland Road, approximately 400 m upstream from the creeks confluence with the Styx River (see location map). Throughout most of its length the width of the SES is defined by the legal property boundaries of the adjacent properties, except where the stream has moved over time to encroach onto private properties. In this latter instance the SES width is defined by the width of the stream between the top of banks to include the area of flowing water and marginal vegetation. In places the width of the SES widens to include specific significant features including 1) the ephemeral ponding area north of Belfast Road/west of Belfast Cemetery (Appendix 1; Figure 2), 2) restoration plantings at Ouruhia Domain (Appendix 1; Figures 5 & 6), 3) remnant wetland vegetation and plantings around springs downstream from Guthries Road (Appendix 1; Figure 7) , 4) young restoration plantings on CCC reserve land at 62R Guthries Road (Appendix 1; Figure 8), and 5) semi-mature restoration plantings at 187B Belfast Road (Appendix 1; Figure 8).

The ephemeral ponding area north of Belfast Road covers approximately 0.8 hectares immediately west of Belfast Cemetery (Refer Appendix 1; Figure 2). The part of the SES covers the full extent of the regularly ponded area, and includes an additional ten metre wide marginal area that is regularly used by waterfowl for roosting and nesting. The SES area does not include areas of driveway, road carriageway or grass/amenity/grazed areas.

## Assessment Summary

The Kaputone Creek site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets representativeness (criterion 1), rarity/distinctiveness (criterion 4) and ecological context criteria (criterion 8).

## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The Belfast Road ephemeral ponding part of the site supports 11 species of bird listed by Crossland (2014) as being associated with freshwater lakes and ponds in the Low Plains Ecological District (refer Appendix 2; Shadbolt 2014). Although the site does not host the full compliment of species, it is still considered significant under this criterion.

Remnant riparian vegetation exists at scattered locations along the length of the SES as recorded by the project ecologist. Species include:

- |                                       |                 |
|---------------------------------------|-----------------|
| • <i>Azola filiculoides</i>           | water fern      |
| • <i>Blechnum minus</i>               | swamp kiokio    |
| • <i>Blechnum penna-marina</i>        | fern            |
| • <i>Carex coriacea</i>               | sedge           |
| • <i>Carex secta</i>                  | sedge           |
| • <i>Coprosma robusta</i>             | karamu          |
| • <i>Cordyline australis</i>          | cabbage tree    |
| • <i>Coprosma propinqua x robusta</i> |                 |
| • <i>Juncus gregiflorus</i>           | wiwi            |
| • <i>Juncus pallidis</i>              | wiwi            |
| • <i>Lemna minor</i>                  |                 |
| • <i>Muehlenbeckia australis</i>      | pohuehue        |
| • <i>Phormium tenax</i>               | harakeke        |
| • <i>Polystichum vestitum</i>         |                 |
| • <i>Pteridium esculentum</i>         | bracken         |
| • <i>Urtica lineata</i>               | climbing nettle |



Species recorded from restoration sites along the Kaputone Creek by the project ecologist in 2014 are listed in Appendix 3.

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

Does not meet this criterion

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

Site not assessed under this criterion

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

Kaputone Creek supports longfin eel (*Anguilla dieffenbachia*) (James 2013) which is classified as At Risk/Declining (Goodman *et al.* 2014). Longfin eels were recorded in Kaputone Creek in several locations as far upstream as 169 Radcliffe Road (750 m downstream of Blakes Road). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of Kaputone Creek downstream of the sampled locations to its confluence with the Styx River SES is included as part of this SES.

Inanga (*Galaxias maculatus*) were recorded in Kaputone Creek at Ouruhia Domain by Taylor and Main (2011). The conservation status of inanga is described as 'declining' by Allibone *et al.* (2010), and At Risk/Declining by Goodman *et al.* (2014).

The Belfast Road ephemeral ponding area provides nesting and feeding site for At Risk/Declining Pied Stilts (*Himantopus himantopus leucocephalus*) and also supports the At Risk/Declining South Island Pied Oystercatcher (*Haematopus ostralegus finschi*) (Robertson *et al.* 2013; Appendix 1; Shadbolt 2014).

The lower reaches of Kaputone Creek from just above Belfast Road (east) supports populations of the At Risk/Declining plant *Urtica linearifolia* (climbing nettle) along the margins of Kaputone Creek. This species is considered to have a large national population (>100,000 mature individuals), but this is predicted to decline by 10 – 70% (de Lange *et al.* 2013).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion



6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet this criterion

#### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet this criterion

#### Ecological Context

8. ***Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

Site supports longfin eel (*Anguilla dieffenbachia*) (James 2013). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of Kaputone Creek downstream of the sampled location to its confluence with the Styx River SES is included as part of this SES. Note that the Styx River downstream of Kaputone Creek is contained within another SES, facilitating a continuous ecological linkage to the sea via Brooklands Lagoon.

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet this criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion



## Site Management

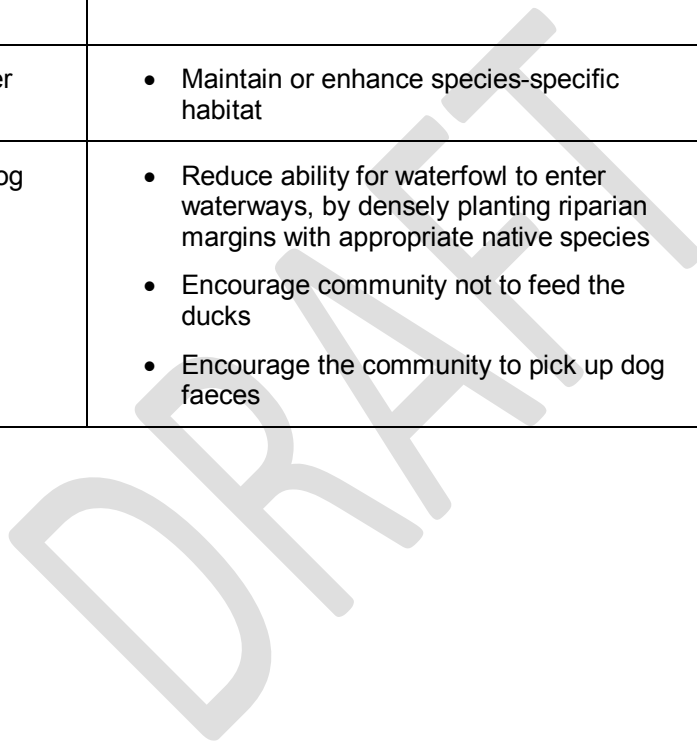
### Existing Protection Status

XXX

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Draining of ponded area</li> </ul>	<ul style="list-style-type: none"> <li>• Consider not draining the ephemeral ponding area</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with landowner about the benefits to biodiversity of wetland areas and discuss options for management.</li> <li>• Assistance available where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>• Disturbance of nesting sites by livestock and uncontrolled dogs</li> </ul>	<ul style="list-style-type: none"> <li>• Remove livestock during stilt nesting season, and ensure dogs do not enter area during this period</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with landowners about the benefits to biodiversity of stock management, especially during breeding season.</li> <li>• Raise awareness about the impact of dogs on biodiversity and look at options for management.</li> <li>• Assistance available where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>• Artificial riverbank retaining, substrates and/or other structures that adversely affect ecological function of waterways</li> </ul>	<ul style="list-style-type: none"> <li>• Naturalise banks (i.e. remove retaining and create sloping banks with appropriate native vegetation) during bank maintenance works and through capital</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

	<p>projects</p> <ul style="list-style-type: none"> <li>Prevent construction of fish barriers (e.g. weirs) and remediate current barriers</li> </ul>	
<ul style="list-style-type: none"> <li>Deficiency of high-quality riparian margins, resulting in a lack of habitat, high water temperatures due to a lack of shading, no buffer/filtering from urban impacts and affects on the functioning of ecological corridors (i.e. species movement)</li> </ul>	<ul style="list-style-type: none"> <li>Supplement riparian margins with dense, native and locally-sourced vegetation of varying heights (i.e. include tall trees to provide shading to the waterway)</li> <li>Focus on planting areas of unstable ground, to reduce erosion and sediment discharges</li> <li>To maintain the riparian margin and ecological corridors, ensure waterway setbacks are maintained (i.e. resource consent is required to build, fill or excavate) and closed fences are not built adjacent to waterways</li> </ul>	<ul style="list-style-type: none"> <li>In collaboration with ECan, discussions with landowners about the benefits to biodiversity of planting along riparian areas and stock management options.</li> <li>Assistance available where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Discharge of contaminants</li> </ul>	<ul style="list-style-type: none"> <li>Treatment of stormwater to a high level prior to discharge into waterways</li> <li>Reduction in occurrence of wastewater overflows to waterways</li> <li>Prevent non-stormwater discharges (e.g. trade-waste and agricultural runoff) from entering stormwater network or waterways</li> <li>Effective sediment control mitigation measures during construction</li> <li>Removal of instream sediment (and therefore other contaminants attached to sediment)</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

<ul style="list-style-type: none"> <li>Excessive amount of leaf-fall from deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li>Plant indigenous locally-sourced evergreen species in riparian margins instead of deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about sourcing alternatives to deciduous trees.</li> </ul>
<ul style="list-style-type: none"> <li>Artificial light impacting on freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Minimise light-spill onto waterway</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Lack of instream habitat for freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Maintain or enhance species-specific habitat</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Pathogen input from waterfowl and dog faeces affecting water quality</li> </ul>	<ul style="list-style-type: none"> <li>Reduce ability for waterfowl to enter waterways, by densely planting riparian margins with appropriate native species</li> <li>Encourage community not to feed the ducks</li> <li>Encourage the community to pick up dog faeces</li> </ul>	<ul style="list-style-type: none"> <li>Raise awareness about the impact of animal faeces upon biodiversity.</li> <li>Discuss options to manage public access and use of the site.</li> </ul>



## References

- Allibone, R., David, B., Hitchmough, R., Jellyman, D., Ling, N., Ravenscroft, P. & Waters, J. (2010). *Conservation status of New Zealand freshwater fish, 2009*. *New Zealand Journal of Marine and Freshwater Research*, 44(4): 271-287.
- Crossland A. C. (2014) *Association of indigenous species; all species that are residents or regular visitors to a given habitat type in Christchurch/Banks Peninsula*. Christchurch City Council (TRIM 14/756446).
- De Lange, P. J., Rolfe, J. R., Champion, P. Courtney, S. P., Heenan, P. B., Barkla, J. W., Cameron, E. K., Norton, D. A., and Hitchmough, R. A. (2013). *Conservation status of New Zealand indigenous vascular plants, 2012*. Department of Conservation, Wellington, New Zealand.
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- Goodman, J. M., Dunn, N. R., Ravenscroft, P. J., Allibone, R. M., Boubee, J. A. T., David, B. O., Griffiths, M., Ling, N., Hitchmough, R. A., and Rolfe, J. R. (2014) *Conservation status of New Zealand freshwater fish, 2013*. (New Zealand Threat Classification Series No. 7). Department of Conservation, Wellington.
- James, A. (2013) *Long-term monitoring of aquatic invertebrates and fish: Styx River catchment*. EOS Ecology, Christchurch, New Zealand.
- Robertson, H., Dowding, J., Elliott, G., Hitchmough, R., Miskelly, C. O'Donnell, C., Powlesland, R., Sagar, P., Scofield, P., Taylor, G. (2013) *Conservation status of New Zealand birds, 2012*. New Zealand Threat Classification Series 4, Dep.t of Conservation.
- Shadbolt, A. B. (2014) *Belfast Road ponding bird monitoring data*. Unpublished dataset. Christchurch City Council. (14/1366415).
- Taylor, M. and M. Main (2011). *Ecological monitoring of Christchurch City waterways: Styx River*. Christchurch, Aquatic Ecology LTD.



**Assessment completed by:** Dr Antony Shadbolt

**Date:** 9th December 2014

**Statement completed by:** Dr Antony Shadbolt

**Date:** 9<sup>th</sup> December 2014

**Statement updated by:** XXX

**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.

Appendix 1: Location Diagrams



Figure 1: Kaputone Creek Ox-bow



Figure 2: Kaputone Creek at Belfast Road (West)

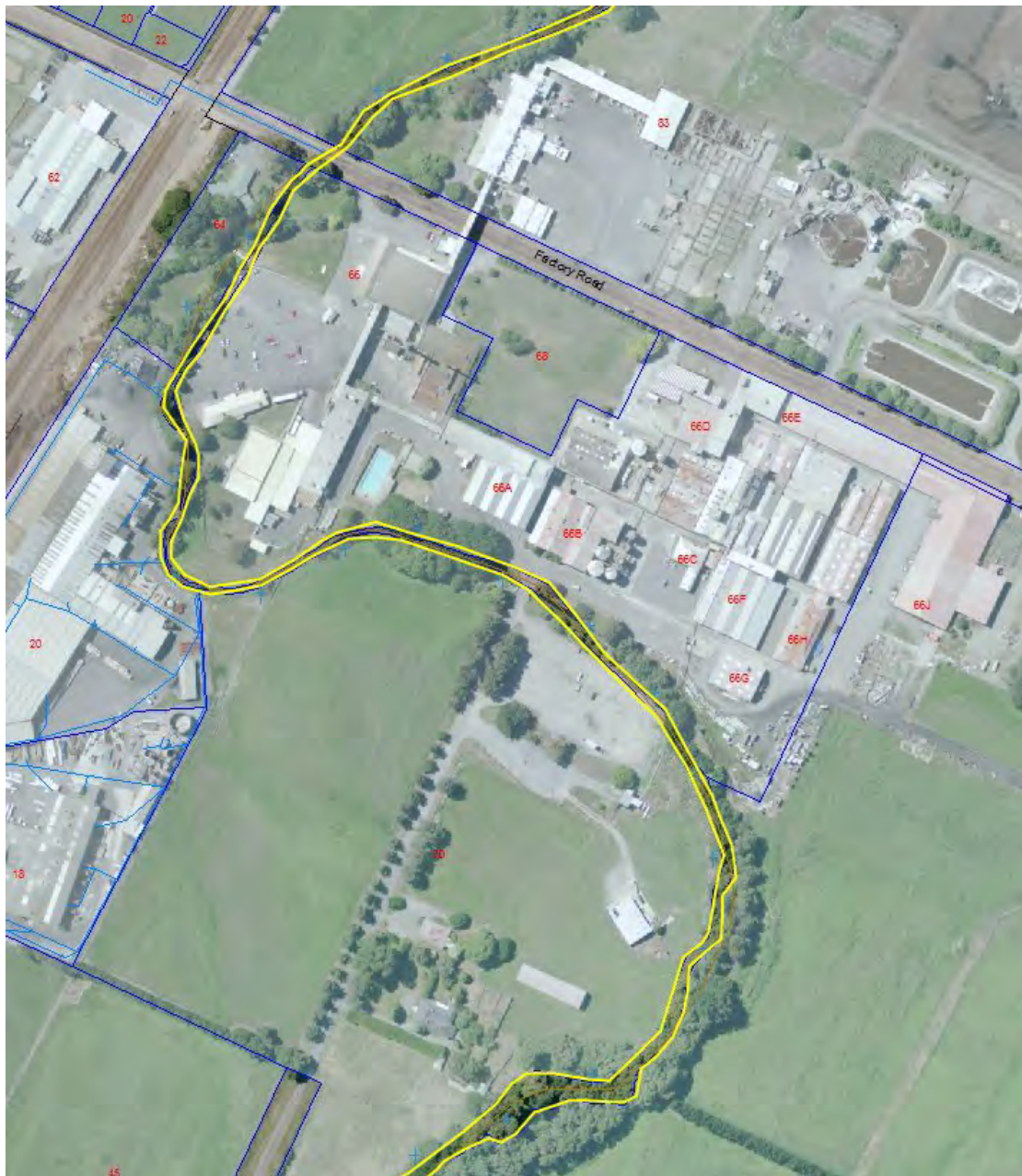


Figure 3: Kaputone Creek at Belfast Freezing Works





Figure 4: Kaputone Creek Upstream of Fords Road

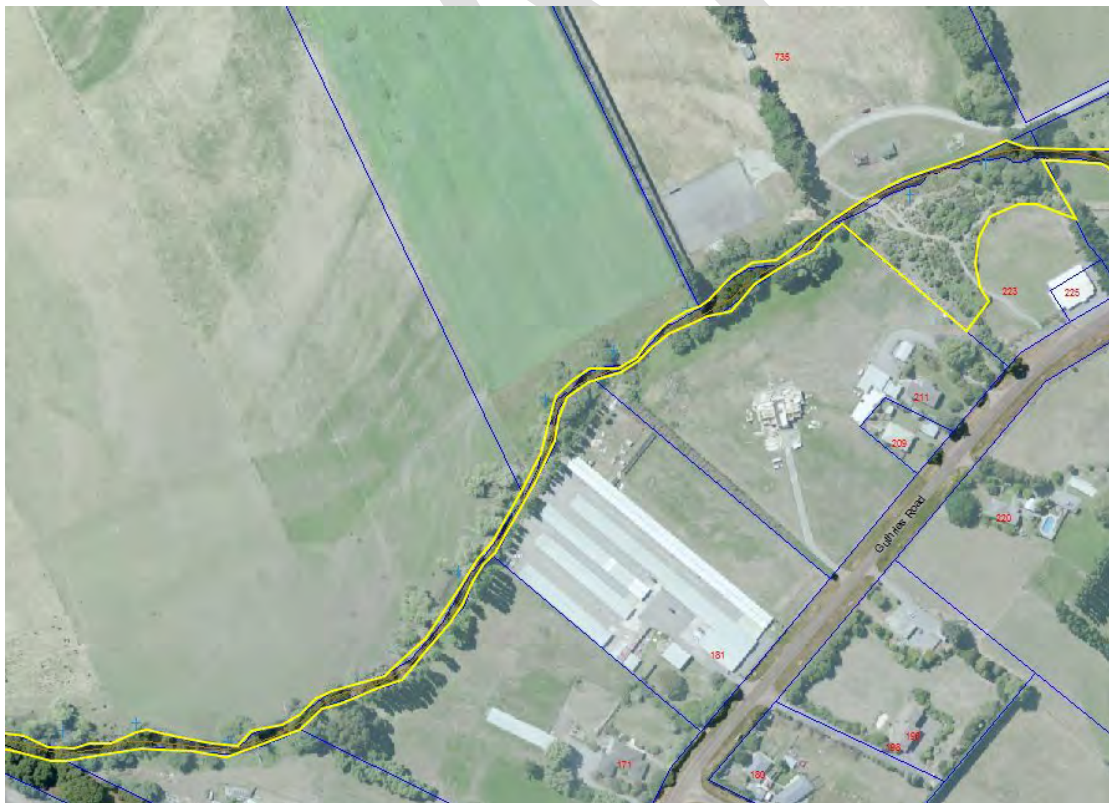


Figure 5: Kaputone Creek Upstream of Ouruhia Domain



Figure 6: Kaputone Creek Downstream of Ouruhia Domain



Figure 7: Kaputone Creek at Thompsons Farm



Figure 8: Kaputone Creek at Sunley Orchard



Figure 9: Kaputone Creek at Belfast Road (East)



## Appendix 2

### Belfast Road Ephemeral Ponding Bird Monitoring Data.

List of species recorded across 23 samples between 31<sup>st</sup> July and 4<sup>th</sup> December 2014 (Refer Shadbolt 2014;TRIM 14/1366415 for detailed count data)

Common Name	Species	Mean Number Birds
Welcome Swallow	<i>Hirundo tahitica</i>	6.00 (n = 2 – 20)
Pukeko	<i>Porphyrio porphyrio melanotus</i>	2.70 (n = 0 - 10)
Grey Teal	<i>Anas gracilis</i>	4.65 (n = 0 - 13)
Paradise Shelduck	<i>Tadorna variegata</i>	2.57 (n = 0 - 8)
New Zealand Shoveler	<i>Anas rhynchos</i>	1.74 (n = 0 - 10)
Black-backed Gull	<i>Larus dominicanus</i>	0.48 (n = 0 - 3)
Pied Stilt	<i>Himantopus himantopus</i>	5.17 (n = 2 - 11)
Australasian Harrier	<i>Circus approximans</i>	0.09 (n = 0 - 1)
Spur Winged Plover	<i>Vanellus miles</i>	1.57 (n = 0 - 4)
South Island Pied Oystercatcher	<i>Haematopus finschi</i>	0.09 (n = 0 - 1)
White Faced Heron	<i>Egretta novaehollandiae</i>	0.13 (n = 0 – 1)

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.



### Appendix 3

#### Restoration Plant Species.

List of indigenous plant species recorded by the project ecologist in December 2014 from restoration plantings along Kaputone Creek at Ouruhia Reserve. Species marked with asterisks (\*) are considered non-local species.

#### Species

*Anemanthele lessoniana*  
*Aristolelia serrata*  
*Astelia fragrans*  
*Austroderia richardii*  
*Carex flagelifera*  
*Carex secta*  
*Carex virgata*  
*Chionocloa flavicans\**  
*Chionocloa rubra\**  
*Coprosma propinqua*  
*Coprosma robusta*  
*Coprosma rotundifolia*  
*Coprosma rubra*  
*Cordyline australis*  
*Cyperus ustulatus*  
*Dacrycarpus dacrydioides*  
*Dodonaea viscosa*  
*Elaeocarpus dentatus*  
*Elaeocarpus hookerianum*  
*Griselinea littoralis*  
*Hebe salicifolia*  
*Hebe strictissima\**  
*Hoheria angustifolia*  
*Juncus gregiflorus*  
*Juncus pallidus*  
*Lophomyrtus obcordata*  
*Melecope simplex*  
*Phormium tenax*  
*Pittosporum eugenioides*  
*Pittosporum tenuifolium*  
*Plagianthus regius*  
*Poa cita*  
*Pseudopanax arboreus*  
*Pseudopanax crassifolius*



## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site Name:** Knights and Nottingham Streams

**Site Number:** SES/LP/29

#### **Summary of Significance:**

The Knights and Nottingham Streams SES supports at-risk species and contributes to an important ecological network/linkage and migration route for migratory fish species.

#### **Site Map (refer Appendix 1 for more detail):**





### **Additional Site Information**

**Central point NZTM:** N5173552, E1562885

**Area of SES (ha):** 4.45ha

### **Site Description**

Knights and Nottingham Streams are natural waterways that have been heavily modified and degraded, having lost much of their original riparian vegetation through land clearance and grazing. Both streams are important habitats and migration corridors for longfin eel which require access from their upstream distribution limit to the sea via the Halswell River.

### **Extent of Site of Ecological Significance**

The Knights and Nottingham Streams SES extends downstream on Knights Stream from Chesmars Drain (opposite the southern boundary of 100 Whincops Road) to the stream's confluence with the Halswell River (See location map). The Nottingham Stream part of the site extends downstream to the confluence with the Halswell River from the CCC reserve at 570 Halswell Road. The width of the SES varies along the lengths of the streams according to the width of the stream beds and include the associated marginal vegetation.

Throughout most of its length (i.e. the entire length downstream from Whincops Road to the Halswell River) the width of the Knights Stream section SES is defined by the City boundary along its true right bank. Along the true left bank of the stream the SES width is defined by the width of the stream between the top of banks to include the area of flowing water and marginal vegetation. Upstream from Whincops road the width of the SES widens to include specific restoration plantings within the CCC's Knights Waterway Reserve.

Similarly, the Nottingham Stream section is also largely defined by the width of the stream between the top of banks to include the area of flowing water and marginal vegetation, and expands to include restoration plantings at the 570 Halswell Road site.

### **Assessment Summary**

The Knights Stream site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets rarity/distinctiveness (criterion 4) and ecological context criteria (criteria 8 and 10).



## Assessment of Significance Criteria

### Representativeness

1. *Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.*

Site not assessed under this criterion

2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

Does not meet this criterion

### Rarity/Distinctiveness

3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

Site not assessed under this criterion

4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.*

The site is significant under this criterion.

Knights Stream supports longfin eel (*Anguilla dieffenbachia*) (Taylor and Blair 2012) which is classified as At Risk/Declining (Allibone *et al.* 2010). Longfin eels were recorded in Knights Stream in several locations as far upstream as the confluence of Chesmars Drain. In Nottingham Stream, longfin eels were recorded by Taylor and Blair (2012) at 570 Halswell Road.

Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of Knights and Nottingham Streams downstream of the sampled locations to their confluences with the Halswell River is included as part of this SES.

Shadbolt and Wong (2013) record the presence of the At Risk/Declining (Grainger *et al.* 2014) koura (*Paranephrops zealandicus*) in Knights Stream immediately upstream from Whincops Road.



5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet this criterion

#### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet this criterion

#### Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

The site is significant under this criterion.

The site supports longfin eel (*Anguilla dieffenbachia*) (James 2013). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of Knights and Nottingham Streams downstream of the sampled locations to their confluences with the Halswell River are included as part of this SES. Note that the Halswell River downstream of Knights and Nottingham Streams is contained within another proposed SES, facilitating a continuous ecological linkage to the sea.

Semi-mature indigenous revegetation plantings within the Knights and Nottingham Stream reserve areas provide a good degree of buffering of the stream from adjacent land uses and provides shade and habitat complexity.

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet this criterion



**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

Knights Stream supports longfin eel (*Anguilla dieffenbachia*) Longfin eels were recorded in Knights Stream in several locations as far upstream as the confluence of Chesmars Drain. In Nottingham Stream, longfin eels were recorded by Taylor and Blair (2012) at 570 Halswell Road.

Shadbolt and Wong (2013) record the presence of koura (*Paranephrops zealandicus*) in Knights Stream immediately upstream from Whincops Road.

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## Site Management

### Existing Protection Status

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Weed invasion</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing monitoring and eradication of biodiversity pest plants</li> </ul>	<ul style="list-style-type: none"> <li>Pest management programming via CCC Operational Pest Management Plan</li> </ul>
<ul style="list-style-type: none"> <li>Artificial riverbank retaining, substrates and/or other structures that adversely affect ecological function of waterways</li> </ul>	<ul style="list-style-type: none"> <li>Naturalise banks (i.e. remove retaining and create sloping banks with appropriate native vegetation) during bank maintenance works and through capital projects</li> <li>Prevent construction of fish barriers (e.g. weirs) and remediate current barriers</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Deficiency of high-quality riparian margins, resulting in a lack of habitat, high water temperatures due to a lack of shading, no buffer/filtering from urban impacts and affects on the functioning of ecological corridors (i.e. species movement)</li> </ul>	<ul style="list-style-type: none"> <li>Supplement riparian margins with dense, native and locally-sourced vegetation of varying heights (i.e. include tall trees to provide shading to the waterway)</li> <li>Focus on planting areas of unstable ground, to reduce erosion and sediment discharges</li> <li>To maintain the riparian margin and ecological corridors, ensure waterway setbacks are maintained (i.e. resource</li> </ul>	<ul style="list-style-type: none"> <li>In collaboration with ECan, discussions with landowners about the benefits to biodiversity of planting along riparian areas and stock management options.</li> <li>Assistance available where appropriate.</li> </ul>

	consent is required to build, fill or excavate) and closed fences are not built adjacent to waterways	
<ul style="list-style-type: none"> <li>Discharge of contaminants</li> </ul>	<ul style="list-style-type: none"> <li>Treatment of stormwater to a high level prior to discharge into waterways</li> <li>Reduction in occurrence of wastewater overflows to waterways</li> <li>Prevent non-stormwater discharges (e.g. trade-waste) from entering stormwater network or waterways</li> <li>Effective sediment control mitigation measures during construction</li> <li>Removal of instream sediment (and therefore other contaminants attached to sediment)</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Excessive amount of leaf-fall from deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li>Plant indigenous locally-sourced evergreen species in riparian margins instead of deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about sourcing alternatives to deciduous trees.</li> </ul>
<ul style="list-style-type: none"> <li>Artificial light impacting on freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Minimise light-spill onto waterway</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Lack of instream habitat for freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Maintain or enhance species-specific habitat, e.g. riffle areas for bluegill bullies</li> </ul>	<ul style="list-style-type: none"> <li>NA</li> </ul>
<ul style="list-style-type: none"> <li>Pathogen input from waterfowl and dog faeces affecting water quality</li> </ul>	<ul style="list-style-type: none"> <li>Reduce ability for waterfowl to enter waterways, by densely planting riparian margins with appropriate native species</li> <li>Encourage community not to feed the</li> </ul>	<ul style="list-style-type: none"> <li>Raise awareness about the impact of animal faeces upon biodiversity.</li> <li>Discuss options to manage public</li> </ul>

	<p>ducks</p> <ul style="list-style-type: none"><li>• Encourage the community to pick up dog faeces</li></ul>	<p>access and use of the site.</p>
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**Assessment completed by:** Dr Antony Shadbolt

**Date:** 9th December 2014

**Statement completed by:** Dr Antony Shadbolt

**Date:** 9<sup>th</sup> December 2014

**Statement updated by:** XXX

**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.

Appendix 1: Location Diagrams



Figure 1: Knights Stream Downstream from Chesmars Drain



Figure 2: Knights Stream Immediately Upstream from Whincops Road



Figure 3: Knights Stream Immediately Upstream from Whincops Road



Figure 4: Knights Stream at Trices Road



Figure: Knights Stream Upstream from Sabys Road



Figure 5: Knights Stream Downstream from Sabys Road



Figure 6: Knights Stream to Halswell River



Figure 7: Nottingham Stream Downstream Section





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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site Name:** Horners Drain and Rhodes Drain  
**Site Number:** SES/LP/30  
**Physical Address of Site:** 645 Hawkins Road  
Marshland  
Christchurch 8051

#### Summary of Significance:

The Horners Drain and Rhodes Drain SES supports the At Risk/Declining longfin eel and koura, and contributes to an important ecological network/linkage and migration route for longfin eel.

#### Site Map:



### Additional Site Information

Central point NZTM: N5186780, E1571290

Area of SES (ha): <0.15 ha

### Site Description

Horners Drain is a timber lined waterway with timber top-struts (refer Appendix 1; Figure 1), located within the road reserve boundary of Hawkins Road. It discharges into Rhodes Drain which is a drain with natural bank profiles that are mostly un-vegetated (refer Appendix 1; Figure 2).

### Extent of Site of Ecological Significance

The Horners Drain and Rhodes Drain SES extends from Prestons Road, to the point where Rhodes Drain discharges into the Styx River (refer location map). The width of the SES is defined by the width of the timber box channelling along Horners Drain, and by the top of bank along the short section of Rhodes Drain. The SES area does not include areas of driveway, road carriageway or grass verge within the road corridor.

### Assessment Summary

The Horners Drain and Rhodes Drain site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets rarity/distinctiveness (criterion 4) and ecological context criterion (criterion 8).

### Assessment of Significance Criteria

#### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

Does not meet this criterion



2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

Does not meet this criterion

#### **Rarity/Distinctiveness**

3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

Site not assessed under this criterion

4. ***Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.***

The site is significant under this criterion.

The site supports longfin eel (*Anguilla dieffenbachia*) (James 2013) which is classified as At Risk/Declining (Allibone *et al.* 2010). Longfin eels were recorded in Horners Drain approximately 185 m upstream of the intersection of Hawkins Road and Selkirk Place. Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the lengths of Horners Drain and Rhodes Drain downstream of the sampled locations to their confluence with the Styx River is included as part of this SES.

NIWA staff recorded the presence of the At Risk/Declining (Grainger *et al.* 2014) koura (*Paranephrops zealandicus*) in Horners Drain immediately downstream from Prestons Road in 2013 (Marty Flanagan *pers comms*; TRIM Reference 14/1542826), refer Figure 1 below.



**Figure 1:** Koura (*Paranephrops zealandicus*) sampled in Horners Drain by NIWA staff immediately upstream from Prestons Road (Photograph, Marty Flanagan, NIWA, 2013).



5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Site not assessed under this criterion

#### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet this criterion

#### Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

The site is significant under this criterion.

The site supports longfin eel (*Anguilla dieffenbachia*) (James 2013). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of Horners Drain and Rhodes Drain downstream of the sampled location to its confluence with the Styx River is included as part of this SES. Note that the Styx River downstream of Rhodes Drain is contained within another SES, facilitating a continuous ecological linkage to the sea via Brooklands Lagoon.

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet this criterion



10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

The site is significant under this criterion.

The site provides habitat for longfin eel (*Anguilla dieffenbachia*) (James 2013) and koura (*Paranephrops zealandicus*).

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## Site Management

### Existing Protection Status

Streams in public ownership

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Weed invasion</li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing monitoring and eradication of biodiversity pest plants</li> </ul>	<ul style="list-style-type: none"> <li>• Pest management programming via CCC Operational Pest Management Plan</li> </ul>
<ul style="list-style-type: none"> <li>• Artificial riverbank retaining, substrates and/or other structures that adversely affect ecological function of waterways</li> </ul>	<ul style="list-style-type: none"> <li>• Naturalise banks (i.e. remove retaining and create sloping banks with appropriate native vegetation) during bank maintenance works and through capital projects</li> <li>• Prevent construction of fish barriers (e.g. weirs) and remediate current barriers</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Deficiency of high-quality riparian margins, resulting in a lack of habitat, high water temperatures due to a lack of shading, no buffer/filtering from urban impacts and affects on the functioning of ecological corridors (i.e. species movement)</li> </ul>	<ul style="list-style-type: none"> <li>• Supplement riparian margins with dense, native and locally-sourced vegetation of varying heights (i.e. include tall trees to provide shading to the waterway)</li> <li>• Focus on planting areas of unstable ground, to reduce erosion and sediment discharges</li> <li>• To maintain the riparian margin and ecological corridors, ensure waterway setbacks are maintained (i.e. resource consent is required to build, fill or excavate) and closed fences are not built</li> </ul>	<ul style="list-style-type: none"> <li>• In collaboration with ECan, discussions with landowners about the benefits to biodiversity of planting along riparian areas and stock management options.</li> <li>• Assistance available where appropriate.</li> </ul>



	adjacent to waterways	
<ul style="list-style-type: none"> <li>Discharge of contaminants</li> </ul>	<ul style="list-style-type: none"> <li>Treatment of stormwater to a high level prior to discharge into waterways</li> <li>Reduction in occurrence of wastewater overflows to waterways</li> <li>Prevent non-stormwater discharges (e.g. trade-waste) from entering stormwater network or waterways</li> <li>Effective sediment control mitigation measures during construction</li> <li>Removal of instream sediment (and therefore other contaminants attached to sediment)</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Excessive amount of leaf-fall from deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li>Plant indigenous locally-sourced evergreen species in riparian margins instead of deciduous trees</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about sourcing alternatives to deciduous trees.</li> </ul>
<ul style="list-style-type: none"> <li>Artificial light impacts on freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Minimise light-spill onto waterway</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Lack of instream habitat for freshwater fauna</li> </ul>	<ul style="list-style-type: none"> <li>Maintain or enhance species-specific habitat, e.g. riffle areas for bluegill bullies</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Pathogen input from waterfowl and dog faeces affecting water quality</li> </ul>	<ul style="list-style-type: none"> <li>Reduce ability for waterfowl to enter waterways, by densely planting riparian margins with appropriate native species</li> <li>Encourage people not to feed the ducks</li> <li>Encourage community to pick up dog faeces</li> </ul>	<ul style="list-style-type: none"> <li>Raise awareness about the impact of animal faeces upon biodiversity.</li> <li>Discuss options to manage public access and use of the site.</li> </ul>

## References

Allibone, R., David, B., Hitchmough, R., Jellyman, D., Ling, N., Ravenscroft, P. & Waters, J. (2010). *Conservation status of New Zealand freshwater fish, 2009*. *New Zealand Journal of Marine and Freshwater Research*, 44(4): 271-287.

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James, A. (2013) *Long-term monitoring of aquatic invertebrates and fish: Styx River catchment*. EOS Ecology, Christchurch, New Zealand.

**Assessment completed by:** Dr Antony Shadbolt

**Date:** 9th December 2014

**Statement completed by:** Dr Antony Shadbolt

**Date:** 9<sup>th</sup> December 2014

**Statement updated by:** XXX

**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.

Appendix 1



Figure 2: Horners Drain downstream from Selkirk Place



Figure 3: Rhodes Drain between Hawkins Road and confluence with Styx River

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Sheppards Stream

**Site number:** SES/LP/31

**Physical address of site:**  
214 & 224R Lower Styx Road  
Marshland  
Christchurch 8083

#### Summary of Significance:

The Sheppards Stream SES is significant because it contains vegetation representative of the Low Plains Ecological District including threatened and/or locally uncommon plant and invertebrate species.

#### Site Map





## Additional Site Information

**Central point NZTM:** N5189358, E1574454

**Area of SES (ha):** 5.47 ha

## Site Description

The site consists of a remnant dune-slack wetland that supports remnant native vegetation (approx 0.5 ha), restored waterways (> 660 m) that support a representative sample of wetland bird species, and large areas of locally sourced restoration plantings.

## Extent of Site of Ecological Significance

The SES covers the entire land parcels of 214 and 224R Lower Stryx Road respectively, but excludes any areas occupied by the private driveway right-of-way access to 212 Lower Styx Road.

## Assessment Summary

The Sheppards Stream Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups.. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1), rarity/distinctiveness criteria (criteria 3 and 4).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Although degraded through historic land management and grazing, the area of remnant wetland vegetation within the SES is representative and characteristic of the natural diversity of the Low Plains Ecological District, and has been



enhanced through ongoing restoration plantings that have expanded on the original core area.

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

Site not assessed under this criterion

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

This site contains wetland vegetation that has been reduced to less than 20% of its former extent in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site supports the Threatened/Nationally Critical (Robertson *et al.* 2013) Grey Duck (*Anas supercilliosa*). Grey Duck were photographed by the project ecologist at three locations within the Sheppards Stream SES using Reconyx PC900 camera traps in August/September 2013.

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

Does not meet criterion



### **Diversity and Pattern**

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet criterion

### **Ecological Context**

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Site not assessed under this criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Site not assessed under this criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion

## Site Management

### Existing Protection Status

- Site is wholly contained within a CCC reserve

Threats and risks	Management recommendations	Support package options
Weed invasion	<ul style="list-style-type: none"> <li>• Ongoing monitoring and eradication of biodiversity pest plants.</li> </ul>	<ul style="list-style-type: none"> <li>• Information packages for neighbouring properties (e.g. 'Plant Me Instead')</li> </ul>
Animal pest incursion	<ul style="list-style-type: none"> <li>• Monitoring of possible animal pest incursions and trapping as necessary</li> </ul>	<ul style="list-style-type: none"> <li>• Provide advice and guidance on pest animal monitoring</li> <li>• Supply traps and related training as necessary</li> </ul>
Disturbance to wildlife from dogs	<ul style="list-style-type: none"> <li>• Prohibit dogs within core wetland areas of SES area</li> <li>• Interpretation highlighting the impacts dogs can have on wildlife values</li> </ul>	
Fire	<ul style="list-style-type: none"> <li>• Establish buffer of low flammability native tree and shrub species</li> </ul>	Information packages for neighbouring properties on low flammability species





## References

Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.

Lloyd, K., McClellan, R., Hutchison, M., Patrick, B., and Shaw, W. (2013) *Guidelines for the application of ecological significance criteria for indigenous vegetation and habitats of indigenous fauna in Canterbury region*. Report prepared for Environment Canterbury by Wildlands Consultants, Rotorua, New Zealand.

Robertson, H., Dowding, J., Elliott, G., Hitchmough, R., Miskelly, C. O'Donnell, C., Powlesland, R., Sagar, P., Scofield, P., Taylor, G. (2013) *Conservation status of New Zealand birds, 2012*. New Zealand Threat Classification Series 4, Dept of Conservation.

Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.

**Assessment completed by:** Antony Shadbolt  
**Date:** 24th June 2014

**Statement completed by:** Antony Shadbolt  
**Date:** 24th June 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



**Appendix 1:**

List of local indigenous conifers and flowering plants recorded by the Project Ecologist within mixed age restoration plantings and remnant wetland vegetation in the Sheppards Stream SES.

*TREES & SHRUBS*

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Cassinia leptophylla</i>	tauhinu
<i>Coprosma acerosa</i>	sand coprosma
<i>Coprosma areolata</i>	thin leaved coprosma
<i>Coprosma crassifolia</i>	stiff-stemmed coprosma
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi
<i>Coprosma robusta</i>	karamu
<i>Cordyline australis</i>	cabbage tree/ti kouka
<i>Corokia cotoneaster</i>	korokio
<i>Dacrycarpus dacrydioides</i>	kahikatea/white pine
<i>Dodonaea viscosa</i>	akeake
<i>Griselinia littoralis</i>	broadleaf/kapuka
<i>Hebe salicifolia</i>	koromiko
<i>Hoheria angustifolia</i>	narrow leaved lacebark/houhere
<i>Kunzea ericoides</i>	white tea tree
<i>Leptospermum scoparium</i>	manuka
<i>Lophomyrtus obcordata</i>	NZ myrtle/rohutu
<i>Muehlenbeckia astonii</i>	shrubby pohuehue
<i>Myoporum laetum</i>	ngaio
<i>Olearia paniculata</i>	golden akeake
<i>Pittosporum eugenioides</i>	lemonwood/tarata
<i>Pittosporum tenuifolium</i>	kohuhu/black matipo
<i>Plagianthus divaricatus</i>	marsh ribbonwood
<i>Plagianthus regius</i>	ribbonwood/manatu
<i>Podocarpus totara</i>	totara
<i>Prumnopitys taxifolia</i>	matai/black pine
<i>Pseudopanax arboreus</i>	five-finger/pauhou
<i>Pseudopanax crassifolius</i>	lancewood/horoeka
<i>Sophora microphylla</i>	South Island kowhai
<i>Teucrium parvifolium</i>	teucrium

*MONOCOT HERBS*

<b>BOTANICAL NAME</b>	<b>COMMON NAME(S)</b>
<i>Anemanthele lessoniana</i>	hunangamoho/NZ wind grass
<i>Astelia fragrans</i>	bush flax/kahaka
<i>Carex flagelifera</i>	shining sedge/mania
<i>Carex secta</i>	sedge/purei
<i>Carex solandri</i>	sedge
<i>Carex virgata</i>	swamp sedge
<i>Cortaderia richardii</i>	toetoe
<i>Juncus gregiflorus</i>	rush
<i>Phormium tenax</i>	NZ flax/harakeke
<i>Poa cita</i>	silver tussock



**Appendix 2:**

List of native wetland birds recorded within Sheppards Stream from camera traps in between 25<sup>th</sup> August and 14<sup>th</sup> September 2013 (Source: A. Shadbolt).

<b>Common Name</b>	<b>Scientific Name</b>	<b>DoC Threat Status</b>
Australasian Harrier	<i>Circus approximans</i>	Not Threatened
Pukeko	<i>Porphyrio melanotus melanotus</i>	Not Threatened
Paradise Shelduck	<i>Tadorna variegata</i>	Not Threatened
Grey Teal	<i>Anas gracilis</i>	Not Threatened
Grey Duck	<i>Anas superciliosa</i>	Nationally Critical
Australian Coot	<i>Fulica atra australis</i>	Coloniser
New Zealand Shoveler	<i>Anas rhynchos</i>	Not Threatened
Welcome Swallow	<i>Hirundo neoxena neoxena</i>	Not Threatened

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Isaacs Carr  
**Site number:** SES/LP/32  
**Physical address of site:** 160 McLeans Island Road  
Harewood

#### Summary of Significance:

The Isaacs Carr SES is significant because it comprises a large area of remnant indigenous vegetation that has been reduced to less than 20% of its former extent within the Low Plains Ecological District, and supports a population of the Nationally Vulnerable dwarf false musk.

#### Site Map:



## Additional Site Information

**Central point NZTM:** N5189181, E1565804

**Area of SES (ha):** 10.01 ha

## Site Description

The SES comprises an area of wooded vegetation of approximately 7.6 ha, and additional wet flush areas in surrounding pasture. The area drains to the south east where there is an un-named waterway near the edge that flows into the Otukaikino River (Waimakariri River South Branch) about 150m downstream. The woodland carr is an unusual vegetation type being an ephemeral wetland; wet in winter, dry in summer (Partridge 2014).

Surrounding the wooded area there is pasture with elements of indigenous wetland vegetation and species. These mostly occur in hollows of former river channels. Some have narrow bands of trees, while other support rushes and sedges. The higher areas are dominated by exotic pasture grasses and are currently grazed by sheep (Partridge 2014).

## Extent of Site of Ecological Significance

The site includes the area of mixed willow woodland (7.6 ha) defined by the drip-zone of the willow trees, and extends to include a large (approximately 2.4 ha) embayment of open pasture/remnant turf/sedge mosaic in the south west part of the site as shown on the location diagram.

## Assessment Summary

The Isaacs Carr Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups.. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), and rarity/distinctiveness (criteria 3, 4 & 6).

## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the***



***best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Although degraded, it contains 32 naturally occurring native turf, sedge, tree, shrub and fern species (Partridge 2014) that are considered representative of the natural diversity of the Low Plains Ecological District (Refer Appendix 1).

**2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

At approximately 10 hectares this site is a relatively large example of its type in the Low Plains Ecological District

**Rarity/Distinctiveness**

**3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

Indigenous vegetation within the site represents vegetation that has been reduced to less than 20% of its former extent in the low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

**4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.***

The site is significant under this criterion.

The site contains a population of the Threatened dwarf false musk *Mazus novaezeelandiae* subsp. *impolitus* f. *impolitus* which is listed by DoC (de Lange *et al.* 2013) as Nationally Vulnerable,  $\leq 15$  subpopulations,  $\leq 500$  mature individuals in the largest sub population, predicted decline 10 – 50%).

**5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.***

Site not assessed under this criterion

**6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare***



***ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

The site is significant under this criterion.

There is a high degree of micro-topography within the wooded area. At the time of visit (25<sup>th</sup> September 2014) much of the site was dry with hollows of standing water. It appeared there was likely to be a high degree of seasonality as evidenced by the behaviour of the vegetation, likely ranging from standing water over much of the area in winter, to scattered ponds in summer. This regime is therefore enough to impose wetland conditions, but not enough to be permanently wet (Partridge 2014).

#### Diversity and Pattern

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

Does not meet criterion

#### Ecological Context

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

Does not meet criterion

- 9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

Does not meet criterion

- 10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

Site not assessed under this criterion

## Site Management

### Existing Protection Status

No current formal protection.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Peripheral land management of swamp tussock outside the core forest (Refer also Partridge 2014).</li> </ul>	<ul style="list-style-type: none"> <li>Consider the appropriate use of herbicide application within remaining stands of swamp tussock, and develop alternative pest plant control strategies</li> </ul>	<ul style="list-style-type: none"> <li>Discuss options with landowners</li> <li>Assistance available where appropriate</li> </ul>
<ul style="list-style-type: none"> <li>Impacts from livestock incursions (Refer also Partridge 2014)</li> </ul>	<ul style="list-style-type: none"> <li>Continue current grazing regime, and prevent cattle grazing within SES site.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about long term benefits to biodiversity of grazing management.</li> </ul>
<ul style="list-style-type: none"> <li>Uncertainty regarding the roles of exotic woody vegetation (e.g. willow) in maintaining indigenous components.</li> </ul>	<ul style="list-style-type: none"> <li>Examine the option of undertaking experimental willow clearance and/or thinning to determine response of indigenous plant species and communities</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about research / experimental management of woody vegetation.</li> </ul>





## References

- de Lange, P. J., Rolfe, J. R., Champion, P. D., Courtney, S. P., Heenan, P. B., Barkla, J. W., Cameron, E.K., Norton, D.A., Hitchmough, R. A. (2013). *Conservation status of New Zealand indigenous vascular plants, 2012* (New Zealand Threat Classification Series No. 3). Department of Conservation, Wellington.
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- Partridge, T. R. (2014) *Vegetation of Isaacs Carr, Otukaikino River catchment*. Unpublished data (Trim: 14/1277056).
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**Assessment completed by:** Antony Shadbolt  
**Date:** 22<sup>nd</sup> October 2014

**Statement completed by:** Antony Shadbolt  
**Date:** 22<sup>nd</sup> October 2014

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.



## Appendix 1

### Indigenous Vascular Plants Recorded at Isaacs Willow Woodland Site

- |   |                                   |
|---|-----------------------------------|
| • <i>Acaena novae-zelandiae</i>   | piripiri                          |
| • <i>Asplenium appendiculatum</i><br>subsp. <i>appendiculatum</i>             | ground spleenwort                 |
| • <i>Blechnum minus</i>   | swamp kiokio                      |
| • <i>Blechnum penna-marina</i>  | little kiokio                     |
| • <i>Callitriche petriei</i>  | starwort                          |
| • <i>Carex coriacea</i>   | purei, rautahi                    |
| • <i>Carex flagellifera</i>   | mania                             |
| • <i>Carex maorica</i>  | purei                             |
| • <i>Carex secta</i>  | pukio                             |
| • <i>Carex virgata</i>  | pukio                             |
| • <i>Coprosma x cunninghamii</i>  | ( <i>C. propinqua x robusta</i> ) |
| • <i>Coprosma propinqua</i>   | mikimiki                          |
| • <i>Coprosma robusta</i>   | karamu                            |
| • <i>Cordyline australis</i>  | ti kouka                          |
| • <i>Eleocharis acuta</i>   | spike sedge                       |
| • <i>Epilobium nummulariifolium</i>   | NZ willowherb                     |
| • <i>Euchiton involucratus</i>  | creeping cudweed                  |
| • <i>Histiopteris incisa</i>  | mata, water fern                  |
| • <i>Hydrocotyle</i> sp.  | NZ waxweed                        |
| • <i>Hypericum pusillum</i>   | NZ St John's wort                 |
| • <i>Hypolepis ambigua</i>  | rough pigfern                     |
| • <i>Isolepis distigmata</i>  | bristle sedge                     |
| • <i>Juncus planifolius</i>   | flat-leaved rush                  |
| • <i>Juncus</i> sp.   | rush                              |
| • <i>Lemna dispersa</i>   | duckweed                          |
| • <i>Mazus novaezeelandiae</i><br>subsp. <i>impolitus</i> f. <i>impolitus</i> | dwarf false musk                  |
| • <i>Myriophyllum propinquum</i>  | NZ milfoil                        |
| • <i>Polystichum vestitum</i>   | prickly shield fern, puniu        |
| • <i>Potamogeton cheesemanii</i>  | pondweed                          |
| • <i>Pteridium esculentum</i>   | bracken fern, rahurahu            |
| • <i>Ranunculus glabrifolius</i>  | NZ hairless buttercup             |
| • <i>Senecio glomeratus</i>   | NZ groundsel                      |



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Christchurch Gun Club Dry Plains Grassland

**Site number:** SES/LP/33

**Physical address of site:** 290 & 580 Chattertons Road  
Harewood  
Christchurch

#### Summary of Significance:

The Christchurch Gun Club Dry Grasslands site is significant because it contains a relatively large area of vegetation that is representative of the Low Plains Ecological District including threatened plant, lizard and invertebrate species.

#### Site Map





## Additional Site Information

Central Point NZTM: N5186110, E1554899

Area of SES (ha): 147.90 ha

## Site Description

A relatively large area of dryland occupies the Gun Club lease east of Chattertons Road. It is dominated by exotic grassland but with significant areas of open stony ground, long abandoned stream channels and terraces that are home to some semi-natural communities. Scattered kowhai dot the grassland landscape. Surprisingly even the gun club carpark supports significant plant and insect communities because the short turf and bare ground mimics natural communities nearby.

## Extent of Site of Ecological Significance

The SES covers the area leased by the Christchurch Gun Club east of Chattertons Road, and the large area to the south, excluding the wide areas of shelter belts and cultivated land as shown on the location map.

## Assessment Summary

The Christchurch Gun Club Dry Plains Grassland site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013a) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1 & 2), and rarity/distinctiveness criteria (criteria 3 & 4).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Despite being degraded, this site contains vegetation that is representative of the natural diversity of the Low Plains Ecological District, and combined with

landforms comprises an area that is most similar in composition and structure to those communities that existed in 1840.

Vascular plant species recorded at the site by Patrick (2014) include the following (See also Environment Canterbury 2013b; Jensen 2012):

- *Carex breviculmis* sedge
- *Carex resectans* sedge
- *Carmichaelia corrugate* prostrate broom
- *Cheilanthes sieberi*
- *Colobanthus brevisepalus*
- *Crassula colligata* crassula
- *Dichondra brevispalis*
- *Dichondra repens*
- *Hypoxis spp*
- *Leucopogon fraseri*
- *Microtis unifolia* orchid
- *Muehlenbeckia axillaris* pohuehue
- *Muehlenbeckia axilaris x ephedroides* pohuehue
- *Muehlenbeckia ephedroides*
- *Oxalis exilis*
- *Olearia adenocarpa*
- *Poa maniototo*
- *Raoulia australis* raoulia
- *Raoulia monroi* raoulia
- *Rytidosperma exiguum*
- *Rytidosperma maculatum*
- *Scleranthus uniflorus*
- *Sophora microphylla* South Island Kowhai
- *Thelymitra longifolia*
- *Zoysia minima*

At least three species of indigenous moss were recorded at this site by Environment Canterbury (2013b), including:

- *Hypnum cupressiforme*
- *Polytrichum juniperinum*
- *Racomitrium spp*

In addition, many lichen species are found at this site and in some communities they dominate the indigenous cover and are usually associated with bare and open ground (Patrick 2014).

Indigenous invertebrates typical of dry grasslands and river terraces are significant at this site with relatively large populations of the undescribed boulder copper butterfly (Canterbury boulder copper of Patrick & Patrick, 2012). Other indigenous invertebrate species typical of these dry grassland habitats recorded by Patrick (2014) at the site include:

- *Monomorium antarcticum* (native ant)
- *Prepalla austrina* (day-flying moth)
- *Phaulacridium marginale* (grasshopper)



- *Pteronemobius bigelowi* (field cricket)
- *Conocephalius semivittatus* (katydid)
- *Pterophorus innotatalis* (plume moth)
- *Orocrambus flexuosellus* (crambid moth)
- *Orocrambus vittellus* (crambid moth)
- *Eudonia manganeutis* (crambid moth)
- *Scoparia exilis* (crambid moth)
- *Scoparia chalicodes* (crambid moth)
- *Capua semiferana* (tortricid moth)
- *Scopula rubraria* (geometrid moth)
- *Helastia corcularia* (geometrid moth)
- *Neocicindella latecincta* (tiger beetle)
- *Nysius huttoni* (tiny bug)

The scattered kowhai trees support a range of insects including the typical moths that depend solely on this host (Patrick 2014). These are:

- *Stathmopoda aposema*
- *Meterana decorata*
- *Pseudocoremia ochrea*
- *Uresiphita maoralis* (kowhai moth)
- *Stigmella sophorae*

Other insects found here are much less common in these savannah grasslands with some only known from this site in this landscape. These rare species include the tiny jumping moth *Kiwaia nsp.* "plains jumper" (Nationally Endangered – only known site in Christchurch's savannah grasslands), hopping moth *Eurythecta robusta* and the tiny moth *Kiwaia thyraula*. The un-named *Kiwaia* species (plains jumper) is only known elsewhere on Rakaia Island and several sites on Kaitorete Spit, but is not common anywhere. Some large moths breed on various herbs and grasses. These noctuids include dryland specialists such as *Aletia sistens*, *A. moderata* and *Tmetolophota propria* (Patrick 2014).

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

Indigenous dryland vegetation on the Canterbury Plains comprises only fragments of what was previously present, and although there are other tiny dryland fragments nearby to the site, none still contain native plants (Partridge 2007). At 147.90 hectares, this site is considered to comprise a relatively large example of this type of vegetation in the Low Plains Ecological District.



**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

This site contains vegetation that has been reduced to less than 20% of its former area in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site contains populations of threatened plant species listed in de Lange *et al.* (2013), including:

- |                                    |                                |
|------------------------------------|--------------------------------|
| • <i>Carmichaelia corrugata</i>    | At Risk/Declining              |
| • <i>Colobanthus brevisepalus</i>  | At Risk/Naturally Uncommon     |
| • <i>Muehlenbeckia ephedroides</i> | At Risk/Declining              |
| • <i>Olearia adenocarpa</i>        | Threatened/Nationally Critical |
| • <i>Raoulia monroi</i>            | At Risk/Declining              |

This may be the largest population of the generally uncommon *Raoulia monroi* in Canterbury and perhaps further afield, making it especially important. Here *R. monroi* is the most abundant indigenous plant (Patrick 2014).

Furthermore, populations of *Melicytus alpinus*, *Zoysia minima*, *Carex breviculmis*, *C. resectans*, *Rytidosperma exiguum*, *R. maculatum*, *Carmichaelia australis*, and *Poa maniototo* within this site are also significant under this criterion as they are considered locally rare, with very few populations remaining in the savannah grasslands (Patrick 2014; Environment Canterbury 2013b).

The site hosts populations of the At Risk/Naturally Uncommon tortricid moth (*Eurythecta robusta*), and the Nationally Endangered flightless 'plains jumper' (*Kiwaia nsp.*) which is only known from this site in Christchurch's savannah grasslands. The tiny moth *Kiwaia thyraula* which also occurs at the site is considered locally uncommon (Patrick 2014).

Common skinks (*Oligosoma polychroma*) are also found at this site (Patrick 2014), and are described as Taxonomically Indeterminate, At Risk/Declining (Hitchmough *et al.* 2013).



5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet criterion

### **Diversity and Pattern**

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet criterion

### **Ecological Context**

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Does not meet criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion



## Site Management

### Existing Protection Status

Land in public ownership (ECan)

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>Monitor pest plant infestations and implement weed control as required.</li> <li>Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Further species loss</li> </ul>	<ul style="list-style-type: none"> <li>Identify and mark existing native plant populations</li> <li>Re-introduce recently locally extinct species</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Changes to soil structure &amp; fertility as a result of changes in land management that threaten existing ecosystem function</li> </ul>	<ul style="list-style-type: none"> <li>Implement a land management change process so that inappropriate actions do not occur</li> <li>Assess any attempts to change the irrigation or fertiliser application regime as part of the land management change process.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Undesirable impacts of grazing</li> </ul>	<ul style="list-style-type: none"> <li>Develop a stock grazing programme that will allow continued use of the land for grazing purposes whilst preserving the existing ecological values.</li> <li>Promote research and monitoring to determine most appropriate stock management regime(s).</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

<ul style="list-style-type: none"> <li>Browsing damage to plants</li> </ul>	<ul style="list-style-type: none"> <li>Consider installation of rabbit proof fencing where appropriate within the SES (including individual plant patches) and eradicate pest animals from within fenced area(s)</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Fire damage through excessive grass growth</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that fire risk is kept low without compromising existing ecological values</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Inappropriate planting</li> </ul>	<ul style="list-style-type: none"> <li>Ensure any planting (e.g. farm shelter, restoration plantings) do not compromise existing ecological values.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Inappropriate impacts of land use by gun club</li> </ul>	<ul style="list-style-type: none"> <li>Consult with gun club management on a regular basis to ensure that they understand the ecological values and significance of plant and animal communities on the site.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

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## References

- De Lange, P. J., Rolfe, J. R., Champion, P. D., Courtney, S. P., Heenan, P. B., Barkla, J. W., Cameron, E. K., Norton, D. A., and Hitchmough, R. A. (2013) *Conservation status of New Zealand indigenous vascular plants, 2012*. Department of Conservation, Wellington, New Zealand.
- Environment Canterbury (2013a) *Canterbury Regional Policy Statement 2013*. Environment Canterbury.
- Environment Canterbury (2013b) *Ecological inspection of conservation areas on the West Melton Reserves, March – September 2012*. Unpublished Report. Environment Canterbury (TRIM 14/1404370).
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- Patrick, B. H. (2014) *Christchurch's savannah grasslands (Draft 27<sup>th</sup> August 2014)*. Unpublished Report for Christchurch City Council (TRIM 14/1419474).
- Patrick, B. H. & Patrick, H. J. H. (2012) *Butterflies of the South Pacific*. University of Otago Press. 250 pages.
- Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.



**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 26<sup>th</sup> November 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 26<sup>th</sup> November 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** McLeans Island Kanuka

**Site number:** SES/LP/34

**Physical address of site:** 890 McLeans Island Road  
Harewood

#### Summary of Significance:

The McLeans Island Kanuka SES is significant because it contains vegetation representative of the Low Plains Ecological District including locally uncommon plains kanuka.

#### Site Map:





### Site Information

**Central point NZTM:** N5188186, E1554937

**Area of SES (ha):** 0.40 ha

### Site Description

The McLeans Island Kanuka site consists of two small groves of remnant plains kanuka (*Kunzea serotina*), located by the Project Ecologist, CCC Botanist Trevor Partridge and Brian Patrick (Wildlands Consultants) in September 2014 within a late rotation plantation forest setting. One area (south east site) has been supplemented with additional kanuka, South Island kowhai (*Sorhora microphylla*) and Pomaderris (*Pomaderris amoena*) restoration plantings, while the second area (north west site) has natural seedling recruitment.

### Extent of Site of Ecological Significance

The proposed SES is in two parts, each consisting of a 25 m radius about the centres of each of the two groves (refer grid references). The 25 m radius is intended to provide a buffer against the adjacent forest management and harvesting operations.

### Assessment Summary

The McLeans Island Kanuka site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups.. Under these criteria the site is assessed as being ecologically significant because it meets the representativeness (criterion 1), and rarity/distinctiveness criteria (criteria 3, 4 & 5).



## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

Plains kanuka (*Kunzea serotina*) is representative of plains vegetation, and although small and degraded, this site is all that remains of this type of vegetation locally.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

Does not meet criterion

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The Threatened Environment Classification System identifies the Low Plains Ecological District as an 'Acutely Threatened' environment where less than 10% of the land area is under some form of indigenous vegetation cover (see Walker *et al.* 2007; Lloyd *et al.* 2013). This site therefore contains vegetation that has been reduced to less than 20% of its former area in the Low Plains Ecological District

- 4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site contains remnant plains kanuka (*Kunzea serotina*) which is uncommon in the Low Plains Ecological District.



**5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.***

The site is significant under this criterion.

Although planted as part of restoration plantings, Pomaderris (*Pomaderris amoena*) reaches its natural southern national distribution limit nearby at Eyrewell Forest on the North side of the Waimakariri River (NZ Plant Conservation Network). However populations of this species in the Eyrewell Forest are under threat from conversion to irrigated dairy farming, and occurrences of this species at nearby sites are likely to important for the conservation of the species.

**6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

Does not meet criterion

**Diversity and Pattern**

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

Does not meet criterion

**Ecological Context**

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

Does not meet criterion

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

Does not meet criterion

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

Does not meet criterion



## Site Management

### Existing Protection Status

Land in public ownership (ECan)

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>Excessive competition from pine trees</li> </ul>	<ul style="list-style-type: none"> <li>Develop a light-gap regime that allows the kanuka trees sufficient light to develop and grow.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Damage (including exposure to wind) resulting from plantation management and harvesting operations</li> </ul>	<ul style="list-style-type: none"> <li>Ensure forest managers are aware of the presence and significance of the kanuka trees, and of the roles (both beneficial and adverse) that the surrounding pine trees play.</li> <li>Ensure care is taken at time of harvest to protect the sites containing the kanuka trees</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Fire</li> </ul>	<ul style="list-style-type: none"> <li>Ensure land owners/managers have a suitable fire management strategy</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Small population size</li> </ul>	<ul style="list-style-type: none"> <li>Collect and propagate seed from trees and re-plant at this site and at other appropriate sites within the Low Plains Ecological District</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>



## References

Lloyd, K., McClellan, R., Hutchison, M., Patrick, B., and Shaw, W. (2013) *Guidelines for the application of ecological significance criteria for indigenous vegetation and habitats of indigenous fauna in Canterbury region*. Report prepared for Environment Canterbury by Wildlands Consultants, Rotorua, New Zealand.

Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 19<sup>th</sup> December 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 19<sup>th</sup> December 2014

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Kainga Road Salt Meadow

**Site number:** SES/LP/35

**Physical address of site:** 344 Kainga Road  
Brooklands  
Christchurch 8083

#### Summary of Significance:

The Kainga Road Salt Meadow SES is significant because it provides an important high tide roosting site for the Threatened - Nationally Vulnerable Banded Dotterel and other native waterfowl and wading birds.

#### Site Map:



### Additional Site Information

Central point NZTM: N5194429, E1574544

Area of SES (ha): 3.76 ha

### Site Description

The Kainga Road Salt Meadow SES straddles what was formerly a tidal stream which drained the low-lying area between the Styx River and the dune country to the west. The salt meadow covers several hectares and is dominated by glasswort and other salt-tolerant vegetation. The area is used as a daily high-tide roost and foraging area by Banded Dotterels (up to 150) and Spur-winged Plovers (up to 40). It is occasionally used as a roosting and feeding sites by other wetland birds (e.g. Paradise Shelduck, South Island Pied Oystercatcher, Pukeko) and is also suitable for uncommon migratory waders, particularly Golden Plover and several species of dotterel and sandpiper.

### Extent of Site of Ecological Significance

The site extends approximately 256 m south from the 200 m Kainga Road frontage (between properties 415 and 433 Kainga Road on the opposite side of the road) to encompass an area of 3.76 ha, including a 320 m length remnant saline channel within the salt meadow area (refer Location Map).

### Assessment Summary

The Kainga Road Salt Meadow SES has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups.. Under these criteria the site is ecologically significant because it meets rarity/distinctiveness (criterion 4), and ecological context (Criterion 10).

### Assessment of Significance Criteria

#### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.*

Site not assessed under this criterion



2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

Site not assessed under this criterion

### **Rarity/Distinctiveness**

3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

Site not assessed under this criterion

4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.*

The site is significant under this criterion.

The site provides a significant high tide roosting site for Threatened/Nationally Vulnerable (Robertson *et al.* 2013) Banded Dotterel (*Charadrius bicinctus bicinctus*) (refer Appendix 1; Crossland 2014).

The area is used as a daily high-tide roost and foraging area by Banded Dotterels (up to 150) and is occasionally used as a roosting and feeding sites by other wetland birds including the At Risk/Declining South Island Pied Oystercatcher (Crossland 2008).

5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet criterion

### **Diversity and Pattern**

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Site not assessed under this criterion



### Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Does not meet criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Site not assessed under this criterion

10. ***Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

The site provides a significant high tide roosting site for native waterfowl and waders, most notably the Threatened/Nationally Vulnerable (Robertson *et al.* 2013) Banded Dotterel (*Charadrius bicinctus bicinctus*).

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## Site Management

### Existing Protection Status

No current protection status.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Filling and/or cultivation of low areas</li> </ul>	<ul style="list-style-type: none"> <li>Consider not filling in of the ephemeral ponding area</li> <li>Consider managing agricultural activities that will benefit biodiversity. ploughing, cultivation and over-sowing</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about benefits to biodiversity of various management regimes.</li> <li>Assistance available where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Draining of ponded area</li> </ul>	<ul style="list-style-type: none"> <li>Consider not draining of the ephemeral ponding area</li> </ul>	

## References

Crossland, A. C. (2008) *Brooklands Lagoon wetland complex: an overview of the site's importance to birdlife with habitat management recommendations*. Christchurch City Council.

Crossland, A. C. (2014) *Kainga Road saltmeadow pond bird monitoring*. Unpublished Dataset, Christchurch City Council. (TRIM Reference 14/1361457).

Robertson, H., Dowding, J., Elliott, G., Hitchmough, R., Miskelly, C. O'Donnell, C., Powlesland, R., Sagar, P., Scofield, P., Taylor, G. (2013) *Conservation status of New Zealand birds, 2012*. New Zealand Threat Classification Series 4, Dept.t of Conservation.

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 30th October 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 30th October 2014

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.





## Appendix 1

Banded Dotterel monitoring data for the Kainga Road Saltmeadow (Source: Crossland 2014)

Date	30/01/11	11/02/11	20/02/11	15/03/11	26/04/11	31/05/11	27/06/11
Number	52	41	12	15	30	83	19

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Lower Styx Road Ephemeral Ponding

**Site number:** SES/LP/36

**Physical address of site:** 119 Lower Styx Road  
Marshland  
Christchurch 8083

#### Summary of Significance:

The Lower Styx Road Ephemeral Ponding SES is significant because it provides an important feeding and nesting site for the At Risk/Declining Pied Stilt, and also supports the At Risk/Declining South Island Pied Oystercatcher.

#### Site Map:





### **Additional Site Information**

**Central point NZTM** N5189000, E1573381

**Area of SES (ha):** 0.84 ha

### **Site Description**

The site comprises an extensive area of ephemerally ponded exotic grazed pasture that is used extensively by native waterfowl and waders, especially Pied Stilts for nesting and feeding.

### **Extent of Site of Ecological Significance**

The site covers approximately 0.84 hectares located on the north side of Lower Styx Road (refer to location map), and covers the extent of the regularly ponded area.

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## Assessment Summary

The Lower Styx Road Ephemeral Ponding site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets rarity/distinctiveness (criterion 4) and ecological context criteria (criterion 10).

## Assessment of Significance Criteria

### Representativeness

1. *Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.*

Does not meet criterion

2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

Does not meet criterion

### Rarity/Distinctiveness

3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

Does not meet criterion

4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.*

The site is significant under this criterion.

The site provides a significant nesting and feeding site for At Risk/Declining Pied Stilts (*Himantopus himantopus leucocephalus*), and also supports the At Risk/Declining South Island Pied Oystercatcher (*Haematopus finschi*) (Crossland 2014; Appendix 1; Robertson *et al.* 2013).



5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet criterion

#### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet criterion

#### Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Does not meet criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet criterion

10. ***Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

The site provides a significant nesting and feeding site for At Risk/Declining Pied Stilts (*Himantopus himantopus leucocephalus*), and also supports the At Risk/Declining South Island Pied Oystercatcher (*Haematopus finschi*) (Crossland 2014; Appendix 1; Robertson *et al.* 2013).

## Site Management

### Existing Protection Status

No current protection status.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Filling of low areas</li> </ul>	<ul style="list-style-type: none"> <li>Consider the impacts on biodiversity of the filling in of the ephemeral ponding area</li> </ul>	<ul style="list-style-type: none"> <li>Engagement between CCC and landowner to discuss the benefits to biodiversity of and options for land management practices.</li> </ul>
<ul style="list-style-type: none"> <li>Draining of ponded area</li> </ul>	<ul style="list-style-type: none"> <li>Consider the impacts on biodiversity of the draining in of the ephemeral ponding area</li> <li>Consider the impacts on biodiversity of ploughing and/or cultivation of the site</li> </ul>	<ul style="list-style-type: none"> <li>Engagement between CCC and landowner to discuss the benefits to biodiversity of and options for land management practices.</li> </ul>
<ul style="list-style-type: none"> <li>Disturbance of nesting sites by livestock and uncontrolled dogs</li> </ul>	<ul style="list-style-type: none"> <li>Ensure stilts and other protected wetland bird species are not disturbed during nesting and rearing young.</li> </ul>	<ul style="list-style-type: none"> <li>Engagement between CCC and landowner to discuss the benefits to biodiversity of public access and stock management, particularly during the breeding season.</li> </ul>



## References

Crossland, A. C. (2014) *Lower Styx Road ephemeral ponding bird monitoring*. Unpublished Dataset, Christchurch City Council. (TRIM Reference 14/621106)

Robertson, H., Dowding, J., Elliott, G., Hitchmough, R., Miskelly, C. O'Donnell, C., Powlesland, R., Sagar, P., Scofield, P., Taylor, G. (2013) *Conservation status of New Zealand birds, 2012*. New Zealand Threat Classification Series 4, Dep.t of Conservation.

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 31st October 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 31st October 2014

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.



**Appendix 1**

**Lower Styx Road Ephemeral Ponding Bird Monitoring (Crossland 2014)**

Species	12/02/12	7/01/13	3/02/13	25/02/14	10/06/14	15/06/14	24/06/14	1/10/14	15/10/14
Black Swan		0	0	0	0	2	2	0	0
Cape Barren Goose	2	2	2	2	0	0	0	0	0
Paradise Shelduck		2	2	32	9	4	2	2	2
Mallard/Grey/Hybrid		12	6	0	18	2	0	0	1
NZ Shoveler		0	0	0	16	0	0	2	2
Grey Teal		6	4	0	88	0	0	0	2
Pukeko		0	0	2	0	0	0	0	0
SIPO		0	0	0	0	2	0	0	2
Pied Stilt		8	6	0	0	25	2	13	8
Spur-winged Plover		0	0	0	2	0	0	2	0
Welcome Swallow		0	0	0	0	0	2	0	0

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Chaney's/Kainga Wetland

**Site number:** SES/LP/37

**Physical address of site:** 65 Kainga Road  
Brooklands  
Christchurch 8083

#### Summary of Significance:

The Chaney's/Kainga Wetland SES is significant because it contains remnant native wetland vegetation including a Nationally Endangered species, and provides a significant habitat for native waterfowl.

#### Site Map:





### **Additional Site Information**

**Central point:** N5192711, E1572313

**Area of SES (ha):** 1.57 ha

### **Site Description**

The site is a lacustrine system dominated by crack and grey willow (*Salix fragilis* and *S. cinerea* respectively), surrounding pukio sedge (*Carex secta*) dominated open wetland and pond areas that provide ideal cover, feeding, resting and nesting habitat for native waterfowl, particularly Grey Teal.

### **Extent of Site of Ecological Significance**

The SES area is largely defined by the areal extent of the willow canopy surrounding the main water bodies and wetlands within the site, but excludes any outlier willows that are not directly associated with the wetland areas (Refer location map).

### **Assessment Summary**

The Chaney/Kainga Wetland has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below). Under these criteria the site is ecologically significant because it meets representativeness (criterion 1), rarity/distinctiveness (criterion 3), and ecological context (criteria 10).



## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion. Although degraded, the site supports remnant wetland vegetation that is typical and characteristic of the natural diversity of the Low Plains Ecological District.

The following vascular plant species were recorded by Meurk *et al.* (1993) and were re-confirmed as present by the project ecologist in November 2014.

- |                             |            |
|-----------------------------|------------|
| • <i>Azola filiculoides</i> | water fern |
| • <i>Carex coriacea</i>     | sedge      |
| • <i>Carex flagelifera</i>  | sedge      |
| • <i>Carex maorica</i>      | sedge      |
| • <i>Carex secta</i>        | sedge      |
| • <i>Elaeocharis acuta</i>  |            |
| • <i>Juncus distegus</i>    | wiwi       |
| • <i>Juncus edgariae</i>    | wiwi       |
| • <i>Juncus pallidus</i>    | wiwi       |
| • <i>Lemna minor</i>        | duck weed  |
| • <i>Typha orientalis</i>   | raupo      |

The Threatened/Nationally Endangered floating aquatic liverwort (*Ricciocarpus natans*) was also recorded by the CCC Botanist and Project Ecologist at this site in 2012.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

Does not meet criterion



### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The site contains remnant wetland vegetation that has been reduced to less than 20% of its former extent in the Low Plains Ecological District. The Threatened Environment Classification reports that less than 10% of indigenous cover remains in the Low Plains Ecological District (See Walker *et al.* 2007; Lloyd *et al.* 2013).

- 4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

This site contains the Threatened/Nationally Endangered aquatic floating liverwort (*Ricciocarpus natans*) recorded by CCC Botanist Trevor Partridge in 2012 (TRIM Reference 14/1401630).

- 5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion

- 6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

Does not meet criterion

### Diversity and Pattern

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

Does not meet criterion



#### Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Does not meet criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Site not assessed under this criterion

10. ***Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

The site provides important local habitat for populations of Grey Teal (*Anas gracilis*) (Refer Crossland 2014).

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## Site Management

### Existing Protection Status

No current protection status.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Livestock access to wetland</li> </ul>	<ul style="list-style-type: none"> <li>Fence margins of wetland to exclude livestock</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Drainage and infilling</li> </ul>	<ul style="list-style-type: none"> <li>Ensure site retains inflow of water and do not increase rate of drainage.</li> <li>Retain more water within wetland if feasible to increase extent and depth of open water and to improve habitat condition.</li> <li>Prohibit further infilling and rubbish dumping</li> <li>Consider excavating edge to increase size of wetland area</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Invasion by willows and invasive weeds</li> </ul>	<ul style="list-style-type: none"> <li>Control growth of weed species</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

## References

- Crossland, A. C. (2014) *Chaney's Wetland bird monitoring 2003 to present*. Unpublished Dataset, Christchurch City Council. (TRIM Reference 14/442714).
- Lloyd, K., McClellan, R., Hutchison, M., Patrick, B., and Shaw, W. (2013) *Guidelines for the application of ecological significance criteria for indigenous vegetation and habitats of indigenous fauna in Canterbury region*. Report prepared for Environment Canterbury by Wildlands Consultants, Rotorua, New Zealand.
- Meurk, C.D., ward, J. C., and O'Connor, K. F. (1993) *Natural areas of Christchurch: evaluation and recommendations for management as heritage*. Christchurch City Council, Christchurch, New Zealand.
- Robertson, H., Dowding, J., Elliott, G., Hitchmough, R., Miskelly, C. O'Donnell, C., Powlesland, R., Sagar, P., Scofield, P., Taylor, G. (2013) *Conservation status of New Zealand birds, 2012*. New Zealand Threat Classification Series 4, Dep.t of Conservation.
- Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 31st October 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 31st October 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



**Appendix 1**

**Chaney's Wetland Bird Monitoring (2003 - Present) (Source Crossland 2014).**

Species	13/08/03	3/02/04	8/10/04	1/04/05	3/05/06	27/05/14	15/10/14
Black Cormorant	0	0	0	0	1	0	0
Paradise Shelduck	0	0	1	2	0	0	2
Mallard/Grey/Hybrid	24	1	8	7	35	6	10
Grey Duck	2	0	0	0	0	0	0
NZ Shoveler	2	0	8	0	2	0	0
Grey Teal	30	3	5	4	45	86	6
Harrier	1	0	0	0	0	1	1
Pukeko	1	0	0	0	0	16	8
Spur-winged Plover	3	0	4	0	0	0	2
NZ Kingfisher	0	0	1	0	0	0	1
Welcome Swallow	2	0	0	0	0	0	0

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Creamery Ponds

**Site number:** SES/LP/38

**Physical address of site:** 86 Sabys Road  
Halswell  
Christchurch 8025

#### Summary of Significance:

The Creamery Ponds SES is significant because it provides habitat for an assemblage of indigenous birds that are representative of freshwater lakes and ponds including two threatened and at-risk species, and also supports at-risk longfin eel.

#### Site Map:



### **Additional Site Information**

**Central point NZTM:** N5173235, E1564293

**Area of SES (ha):** 3.00 ha

### **Site Description**

The site includes a series of constructed ponds within a CCC reserve (Creamery Ponds Reserve), and their marginal vegetation, including both native sedges and rushes, and also rank grasses that are used for nesting and cover. Indigenous plant species within the reserve area are limited to those that have either been planted or naturally established around the margins of the lakes, while the balance of the reserve area remains undeveloped rank exotic pasture grasses. Downstream from Sabys Road, Creamery Stream is a natural but degraded watercourse that passes through private farmland before discharging into Knights Stream approximately 200 m upstream with its confluence with Halswell River.

### **Extent of Site of Ecological Significance**

The SES area covers approximately three hectares, and encompasses all the waterbodies within the Creamery Ponds Reserve. The SES extends back from the waters edge to the limit of the regularly mown grass areas, measuring approximately 10 m in width along the margins of the two northern ponds, and approximately 6 m in width along the margins of the southern pond as shown on the location map. The width of the Creamery Stream SES downstream from Sabys Road is defined by the width of the stream between the top of banks to include the area of flowing water and marginal vegetation. Here the approximate width of the SES is ten metres.

### **Assessment Summary**

The Creamery Pond site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets representativeness (criteria 1), and rarity/distinctiveness (criterion 4).



## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

This site regularly hosts a representative assemblage (15 species) of native birds that are associated with freshwater lakes and ponds (Crossland 2014b) in the Low Plains Ecological District (Refer Appendix 1; Crossland 2014a).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

Does not meet criterion

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

Does not meet criterion

- 4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The Creamery Ponds SES supports At Risk/Declining pied stilts (*Himantopus himantopus leucocephalus*), and the At Risk/Naturally Uncommon Black Cormorant (*Phalacrocorax carbo novaehollandiae*) (Refer Crossland 2014; Robertson *et al.* 2012).

Creamery Drain supports longfin eel (*Anguilla dieffenbachia*) (Taylor and Blair 2012) which is classified as At Risk -Declining (Allibone *et al.* 2010). Longfin eels were recorded in Creamery Drain in several locations as far upstream as the upper pond in Creamery Reserve. Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of Creamery Drain downstream of the sampled locations to its confluence with Knights Stream SES is included as part of this SES.



5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Does not meet criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet criterion

#### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet criterion

#### Ecological Context

8. ***Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

This site supports longfin eel (*Anguilla dieffenbachia*) (Taylor and Blair 2012). Because longfin eel are a migratory species, they require migration routes to the sea, and therefore the length of Creamery Drain downstream of the sampled location to its confluence with Knights Stream is included as part of this SES. Note that both Knights Stream and the Halswell River downstream of Creamery Drain are contained within other proposed SES's, facilitating a continuous ecological linkage to the sea.

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion

## Site Management

### Existing Protection Status

Partly in public ownership

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Disturbance to wildlife by people once reserve area is developed and officially open to the public</li> </ul>	<ul style="list-style-type: none"> <li>Liaise with CCC ornithologist and ecologists to determine optimum planting strategy to screen high use areas from wildlife</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Uncontrolled dogs</li> </ul>	<ul style="list-style-type: none"> <li>Establish areas of reserve where dogs must be on a leash, and install interpretive signage highlighting the threat/disturbance to wildlife posed by dogs</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>High populations of mallard and mallard/grey duck hybrids likely to have adverse impacts on water quality</li> </ul>	<ul style="list-style-type: none"> <li>Establish dense riparian, shrub and forest vegetation around margins of ponds and throughout the wider reserve area to discourage these species, and encourage indigenous waterfowl and swampbird species.</li> <li>Prohibit duck feeding by visitors</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Reserve may be developed as high-use picnic and recreational site</li> </ul>	<ul style="list-style-type: none"> <li>Ensure development planning for the wider reserve area is complementary with the natural values of the SES.</li> <li>Ensure that substantial parts of the shoreline and the island are inaccessible to people and</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

	<p>dogs.</p> <ul style="list-style-type: none"><li>• Complete planting programme of native riparian and woodland plant species to maximise habitat value and to buffer pond margins.</li></ul>	
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## References

Allibone, R., David, B., Hitchmough, R., Jellyman, D., Ling, N., Ravenscroft, P. & Waters, J. (2010). *Conservation status of New Zealand freshwater fish, 2009*. *New Zealand Journal of Marine and Freshwater Research*, 44(4): 271-287.

Crossland, A. C. (2014a) *Creamery Reserve bird monitoring*. Unpublished Dataset, Christchurch City Council. (TRIM Reference 14/608059).

Crossland, A. C. (2014b) *Association of indigenous species; all species that are residents or regular visitors to a given habitat type in Christchurch/Banks peninsula*. Christchurch City Council. (TRIM Reference 14/756446).

Goodman, J. M., Dunn, N. R., Ravenscroft, P. J., Allibone, R. M., Boubee, J. A. T., David, B. O., Griffiths, M., Ling, N., Hitchmough, R. A., and Rolfe, J. R. (2014) *Conservation status of New Zealand freshwater fish, 2013*. (New Zealand Threat Classification Series No. 7). Department of Conservation, Wellington.

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Taylor, M. and W. Blair (2012). *Halswell and Heathcote aquatic values*. Christchurch, Aquatic Ecology LTD.

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 31st October 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 31st October 2014

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.



**Appendix 1**

**Creamery Reserve Bird Monitoring (2014)** (Source Crossland 2014).

Species	9/02/14	5/05/14	29/06/14	20/08/14	24/08/14	26/10/14	3/11/14
Black Cormorant	0	1	0	0	0	1	2
Little Cormorant	1	0	2	1	1	0	0
Black Swan	2	2	1	2	2	0	2
Paradise Shelduck	9	4	1	0	0	0	2
NZ Shoveler	2	29	27	9	7	4	9
NZ Scaup	54	31	22	22	22	40	36
Grey Teal	5	3	4	2	0	0	0
Harrier	1	0	1	0	1	0	0
Pukeko	5	0	15	11	15	6	8
Australasian Coot	0	0	0	0	0	2	3
Pied Stilt	0	0	0	0	0	0	3
Spur-winged Plover	0	0	0	0	2	2	0
Black-backed Gull	0	0	0	0	0	0	0
NZ Kingfisher	0	0	0	0	0	1	0
Welcome Swallow	2	1	2	0	2	6	9

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Cashmere Road Ephemeral Pond

**Site number:** SES/LP/39

**Physical address of site:** 750 Cashmere Road & 32 Sutherlands Road  
Halswell  
Christchurch 8025

#### Summary of Significance:

The Cashmere Road Ephemeral Ponding SES is significant because it provides an important feeding and nesting site for the At Risk/Declining Pied Stilt, and supports 12 other native bird species that associated with freshwater lakes and ponds.

#### Site Map:





## Additional Site Information

**Central point NZTM:** N5173607, E1566512

**Area of SES (ha):** 2.50 ha

## Site Description

The site comprises an extensive area of ephemerally ponded exotic grazed pasture that is used extensively by native waterfowl and waders, most notably Pied Stilts for nesting and feeding.

## Extent of Site of Ecological Significance

The site covers approximately 2.5 hectares located on the northwest side of Cashmere Road (refer to location map), and covers the extent of the regularly ponded area.

## Assessment Summary

The Cashmere Road Ephemeral Ponding site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets representative (criterion 1), rarity/distinctiveness (criterion 4) and ecological context criteria (criterion 10).

## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The Cashmere Road Ephemeral Ponding site supports 13 species of bird listed by Crossland (2014a) as being associated with freshwater lakes and ponds in the Low Plains Ecological District. Although the site does not host the full compliment of species, it is still significant under this criteria as it is one of the best remaining examples of this type of habitat.



2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

Site not assessed under this criterion

#### **Rarity/Distinctiveness**

3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

Does not meet criterion

4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.*

The site is significant under this criterion.

The site provides a significant nesting and feeding site for At Risk/Declining (Robertson *et al.* 2013) pied stilts (*Himantopus himantopus leucocephalus*) (Crossland 2014b; Appendix 1). During a site visit by the Project Ecologist on 3<sup>rd</sup> November 2014, at least 19 Pied Stilts were present at this site.

5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet criterion

#### **Diversity and Pattern**

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet criterion



## Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Does not meet criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet criterion

- 10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

The site provides a significant nesting and feeding site for At Risk/Declining (Robertson *et al.* 2013) pied stilts (*Himantopus himantopus leucocephalus*) (Crossland 2014b; Appendix 1). During a site visit by the Project Ecologist on 3<sup>rd</sup> November 2014, at least 19 Pied Stilts were present at this site.

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## Site Management

### Existing Protection Status

Partly in public ownerships.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Filling of low areas</li> </ul>	<ul style="list-style-type: none"> <li>Consider not filling in of the ephemeral ponding area</li> <li>Consider not ploughing and cultivation of habitat.</li> </ul>	<ul style="list-style-type: none"> <li>Discussions with landowner about benefits to biodiversity of different management regimes</li> <li>Assistance available where appropriate</li> </ul>
<ul style="list-style-type: none"> <li>Draining of ponded area</li> </ul>	<ul style="list-style-type: none"> <li>Consider not draining in of the ephemeral ponding area</li> <li>Consider not ploughing and cultivation of habitat.</li> </ul>	
<ul style="list-style-type: none"> <li>Disturbance of nesting sites by livestock and uncontrolled dogs</li> </ul>	<ul style="list-style-type: none"> <li>Remove livestock during stilt nesting season, and ensure dogs do not enter area during this period</li> </ul>	
<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Investigate land-swap with neighbouring CCC owned land to ensure natural values are protected, developed and managed appropriately into the future</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about options available</li> </ul>



## References

Crossland A. C. (2014a) *Association of indigenous species; all species that are residents or regular visitors to a given habitat type in Christchurch/Banks Peninsula*. Christchurch City Council (TRIM 14/756446).

Crossland, A. C. (2014b) *Cashmere Road ephemeral pond bird monitoring*. Unpublished Dataset, Christchurch City Council. (TRIM Reference 14/633531)

Robertson, H., Dowding, J., Elliott, G., Hitchmough, R., Miskelly, C. O'Donnell, C., Powlesland, R., Sagar, P., Scofield, P., Taylor, G. (2013) *Conservation status of New Zealand birds, 2012*. New Zealand Threat Classification Series 4, Dep.t of Conservation.

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 31st October 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 31st October 2014

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.

## Appendix 1

### Cashmere Road Ephemeral Ponding Bird Monitoring (Crossland 2014)

Species	21/10/12	17/01/13	5/05/14	14/07/14	28/09/14	9/10/14	23/10/14	3/11/14
Aust Little Grebe	0	0	0	0	0	0	0	n/c
Black Cormorant	0	0	0	0	0	0	0	n/c
Little Cormorant	0	0	0	0	0	1	0	n/c
White-faced Heron	0	0	0	0	0	0	1	n/c
Mute Swan	0	0	0	0	0	0	0	n/c
Black Swan	0	0	0	1	0	0	0	n/c
Canada Goose	0	0	0	0	2	0	0	n/c
Feral Goose	0	0	0	0	0	0	0	n/c
Paradise Shelduck	2	0	0	2	0	0	2	n/c
Mallard/Grey/Hybrid	6	2	12	64	12	13	14	n/c
NZ Shoveler	4	0	12	96	64	34	16	n/c
NZ Scaup	3	0	0	0	4	0	2	n/c
Grey Teal	4	0	38	92	28	12	22	n/c
Harrier	0	0	0	1	1	0	1	n/c
Pukeko	0	0	9	17	0	5	4	n/c
Australasian Coot	0	0	0	0	0	0	0	n/c
Pied Stilt	3	2	2	0	14	19	10	19
Spur-winged Plover	0	0	2	0	0	2	2	n/c
Black-backed Gull	0	0	0	1	0	0	0	n/c
Red-billed Gull	0	0	0	0	0	0	0	n/c
Black-billed Gull	0	0	0	0	0	0	0	n/c
NZ Kingfisher	0	0	0	0	0	0	0	n/c
Welcome Swallow	3	8	0	2	4	4	0	n/c
<b>TOTAL</b>	<b>25</b>	<b>12</b>	<b>75</b>	<b>276</b>	<b>129</b>	<b>90</b>	<b>74</b>	<b>-</b>



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Main North Road Ephemeral Ponding

**Site number:** SES/LP/40

**Physical address of site:** 2 Link Road & 1180 Main North Road  
Bridgend  
Christchurch 8083

#### Summary of Significance:

The Main North Road Ephemeral Ponding SES is significant because it provides an important feeding and nesting site for the At Risk/Declining Pied Stilt and also supports the At Risk/Declining South Island Pied Oystercatcher.

#### Site Map:







## Additional Site Information

**Central point NZTM:** N5191759, E1571763

**Area of SES (ha):** 1.90 ha

## Site Description

The site comprises an extensive area of ephemerally ponded exotic grazed pasture that is used by native waterfowl and waders, especially Pied Stilts for nesting and feeding.

## Extent of Site of Ecological Significance

The site covers approximately 1.9 hectares located on the east side of Marshland Road (refer to location map), and covers the extent of the regularly ponded area.

## Assessment Summary

The Main North Road Ephemeral Ponding site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets rarity/distinctiveness (criterion 4) and ecological context criteria (criterion 10).

## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.*

Does not meet criterion

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

Does not meet criterion



### Rarity/Distinctiveness

3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

Does not meet criterion

4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.*

The site is significant under this criterion.

The site provides a significant nesting and feeding site for At Risk/Declining Pied Stilts (*Himantopus himantopus leucocephalus*) and also supports the At Risk/Declining South Island Pied Oystercatcher (*Haematopus ostralegus finschi*) (Robertson *et al.* 2013; Crossland 2014; Appendix 1).

5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Does not meet criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet criterion

### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet criterion

### Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Does not meet criterion



9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

The site is significant under this criterion.

The site provides a significant nesting and feeding site for At Risk/Declining Pied Stilts (*Himantopus himantopus leucocephalus*) and also supports the At Risk/Declining South Island Pied Oystercatcher (*Haematopus ostralegus finschi*) (Robertson *et al.* 2013; Crossland 2014; Appendix 1).

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## Site Management

### Existing Protection Status

No current protection status.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Filling of low areas</li> </ul>	<ul style="list-style-type: none"> <li>Consider not filling in of the ephemeral ponding area</li> </ul>	<ul style="list-style-type: none"> <li>Discussions with landowner about the benefits to biodiversity of different options of land and stock management</li> <li>Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Draining of ponded area</li> </ul>	<ul style="list-style-type: none"> <li>Consider not draining in of the ephemeral ponding area</li> </ul>	
<ul style="list-style-type: none"> <li>Disturbance of nesting sites by livestock and uncontrolled dogs</li> </ul>	<ul style="list-style-type: none"> <li>Consider the removal of livestock during stilt nesting season, and ensure dogs do not enter area during this period</li> </ul>	
<ul style="list-style-type: none"> <li>Cultivation and ploughing – see this entry under other sites</li> </ul>	<ul style="list-style-type: none"> <li>Consider not ploughing and cultivation of habitat.</li> </ul>	

## References

Crossland, A. C. (2014) *Main North Road (Chaney's) ephemeral wetlands bird monitoring*. Unpublished Dataset, Christchurch City Council. (TRIM Reference 14/1233957).

Robertson, H., Dowding, J., Elliott, G., Hitchmough, R., Miskelly, C. O'Donnell, C., Powlesland, R., Sagar, P., Scofield, P., Taylor, G. (2013) *Conservation status of New Zealand birds, 2012*. New Zealand Threat Classification Series 4, Dep.t of Conservation.

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 31st October 2014

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 31st October 2014

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.



**Appendix 1**

**Naon North Road (Chaney's) Ephemeral Wetlands Bird Monitoring Data (Crossland 2014).**

Species	1/10/2014	15/10/2014
Black Cormorant	0	0
Little Cormorant	0	0
White Heron	0	0
White-faced Heron	0	1
Black Swan	0	0
Canada Goose	0	0
Feral Goose	0	0
Paradise Shelduck	4	2
Mallard/Grey/Hybrid	4	7
Grey Duck	0	0
NZ Shoveler	0	0
NZ Scaup	0	0
Grey Teal	0	0
Harrier	0	0
Pukeko	4	0
Australasian Coot	0	0
SIPO	2	0
Pied Stilt	10	8
Spur-winged Plover	2	4
Black-backed Gull	0	0
Red-billed Gull	0	0
Black-billed Gull	0	0
NZ Kingfisher	0	0
Welcome Swallow	0	0
<b>TOTAL</b>	<b>26</b>	<b>22</b>

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** McLeans Island Road

**Site number:** SES/LP/41

**Physical address of site:** 1) 140 Clarksons Road  
Harewood

2) 180 Conservators Road  
Harewood

#### Summary of Significance:

The McLeans Island Road site has is significant because it contains vegetation representative of the Low Plains Ecological District including a locally uncommon clematis and hybrid kowhai species.

#### Site Map:



**Site Information**

**Central point NZTM:** N5186612, E1558010

**Area of SES (ha):** 1.60 ha

**Site Description**

The McLeans Island Road SES is a degraded remnant danthonia grassland containing several indigenous woody species.

**Extent of Site of Ecological Significance**

The SES is defined by a north-south fence line along the eastern side of the site, and includes an area of danthonia grassland around fenced off plot containing a large kowhai tree and other indigenous plant species. The SES also extends to include a small portion of Fulton Hogan land containing a locally uncommon kowhai hybrid and other remnant vegetation as shown on the location diagram.

**Assessment Summary**

The McLeans Island Road site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is assessed as being ecologically significant because it meets the representativeness (criterion 1), and rarity/distinctiveness criteria (criteria 3 and 4).





## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The SES contains plant species that are representative of plains vegetation, and although small and degraded, this site one of few sites that remain of this type of vegetation locally.

- |  |                        |
|--|------------------------|
| • <i>Clematis quadribracteolata</i>      | a native clematis      |
| • <i>Dichondra repens</i>                | dichondra              |
| • <i>Discaria toumatu</i>                | matagouri              |
| • <i>Elymus spp.</i>                     | a native grass species |
| • <i>Muehlenbeckia axillaris</i>         | pohuehue               |
| • <i>Poa cita</i>                        | silver tussock         |
| • <i>Rytidosperma spp.</i>               | danthonia              |
| • <i>Sophora microphylla</i>             | South Island kowhai    |
| • <i>Sophora microphylla x prostrata</i> | hybrid kowhai          |
| • <i>Zoysia minima</i>                   | sand twitch            |

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

Does not meet criterion

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion. The Threatened Environment Classification System identifies the Low Plains Ecological District as an 'Acutely Threatened' environment where less than 10% of the land area is under some form of indigenous vegetation cover (see Walker *et al.* 2007; Lloyd *et al.* 2013). This site therefore contains vegetation that has been reduced to less than 20% of its former area in the Low Plains Ecological District



**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion. Site contains remnant *Clamatis quadibracteolata* and *Sophora microphylla x prostrata* which are both considered uncommon in the Low Plains Ecological District.

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

Does not meet criterion

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

Does not meet criterion

**Ecological Context**

**8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

Does not meet criterion

**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

Does not meet criterion

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

Site not assessed under this criterion

## Site Management

### Existing Protection Status

Land in public ownership (CCC and ECan)

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>• Competition and suppression of native plants by exotic marram grass and other undesirable exotic species within the enclosure plot.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop a management programme to reverse undesirable trends within the enclosure plot (marram spread, elderberry growth, excessive grass growth).</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Pest plant incursion</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor pest plant infestations and implement control as required.</li> <li>• Assess new pest plant incursions and implement control as required</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Further species loss</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and mark existing native plant populations</li> <li>• Re-introduce recently locally extinct species</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>
<ul style="list-style-type: none"> <li>• Changes to soil structure &amp; fertility as a result of changes in land management that threaten existing ecosystem function</li> </ul>	<ul style="list-style-type: none"> <li>• Implement a land management change process so that inappropriate actions do not occur</li> <li>• Assess any attempts to change the irrigation or fertiliser application regime as part of the land management change process.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>

<ul style="list-style-type: none"> <li>Undesirable impacts of grazing</li> </ul>	<ul style="list-style-type: none"> <li>Develop a stock grazing programme that will allow continued use of the land for grazing purposes whilst preserving the existing ecological values.</li> <li>Promote research and monitoring to determine most appropriate stock management regime(s).</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Browsing damage to plants</li> </ul>	<ul style="list-style-type: none"> <li>Consider installation of rabbit proof fencing where appropriate within the SES (including individual plant patches) and eradicate pest animals from within fenced area(s)</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Fire damage through excessive grass growth</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that fire risk is kept low without compromising existing ecological values</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Inappropriate planting</li> </ul>	<ul style="list-style-type: none"> <li>Ensure any planting (e.g. farm shelter, restoration plantings) do not compromise existing ecological values.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

DRAFT



## References

Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.

Lloyd, K., McClellan, R., Hutchison, M., Patrick, B., and Shaw, W. (2013) *Guidelines for the application of ecological significance criteria for indigenous vegetation and habitats of indigenous fauna in Canterbury region*. Report prepared for Environment Canterbury by Wildlands Consultants, Rotorua, New Zealand.

Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., and Porteous, T. (2007) *Guide to users of the threatened environment classification*. Landcare Research, Lincoln, New Zealand.

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 13<sup>th</sup> February 2015

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 13<sup>th</sup> February 2015

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site Name:** Papanui Stream

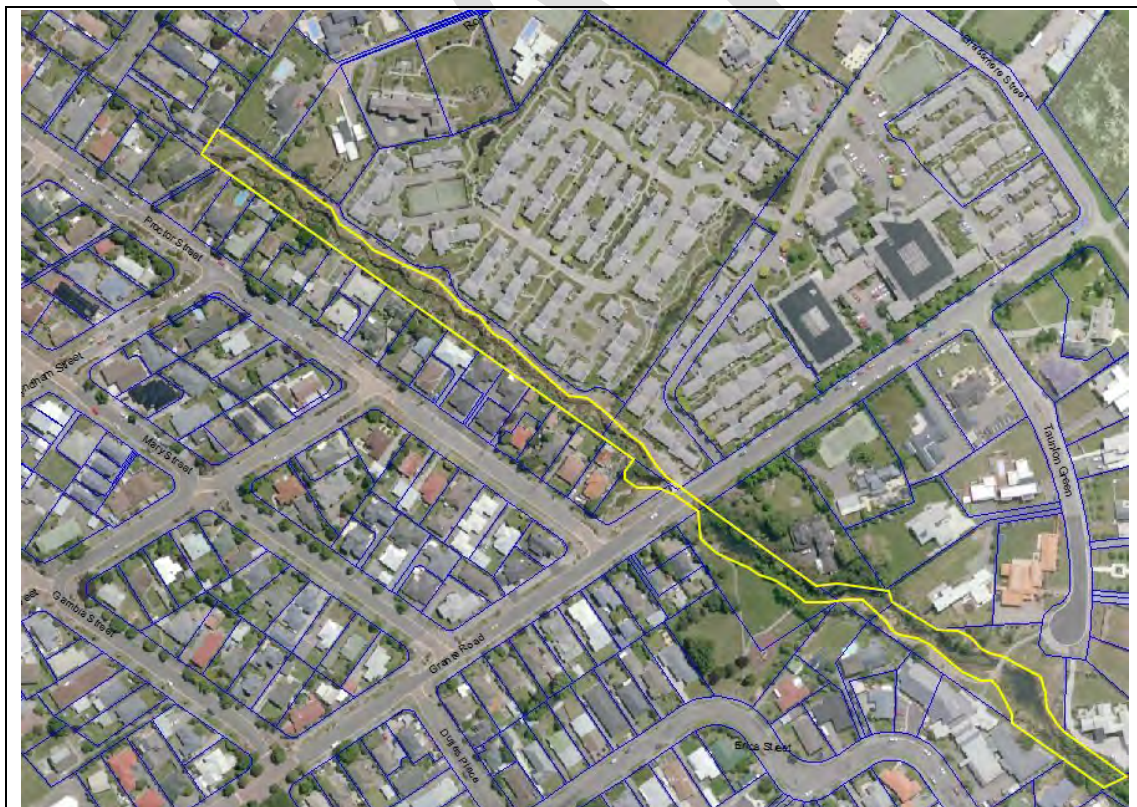
**Site Number:** SES/LP/43

**Physical Address of Site:** Papanui

#### Summary of Significance:

The site supports at-risk fish species and contributes to an important ecological network/linkage and migration route for migratory fish species.

#### Site Map:



### **Additional Site Information**

**Central point NZTM:** N5183939, E1568944

**Area of SES (ha):** 0.75 ha

### **Site Description**

The ecosystem within the SES consists of a 600 m section of naturalised waterway and associated locally sourced indigenous riparian plantings which include some semi-mature kahikatea towards the downstream end of the site.

### **Extent of Site of Ecological Significance**

The SES is fully contained within public reserve areas spanning from the rear of 57 Halliwell Avenue at the upstream end, to the point where it enters 123 Paparoa Street downstream. Upstream of Grants Road the SES is defined by the legal property boundaries along the southern side, and by the pedestrian path/limit of vegetation on the northern side. Downstream from Grants Road the SES is largely defined by the extent of locally sourced indigenous plantings as shown on the location map.

### **Assessment Summary**

Papanui Stream has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets representativeness (criterion 1), rarity/distinctiveness (criterion 4) and ecological context criteria (criteria 8 & 10).



## Assessment of Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

The Papanui Stream corridor within the SES supports at least 38 planted (including semi-mature) locally sourced indigenous riparian, forest and shrubland species that are considered representative of the Low Plains Ecological District (Refer Appendix 1).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

Site not assessed under this criterion

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

Does not meet this criterion

- 4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

Blakely (2014) recorded the At Risk/Declining (Goodman *et al.* 2014) longfin eel in Papanui Stream as far upstream as Grants Road.

- 5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

Site not assessed under this criterion





6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet this criterion

#### Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet this criterion

#### Ecological Context

8. ***Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The site supports longfin eel (*Anguilla dieffenbachia*). Because longfin eel are a migratory species, they require migration routes to the sea, and this section of Papanui Stream forms part of this migration route.

Semi-mature re-vegetation plantings along Papanui Drain provide a good degree of buffering of the stream from adjacent land uses and provides shade and habitat complexity.

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet this criterion

10. ***Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

Papanui Stream supports longfin eel (*Anguilla dieffenbachia*) Longfin eels were recorded in Papanui Stream in several locations as far upstream as the Grants Road (Blakely 2014).

## Site Management

### Existing Protection Status

Site is fully contained within a CCC public reserve area

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Problem weeds at site include grey willow, convolvulus, blackberry.</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing weed management</li> <li>Encourage neighbouring property owners/occupiers to help manage weeds within the stream corridor</li> </ul>	<ul style="list-style-type: none"> <li>Provide weed ID pamphlets to neighbouring property owners.</li> <li>Provide larger sized green-waste bins to owners willing to help with weed control within stream corridor.</li> </ul>
<ul style="list-style-type: none"> <li>Encroachment of private gardens into stream corridor</li> </ul>	<ul style="list-style-type: none"> <li>Instruct property owners/occupiers to remove garden plants and/or structures from stream corridor.</li> <li>Re-plant encroachment areas with appropriate locally sourced indigenous plant species.</li> <li>Encourage clear boundary delineation through the use of see-through style fencing</li> </ul>	<ul style="list-style-type: none"> <li>Discuss fencing cost-share between property owner and CCC.</li> </ul>



## References

Blakely, T. (2014). *Ecological values of the Avon River catchment: an ecological survey of the Avon SMP catchment*. Report for Christchurch City Council. Boffa Miskell, Christchurch. [currently in draft form]

Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.

Goodman, J. M., Dunn, N. R., Ravencroft, P. J., Allibone, R. M., Boubee, J. A. T., David, B. O., Griffiths, M., Ling, N., Hitchmough, R. A., and Rolfe, J. R. (2014) *Conservation status of New Zealand freshwater fish, 2013*. (New Zealand Threat Classification Series No. 7). Department of Conservation, Wellington.

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 2<sup>nd</sup> January 2015

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 2<sup>nd</sup> January 2015

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.



## Appendix 1. Restoration Plant Species.

List of indigenous plant species recorded by the project ecologist in January 2015 from restoration plantings along Papanui Stream. Species marked with asterisks (\*) are considered non-local species.

### Species

<i>Anemanthele lessoniana</i>	wind grass
<i>Arthropodium cirratum</i> *	rengarenga lily
<i>Austroderia richardii</i>	toetoe
<i>Blechnum minus</i>	swamp kiokio
<i>Carex flagelifera</i>	sedge
<i>Carex secta</i>	pukio sedge
<i>Carex testacea</i> *	sedge
<i>Carex virgata</i>	sedge
<i>Cassinia leptophylla</i>	tahinui
<i>Coprosma crassifolium</i>	mikimiki
<i>Coprosma propinqua</i>	mikimiki
<i>Coprosma propinqua x robusta</i>	
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round leafed coprosma
<i>Coprosma virescens</i>	
<i>Cordyline australis</i>	ti kouka/cabbage tree
<i>Corokia cotoneaster</i>	korokio
<i>Cyperus ustulatus</i>	umbrella sedge
<i>Dacrycarpus dacrydioides</i>	kahikatea
<i>Dacrydium cupressinum</i> *	rimu
<i>Dodonaea viscosa</i>	akeake
<i>Griselinia littoralis</i>	broadleaf
<i>Hebe salicifolia</i>	koromiko
<i>Hebe strictissima</i> *	koromiko
<i>Hoheria angustifolia</i>	houhere
<i>Hypolepsis ambigua</i>	
<i>Juncus gregiflorus</i>	wiwi
<i>Juncus pallidus</i>	wiwi
<i>Kinzea ericoides</i>	kanuka
<i>Lemna minor</i>	
<i>Libertia ixioides</i>	mikoikoi
<i>Libocedrus bidwillii</i> *	
<i>Lophomyrtus obcordata</i>	rohutu
<i>Phormium tenax</i>	NZ flax/harakeke
<i>Pittosporum crassifolium</i> *	karo
<i>Pittosporum eugenioides</i>	lemonwood
<i>Pittosporum tenuifolium</i>	kohuhu
<i>Plagianthus regius</i>	lowland ribbonwood
<i>Poa cita</i>	silver tussock
<i>Pseudopanax arboreus</i>	fivefinger
<i>Pseudopanax crassifolius</i>	lancewood
<i>Pseudowintera colorata</i>	horopito
<i>Solanum aviculare</i>	poroporo
<i>Sophora tetraptera</i> *	North island kowhai
<i>Typha orientalis</i>	raupo

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site Name:** Cavendish Drain  
**Site Number:** SES/LP/44  
**Physical Address of Site:** Multiple Addresses

#### Summary of Significance:

The site supports inanga (*Galaxias maculatus*) which is classified as an at-risk species.

#### Site Map:





### **Additional Site Information**

**Central point NZTM:** N5187077, E1568376

**Area of SES (ha):** 0.53 ha

### **Site Description**

The ecosystem within the SES consists a naturalised section of Cavendish Drain, and a constructed freshwater, spring-fed pond and associated riparian plantings.

### **Extent of Site of Ecological Significance**

The stream reach included in the SES extends from Regents Park Drive to include the pond area within Sharnbrook Reserve, to the point that Cavendish Drain meets the Styx River SES within in Styx Mill Conservation Reserve. Immediately downstream from Sharnbrook Reserve, Cavendish Drain passes through private properties on Sharnbrook Lane and Creedon Glen for a distance of approximately 120 m. Through this short section, the SES includes only the area of stream bed, banks and associated riparian vegetation.

### **Assessment Summary**

The Cavendish Drain site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets rarity/distinctiveness criterion (criterion 4).

### **Assessment of Significance Criteria**

#### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.*

Does not meet this criterion



2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

Does not meet this criterion

### **Rarity/Distinctiveness**

3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

Does not meet this criterion

4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.*

The site is significant under this criterion.

Inanga (*Galaxias maculatus*) have been recorded in Cavendish Drain as far upstream as Sharnbrook Reserve (Margetts 2014; TRIM 14/1235962). Inanga are listed by Goodman *et al.* (2014) as At Risk/Declining.

5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet this criterion

### **Diversity and Pattern**

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet this criterion



Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Does not meet this criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Does not meet this criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

Site not assessed under this criterion

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**Site Management**

**Existing Protection Status**

No formal protection

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Problem weeds at site include grey willow, convolvulus, blackberry.</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing weed management</li> <li>Encourage neighbouring property owners/occupiers to help manage weeds within the stream corridor</li> </ul>	<ul style="list-style-type: none"> <li>Provide weed ID pamphlets to neighbouring property owners.</li> <li>Provide larger sized green-waste bins to owners willing to help with weed control within stream corridor.</li> </ul>
<ul style="list-style-type: none"> <li>Encroachment of private gardens into stream corridor</li> </ul>	<ul style="list-style-type: none"> <li>Instruct property owners/occupiers to remove garden plants and/or structures from stream corridor.</li> <li>Re-plant encroachment areas with appropriate locally sourced indigenous plant species.</li> <li>Encourage clear boundary delineation through the use of see-through style fencing</li> </ul>	<ul style="list-style-type: none"> <li>Discuss fencing cost-share between property owner and CCC.</li> </ul>



## References

Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.

Goodman, J. M., Dunn, N. R., Ravencroft, P. J., Allibone, R. M., Boubee, J. A. T., David, B. O., Griffiths, M., Ling, N., Hitchmough, R. A., and Rolfe, J. R. (2014) *Conservation status of New Zealand freshwater fish, 2013*. (New Zealand Threat Classification Series No. 7). Department of Conservation, Wellington.

Margetts, B. (2014) *Freshwater fish database records of threatened fish in Christchurch city: 2010 – October 2014*. Christchurch City Council Database. (TRIM 14/1235962).

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 2<sup>nd</sup> January 2015

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 2<sup>nd</sup> January 2015

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site Name:** Peacock Springs

**Site Number:** SES/LP/45

**Physical Address of Site:** 22 McArthurs Road,  
Harewood,  
Christchurch

#### Summary of Significance:

The site supports Canterbury mudfish (*Neochanna burrowsius*) which is classified as Threatened/Nationally Critical.

#### Site Map:





## **Additional Site Information**

**Central point NZTM:** N5186963, E1562298

**Area of SES (ha):** 1.48 ha

## **Site Description**

The ecosystem within the SES consists of a constructed freshwater lake formed within an ex-shingle extraction pit surrounded by willow trees.

## **Extent of Site of Ecological Significance**

The extent of the SES is limited to the areas of open water within the lake and the extent of riparian vegetation growing along the lake shore/banks, including the willow woodland area.

## **Assessment Summary**

The Peacock Springs site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets rarity/distinctiveness (criterion 4) and ecological context criteria (criterion 10).

## **Assessment of Significance Criteria**

### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.*

Site not assessed under this criterion



2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

Site not assessed under this criterion

### **Rarity/Distinctiveness**

3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

Site not assessed under this criterion

4. ***Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.***

The site is significant under this criterion.

Canterbury mud fish (*Neochanna burrowsius*) have been recorded in the Peacock Springs lake as recently as June 2013 (Margetts 2014; TRIM 14/1235962). Inanga are listed by Goodman *et al.* (2014) as Threatened/Nationally Critical.

5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

Site not assessed under this criterion

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

Does not meet this criterion

### **Diversity and Pattern**

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

Does not meet this criterion



### Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

Does not meet this criterion

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

Site not assessed under this criterion

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

The Peacock Springs lake supports Canterbury mudfish, and given the threat status of this species (Threatened/Nationally Critical), the SES is considered an important habitat for this species.

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## Site Management

### Existing Protection Status

No formal protection

Threats and risks	Management recommendations	Support package options
Weed invasion	<ul style="list-style-type: none"> <li>Ongoing monitoring and eradication of biodiversity pest plants.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about monitoring and control of pest plants</li> <li>Assistance available where appropriate</li> </ul>
Animal pest incursion	<ul style="list-style-type: none"> <li>Monitoring of possible animal pest incursions and trapping as necessary</li> <li>Trap for incursions by feral cats, ferrets, stoats and other wild mammalian predators</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about monitoring and control of pest animals</li> <li>Assistance available where appropriate</li> </ul>
Human disturbance	<ul style="list-style-type: none"> <li>Maintain low impact/passive recreation</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about options for recreational management / biodiversity</li> </ul>

## References

Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.

Goodman, J. M., Dunn, N. R., Ravencroft, P. J., Allibone, R. M., Boubee, J. A. T., David, B. O., Griffiths, M., Ling, N., Hitchmough, R. A., and Rolfe, J. R. (2014) *Conservation status of New Zealand freshwater fish, 2013*. (New Zealand Threat Classification Series No. 7). Department of Conservation, Wellington.

Margetts, B. (2014) *Freshwater fish database records of threatened fish in Christchurch city: 2010 – October 2014*. Christchurch City Council Database. (TRIM 14/1235962).

**Assessment completed by:** Dr Antony Shadbolt  
**Date:** 2<sup>nd</sup> January 2015

**Statement completed by:** Dr Antony Shadbolt  
**Date:** 2<sup>nd</sup> January 2015

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** French Farm Wetland

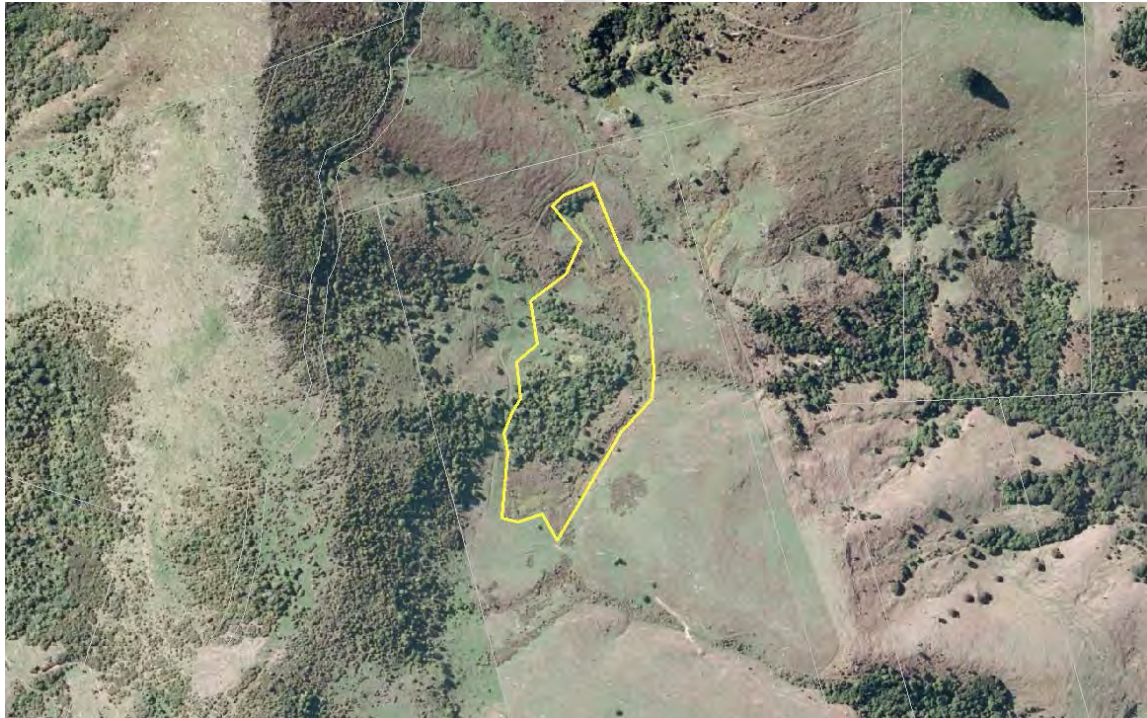
**Site number:** SES/A/1

**Physical address of site:** 23 Winery Road, Wainui.

#### Summary of Significance:

The site is significant because it has a rare and representative mesotrophic spring-fed seepage wetland that is one of the largest examples of its type within the Akaroa ED. There is a small area of peat-based wetland with “stunted bog forest” that is a distinctive vegetation community and the only known example of its type on Banks Peninsula. The site supports indigenous plant species that are either nationally At Risk or uncommon within the ecological region or ecological district and indigenous invertebrate species that are either nationally At Risk, endemic to Banks Peninsula or uncommon within the ecological district.

#### Site Map



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 4.12

**Central point (NZTM):** E1589646, N5153205

## Site Description

The site includes spring-fed seepage wetlands and adjoining drier indigenous forest and treeland on an area of gently sloping east facing hill country. It is north-east of Wainui Pass and above French Farm at between 470 and 520 m above sea level. The area has not been grazed for 2 years after being fenced to exclude stock as part of the BPCT covenanting process (Jensen unpubl. data 2014).

The following description of the site is from Grove (2010) and Jensen unpubl. data (2014).

Wetlands cover much of the unforested area within the site. They originate from springs seeping down the hill and support a mix of native and introduced species. The indigenous rush wiwi (*Juncus edgariae*) and cutty grass (*Carex geminata*) dominate the canopy of the flush wetlands that occupy the gullies below the spring heads. The ground cover of these wetlands is mostly introduced grass and herbaceous species. In the south-east corner of the area, the gully wetlands coalesce to form the headwaters of French Farm Stream.

A notable feature of the site, identified by Wilson (unpubl. data) is a narrow strip of “stunted bog forest” on the edge of the forest next to the wetland at the southern end of the block. This distinctive peat-based wetland supports a diverse number of species and has a fringe of native shrubs, small trees and ferns around its margins.

The steeper well drained slopes and spurs within the site are covered in mixed hardwood forest. The main forest area occupies much of the southern half of the site. A smaller patch of forest covers the headwall above the spring and wetland at the northern end of the site, and another patch is separated from the main forest by grassy clearings and treeland.

A cluster of large old growth thin-barked totara (*Podocarpus cunninghamii*) with several other hardwood and broad-leaved tree species are scattered over a gentle grassy spur at the southern end of the block and scattered *Coprosma* are also present. Another area of treeland with scattered trees and shrubs over pasture separates the forested areas in the middle of the block.

Birds seen and heard during the botanical survey (Jensen unpubl. data 2014) include New Zealand pigeon (*Hemiphaga novaeseelandiae novaeseelandiae*), bellbird (*Anthornis melanura melanura*), brown creeper (*Mohoua novaeseelandiae*), silvereye (*Zosterops lateralis lateralis*), and South Island tomtit (*Petroica macrocephala macrocephala*).



## Extent of Site of Ecological Significance

The boundary of the site is the Banks Peninsula Conservation Trust Covenant boundary.

## Assessment Summary

The French Farm Wetland Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Mesotrophic wetlands are of restricted occurrence in the Akaroa Ecological District (Grove and Parker 2013) so the site is distinctive (refer to criterion 6), rather than representative of the natural diversity of the ecological district. However, the mixed hardwood forest has many tree and shrub seedlings on the forest floor (Jensen unpubl. data 2014) and is representative.

The wetland supports a characteristic invertebrate assemblage across several insect orders. This reflects the intactness of the wetland habitat (Wildland Consultants unpubl. data 2014).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

Although small, it is one of the largest examples of a spring-fed seepage wetland within the Akaroa ED.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***



The site is significant under this criterion.

Wetland ecosystems have been reduced to less than 20% of their former extent at the regional and freshwater biogeographic unit scales. Ausseil *et al.* (2008) estimate that wetlands have been reduced to 10.6% of their original extent in the Canterbury Region and 7.0% in the Canterbury freshwater biogeographic unit. On Banks Peninsula, most of the original wetlands have been cleared and drained and only remnants remain.

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has indigenous plant species that are either nationally At Risk or uncommon within the ecological region or ecological district and indigenous invertebrate species that are nationally At Risk and endemic to Banks Peninsula.

**Plants**

Nationally At Risk plant species (de Lange *et al.* 2013) recorded from the site (Jensen unpubl. data 2014) are:

- climbing groundsel (*Brachyglottis sciadophila*) (At Risk – Declining)

Plant species recorded from the site that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Coprosma ciliata* (Wilson unpubl. data, Grove 2010)
- *Hymenophyllum sanguinolentum* (Wilson unpubl. data, Grove 2010, Jensen unpubl. data 2014)

**Invertebrates**

Nationally At Risk invertebrate species recorded from the site (Wildland Consultants unpubl. data 2014) are:

- Mistletoe miner (*Zelleria spenota*) mistletoe miner (At Risk – Declining)
- Ward's stonefly (*Zelandobius wardi*) (At Risk – Naturally Uncommon and endemic to Banks Peninsula)

The species that is endemic to Banks Peninsula (Wildland Consultants unpubl. data 2014) is:

- Green cicada (*Kikihia* ‘new species’)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site does not contain any indigenous vegetation or an indigenous species that are at their distribution limit within Canterbury Region or nationally.



- 6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

It contains seepage wetlands and a small area of peat-based wetland. Wetlands are of restricted occurrence in the Akaroa ED (Grove and Parker 2013). Seepages and flushes, although relatively common on Banks Peninsula (Grove and Parker 2013), are classified as 'originally rare' ecosystems at a national scale (Williams et al. 2007). The small area of peat-based wetland with a fringe of native shrubs, small trees and ferns around the margins, described by Wilson (unpubl. data) as "stunted bog forest" is a distinctive vegetation community and the only known example of its type on Banks Peninsula.

### Diversity and Pattern

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

The "stunted bog forest" has a high diversity of ferns, trees and shrubs (Grove 2010, Jensen unpubl. data 2014).

The diversity of indigenous invertebrates recorded at the site is also high relative to other wetland sites on Banks Peninsula (Wildland Consultants unpubl. data 2014). A list of the invertebrate species recorded at the site is provided in Appendix 2.

### Ecological Context

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is not significant under this criterion. It is small and relatively isolated and is unlikely to provide or contribute to an important ecological linkage or network, or provide an important buffering function.

- 9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. The relatively small wetland areas within the site are unlikely to provide important benefits to the areas and ecosystems beyond their immediate boundaries. They are spring-fed and situated high on a hill slope in the head of a small stream catchment and do not play an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

It provides important permanent habitat for indigenous invertebrates. It supports two nationally At Risk invertebrate species (one of which is endemic to Banks Peninsula), and another that is endemic to Banks Peninsula (a new species of *Kikihia*). It also provides habitat for a diverse and characteristic range of common indigenous invertebrates (Wildland Consultants unpubl. data 2014).

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## Site Management

### Existing Protection Status

The entire site is protected by a Banks Peninsula Conservation Trust covenant.

The site is fenced (post and netting) and there are few weed issues (Grove 2010).

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Blackberry (<i>Rubus fruticosus agg.</i>) occurs near the top fence at the southern end (Jensen unpubl. data 2014).</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling blackberry</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about pest plants. Possible assistance with control.</li> </ul>
<ul style="list-style-type: none"> <li>Stock. The fence around the site is in good condition and stock proof.</li> </ul>	<ul style="list-style-type: none"> <li>Consider periodic inspections of the fence to ensure it is stock-proof with maintenance as required.</li> </ul>	<ul style="list-style-type: none"> <li>Assistance to landowner with monitoring of stock fence on regular basis. Guidance and assistance with any maintenance as required.</li> </ul>
<ul style="list-style-type: none"> <li>Weed invasion</li> </ul>	<ul style="list-style-type: none"> <li>Consider regular surveillance for widely-dispersed weeds with appropriate control if/when required.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about monitoring pest plant incursions and possible assistance with control as required.</li> </ul>



## References

- Ausseil, A-G.; Gerbeaux, P.; Chadderton, W.L.; Stephens, T.; Brown, D.; and Leathwick, J. (2008). *Wetland ecosystems of national importance for biodiversity: Criteria, methods and candidate list of nationally important inland wetlands*. Landcare Research Contract Report: LC0708/158. 174pp.
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- Wilson, H.D. *Banks Peninsula Botanical Survey card number 318, Akaroa. Small Wetland NE of Wainui Pass, Above French Farm*. Unpublished data.
- Wilson, H.D. (2013). *Plant Life on Banks Peninsula*. Manuka Press, Cromwell. 412 pp.

**Assessment completed by:** Scott Hooson  
**Date:** 4 July 2014

**Statement completed by:** Scott Hooson  
**Date:** 4 July 2014

**Statement updated by:** XXX  
**Date:** XXX

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## Appendix 1: Plant Species List

Sourced from unpublished field survey data (Jensen unpubl. data 2014)

Scientific Name	Common Name
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Arisotelia serrata</i>	wineberry, makomako
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum discolor</i>	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum penna-marina</i>	little hard fern
<i>Blechnum procerum</i>	small kiokio
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Calystegia tuguriorum</i>	NZ bindweed, pōwhiwhi
<i>Carex geminata</i>	cutty grass, rautahi
<i>Carpodetus serratus</i>	marbleleaf, putaputāwētā
<i>Clematis paniculata</i>	puawananga
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Cyathea smithii</i>	Smith's tree fern, kātote
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dichondra repens</i>	dichondra
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Griselinia littoralis</i>	broadleaf, kāpuka
<i>Hebe salicifolia</i>	koromiko
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hymenophyllum sanguinolentum</i>	filmy fern
<i>Hypolepis rufobarbata</i>	sticky pig fern
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea ericoides</i>	kānuka
<i>Melicope simplex</i>	poataniwha
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Muehlenbeckia australis</i>	large-leaved pōhuehue
<i>Myrsine divaricata</i>	weeping matipo, weeping māpou
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbifera</i>	kaikōmako, ducks foot
<i>Pittosporum eugenioides</i>	lemonwood, tarātā
<i>Plagianthus regius</i>	lowland ribbonwood, mānatu
<i>Podocarpus cunninghamii</i>	mountain tōtara, thin-barked tōtara
<i>Polystichum vestitum</i>	prickly shield fern, pūniu



<i>Prumnopitys taxifolia</i>	mataī, black pine
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pteridium esculentum</i>	bracken, rārahu, rauaruhe
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Rubus cissoides</i>	bush lawyer, tātarāmoa
<i>Rubus schmidelioides</i>	bush lawyer, tātarāmoa
<i>Schefflera digitata</i>	patē, seven-finger
<i>Sophora microphylla</i>	small-leaved kōwhai
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species</b>	
<i>Agrostis capillaris</i>	brown top
<i>Erythranthe guttata</i>	monkey musk
<i>Holcus lanatus</i>	Yorkshire fog

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## Appendix 2: Invertebrate Species List

Sourced from Wildland Consultants unpubl. data (2014).

\* = exotic species

ORDER/Family/genus/species	Common Name
<b>MECOPTERA</b>	scorpionfly
<b>Nannochoristidae</b>	
<i>Nannochorista philpotti</i>	
<b>HEMIPTERA</b>	
<b>Tibicinidae</b>	cicada
<i>Amphipsalta zelandica</i>	clapping cicada
<i>Kikihia new species</i>	
<b>Acanthosomatidae</b>	shield bug
<i>Rhopalimorpha obscura</i>	
<b>Cixiidae</b>	
<i>Cixiid bug</i>	
<b>ORTHOPTERA</b>	
<b>Tettigoniidae</b>	katydid
<i>Conocephalus bilineatus</i>	
<b>Gryllidae</b>	cricket
<i>Pteronemobius bigelowi</i>	
<b>Acrididae</b>	grasshoppers
<i>Phaulacridium marginale</i>	
<b>COLEOPTERA</b>	
<b>Carabidae</b>	ground beetles
<i>Megadromus antarcticus</i>	
<b>HYMENOPTERA</b>	
<b>Formicidae</b>	ant
<i>Monomorium antarcticum</i>	
<b>Pompilidae</b>	spider wasp
<i>Epipompilus insularis</i>	
<b>Sphecidae</b>	hunting wasp
<i>Podagritis albipes</i>	
<b>LEPIDOPTERA</b>	
<b>Glyphipterigidae</b>	
<i>Glyphipterix alchyoessa</i>	
<i>Glyphipterix triselena</i>	
<b>Elachistidae</b>	
<i>Cosmiotes ombrodoxa</i>	
<b>Yponomeutidae</b>	
<i>Zelleria spenota</i>	
<b>Oecophoridae</b>	
<i>Barea exarcha</i>	
<i>Gymnobathra parca</i>	
<i>Gymnobathra tholodella</i>	
<i>Hierodoris s-fractum</i>	
<i>Izatha huttoni</i>	



<i>Leptocroca scholaea</i>	
<i>Stathmopoda horticola</i>	
<i>Tingena melinella</i>	
<b>Pterophoridae</b>	plumemoth
<i>Platyptilia repletalis</i>	
<b>Tortricidae</b>	leaf rollers
<i>Capua semiferana</i>	
<i>Cnephasia jactatana</i>	
<i>Ctenopseustis obliquana</i>	
<i>Epichorista siriana</i>	
<i>Merophyas leucaniana</i>	
<i>Planotortrix excessana</i>	
<i>New genus and species</i>	
<b>Thyrididae</b>	
<i>Morova subfasciata</i>	
<b>Crambidae</b>	
<i>Deana hybreasalis</i>	
<i>Eudonia feredayi</i>	
<i>Eudonia luminatrix</i>	
<i>Eudonia leptalea</i>	
<i>Eudonia sabulosella</i>	
<i>Eudonia submarginalis</i>	
<i>Glaucocharis auriscriptella</i>	
<i>Glaucocharis lepidella</i>	
<i>Hygraula nitens</i>	
<i>Orocrambus flexuosellus</i>	
<i>Orocrambus ramosellus</i>	
<i>Orocrambus vittellus</i>	
<i>Udea flavidalis</i>	
<i>Udea marmarina</i>	
<b>GEOMETRIDAE</b>	
<i>Asaphodes abrogata</i>	
<i>Asaphodes beata</i>	
<i>Austrocidaria gobiata</i>	
<i>Austrocidaria similata</i>	
<i>Epiphyrne undosata</i>	
<i>Epyaxa rosearia</i>	
<i>Homodotis megaspilata</i>	
<i>Helastia corcularia</i>	
<i>Hydriomena deltoidata</i>	
<i>Hydriomena rixata</i>	
<i>Xanthorhoe semifissata</i>	
<b>Noctuidae</b>	
<i>Graphania insignis</i>	
<i>Graphania morosa</i>	
<i>Graphania mutans</i>	
<i>Graphania plena</i>	
<i>Meterana ochthistis</i>	
<i>Meterana stipata</i>	
<i>Persectania aversa</i>	
<i>Proteuxoa comma</i>	
<i>Tmetolophota atristriga</i>	
<i>Tmetolophota propria</i>	



<i>Tmetolophota semivittata</i>	
<b>Lycaenidae</b>	coppers/ blues
<i>Lycaena "comon copper" complex</i>	
<i>Zizina oxleyi</i>	southern blue
<b>Nymphalidae</b>	admirals
<i>Vanessa gonerilla</i>	red admiral
<b>Pieridae</b>	white butterfly
<i>*Pieris rapae</i>	
<b>PLECOPTERA</b>	stonefly
<b>Gripopterygidae</b>	
<i>Zelandobius wardi</i>	
<b>ODONATA</b>	
<b>Coenagrionidae</b>	damselfly
<i>Xanthocnemis zelandica</i>	

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Wainui Pass Wetland

**Site number:** SES/A/2

**Physical address of site:** XXX

#### **Summary of Significance:**

The site is significant because it contains a seepage wetland. Wetlands have been reduced to less than 20% of its former extent at the regional and freshwater biogeographic unit scales. Although relatively common on Banks Peninsula seepages are 'originally rare' ecosystems at a national scale. The wetland supports three indigenous plant species that are uncommon within the ecological region or ecological district.

#### **Site Map**



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 1.06

**Central point (NZTM):** E1590819, N5153087

## Site Description

The site is a spring-fed seepage that has formed on an area of gently sloping south-facing hillslope at 220 – 280 m above sea level on the eastern ridge of French Hill above Winery Road. The site contains wi (*Juncus edgariae*) rushland, a small area of riparian kanuka (*Kunzea robusta*) forest and an area of raupo (*Typha orientalis*) reedland. The descriptions of these vegetation communities are sourced from Jensen (unpubl. data 2014).

The wi rushland is fed by a spring at the top (eastern) end of the site. Sharp spike sedge is common at the source of the spring and there is a small area of water fern (*Azolla rubra*). From the spring the rushland divides and seeps downslope in two long linear arms. The true left seep drains downslope to the south and ends in a small group of trees containing narrow-leaved lacebark (*Hoheria angustifolia*) and kanuka. The true right seep drains in a south-westerly direction against the toe of the hillslope above into a small area of kanuka forest. The rushland is grazed and pugged by stock and the cover is mainly exotic Yorkshire fog (*Holcus lanatus*), jointed rush (*Juncus articulatus*) and monkey musk (*Erythranthe guttata*) but wi lines the margins of the long linear seeps. Occasional *Coprosma rigida*, ongaonga (*Urtica ferox*) and narrow-leaved lacebark occur on the drier margins.

From the wi rushland a stream descends through a small area of tall kanuka forest via a rocky bed into a small wetland dominated by raupo reedland. Amongst the kanuka are occasional trees of tree fuchsia (*Fuchsia excorticata*), mahoe (*Meliccytus ramiflorus*) and kaikomako (*Pennantia corymbosa*). The vines large-leaved pohuehue (*Muehlenbeckia australis*) and bush lawyer (*Rubus cissoides*) are also common. Under the kanuka canopy the understorey is relatively bare as stock have access to the forest. The few species present in the understorey are scattered kiwakiwa (*Blechnum fluviatile*), *Coprosma rhamnoides* and some tree fuchsia seedlings. On the margins of the kanuka are scattered foxglove (*Digitalis purpurea*), *Coprosma rigida*, *C. dumosa* and *C. rotundifolia*.

The raupo reedland grows in a very wet flush dominated by raupo with tall *Hypolepis lacteal* (an indigenous fern), abundant wi and frequent swamp kiokio (*Blechnum minus*). The raupo is browsed and broken down by stock, leaving few tall stems. Exotic creeping buttercup (*Ranunculus repens*) and the grass creeping bent (*Agrostis stolonifera*) are abundant with monkey musk and glaucous sweetgrass (*Glyceria declinata*). The flush is edged by kanuka on drier ground.

Plant and invertebrate species lists from botanical and entomological surveys are provided in Appendices 1 and 2 respectively.



## **Extent of Site of Ecological Significance**

The site includes the wetland area and the small area of riparian kanuka forest linking the wi rushland and the raupo reedland.

## **Assessment Summary**

The Wainui Pass Wetland Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the rarity/distinctiveness criteria (criteria 3, 4 and 6). It is recommended that this site is included as a Significant Ecological Site in the District Plan.

## **Assessment against Significance Criteria**

### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.*

The site is not significant under this criterion. Although there are few examples of similar wetland communities in the Akaroa ED, this site is highly modified and there are better examples. All three vegetation communities within the site have been degraded by stock (Jensen unpubl. data 2014). The wi rushland has been grazed and pugged by stock and has a mainly exotic cover of Yorkshire fog, jointed rush and monkey musk. The kanuka forest is secondary forest and the structure of the understorey and ground tiers has been substantially modified by stock. The raupo is browsed and broken down by stock with few tall stems and although raupo is dominant and other indigenous species are common, introduced plants including creeping buttercup, creeping bent, monkey musk and glaucous sweetgrass are also common (Jensen unpubl. data 2014).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

The site is not significant under this criterion. This site is small and there are larger examples of mesotrophic spring-fed seepage wetlands within the Akaroa ED.





### Rarity/Distinctiveness

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

Wetland ecosystems have been reduced to less than 20% of their former extent at the regional and freshwater biogeographic unit scales. Ausseil et al. (2008) estimate that wetlands have been reduced to 10.6% of their original extent in the Canterbury Region and 7.0% in the Canterbury freshwater biogeographic unit. On Banks Peninsula, most of the original wetlands have been cleared and drained and only remnants remain.

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has four indigenous plant species that are uncommon within the ecological region or ecological district.

Plant species recorded from the site (Jensen unpubl. data 2014) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- Common maidenhair (*Adiantum cunninghamii*)
- *Hypolepis lactea* (uncommon in Canterbury (Wilson 1992))
- Water fern (*Azolla rubra*)
- Raupo (*Typha orientalis*)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is not significant under this criterion. It does not contain indigenous vegetation or an indigenous species that are at their distribution limit within Canterbury Region or nationally.

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

Mesotrophic wetlands are of restricted occurrence in the Akaroa ED (Grove and Parker 2013) and seepages and flushes, although relatively common on Banks Peninsula (Grove and Parker 2013), are classified as ‘originally rare’ ecosystems at a national scale (Williams et al. 2007).



## Diversity and Pattern

- 7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is not significant under this criterion. The site does not contain a high diversity of indigenous ecosystems or habitat types or indigenous taxa, or have changes in species composition reflecting the existence of diverse natural features or ecological gradients. There are only three vegetation communities within the site and indigenous plant diversity within all three is low (Jensen unpubl. data 2014). Invertebrate density is also low (Wildland Consultants unpubl. data 2014).

## Ecological Context

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is not significant under this criterion. It is small and relatively isolated and is unlikely to provide or contribute to an important ecological linkage or network, or provide an important buffering function.

The small area of indigenous kanuka forest between the wi rushland and the raupo reedland is included within this site because it provides an ecological linkage between the two wetland communities.

- 9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. This relatively small wetland is unlikely to provide important benefits to the areas and ecosystems beyond its immediate boundaries. It is fed by hill slope springs and is situated high on a hill slope where it does not play an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.

- 10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is not significant under this criterion. Its small size and modified nature mean it does not provide important habitat for indigenous species.

## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Stock</li> </ul>	<ul style="list-style-type: none"> <li>• Consider fencing the wetland, or otherwise excluding stock.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with landowner about the impacts of stock and about options for management.</li> </ul>

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## References

- Ausseil, A-G., Gerbeaux, P., Chadderton, W.L., Stephens, T., Brown, D., Leathwick, J. (2008). *Wetland ecosystems of national importance for biodiversity: Criteria, methods and candidate list of nationally important inland wetlands*. Landcare Research Contract Report: LC0708/158. 174pp.
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- Wilson, H.D. (2013). *Plant Life on Banks Peninsula*. Manuka Press, Cromwell. 412 pp.

**Assessment completed by:** Scott Hooson  
**Date:** 26 November 2014

**Statement completed by:** Scott Hooson  
**Date:** 26 November 2014

**Statement updated by:** XXX  
**Date:** XXX

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## Appendix 1: Indigenous Plant Species List

Sourced from Jensen unpubl. data (2014).

N.B. exotic species were not recorded during this survey.

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Azolla rubra</i>	water fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum minus</i>	swamp kiokio
<i>Blechnum penna-marina</i>	little hard fern
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Eleocharis acuta</i>	sharp spike sedge
<i>Epilobium atriplicifolium</i>	willow herb
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hypolepis lactea</i>	
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea robusta</i>	kanuka
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Nasturtium microphyllum</i>	one-rowed cress
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Typha orientalis</i>	raupo, bull rush
<i>Urtica ferox</i>	ongaonga, tree nettle



## Appendix 2: Invertebrate Species List

Sourced from Wildland Consultants unpubl. data (2014).

\* = exotic species

ORDER/Family/genus/species	Common Name
<b>HEMIPTERA</b>	
<b>Tibicinidae</b>	cicada
<i>Amphipsalta zelandica</i>	clapping cicada
<b>Pentatomidae</b>	shieldbug
<i>Dictyotis caenosus</i>	
<b>Acanthosomatidae</b>	
<i>Rhopalimorpha obscura</i>	
<b>ORTHOPTERA</b>	
<b>Tettigoniidae</b>	katydid
<i>Conocephalus bilineatus</i>	
<b>Gryllidae</b>	cricket
<i>Pteronemobius bigelowi</i>	
<b>Acrididae</b>	grasshoppers
<i>Phaulacridium marginale</i>	
<b>Coccinellidae</b>	
<i>Coccinella leonina</i>	ladybird
<b>Scarabaeidae</b>	chafers
<i>Costelytra zelandica</i>	
<b>HYMENOPTERA</b>	
<b>Formicidae</b>	ant
<i>Monomorium antarcticum</i>	
<b>Pompilidae</b>	spider wasp
<i>Priocnemis carbonarius</i>	
<b>Vespulidae</b>	
<i>Vespula vulgaris</i>	common wasp
<b>LEPIDOPTERA</b>	
<b>Hepialidae</b>	porina moths
<i>Wiseana umbraculata</i>	
<b>Glyphipterigidae</b>	
<i>Glyphipterix triselena</i>	
<b>Elachistidae</b>	
<i>Cosmiotes ombrodoxa</i>	
<b>Oecophoridae</b>	
<b>Xyloryctinae</b>	
<i>Scieropepla typhicola</i>	
<b>Plutellidae</b>	
<i>Plutella antiphona</i>	
<b>Tortricidae</b>	leaf rollers
<i>Capua semiferana</i>	
* <i>Cydia succedana</i>	
<i>Epichorista siriana</i>	
<b>Crambidae</b>	



<i>Eudonia feredayi</i>	
<i>Eudonia leptalea</i>	
<i>Eudonia sabulosella</i>	
<i>Eudonia submarginalis</i>	
<i>Orocrambus flexuosellus</i>	
<i>Orocrambus ramosellus</i>	
<b>GEOMETRIDAE</b>	
<i>Asaphodes abrogata</i>	
<i>Epyaxa rosearia</i>	
<i>Helastia corcularia</i>	
<i>Scopula rubraria</i>	
<b>Lycaenidae</b>	coppers/ blues
<i>Zizina oxleyi</i>	southern blue
<b>ODONATA</b>	
<b>Coenagrionidae</b>	damselfly
<i>Xanthocnemis zelandica</i>	

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Breitmeyers

**Site number:** SES/A/3

**Physical address of site:** 153 Breitmeyers Road, Little River

#### Summary of Significance:

This site is significant because it contains a relatively large example of representative and rare lowland podocarp/hardwood forest. It supports two nationally At Risk plant species, two that are uncommon within the ecological region or ecological district, a nationally rare, un-described fungus, two nationally threatened invertebrates, one that is endemic to Banks Peninsula and one that is uncommon in the ecological district. It also provides important habitat for invertebrates including two nationally threatened moths. The site supports the only known population of one of these species, *Epichorista lindsayi*, a nationally threatened day-flying moth.

#### Site Map





## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 18.39

**Central point (NZTM):** E1584138, N5153581

## Site Description

The Breitmeyers Site is located between Waiwera and Breitmeyers Roads, above and east of the Okana River and the township of Little River. It is situated on relatively gently sloping west facing hill slopes between approximately 50 and 160 m above sea level. Two streams, small tributaries of the Okana River flow through the site. The Department of Conservation identified this site as a Recommended Area for Protection (RAP 3 - Breitmeyers) (Wilson 1992). A small area (0.48 ha) in the north-eastern part of the site is protected by a Banks Peninsula Conservation Trust covenant and has stock-proof fencing around it (Hutchison 2009).

The vegetation consists of secondary growth lowland hardwood-kanuka forest with occasional large remnant emergent remnant podocarp trees (lowland totara (*Podocarpus totara*), matai (*Prumnopitys taxifolia*), and kahikatea (*Dacrycarpus dacrydioides*)). Juveniles of all three species of podocarp are present and regeneration of lowland totara is particularly notable with numerous individuals in all age classes. The main canopy species are mahoe (*Melicytus ramiflorus*), kanuka (*Kunzea robusta*) and narrow-leaved lacebark (*Hoheria angustifolia*), with lesser amounts of titoki (*Alectryon excelsus*), kowhai (*Sophora microphylla*), and kaikomako (*Pennantia corymbosa*). The sub-canopy is reasonably diverse, with a wide variety of tree species such as pigeonwood (*Hedycarya arborea*), rohutu (*Lophomyrtus obcordata*), kawakawa (*Piper excelsum*), lemonwood (*Pittosporum eugenioides*), kohuhu (*Pittosporum tenuifolium*), small-leaved milk tree (*Streblus heterophyllus*), and akeake (*Dodonaea viscosa*). The understory is mostly dominated by unpalatable species, with small leaved coprosma/mikimiki (*Coprosma areolata*, *C. rhamnoides*, and *C. rotundifolia*) being the most common shrub species. Climbers are abundant throughout the site, particularly pohuehue (*Muehlenbeckia australis*), native passionfruit (*Passiflora tetrandra*), native jasmine (*Parsonsia heterophylla*), and leafless bush lawyer (*Rubus squarrosus*). The understory inside the fenced covenant is starting to regenerate well, with noticeably higher numbers of palatable seedlings and ferns than outside the fence (Wildland Consultants unpubl. data 2014a).

Indigenous birds recorded from the site are New Zealand wood pigeon (*Hemiphaga novaeseelandiae novaeseelandiae*), bellbird (*Anthornis melanura melanura*), grey warbler (*Gerygone igata*), South Island fantail (*Rhipidura fuliginosa fuliginosa*), shining cuckoo (*Chrysococcyx lucidus lucidus*), brown creeper (*Mohua novaeseelandiae*) and silvereye (*Zosterops lateralis lateralis*) (Wilson 1992, Wildland Consultants unpubl. data 2014a).



## Extent of Site of Ecological Significance

The boundary of the site is the outside extent of both forest patches.

## Assessment Summary

The Breitmeyers Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 5), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

With the exception of the understorey, which has historically been degraded by stock and animal pests and is mostly dominated by unpalatable species, the structure and composition forest is representative. Occasional large emergent remnant podocarps (lowland totara, matai, and kahikatea) and juveniles of all three species of podocarp are present and podocarp regeneration, particularly of lowland totara is outstanding (Hutchison 2009). The canopy is good condition and has a representative range of hardwood species and the subcanopy is relatively diverse, with a wide variety of tree species (Wildland Consultants unpubl. data 2014a).

The site also supports a representative assemblage of indigenous Lepidoptera that is considered to be typical of north-facing indigenous lowland podocarp/hardwood forest (Wildland Consultants unpubl. data 2014b). A list of the invertebrate species recorded at the site is provided in Appendix 2.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

At approximately 24 ha, the site is a large example of indigenous lowland forest within the Akaroa Ecological District and is significant under this criterion.



### Rarity/Distinctiveness

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

It supports secondary growth lowland hardwood-kanuka forest with occasional large emergent remnant podocarp trees (totara, matai, and kahikatea). Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). Harding (2009) estimates that the original extent of podocarp/hardwood forest in the Akaroa Ecological District (ED) (as a % of the ED) was 51 - 75%. Both lowland forest and old growth forest has been reduced to a fragment of its former extent at the Region and ecological district scales. The present extent of all old growth forest is estimated to be approximately 800 ha or <1% of its original extent (Wilson 2009) and the extent of all indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 10% of the ecological district (New Zealand Landcover Database (Version 4)).

This site also meets this criteria at the Level IV land environment scale. The majority of the indigenous forest within the site is on an Acutely Threatened land environment (F3.1a) where 9.9% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has two nationally At Risk plant species, two that are uncommon within the ecological region or ecological district, a nationally rare, un-described fungus, two nationally threatened invertebrates, one that is endemic to Banks Peninsula and one that is uncommon in the ecological district.

#### Plants

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Wildland Consultants unpubl. data 2014a) are:

- *Coprosma virescens* (At Risk - Declining)
- Fierce lancewood (*Pseudopanax ferox*) (Nationally Uncommon) (both adults and juveniles).

Plant species recorded from the site (Wildland Consultants unpubl. data 2014a) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- velvet fern (*Lastreopsis velutina*)
- bamboo rice grass (*Microlaena polynoda*)

Bamboo rice grass was frequently encountered at the site, including a number of very large patches and the site appears to be a stronghold for this species.



A nationally rare, un-described fungus *Amanita* 'Noddy's flycap' was found in the northern patch of forest in 2014. This is only the third record of this species in the South Island, and the 11th record for New Zealand (Wildland Consultants unpubl. data 2014a).

### Invertebrates

The intactness and size of the forest within the site means it has retained a suite of indigenous invertebrate species that are now of very restricted occurrence. Three of the moth species have not been recorded anywhere else on Banks Peninsula and this is the first record of two of them on Banks Peninsula (Wildland Consultants unpubl. data 2014b).

The site has two Nationally Threatened moths (Wildland Consultants unpubl. data 2014b):

- *Stathmopoda albimaculata* (Threatened - Nationally Endangered)
- *Epichorista lindsayi* (Threatened - Nationally Endangered)

*Epichorista lindsayi* is a day flying moth associated with *Microlaena polynoda*. This site supports the only known population of this species which was re-discovered here after 79 years (Wildland Consultants 2014c).

One invertebrate that is endemic to Banks Peninsula has been recorded from the site (Wildland Consultants unpubl. data 2014b):

- A cicada (*Kikihia* 'new species')

One invertebrate that is uncommon in the Akaroa Ecological District has been recorded from the site (Wildland Consultants unpubl. data 2014b):

- Looper moth (*Chrysolarentia subrectaria*) – this site is one of three known locations where this species occurs on Banks Peninsula.

### 5. **The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

It has four plant species (Wildland Consultants unpubl. data 2014a) at their southern national limit on Banks Peninsula and one species at its southern regional limit (Wilson 2013):

- Titoki (*Alectryon excelsus*) (southern national limit)
- Akeake (*Dodonaea viscosa*) (southern national limit)
- Native passion vine (*Passiflora tetrandra*) (southern national limit)
- Kawakawa (*Piper excelsum*) (southern national limit)
- Pigeonwood (*Hedycarya arborea*) (southern regional limit)

### 6. **Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**



The site is not significant under this criterion. It does not contain indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors. It is not significant under this criterion.

### **Diversity and Pattern**

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

While the indigenous forest at the site is relatively homogenous, it supports a diverse range of plant, bird and invertebrate species.

Seventy-two indigenous plant species, seven indigenous forest birds and 132 invertebrates (of which 109 are moths and butterflies) have been recorded from the site (Wildland Consultants unpubl. data 2014a, 2014b).

The site also contains a diverse indigenous invertebrate fauna. A recent survey (Wildland Consultants unpubl. data 2014b) which targeted Lepidoptera (moths and butterflies) found 127 indigenous species, of which 107 were moths and butterflies. A list of the invertebrate species recorded at the site is provided in Appendix 2.

### **Ecological Context**

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is not significant under this criterion. It is relatively isolated within the wider landscape and does not provide or contribute to an important ecological linkage or network, although like many of Banks Peninsula's indigenous forest patches it is likely to play some role as part of network of forest patches that assist the movement and dispersal of indigenous fauna within the wider landscape. The site does not provide an important buffering function.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.



It provides important habitat for a range of common indigenous forest bird species and provides important habitat for a high diversity of indigenous moths and butterflies (Wildland Consultants unpubl. data 2014b). It supports the only known population of the Threatened - Nationally Endangered day-flying moth *Epichorista lindsayi* which was re-discovered here in 2014 after 79 years (Wildland Consultants 2014c) and provides habitat for the Threatened - Nationally Vulnerable moth *Stathmopoda albimaculata* and a cicada (*Kikihia* sp.) that is endemic to Banks Peninsula.

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## Site Management

### Existing Protection Status

A small area (0.48 ha) in the north-eastern part of the site is protected by a Banks Peninsula Conservation Trust covenant (Hutchison 2009).

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants. The site has a serious common barberry (<i>Berberis glaucocarpa</i>) infestation, particularly on the north side of the northern patch of forest. Other high priority existing pest plant threats are hawthorn (<i>Crataegus monogyna</i>), karo (<i>Pittosporum ralphii</i>) (a non-local native), cherry laurel (<i>Prunus laurocerasus</i>) and cherry plum (<i>Prunus cerasifera</i>) (Wildland Consultants unpubl. data 2014a).</li> <li>Ongoing invasion via dispersal of seeds by birds and wind.</li> </ul>	<ul style="list-style-type: none"> <li>Consider control of common barberry. Control of this species is a high priority at this site.</li> <li>Consider ongoing control and monitoring of other biodiversity pest plants.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about pest plant incursions.</li> <li>Possible assistance with pest plant control.</li> <li>Advice and guidance to landowner about monitoring of pest plants. Possible assistance with monitoring.</li> </ul>
<ul style="list-style-type: none"> <li>Loss of the only known population of the day-flying moth <i>Epichorista lindsayi</i></li> </ul>	<ul style="list-style-type: none"> <li>Seek advice on appropriate management and monitoring for this species at this site.</li> </ul>	<ul style="list-style-type: none"> <li>Discuss appropriate management and monitoring with landowner and provide assistance where appropriate.</li> </ul>



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- Wilson, H.D. (2013). *Plant Life on Banks Peninsula*. Manuka Press, Cromwell. 412 pp.





**Assessment completed by:** Scott Hooson  
**Date:** 2 September 2014

**Statement completed by:** Scott Hooson  
**Date:** 2 September 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2014a).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Alectryon excelsus</i>	titoki
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carmichaelia australis</i>	native broom, common broom
<i>Carex forsteri</i>	cutty grass
<i>Clematis foetida</i>	yellow clematis
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Crassula colligata</i>	stonecrop
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	Mercury Bay weed, dichondra
<i>Dodonaea viscosa</i>	akeake
<i>Echinopogon ovatus</i>	hedgehog grass
<i>Euchiton species</i>	cudweed
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Geranium aff. microphyllum</i>	native geranium
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Haloragis erecta</i>	toatoa
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum lanceolatum</i>	ninia
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Ileostylus micranthus</i>	green mistletoe
<i>Korthalsella lindsayi</i>	dwarf mistletoe
<i>Kunzea robusta</i>	kanuka
<i>Lagenophora strangulata</i>	parani
<i>Lastreopsis velutina</i>	velvet fern
<i>Leptinella dioica</i>	button daisy
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Microlaena polynoda</i>	bamboo rice grass
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou



<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Pneumatopteris pennigera</i>	gully fern, pakau
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax crassifolius</i>	lancewood, horoeke
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Rytidosperma unarede</i>	danthonia
<i>Scandia geniculata</i>	climbing aniseed
<i>Senecio glomeratus</i>	groundsel, fireweed
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Streblus heterophyllus</i>	small-leaved milk tree, turepo
<i>Uncinia leptostachya</i>	hook grass
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Wahlenbergia gracilis</i>	NZ harebell
<b>Exotic species</b>	
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Berberis glaucocarpa</i>	barberry
<i>Callitriche stagnalis</i>	starwort
<i>Cirsium arvense</i>	Californian thistle
<i>Conyza species</i>	fleabane
<i>Crataegus monogyna</i>	hawthorn
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Epilobium ciliatum</i>	tall willowherb
<i>Euphorbia peplus</i>	petty spurge, milkweed
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Juncus bufonius</i>	toad rush
<i>Juncus effusus</i>	soft rush
<i>Lolium perenne</i>	ryegrass
<i>Mentha pulegium</i>	pennyroyal
<i>Orobanche minor</i>	broomrape
<i>Pittosporum ralphii</i>	karo
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Plantago major</i>	broad-leaved plantain



<i>Prunus laurocerasus</i>	cherry laurel
<i>Prunus cerasifera</i>	cherry plum
<i>Prunella vulgaris</i>	selfheal
<i>Ranunculus repens</i>	creeping buttercup
<i>Ranunculus sceleratus</i>	celery-leaved buttercup
<i>Rosa rubiginosa</i>	sweet briar, briar rose
<i>Rubus fruticosus</i>	blackberry
<i>Rytidosperma racemosum</i>	danthonia
<i>Sambucus nigra</i>	elderberry
<i>Solanum chenopodioides</i>	velvety nightshade
<i>Solanum dulcamara</i>	bittersweet
<i>Teline monspessulana</i>	Montpellier broom
<i>Trifolium repens</i>	white clover
<i>Ulex europaeus</i>	gorse

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## Appendix 2: Invertebrate Species List

Sourced from Wildland Consultants unpubl. data (2014b).

\* = exotic species

ORDER/Family/genus/species	Common Name
<b>MECOPTERA</b>	scorpionfly
<b>Nannochoristidae</b>	
<i>Nannochorista philpotti</i>	
<b>NEUROPTERA</b>	lacewings
<b>Hemerobiidae</b>	
* <i>Drepanacra binocula</i>	
* <i>Micromus tasmaniae</i>	
<b>HEMIPTERA</b>	
<b>Tibicinidae</b>	cicadas
<i>Amphipsalta zelandica</i>	<i>clapping cicada</i>
<i>Kikihia</i> new species	<i>green cicada</i>
<b>Pentatomidae</b>	shieldbug
<i>Dictyotis caenosus</i>	
<b>Miridae</b>	
<i>Bipuncticoris</i> species	
<b>ORTHOPTERA</b>	
<b>Tettigoniidae</b>	katydid
<i>Conocephalus bilineatus</i>	
<b>Gryllidae</b>	cricket
<i>Pteronemobius bigelowi</i>	
<b>Acrididae</b>	grasshoppers
<i>Phaulacridium marginale</i>	
<b>Anastostomatidae</b>	tree weta
<i>Hemideina femorata</i>	
<b>COLEOPTERA</b>	
<b>Carabidae</b>	ground beetles
<i>Megadromus antarcticus</i>	
<i>Neocicindella latecincta</i>	<i>tiger beetle</i>
<b>Cerambycidae</b>	
<i>Prionoplus reticularis</i>	<i>huhu</i>
<b>Coccinellidae</b>	
<i>Coccinella leonina</i>	<i>ladybird</i>
<b>Scarabaeidae</b>	chafers
<i>Odontria striata</i>	<i>striped chafer</i>
<i>Odontria</i> species	
<i>Pyronota festiva</i>	
<b>HYMENOPTERA</b>	
<b>Ichneumonidae</b>	ichneumon
<i>Netelia producta</i>	
<b>Formicidae</b>	ant
<i>Monomorium antarcticum</i>	
<b>Pompilidae</b>	spider wasp



<i>Epipompilus insularis</i>	
<b>Vespulidae</b>	
* <i>Vespula vulgaris</i>	common wasp
<b>LEPIDOPTERA</b>	
<b>Hepialidae</b>	porina moths
<i>Wiseana copularis</i>	
<i>Wiseana umbraculata</i>	
<b>Tineidae</b>	
<i>Erechthias fulguritella</i>	
* <i>Monopis ethelella</i>	
<i>Opogona comptella</i>	
<i>Opogona omoscopa</i>	
<i>Sagephora phortigera</i>	
<i>Tinea mocholota</i>	
<b>Psychidae</b>	
<i>Liothula omnivora</i>	
<b>Glyphipterigidae</b>	
<i>Glyphipterix alchyoessa</i>	
<i>Glyphipterix nephoptera</i>	
<i>Glyphipterix erastis</i>	
<i>Glyphipterix zelota</i>	
<b>Cosmopterigidae</b>	
<i>Microcolona limodes</i>	
<b>Elachistidae</b>	
<i>Cosmiotes ombrodoca</i>	
<b>Lyonetiidae</b>	
<i>Bedellia psammitis</i>	
<b>Plutellidae</b>	
<i>Chrysorthenches porphyritis</i>	
<i>Plutella antiphona</i>	
<b>Carposinidae</b>	
<i>Heterocrossa gonosemana</i>	
<b>Depressariidae</b>	
<i>Eutorna symmorpha</i>	
<b>Gelechiidae</b>	
<i>Anisoplaca achyrota</i>	
<b>Oecophoridae</b>	
<i>Barea exarcha</i>	
<i>Gymnobathra flavidella</i>	
<i>Gymnobathra parca</i>	
<i>Gymnobathra sarcoxantha</i>	
<i>Gymnobathra tholodella</i>	
<i>Izatha huttoni</i>	
<i>Leptocroca scholaea</i>	
<i>Stathmopoda albimaculata</i>	
<i>Stathmopoda horticola</i>	
<i>Tingena marcida</i>	
<i>Tingena macarella</i>	
<i>Tingena melinella</i>	
<i>Trachypepla spartodeta</i>	
<i>Trachypepla euryleucota</i>	
<b>Pterophoridae</b>	plumemoth
<i>Platyptilia repletalis</i>	



<i>Pterophorus innotatalis</i>	
<b>Tortricidae</b>	leaf rollers
<i>Capua semiferana</i>	
<i>Cnephasia jactatana</i>	
<i>Ctenopseustis obliquana</i>	
<i>Epichorista lindsayi</i>	
<i>Harmologa amplexana</i>	
<i>Merophyas leucaniana</i>	
<i>Planotortrix excessana</i>	
New genus and species	
<i>Cryptasasma querula</i>	
<b>Thyrididae</b>	
<i>Morova subfasciata</i>	
<b>Pyralidae</b>	
<i>Patagoniodes farinaria</i>	
<b>Crambidae</b>	
<i>Deana hybreasalis</i>	
<i>Eudonia asterisca</i>	
<i>Eudonia colpota</i>	
<i>Eudonia feredayi</i>	
<i>Eudonia luminatrix</i>	
<i>Eudonia minualis</i>	
<i>Eudonia philerga</i>	
<i>Eudonia leptalea</i>	
<i>Eudonia sabulosella</i>	
<i>Eudonia submarginalis</i>	
<i>Eudonia aff. minualis</i>	
<i>Musotima nitidalis</i>	
<i>Orocrambus flexuosellus</i>	
<i>Orocrambus ramosellus</i>	
<i>Orocrambus vittellus</i>	
<i>Scoparia halopis</i>	
<i>Scoparia minusculalis</i>	
<i>Scoparia ustimcaula</i>	
<i>Udea flavidalis</i>	
<i>Udea marmarina</i>	
<i>Uresiphita maoralis</i>	
<b>GEOMETRIDAE</b>	
<i>Asaphodes beata</i>	
<i>Austrocidaria gobiata</i>	
<i>Austrocidaria similata</i>	
<i>Chrysolarentia subrectaria</i>	
<i>Chloroclystis inductata</i>	
<i>Declana junctilinea</i>	
<i>Epiphyrne undosata</i>	
<i>Homodotis megaspilata</i>	
<i>Helastia cinerearia</i>	
<i>Helastia corcularia</i>	
<i>Hydriomena deltoidata</i>	
<i>Pasiphila bilineolata</i>	
<i>Pasiphila urticae</i>	
<i>Poecilasthena schistaria</i>	
<i>Pseudocoremia indistincta</i>	



<i>Pseudocoremia leucelaea</i>	
<i>Pseudocoremia pergrata</i>	
<i>Pseudocoremia suavis</i>	
<i>Scopula rubraria</i>	
<i>Xyridacma ustaria</i>	
<b>Noctuidae</b>	
<i>Cosmodes elegans</i>	
<i>Feredayia graminosa</i>	
<i>Graphania infensa</i>	
<i>Graphania insignis</i>	
<i>Graphania lignana</i>	
<i>Graphania morosa</i>	
<i>Graphania mutans</i>	
<i>Graphania plena</i>	
<i>Graphania rubescens</i>	
<i>Graphania ustistriga</i>	
<i>Persectania aversa</i>	
<i>Proteuxoa comma</i>	
<i>Tmetolophota atristriga</i>	
<b>Erebidae</b>	
<i>Rhaphsa scotoscialis</i>	
<i>Schrankia costaestrigalis</i>	
<b>Lycaenidae</b>	coppers/ blues
<i>Lycaena "comon copper" complex</i>	
<i>Lycaena feredayi</i>	
<i>Zizina oxleyi</i>	southern blue
<b>Nymphalidae</b>	admirals
<i>Vanessa gonerilla</i>	red admiral
<b>Pieridae</b>	white butterfly
<i>*Pieris rapae</i>	
<b>PHASMIDA</b>	stick insects
<i>Clitarchus hookeri</i>	





## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Cloud Farm

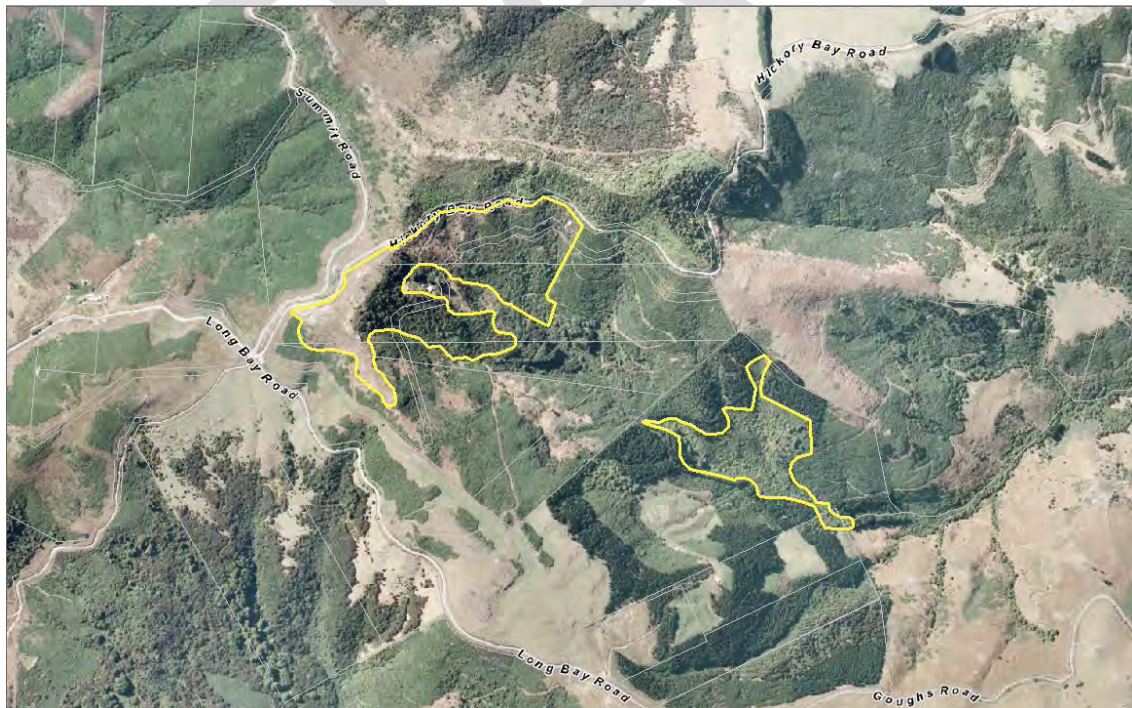
**Site number:** SES/A/4

**Physical address of site:** 68 Hickory Bay Road and 304 Goughs Bay Road

#### Summary of Significance:

The site is significant because it contains vegetation communities that are representative, distinctive and/or of restricted occurrence, supports a number of plant and invertebrate species that are either nationally At Risk, endemic, or uncommon and at their distributional limits. It buffers the southern boundary of Ellangowan Scenic Reserve.

#### Site Map



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 24.15

**Central point (NZTM):** E1602125, N5150238

## Site Description

The site is situated in the head of the Goughs Bay catchment on moderately steep south facing hill slopes on the lower (southern side) of Hickory Bay Road and immediately south of Ellangowan Scenic Reserve. The altitudinal range of the site extends from approximately 300 to 680 m above seal level.

Jensen unpubl. data (2014) describes the main vegetation communities at the site. They are:

- *Chionochloa rigida* tussockland on a high exposed grassland knob above The Cabstand;
- (Thin-bark totara)/fuchsia-broadleaf old growth forest on a steep south-east facing gully;
- Regenerating mountain five finger-fuchsia-thin-bark totara scrub and shrubland on south-facing slopes;
- (Red beech)-(thin-bark totara)/fuchsia-lancewood-broadleaf scrub

These communities are described in more detail below (from Jensen unpubl. data 2014).

The *Chionochloa rigida* tussockland on the high exposed grassland knob above The Cabstand has scattered tall tussocks with rocky outcrops. The rocky outcrops support a range of native shrubs, grasses and herbs. *Raoulia monroi* (At Risk - Declining) and *Hebe laudiana* (At Risk - Declining) occur here. Other notable plants associated with the rock outcrops include *Leucopogon fraseri*, *Colobanthus strictus*, *Crassula colligata*, *Brachyglottis lagopus*, *Rytidospermum corinum*, *Raoulia glabra* and the grasses *Dichelachne crinita* and *Elymus solandri*. This area is under a QEII covenant and is not grazed. There are a few small scattered gorse plants in the grassland and a large patch at the lower southern end above Long Bay Road.

The (thin-bark totara)/tree fuchsia-broadleaf montane old growth forest in the steep south-east facing gully has a lush understorey of fuchsia and mountain five finger with some large old broadleaf trees and a dense ferny ground cover. A notable feature is the amount of goblin moss (*Weymouthia mollis*) hanging from the very large old totara trees and fuchsia. This moss can be locally abundant in moist upland forest. Epiphytes (including *Asplenium flaccidum*, *Huperzia varia* and hounds tongue) are abundant hanging from mossy tree trunks and branches. The primary hardwood forest is under a QEII covenant and is not grazed and there is a very dense ground cover of ferns and copious tree seedlings. There were no weeds present in the forest.

Regenerating mountain five finger-tree fuchsia-thin-bark totara scrub and shrubland with some grassy clearings covers the steep hill slopes above the house. Dense scrub covers the slope across to a Douglas fir plantation to the east. Gorse is present but there is vigorous regeneration with taller totara, broadleaf and fuchsia overtopping the gorse. There are tracks cross the slope but they are becoming eroded and considerable regeneration is taking place on the tracks and banks. Around and below the house there is considerable regeneration of native shrubs and trees but also numerous planted exotic trees and shrubs. This area is part of a QEII covenant and is not grazed.

An area of regenerating scrub and low forest with several large red beech and several groups of large totara is situated further down in the valley. This area is completely surrounded by planted pines and macrocarpa. Several tall red beech trees survive in dense scrub/low forest on the valley floor. The slopes above are completely covered in dense regenerating forest with several clusters of remnant totara. The mixed broadleaf scrub/low forest has a dense canopy of totara, broadleaf, lancewood, horopito, mahoe, fuchsia and narrow-leaved lacebark. Tree ferns including soft fern, silver fern and rough tree fern are common.

Indigenous birds recorded at the site during the botanical survey were New Zealand pigeon, bellbird, rifleman, brown creeper and tomtit (Jensen unpubl. data 2014).

### **Extent of Site of Ecological Significance**

The site includes the *Chionochloa rigida* tussockland, (thin-bark totara)/fuchsia-broadleaf old growth forest and regenerating mountain five finger-fuchsia-thin-bark totara scrub and shrubland in the upper part of the site south of Ellangowan Scenic Reserve. It excludes the house and the gardens, grassy clearings and mixture of planted trees (including macrocarpa, Eucalyptus, Acacia, monkey puzzle and fruit trees) and regenerating native shrubs and trees around and below the house. It also excludes the gorse covering much of the valley floor down to the lower Trought property boundary, the Douglas fir plantation on the south facing slopes below Hickory Bay Road and the pines on the steeper hill slopes on the Sage property.

### **Assessment Summary**

The Cloud Farm Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 10).

### **Assessment against Significance Criteria**

#### **Representativeness**



- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

The (thin-bark totara)/fuchsia-broadleaf old growth forest is highly representative and significant under this criterion. It is old growth vegetation, has a very dense ground cover of ferns and regenerating seedlings and there are no weeds present in the forest (Jensen unpubl. data 2014).

The Lepidoptera assemblage is characteristic of a montane old-growth forest in the Akaroa Ecological District (Wildland Consultants unpubl. data 2014).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is not significant under this criterion. It does not contain vegetation communities or habitats of indigenous fauna that are relatively large examples of their type within the relevant ecological district

#### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The old growth montane thin-barked totara forest, red beech forest and second-growth forest within the site are significant under this criterion because they have been reduced to less than 20% of their former extent in the ecological district. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). Following human arrival the extent of forest in the ecological district (and region) was greatly reduced. The present extent of old growth forest is estimated to be approximately 800 ha or <1% of its original extent (Wilson 2009) and the present extent of all indigenous forest in the ED is estimated to be 10% (17.8% including manuka and kanuka) (New Zealand Landcover Database (Version 4)).

- 4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

A number of plant and invertebrate species have been recorded from the site that are nationally At Risk, endemic, or uncommon either within the ecological district or region.

#### Plants



Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Jensen unpubl. data 2014) are:

- *Hebe strictissima* (At Risk - Naturally Uncommon and endemic to Banks Peninsula) (red beech/thin bark totara scrub and regenerating scrub and shrubland)
- *Heliohebe lavaudiana* (At Risk - Declining and endemic to Banks Peninsula) (*Chionochloa rigida* tussockland /rock outcrops)
- *Raoulia monroi* (At Risk - Declining) (*Chionochloa rigida* tussockland /rock outcrops)

Plant species recorded from the site (Jensen unpubl. data 2014) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Phlegmariurus varius* (old-growth thin-bark totara forest)
- *Fuscospora fusca* (regenerating scrub and shrubland and red beech/thin bark totara scrub)
- *Anisotome aromatica* (*Chionochloa rigida* tussockland /rock outcrops)
- *Colobanthus strictus* (*Chionochloa rigida* tussockland /rock outcrops)
- *Gonocarpus montanus* (*Chionochloa rigida* tussockland /rock outcrops)
- *Rytidosperma corinum* (*Chionochloa rigida* tussockland /rock outcrops)

Wilson (unpubl. data, no date) recorded a number of additional plant species within the site that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013).

### **Birds**

One bird species that is uncommon in the Akaroa ED occurs at the site:

- South Island rifleman

### **Invertebrates**

Invertebrate species recorded from the site (Wildland Consultants unpubl. data 2014) that are nationally At Risk and endemic to Banks Peninsula are:

- The tree weta *Hemideina ricta* (At Risk – Naturally Uncommon and endemic to Banks Peninsula)
- The stonefly *Zelandobius wardi* (At Risk – Naturally Uncommon and endemic to Banks Peninsula)

The site also supports another endemic invertebrate (Wildland Consultants unpubl. data 2014):

- *Asterivora* ‘new species’ (Banks Peninsula jet)

One invertebrate that is uncommon in the Akaroa Ecological District has been recorded from the site (Wildland Consultants unpubl. data 2014):

- *Glyphipterix aulogramma* (first record for Banks Peninsula).



**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are two plant species at their distributional limits on Banks Peninsula (Jensen unpubl. data 2014).

The plant species at its southern national limit is:

- *Dracophyllum acerosum* (regenerating scrub and shrubland)

The species at its northern regional limit is:

- *Chionochloa rigida* (*Chionochloa rigida* tussockland /rock outcrops and regenerating scrub and shrubland)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

The vegetation communities at the site that are distinctive or of restricted occurrence are:

- (Red beech)-(thin-bark totara)/fuchsia-lancewood-broadleaf scrub
- *Chionochloa rigida* tussockland
- Old growth (thin-bark totara)/fuchsia-broadleaf cloud forest

On Banks Peninsula vegetation supporting red beech is a distinctive. Red beech is unique to the Akaroa ED, and is restricted to small patches in the wettest, coolest uplands in the south-east corner of the district (Wilson 2009).

*Chionochloa rigida* tussockland is of restricted occurrence on Banks Peninsula and is only found on the tops of the highest peaks on the peninsula.

Old growth cloud forest is restricted to high altitude areas at the eastern end of Banks Peninsula.

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

The vegetation types contain a moderate diversity of indigenous species for their type. The site contains four distinct vegetation communities. With the exception of the original thin-bark totara forest, the pattern and distribution across the site



reflects changes in aspect and altitude and different stages of vegetation succession following modification by humans.

The site supports a relatively diverse number of indigenous invertebrates across a number of orders. A recent survey (Wildland Consultants unpubl. data 2014b) which targeted Lepidoptera (moths and butterflies) found 79 indigenous invertebrate species, of which 65 were moths and butterflies. A list of the invertebrate species recorded at the site is provided in Appendix 2.

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The upper part of the site is significant under this criterion.

Although there is a road between Ellangowan Scenic Reserve and the upper part of the site, it buffers and extends the southern margin of the reserve. The site is also part of a network of protected and un-protected areas of indigenous habitats in the surrounding area.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site that meet this criterion.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

It provides important habitat for nationally At Risk invertebrates and invertebrates that are endemic to Banks Peninsula (Bowie et al. 2011, Wildland Consultants unpubl. data 2014).

## Site Management

### Existing Protection Status

With the exception of the (red beech)-(thin-bark totara)/fuchsia-lancewood-broadleaf scrub further down the valley the site is protected by QEII covenants.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Existing accessways. There is a driveway and farm several tracks within the site.</li> </ul>	<ul style="list-style-type: none"> <li>The landowner will continue to be able to use and maintain existing accessways.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the landowner is informed</li> </ul>
<ul style="list-style-type: none"> <li>Garden escapes from the dwelling adjacent to the site are a potential threat.</li> </ul>	<ul style="list-style-type: none"> <li>Consider ongoing surveillance for, and control of garden escapes and other biodiversity pest plants.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about garden escapes and other pest plants. Possible assistance with control where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Spread of Douglas fir and pines from adjoining and nearby plantations. Douglas fir in particular is a highly invasive species.</li> </ul>	<ul style="list-style-type: none"> <li>Consider ongoing surveillance for, and control of seedling Douglas fir and pines.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about wilding pines. Possible assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Gorse spreading into the <i>Chionochloa rigida</i> tussockland</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling gorse to prevent further spread into the <i>Chionochloa rigida</i> tussockland.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about gorse. Possible assistance where appropriate.</li> </ul>





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**Assessment completed by:** Scott Hooson  
**Date:** 9 October 2014

**Statement completed by:** Scott Hooson  
**Date:** 9 October 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Plant Species List

Sourced from Jensen unpubl. data (2014).

N.B. exotic species were not recorded during this survey.

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Anisotome aromatica</i>	kopoti
<i>Anthosachne solandri</i>	native wheatgrass, blue wheatgrass
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium gracillimum</i>	
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum discolor</i>	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum procerum</i>	small kiokio
<i>Brachyglottis lagopus</i>	groundsel, yellow rock daisy
<i>Carex breviculmis</i>	grassland sedge
<i>Carex forsteri</i>	cutty grass
<i>Carpodetus serratus</i>	marbleleaf, putaputāwētā
<i>Chionochloa rigida</i>	narrow-leaved snow tussock
<i>Colobanthus strictus</i>	
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamū
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Crassula colligata</i>	stonecrop
<i>Cyathea colensoi</i>	rough tree fern, mountain tree fern
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Cyathea smithii</i>	Smith's tree fern, kātote
<i>Dichelachne crinita</i>	plume grass
<i>Dicksonia squarrosa</i>	whēkī, rough tree fern
<i>Dracophyllum acerosum</i>	turpentine scrub
<i>Epilobium pubens</i>	willow herb
<i>Euchiton audax</i>	native cudweed
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Fuchsia x colensoi</i>	
<i>Fuscospora fusca</i>	red beech
<i>Gaultheria antipoda</i>	bush snowberry
<i>Geranium brevicaule</i>	short-flowered cranesbill
<i>Gonocarpus montanus</i>	
<i>Griselinia littoralis</i>	broadleaf, kāpuka
<i>Gunnera monoica</i>	native gunnera
<i>Hebe salicifolia</i>	koromiko



<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Heliohebe lavaudiana</i>	Banks Peninsula sun hebe
<i>Hierochloa redolens</i>	holy grass, kāretu
<i>Histiopteris incisa</i>	water fern, mātātā
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Huperzia varia</i>	clubmoss
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Hypolepis millefolium</i>	thousand-leaved fern
<i>Hypolepis rufobarbata</i>	sticky pig fern
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea robusta</i>	kānuka
<i>Leptopteris hymenophylloides</i>	crepe fern, heruheru
<i>Leucopogon fraseri</i>	dwarf heath, pātōtara
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Luzula banksiana</i> var. <i>orina</i>	woodrush
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Microtis unifolia</i>	onion orchid, maikaika
<i>Muehlenbeckia australis</i>	large-leaved pōhuehue
<i>Muehlenbeckia complexa</i>	scrub pōhuehue, wire vine
<i>Myrsine australis</i>	red māpou, red matipo
<i>Notogrammitis heterophylla</i>	comb fern
<i>Phormium cookianum</i>	mountain flax, wharariki
<i>Pittosporum eugenioides</i>	lemonwood, tarātā
<i>Pittosporum tenuifolium</i>	kōhūhū, black matipo
<i>Poa cita</i>	silver tussock, wī
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus cunninghamii</i>	mountain tōtara, thin-barked tōtara
<i>Polystichum vestitum</i>	prickly shield fern, pūniu
<i>Prasophyllum colensoi</i>	leek orchid
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax colensoi</i>	mountain five-finger
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pteridium esculentum</i>	bracken, rārahu, rauaruhe
<i>Raoulia glabra</i>	mat daisy
<i>Raoulia monroi</i>	fan-leaved mat daisy
<i>Rubus cissoides</i>	bush lawyer, tātarāmoa
<i>Rytidosperma corinum</i>	danthonia, bristle grass
<i>Rytidosperma unarede</i>	danthonia
<i>Schefflera digitata</i>	patē, seven-finger
<i>Thelymitra longifolia</i>	white sun orchid
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle



## Appendix 2: Invertebrate Species List

Sourced from Wildland Consultants unpubl. data (2014b)

\* = exotic species

ORDER/Family/genus/species	Common Name
<b>MECOPTERA</b>	scorpionfly
<b>Nannochoristidae</b>	
<i>Nannochorista philpotti</i>	
<b>MEGALOPTERA</b>	dobsonfly
<b>Corydalidae</b>	
<i>Archichauliodes diversus</i>	
<b>Pentatomidae</b>	shieldbug
<i>Dictyotis caenosus</i>	
<b>ORTHOPTERA</b>	
<b>Acrididae</b>	grasshoppers
<i>Phaulacridium marginale</i>	
<b>Anastostomatidae</b>	
<i>Hemideina ricta</i>	
<i>Hemiandrus new species</i>	
<b>Rhaphidophoidae</b>	
<i>Pleioplectron simplex</i>	
<b>COLEOPTERA</b>	
<b>Cerambycidae</b>	
<i>Prionoplus reticularis</i>	<i>huhu</i>
<b>Curculionidae</b>	weevils
<i>Tribe Eugnomini</i>	
<i>Undescribed genus and species</i>	
<b>HYMENOPTERA</b>	
<b>Pompilidae</b>	spider wasp
<i>Epipompilus insularis</i>	
<b>Ichneumonidae</b>	
<i>Small species</i>	
<b>DIPTERA</b>	
<i>Trupanea imperfecta</i>	<i>fruit fly</i>
<b>LEPIDOPTERA</b>	
<b>Micropterigidae</b>	
<i>Sabatinca aenea</i>	
<b>Hepialidae</b>	porina moths
<i>Wiseana umbraculata</i>	
<b>Nepticulidae</b>	
<i>Stigmella fulva</i>	
<b>Psychidae</b>	
<i>Liothula omnivora</i>	
<b>Glyphipterigidae</b>	
<i>Glyphipterix alchoyessa</i>	
<i>Glyphipterix triselena</i>	
<i>Glyphipterix aulogramma</i>	



<b>Gracillariidae</b>	
<i>Acrocercops panacicorticis</i>	
<i>Acrocercops panacitorsens</i>	
<b>Elachistidae</b>	
<i>Cosmiotes ombrodoxa</i>	
<b>Plutellidae</b>	
<i>Chrysorthenches porphyritis</i>	
<b>Batrachedridae</b>	
<i>Batrachedra "grey"</i>	
<b>Depressariidae</b>	
* <i>Agonopterix umbellana</i>	
<i>Eutorna caryochroa</i>	
<i>Eutorna symmorpha</i>	
<i>Nymphostola galactina</i>	
<b>Gelechiidae</b>	
<i>Megacraspedus calamogonus</i>	
<b>Oecophoridae</b>	
<i>Gymnobathra caliginosa</i>	
<i>Gymnobathra parca</i>	
<i>Gymnobathra sarcoxantha</i>	
<i>Leptocroca scholaea</i>	
<i>Phaeosaces apocrypta</i>	
<i>Stathmopoda horticola</i>	
<i>Tingena apertella</i>	
<i>Tingena marcida</i>	
<i>Tingena macarella</i>	
<i>Tingena melinella</i>	
<i>Tingena plagiata</i>	
<i>Trachypepla euryleucota</i>	
<i>Trachypepla species</i>	
<i>Terachypepla aspidephora</i>	
<b>Pterophoridae</b>	plumemoth
<i>Aciptilia monospilalis</i>	
<i>Platyptilia repletalis</i>	
<i>Stenoptilia orites</i>	
* <i>Stenoptilia zophodactyla</i>	
<b>Choreutidae</b>	jets
<i>Asterivora new species</i>	
<b>Tortricidae</b>	leaf rollers
* <i>Cydia succedana</i>	
<i>Dipterina imbriferana</i>	
<i>Harmologa amplexana</i>	
<i>Leucotenes coprosmae</i>	
<i>Planotortrix excessana</i>	
<b>Crambidae</b>	
<i>Deana hybreasalis</i>	
<i>Eudonai chlamydota</i>	
<i>Eudonia sabulosella</i>	
<i>Glaucocharis pyrsophanes</i>	
<i>Orocrambus flexuosellus</i>	
<i>Orocrambus ramosellus</i>	
<i>Orocrambus vittellus</i>	
<i>Udea flavidalis</i>	



<i>Udea marmorata</i>	
<b>GEOMETRIDAE</b>	
* <i>Chloroclystis filata</i>	
<i>Chloroclystis sphragitis</i>	
<i>Cleora scriptaria</i>	
<i>Declana egregia</i>	
<i>Declana floccosa</i>	
<i>Declana leptomera</i>	
<i>Declana junctilinea</i>	
<i>Ischalis fortinata</i>	
<i>Pseudocoremia fasciculata</i>	
<i>Sestra flexata</i>	
<b>Noctuidae</b>	
<i>Feredayia graminosa</i>	
<i>Graphania mollis</i>	
<i>Graphania mutans</i>	
<i>Graphania omoplaca</i>	
<i>Tmetolophota atristriga</i>	
<i>Tmetolophota purdii</i>	
<b>Lycaenidae</b>	coppers/ blues
<i>Lycaena "comon copper" complex</i>	
<i>Lycaena feredayi</i>	
<b>Nymphalidae</b>	admirals
<i>Vanessa gonerilla</i>	red admiral
<b>PLECOPTERA</b>	stonefly
<b>Gripopterygidae</b>	
<i>Zelandobius wardi</i>	

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Decanter Headland

**Site number:** SES/A/5

**Physical address of site:** 203 Decanter Bay Road

#### **Summary of Significance:**

It is a large example of a mosaic of indigenous secondary forest, and shrubland on dry coastal and lowland hill slopes that has basic cliffs, scarps and tors, and coastal cliffs which are both originally rare ecosystems. It supports a diverse range of indigenous plant taxa including an indigenous plant species that is nationally Threatened, several that are nationally At Risk (including two that are also endemic to Banks Peninsula) and uncommon within the ecological district or region and five that are at their distributional limit on Banks Peninsula.

#### **Site Map**



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 68.71

**Central point (NZTM):** E1599975, N5165495

## Site Description

This site is located on the western side of Little Akaloa Bay on the very steep south-eastern side of the headland between Little Akaloa and Decanter Bays. The altitudinal range of the site is from sea level to 280 m above sea level. It is a Recommended Area for Protection (Akaroa RAP 42 – Decanter) (Wilson 1992). Bands of rock scarps and rock outcrops occur throughout the site.

The main indigenous vegetation communities, as described by Wildland Consultants (2013) are:

- (Shining broadleaf)-narrow-leaved lacebark-lowland ribbonwood-mahoe/*Coprosma virescens* forest and shrubland on steep coastal and lowland hill slopes
- Silver tussock/sweet vernal-cocksfoot grassland on steep coastal and lowland hill slopes
- Common native broom - *Coprosma virescens* - *C. crassifolia* shrubland on steep coastal and lowland hill slopes.

These communities are described in more detail below (from Wildland Consultants 2013).

The majority of the site consists of a mosaic of regenerating native coastal/lowland hardwood forest and shrubland. The main canopy species are lowland ribbonwood, narrow-leaved lacebark, and mahoe, with lesser amounts of kowhai, kaikomako, and ngaio. *Coprosma virescens* is the most abundant shrub at the site, followed by native broom (*Carmichaelia australis*) and thick-leaved mikimiki (*Coprosma crassifolia*). Ongaonga is also very common under the forest canopy. Kanuka, matagouri, and prostrate kowhai are relatively localised at the site, and mainly occur around the top of rock bluffs or near the road. A suite of specialist plants occur on rock outcrops at the site, including *Cheilanthes sieberi*, *Linum monogynum*, *Hebe strictissima*, *Pellaea calidirupium*, *Luzula banksiana* var. *orina*, and *Disphyma australe*. Puka (*Griselinia lucida*) is also associated with rock outcrops at the site, and mostly occurs in relatively inaccessible places at the top of cliffs. A wide variety of native climbers occur at the site; the most abundant species are New Zealand bindweed (*Calystegia tuguriorum*), jasmine (*Parsonsia capsularis*), Clematis foetida, and pohuehue (*Muehlenbeckia australis* and *M. complexa*). Two species of native mistletoe were recorded on *Coprosma virescens* (*Ileostylis micranthus* and *Korthalsella lindsayi*).

Silver tussock forms a reasonably dense cover at the southern end of this vegetation type, however exotic grasses (particularly sweet vernal and cocksfoot) become dominant in other places. Scattered shrubs of native broom and small-leaved coprosma/mikimiki (*C. virescens* and *C. crassifolia*) occur in the grassland. A number



of rock outcrops are present in this area, and these support a few specialist plants (e.g. *Leptinella minor*), however the vegetation cover is relatively sparse on the rocks.

Near the headland the vegetation cover is dominated by native broom, with lesser amounts of small-leaved coprosma/mikimiki (*C. virescens* and *C. crassifolia*) and niniaio. The density of shrubs is generally higher towards the lower half of the slope (near the sea). Some reasonably large rock outcrops occur in this vegetation type, and these support some typical rock outcrop species (e.g. *Einadia triandra* and *Senecio glaucophyllus* subsp. *basinudus*), including introduced weeds such as pigs ear.

### **Extent of Site of Ecological Significance**

The site includes the forest, shrubland and silver tussock grassland on the east facing slopes above Little Akaloa Bay. The silver tussock grassland between the forest and shrubland at the southern end of the site and the shrubland at the end of the headland is included because it contains rock outcrops with indigenous vegetation (an originally rare ecosystem), supports two nationally At Risk species (*Leptinella minor* and *Coprosma virescens*) and because it is part of a discontinuous sequence of indigenous vegetation across the headland that connects the two areas of forest and shrubland.

The boundaries of this site logically extend beyond the mapped site boundaries to include an additional area of connected indigenous forest, treeland and shrubland on the hill slopes south-west of the site. There is no information available on this area so an ecological survey of this potential extension to the site is recommended.

### **Assessment Summary**

The Decanter Headland Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8).

### **Assessment against Significance Criteria**

#### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion



The secondary growth forest and shrubland within the site is moderately representative and meets the threshold for significance under this criterion.

The site is a mosaic of indigenous vegetation and grassland. The silver tussock grassland is dominated by exotic grass species (particularly sweet vernal and cocksfoot) and is not significant under this criterion. The forest and shrublands are grazed and contain a large number of exotic plant species, but they also support a diverse range of indigenous plants, including a number of threatened and at risk species. They are moderately representative of coastal forest and shrubland in the ecological district. The rock outcrops within the site support plant species that are typical of rock outcrops in this situation, although the vegetation cover on rock outcrops within the silver tussock grassland is relatively sparse (Wildland Consultants 2013).

**2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It is a large example of a mosaic of indigenous secondary forest, and shrubland on dry coastal and lowland hill slopes in the Akaroa Ecological District.

**Rarity/Distinctiveness**

**3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The forest within the site is significant under this criterion.

At the ecological district (and ecological region) scale indigenous forest has been reduced to less than 20% at the ecological district scale. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and kanuka) in the ED is estimated to be 10% (17.8% including manuka and kanuka) (New Zealand Landcover Database (Version 4)). There is no accurate information to assess the change in extent of indigenous scrub and shrublands within the ecological district, but indigenous coastal shrublands have been vastly reduced in extent and most of those that remain are very small highly modified fragments (Lettink 2013).

**4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.***

The site is significant under this criterion.

It supports an indigenous plant species that is nationally Threatened and several that are nationally At Risk (including two that are also endemic to Banks Peninsula) and uncommon within the ecological district or region.

**Plants**



Nationally Threatened and At Risk plant species (de Lange et al. 2013) recorded from the site (Wildland Consultants 2013, Walls 2001) are:

- *Geranium retrorsum* (Threatened - Nationally Vulnerable)
- *Coprosma virescens* (At Risk - Declining) abundant in forest and shrubland within the site
- *Olearia fragrantissima* (At Risk - Declining), Walls (2001) recorded at least 15 plants and Wildland Consultants (2013) recorded 4 adults plants
- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to Banks Peninsula), occasional on rock outcrops
- *Pseudopanax ferox* (At Risk - Naturally Uncommon)
- *Leptinella minor* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Senecio glaucophyllus subsp. basinudus* (Nat Unc)

Plant species recorded from the site (Wildland Consultants 2013) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Brachyscome radicata*
- *Griselinia lucida*, some large trees on rock outcrops
- *Hydrocotyle novae-zeelandiae*
- *Pellaea calidirupium*

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are four species that are at their southern national distributional limits on Banks Peninsula and one that is at its northern national limit (Wilson 2013). These species are (Wildland Consultants 2013):

- *Asplenium oblongifolium* (southern national limit)
- *Dodonaea viscosa* (southern national limit)
- *Piper excelsum* (southern national limit)
- *Griselinia lucida* (southern regional limit)
- *Olearia fragrantissima* (northern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion. There are igneous bluffs, scarps and rock outcrops throughout the site including along the coast. At a national scale, basic cliffs, scarps and tors, and coastal cliffs are both originally rare ecosystems (Williams et al. 2007). Where indigenous vegetation occurs on these features within the site they are significant under this criterion.



## Diversity and Pattern

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

It supports a sequence of indigenous vegetation extending from the coastal cliffs at sea level to approximately 280 m. The vegetation is comprised of a mosaic of indigenous vegetation communities including secondary forest, shrubland and grassland that together support a diverse range of indigenous plant taxa. Eighty-one species were recorded at the site in a recent botanical survey (Wildland Consultants 2013).

## Ecological Context

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is not significant under this criterion. The regenerating native coastal/lowland hardwood forest and shrubland that make up the site is part of a network of forest, scrub and forest habitats in the Little Akaloa catchment and wider landscape. However, its role as an ecological linkage or part of an ecological network is not important, particularly because it extends onto a headland that is otherwise surrounded by pasture grassland.

The site is also directly above the coast and connected to the marine environment. It probably plays a localised role in reducing sediment and nutrient run-off into the coastal marine environment. However, this role is unlikely to be important enough to meet the threshold for significance under this criterion.

- 9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. There are no wetlands within the site.

- 10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

There is insufficient information to assess the site against this criterion.

## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Lack of recruitment of <i>Olearia fragrantissima</i>. regeneration is limited by stock, rabbits, hares and possums. (Walls 2001)</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing a portion of the site, preferably with rabbit proof fencing, to protect plants from stock, rabbits and hares.</li> <li>Consider cultivating progeny and re-planting them back into the site (Walls 2001)</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about benefits of protecting <i>Olearia fragrantissima</i> and possible options. Advice and guidance, along with assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants. White-edged nightshade (an eradication pest plant under the Canterbury RPMS), pigs ear, rose campion, wilding macrocarpa, hawthorn, sweet briar (Wildland Consultants 2013)</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling high priority pest plants, particularly white-edged nightshade, grey willow and hawthorn and those such as wilding macrocarpa trees that could be controlled relatively easily.</li> <li>Consider containing pigs ear to coastal cliffs to protect rock out-crop and shrubland values.</li> <li>Consider ongoing surveillance for, and control if detected, of other biodiversity pest plants such as boxthorn that are known to occur in the vicinity of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about pest plants and assistance with control where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>A road passes through the site: pest plants along roadside.</li> </ul>	<ul style="list-style-type: none"> <li>The road will continue to be able to be maintained but threats including the establishment of woody weeds such as gorse</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about monitoring roadside pest plants. Assistance with control where appropriate.</li> </ul>

	and broom, fire risk etc. should be managed appropriately.	
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**Assessment completed by:** Scott Hooson  
**Date:** 22 December 2014

**Statement completed by:** Scott Hooson  
**Date:** 22 December 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2014a).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Alectryon excelsus</i>	titoki
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Asplenium oblongifolium</i>	shining spleenwort, huruhuruwhenua
<i>Brachyscome radicata</i>	
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carmichaelia australis</i>	native broom, common broom
<i>Cardamine species</i>	bittercress
<i>Cheilanthes sieberi</i>	rock fern
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Convolvulus waitaha</i>	grass convolvulus
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	Mercury Bay weed, dichondra
<i>Disphyma australe</i>	NZ iceplant
<i>Discaria toumatou</i>	matagouri, wild irishman
<i>Dodonaea viscosa</i>	akeake
<i>Einadia triandra</i>	pigweed
<i>Euchiton species</i>	cudweed
<i>Ficinia nodosa</i>	club rush, wiwi
<i>Fuchsia excorticata x perscandens</i>	shrubby fuchsia
<i>Galium propinquum</i>	native bedstraw
<i>Geranium aff. microphyllum</i>	native geranium
<i>Geranium retrorsum</i>	turnip-rooted geranium
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Griselinia lucida</i>	shining broadleaf, puka
<i>Haloragis erecta</i>	toatoa
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum lanceolatum</i>	niniaio
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle moschata</i>	pennywort
<i>Hydrocotyle novae-zeelandiae</i>	pennywort
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Korthalsella lindsayi</i>	dwarf mistletoe
<i>Kunzea ericoides</i>	kanuka
<i>Leptinella dioica</i>	button daisy
<i>Leptinella minor</i>	Banks Peninsula button daisy





<i>Linum monogynum</i>	NZ linen flax
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Luzula banksiana</i> var. <i>orina</i>	woodrush
<i>Macropiper excelsum</i>	kawakawa
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Microtis unifolia</i>	onion orchid, maikaika
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Olearia fragrantissima</i>	fragrant tree daisy
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	native oxalis
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parietaria debilis</i>	NZ pellitory
<i>Pellaea calidrupium</i>	
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Poa cita</i>	silver tussock
<i>Poa imbecilla</i>	weak poa
<i>Polystichum neozelandicum</i> subsp. <i>zerophyllum</i>	shield fern
<i>Polystichum oculatum</i>	shield fern
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax ferrox</i>	fierce lancewood
<i>Pyrrosia eleagnifolia</i>	leatherleaf fern
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Scandia geniculata</i>	climbing aniseed
<i>Senecio glaucophyllus</i> subsp. <i>basinudus</i>	groundsel
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Sophora prostrata</i>	dwarf kowhai, prostrate kowhai
<i>Urtica ferrox</i>	ongaonga, tree nettle
<i>Wahlenbergia gracilis</i>	NZ harebell
<b>Exotic Species</b>	
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Aira caryophyllea</i>	silvery hair grass
<i>Anthriscus caucalis</i>	beaked parsley
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Anthosachne scabra</i>	blue wheatgrass
<i>Bellis perennis</i>	daisy
<i>Bromus diandrus</i>	rippgut brome
<i>Bromus hordeaceus</i>	soft brome
<i>Carduus tenuiflorus</i>	winged thistle
<i>Centaureum tenuiflorum</i>	slender centaury



<i>Cerastium glomeratum</i>	chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Claytonia perfoliata</i>	miners lettuce
<i>Cotyledon orbiculata</i>	pig's ear, elephant's ear
<i>Crataegus monogyna</i>	hawthorn
<i>Critesion marinum</i>	salt barley grass
<i>Critesion murinum</i>	barley grass
<i>Cupressus macrocarpa</i>	macrocarpa, Monterey cypress
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Epilobium cinereum</i>	willow herb
<i>Erodium cicutarium</i>	storksbill
<i>Euphorbia peplus</i>	petty spurge, milkweed
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Juncus bufonius</i>	toad rush
<i>Lolium perenne</i>	ryegrass
<i>Lychnis coronaria</i>	rose campion
<i>Marrubium vulgare</i>	horehound
<i>Medicago arabica</i>	spotted bur medick
<i>Myosotis arvensis</i>	field forget-me-not
<i>Orobanche minor</i>	broomrape
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Polycarpon tetraphyllum</i>	allseed
<i>Ranunculus repens</i>	creeping buttercup
<i>Rosa rubiginosa</i>	sweet briar, briar rose
<i>Rytidosperma racemosum</i>	danthonia
<i>Sagina procumbens</i>	procumbent pearlwort
<i>Salix cinerea</i>	grey willow
<i>Sedum acre</i>	stonecrop
<i>Sherardia arvensis</i>	field madder
<i>Silene gallica</i>	catchfly
<i>Silybum marianum</i>	variegated thistle
<i>Sisymbrium officinale</i>	hedge mustard
<i>Solanum marginatum</i>	white edged nightshade
<i>Sonchus oleraceus</i>	puha, smooth sow thistle
<i>Spergularia rubra</i>	sand spurrey
<i>Stellaria media</i>	chickweed
<i>Trifolium dubium</i>	suckling clover
<i>Trifolium repens</i>	white clover
<i>Ulex europaeus</i>	gorse
<i>Urtica urens</i>	nettle
<i>Veronica arvensis</i>	field speedwell
<i>Verbascum thapsus</i>	woolly mullein
<i>Vicia sativa</i>	vetch
<i>Vulpia bromoides</i>	vulpia hair grass



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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** North West Okains Bay

**Site number:** SES/A/6

**Physical address of site:** 75 Boleyns Road, Okains Bay

#### Summary of Significance:

This site is significant because it contains rare, representative and diverse coastal and lowland forest and shrublands on an Acutely Threatened land environment. The site supports an outstanding number of indigenous plant species that are nationally Threatened or At Risk and has four plant species at their distributional limits. It contains shrublands that have two nationally threatened shrubs with very limited distributions on Banks Peninsula: *Pittosporum obcordatum* and *Olearia fimbriata*.

#### Site Map



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 28.4

**Central point (NZTM):** E1604786, N5163750

## Site Description

The North West Okains Bay Site is located in North West Bay inside Okains Bay West Head. The site comprises the forested part of the main valley, which drains to the northeast into North West Bay, several side gullies which drain to the south and east, and the south-facing slopes at the eastern end of the site. The altitudinal range of the site is from sea level to 160. A small stream flows through the site. The Department of Conservation identified the site as a Recommended Area for Protection (Akaroa RAP 39 – North West Bay) (Wilson 1992).

The vegetation at North West Bay has many species of botanical interest (Wilson 1992). It is a mosaic of small-leaved shrubland, secondary growth podocarp-hardwood forest, and treeland over exotic grassland. The main valley (western part of the site) supports taller, denser forest and contains some large original remnant podocarps (several matai and one kahikatea). Towards the eastern end of the site, the vegetation is lower and the canopy cover is more patchy, with exotic grasses forming the dominant ground cover. The site also includes the coastal vegetation communities growing on the coastal cliffs, rocks and beaches. Wildland Consultants unpubl. data (2012) describe the four main vegetation communities at the site. They are:

- Mixed canopy secondary hardwood forest with emergent podocarps (matai, kahikatea and totara) on gentle south-facing slopes.
- Mixed canopy secondary hardwood forest and small-leaved shrubland on south-east facing slopes towards the beach.
- Secondary kanuka forest and treeland over exotic grassland near the head of the valley.
- Coastal shrubland with scattered ngaio.

These communities are described in more detail below (from Wildland Consultants unpubl. data 2012).

The canopy of the mixed secondary hardwood forest is quite diverse, with titoki, lowland ribbonwood, ngaio and narrow-leaved lacebark being the most common species. There are several large remnant podocarp trees in the middle of the valley, including a very large kahikatea. Native vines are abundant, particularly near the head of the valley where the canopy is more open. The forest has been heavily grazed by stock and there is very little regeneration of native species in the understorey. There is a sizeable population of fierce lancewood, with many adults and juveniles, however no seedlings were seen. Small patches of *Brachyglottis sciadophila* and *Australina pusilla* are present near the podocarps.

The mixed canopy secondary hardwood forest and small-leaved shrubland on the south-east facing slopes towards the beach consists of a mosaic of mixed secondary hardwood forest and small-leaved shrubs. Lowland ribbonwood, ngaio and narrow-leaved lacebark are the most abundant canopy trees, and *Coprosma crassifolia* and *C. virescens* are the most common shrubs. Several species of native vines are abundant throughout the area. The vegetation has been subject to heavy grazing pressure and the understorey is quite bare (apart from ongaonga). There are a number of large karaka trees next to the beach (see Wilson 1986 and Wilson 1992). There are adult *Olearia fragrantissima* trees in this area, however there appears to be little or no regeneration as no seedlings were seen. One of the small side gullies just outside the site boundary contains two nationally threatened species - *Pittosporum obcordatum* and *Olearia fimbriata*.

Small patches of kanuka forest and treeland buffer the indigenous secondary hardwood forest, particularly on the drier, north-facing side of the valley. A variety of small-leaved shrubs also occur in these areas and native vines are common. The kanuka has been heavily grazed by stock, and there is little underneath apart from exotic grasses and ongaonga.

The south-facing slopes and coastal cliffs above the bouldery beach support coastal shrubland dominated by small-leaved *Coprosma* species, native broom and korokio. There are some larger trees scattered through this vegetation type and at the base of the cliffs; these consist mainly of ngaio and lowland ribbonwood. There is a steeper, rocky area at the far eastern end of the site where the shrubs are more sparse and stunted.

Indigenous birds recorded at the site are bellbird, South Island fantail, grey warbler shining cuckoo, and swamp harrier with black-backed and red-billed gulls (Wildland Consultants unpubl. data 2012). The bouldery beach at the base of the cliffs is a haul-out area and breeding colony for New Zealand fur seals (Walls 2001, Hutchison 2014).

### **Extent of Site of Ecological Significance**

This site includes the area of coastal scrub on the headland on the northern side of the bay and the indigenous lowland podocarp/hardwood forest and connected kanuka forest that occupies the gully inland of Northwest Okains Bay.

### **Assessment Summary**

The NW Okains Bay Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups.. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 8).



## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

Although the forest within the site has been heavily grazed by stock and there is very little regeneration of native species in the understorey it has retained some original remnant matai, kahikatea and totara (Wildland Consultants unpubl. data 2012). It is a good example of its type in the ecological district and is representative of forest on lowland hill slopes. The coastal shrublands are also relatively intact and support several notable species. The site is almost entirely free of invasive weeds, apart from occasional pigs ear on the coastal cliffs (Hutchison 2014).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

At 28 ha in size, the site is a relatively large example of coastal and lowland podocarp/hardwood forest and coastal shrublands in the Akaroa Ecological District.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The lowland podocarp/hardwood forest within the site is significant under this criterion.

Coastal and lowland forest has been reduced to a fragment of its former extent at the Region and ecological district scales. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 10% (New Zealand Landcover Database (Version 4)).

This site also meets this criterion at the Level IV land environment scale. It is entirely on an Acutely Threatened land environment (F3.1a) where 9.9% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).



**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has a large number of indigenous plant species that are threatened, at risk, or uncommon, either nationally or within the ecological region or ecological district (Wildland Consultants unpubl. data 2012, Hutchison 2014, Walls 2001).

Nationally Threatened and At Risk species (de Lange et al. 2013) recorded from the site (Wildland Consultants unpubl. data 2012) are:

- *Pittosporum obcordatum* (Threatened - Nationally Vulnerable). At least 65 plants plus seedlings. This species is only known from this location on Banks Peninsula with the exception of one individual plant recently found growing nearby.
- *Olearia fimbriata* (Threatened - Nationally Vulnerable). A single large tree. *O. fimbriata* is very rare on Banks Peninsula, and is only known from two other sites nearby (Walls 2001)
- *Carex inopinata* (Threatened - Nationally Vulnerable)
- *Olearia fragrantissima* (At Risk - Declining). Ten - 20 trees
- *Coprosma virescens* (At Risk - Declining)
- *Brachyglottis sciadophila* (At Risk - Declining)
- *Tupeia antarctica* (At Risk - Declining)
- *Coprosma virescens* (At Risk - Declining)
- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Pseudopanax ferox* (At Risk - Naturally Uncommon). Good population with adults, adolescents and juveniles.
- *Chenopodium allanii* (At Risk - Naturally Uncommon)
- *Senecio glaucophyllus subsp. basinudus* (At Risk - Naturally Uncommon)

Plant species recorded from the site (Wildland Consultants unpubl. data 2012) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Australina pusilla*
- *Melicytus micranthus*
- *Tetragonia implexicoma*

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

It has three species at their southern national limit on Banks Peninsula and one at its northern national limit on Banks Peninsula (Wildland Consultants unpubl. data 2012, Hutchison 2014, Walls 2001). These species are:

- *Olearia fragrantissima* (northern national limit)
- *Alectryon excelsus* (southern national limit)
- *Passiflora tetrandra* (southern national distribution)
- *Cheilanthes distans* (southern national limit)





- 6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

The coastal part of the site has indigenous vegetation on basic coastal cliffs which are an 'originally rare ecosystem' (Williams et al. 2007). The site also supports shrublands that have two species with very limited distributions on Banks Peninsula. It is the only known location for *Pittosporum obcordatum* on Banks Peninsula (Hutchison 2014) and *Olearia fimbriata* is only known from two other sites nearby (Walls 2001).

### Diversity and Pattern

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

It contains a vegetation sequence from the marine environment to forest on lowland hill slopes. It includes the beach, coastal cliffs, and indigenous shrublands on coastal and lowland hill slopes and podocarp/hardwood forest on lowland hill slopes.

The vegetation at the site is also diverse, with 74 indigenous plant taxa recorded (Hutchison 2014).

### Ecological Context

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is significant under this criterion.

The site is not linked to any other sites, and with the exception of a small partially forested gully to the immediate south, the site is relatively isolated. However, like many of Banks Peninsula's indigenous forest patches it is likely to play some role as a stepping stone for the dispersal of indigenous fauna within the wider landscape and the forested gully and coastal shrublands buffer the coast and the marine environment. Within the site, areas of connected kanuka forest and treeland have been included within the site boundary where they provide a buffer to the secondary hardwood forest.

- 9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is significant under this criterion. There are no wetlands within the site.



*10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

There is insufficient information to assess the site against this criterion.

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## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Loss or decline of the <i>Pittosporum obcordatum</i> population.</li> </ul>	<ul style="list-style-type: none"> <li>Consider monitoring as recommended by Hutchison (2014) as follows:                             <ul style="list-style-type: none"> <li>Ongoing monitoring of tagged individuals should be carried out to assess long-term survival, growth, and seed production rates.</li> <li>Monitoring of seedling survival and growth should be carried out to determine the key factors affecting seedling establishment and recruitment.</li> <li>A trial to determine the optimal grazing regime for <i>P. obcordatum</i> seedling establishment, (excluding sheep from part of the site and monitoring seed germination and seedling survival in both grazed and un-grazed areas)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about ongoing monitoring and protection of <i>Pittosporum obcordatum</i>. Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Land-use or landowner change</li> </ul>	<ul style="list-style-type: none"> <li>Consider legal protection of the site (or the part of the site with <i>P. obcordatum</i> in order to</li> </ul>	<ul style="list-style-type: none"> <li>Not appropriate: this is a decision for the landowner.</li> </ul>

	ensure that its habitat is permanently protected) (Hutchison 2014).	
<ul style="list-style-type: none"> <li>Stock browse and damage (Wildland Consultants unpubl. data 2012)</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the site, or parts of the site to keep stock out and promote seedling recruitment and recovery of the understorey.</li> <li>Consider intermittent sheep grazing in the part of the site with <i>P. obcordatum</i> (subject to the result of the trial discussed above) (Hutchison 2014)</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about stock management to protect <i>P. obcordatum</i>. Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Ongoing invasion via dispersal of seeds both by birds and wind.</li> </ul>	<ul style="list-style-type: none"> <li>Consider containing pigs ear to coastal cliffs to protect rock out-crop and shrubland values.</li> <li>Consider ongoing surveillance for, and control if detected, of other biodiversity pest plants such as banana passionfruit, boxthorn and old mans beard that are known to occur in the vicinity of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about pest plant monitoring and control. Assistance where appropriate.</li> </ul>



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**Assessment completed by:** Scott Hooson  
**Date:** 8 September 2014

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Sourced from Wildland Consultants unpubl. data (2012).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Alectryon excelsus</i>	tītoki
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Australina pusilla</i>	
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carex inopinata</i>	grassy mat sedge
<i>Carmichaelia australis</i>	native broom, common broom
<i>Chenopodium allanii</i>	dicot herb
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma rubra</i>	mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, tī kōuka
<i>Corokia cotoneaster</i>	korokio
<i>Corynocarpus laevigatus</i>	karaka
<i>Cotula australis</i>	common cotula, soldiers button
<i>Crassula sieberiana</i>	stonecrop
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dichondra repens</i>	Mercury Bay weed, dichondra
<i>Disphyma australe</i>	NZ iceplant
<i>Ficinia nodosa</i>	club rush, wiwi
<i>Geranium aff. microphyllum</i>	native geranium
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum lanceolatum</i>	ninia
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle moschata</i>	pennywort
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus edgariae</i>	leafless rush, wiwi
<i>Korthalsella lindsayi</i>	dwarf mistletoe
<i>Kunzea ericoides</i>	kānuka
<i>Lophomyrtus obcordata</i>	rōhutu, NZ myrtle
<i>Melicope simplex</i>	poataniwha
<i>Melicytus micranthus</i>	swamp māhoe
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Muehlenbeckia australis</i>	large-leaved pōhuehue
<i>Muehlenbeckia complexa</i>	scrub pōhuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red māpou, red matipo



<i>Myrsine divaricata</i>	weeping matipo, weeping māpou
<i>Olearia fimbriata</i>	
<i>Olearia fragrantissima</i>	fragrant tree daisy
<i>Parietaria debilis</i>	NZ pellitory
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Plagianthus regius</i>	lowland ribbonwood, mānatu
<i>Poa cita</i>	silver tussock, wī
<i>Poa imbecilla</i>	weak poa
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus totara</i>	lowland tōtara
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	mataī
<i>Pseudognaphalium luteoalbum</i>	jersey cudweed
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Scandia geniculata</i>	climbing aniseed
<i>Senecio glaucophyllus</i> subsp. <i>basinudus</i>	yellow rock groundsel
<i>Sophora microphylla</i>	kōwhai, weeping kōwhai
<i>Sophora prostrata</i>	dwarf kōwhai, prostrate kōwhai
<i>Streblus heterophyllus</i>	small-leaved milk tree, tūrepo
<i>Tetragonia implexicoma</i>	climbing shore spinach
<i>Tupeia antarctica</i>	pirita, white-berried mistletoe
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species</b>	
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Bellis perennis</i>	lawn daisy
<i>Bromus diandrus</i>	rippgut brome
<i>Bromus hordeaceus</i>	soft brome
<i>Carduus</i> sp.	thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Claytonia perfoliata</i>	miner's lettuce
<i>Cotyledon orbiculata</i>	pig's ear, elephant's ear
<i>Critesion murinum</i>	barley grass
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Lolium perenne</i>	ryegrass
<i>Polycarpon tetraphyllum</i>	allseed
<i>Stellaria media</i>	chickweed





<i>Trifolium repens</i>	white clover

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Steep Head

**Site number:** SES/A/7

**Physical address of site:** 225 Dalglishs Road, Le Bons Bay

#### Summary of Significance:

The site is significant because it contains a rare and moderately representative example of coastal forest, treeland and scrub on a dry coastal headland. It also has basic coastal cliffs and basic cliffs, scarps and tors that are originally rare ecosystems at a national scale. These vegetation communities support five plant species that are nationally At Risk and four that are at their southern national distributional limits on Banks Peninsula.

#### Site Map



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 45.27

**Central point (NZTM):** E1608348, N5156620

## Site Description

The site is on the steep headland on the southern side of Le Bons Bay. It is north of the end of Dalglishs Road and inland of Steep Head and directly above the mouth of Le Bons Estuary mouth and the southern end of Le Bons Bay beach. It extends from sea level to approximately 260 m above sea level. The aspect is generally north-west and the topography is steep to very steep.

The vegetation at the site is comprised of coastal (lowland totara)/kanuka-ngaio-kowhai forest and treeland and coastal kanuka-ngaio treeland. It includes the coastal cliffs, as well as occasional rock bluffs and outcrops. The description of the vegetation (below) is sourced from Jensen (unpubl. data 2013).

The (lowland totara)/kanuka-ngaio-kowhai forest and treeland is a dry coastal forest with a mixed canopy with co-dominant ngaio, kanuka and kowhai and frequent mahoe, narrow-leaved lacebark, ribbonwood and titoki. There are occasional remnant lowland totara. Indigenous shrubs and vines are common. Rock outcrops within this vegetation community support *Hebe strictissima*, *Sophora prostrata* and *Tetragonia implexicoma*. There is some regeneration of forest and shrub species under the forest canopy and kanuka is extending out into grassland openings.

In the remainder of the site scattered old ngaio trees, clusters of kanuka and an occasional lowland totara grow over exotic grassland on steep coastal faces. Shallow gullies support clusters of indigenous trees and shrubs. Much of this area is grazed with little understorey and stock camps under any shelter. Pigs ear is becoming established on the small rock outcrops.

## Extent of Site of Ecological Significance

The site includes the areas of coastal (lowland totara)/kanuka-ngaio-kowhai forest and treeland and coastal kanuka-ngaio treeland. It includes the coastal cliffs, as well as rock bluffs and outcrops.

## Assessment Summary

The Steep Head Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically



significant because it meets the representativeness (criteria 1 and 2) and rarity/distinctiveness criteria (criteria 3, 4, 5 and 6).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

The (lowland totara)/kanuka-ngaio-kowhai forest and treeland is significant under this criterion. It is representative example of coastal forest on dry coastal headlands in the Akaroa ED. The kanuka-ngaio treeland and *Melicope simplex*, *Coprosma virescens* and *C. crassifolia* shrublands still support a range of plants that are characteristic of dry coastal bluff treeland and shrubland communities. Importantly, remnant lowland totara have persisted.

The site is grazed, dominated by exotic grassland and has little understorey (Jensen unpubl. data 2013). However, most indigenous vegetation communities on dry north to west facing coastal headlands and bluffs have been cleared and there are now very few examples of this vegetation community remaining in the Akaroa ED. Most of those that do remain are similarly grazed and degraded. This vegetation community is one of the better examples in the ED.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

It is a relatively large example of dry coastal forest, treeland and shrubland in the Akaroa ED.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The forest within the site is significant under this criterion. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). Now, the extent of all indigenous forest in the ecological district (as a percentage of the ecological district) is



estimated to be 10% (17.8% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

There is no accurate information to assess the change in extent of indigenous scrub and shrublands within the ecological district, but indigenous coastal shrublands have been vastly reduced in extent and most of those that remain are very small highly modified fragments (Head 2007 *in*: Lettink 2013).

The site is not significant at the level IV land environment scale. It is on an At Risk land environment (F3.2a) where 23.0% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports four plant species (Jensen unpubl. data 2013) that are nationally At Risk (de Lange et al. 2013):

- *Coprosma virescens* (At Risk - Declining)
- *Chenopodium allanii* (At Risk - Naturally Uncommon)
- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Pseudopanax ferox* (At Risk - Naturally Uncommon).

Hugh Wilson (unpubl. data n.d.) recorded *Brachiglottis sciadophila* (At Risk – Declining) at the site but it was not recorded during the more recent survey by Jensen (2013).

Two plant species have been recorded from the site (Jensen unpubl. data 2013) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013):

- *Pyrrosia eleagnifolia*
- *Tetragonia implexicoma*

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

It contains four species (Jensen unpubl. data 2013) that are at their southern national distributional limits on Banks Peninsula (Wilson 2013). They are:

- Titoki (southern national limit)
- Shining spleenwort (southern national limit)
- Native passion vine (southern national limit)
- Kawakawa (southern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**



The site is significant under this criterion.

There are basic igneous sea cliffs above the coastline, as well as occasional basic rock scarps and rock outcrops within the site. At a national scale basic coastal cliffs and basic cliffs, scarps and tors are originally rare ecosystems (Williams et al. 2007). Where indigenous vegetation occurs on these features within the site they are significant under this criterion.

### **Diversity and Pattern**

- 7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is not significant under this criterion. It has a small number of indigenous ecosystems and habitat types: dry coastal (lowland totara)/kanuka-ngaio-kowhai forest, coastal kanuka-ngaio treeland, coastal cliffs, and rock bluffs and outcrops. The site is not significant for the diversity of plant taxa it contains.

### **Ecological Context**

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site buffers the mouth of the Le Bons Bay estuary and the sea to some extent, but is not significant under this criterion.

- 9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

There are no wetlands within the site.

- 10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess this site against this criterion.

## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants: Pigs ear is establishing on some of rock outcrops. Spread from hawthorn tree (<i>Crataegus monogyna</i>) on the edge of the forest near the homestead and a single pine (<i>Pinus radiata</i>) in the forest is also a threat (Jensen unpubl. data 2013).</li> </ul>	<ul style="list-style-type: none"> <li>Consider containing pigs ear, wallflower and boxthorn to coastal cliffs to protect rock outcrop and shrubland values.</li> <li>Consider removing the hawthorn and wilding pine trees and ongoing surveillance for, and control of, other biodiversity pest plants such as pride of Madeira and fennel.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about monitoring and control of pest plants. Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Stock</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the (lowland totara)/kanuka-ngaio-kowhai forest to encourage seedling recruitment and understorey development.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about management of lowland totara forest and stock management. Assistance where appropriate.</li> </ul>



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- Wilson, H.D. (2013). *Plant Life on Banks Peninsula*. Manuka Press, Cromwell. 412 pp.

**Assessment completed by:** Scott Hooson  
**Date:** 5 September 2014

**Statement completed by:** Scott Hooson  
**Date:** 5 September 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.





## Appendix 1: Plant Species List

Sourced from Jensen unpubl. data (2013).

N.B. exotic species were not recorded during this survey.

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Alectryon excelsus</i>	titoki
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium oblongifolium</i>	shining spleenwort, huruhuruwhenua
<i>Calystegia tuguriorum</i>	NZ bindweed, pōwhiwhi
<i>Carmichaelia australis</i>	native broom, common broom
<i>Chenopodium allanii</i>	
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Corokia cotoneaster</i>	korokio
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	dichondra
<i>Ficinia nodosa</i>	club rush, wiwi
<i>Haloragis erecta</i>	toatoa
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum lanceolatum</i>	niniao
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus distegus</i>	wiwi
<i>Kunzea robusta</i>	kanuka
<i>Linum monogynum</i>	NZ linen flax
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Luzula banksiana</i> var. <i>orina</i>	woodrush
<i>Melicope simplex</i>	poataniwha
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Microlaena stipoides</i>	meadow rice grass, patiti
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine divaricata</i>	weeping matipo, weeping māpou
<i>Parietaria debilis</i>	NZ pellitory
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Piper excelsum</i>	kawakawa



<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Poa cita</i>	silver tussock, wi
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Pyrrhosia eleagnifolia</i>	leatherleaf fern
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Scandia geniculata</i>	climbing aniseed
<i>Senecio quadridentatus</i>	cotton fireweed, pekapeka
<i>Sophora microphylla</i>	small-leaved kōwhai
<i>Sophora prostrata</i>	dwarf kowhai, prostrate kowhai
<i>Tetragonia implexicoma</i>	climbing shore spinach
<i>Urtica ferox</i>	ongaonga, tree nettle

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Tumbledown Bay Dunes

**Site number:** SES/A/8

**Physical address of site:** 414 Te Oka Bay Road

#### Summary of Significance:

The site is significant because it contains the best and largest example of pingao sedgeland in the ecological region, supports a nationally At Risk plant species, three uncommon plant species, one plant species at its southern national distributional limit on Banks Peninsula and several bird species that are nationally Threatened. It also has indigenous dune vegetation communities on active sand dunes which are an originally rare ecosystem.

#### Site Map



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 3.86

**Central Point (NZTM):** E1581531, N5144422

## Site Description

The site is situated at the head of Tumbledown Bay. Tumbledown Bay is a small south-west facing sandy bay on the southern side of Banks Peninsula. It has cliffed headlands and a prominent rock stack at each headland (Wilson 1992). A small stream flows down through the western side of the bay into the sea. The site was identified as a Recommended Area for Protection (Akaroa RAP 8 – Tumbledown Bay) (Wilson 1992). Wilson (1992) noted that the site held the only significant population of pingao in the ecological district and the ecological region.

Partridge unpubl. data (2014) describes the main vegetation communities at the site as:

- Pingao/yarrow dune sedgeland
- Marram dune grassland
- Sand sedge dune sedgeland
- Yorkshire fog-cocksfoot grassland with scattered shrubs

These communities are described in more detail below (from Partridge unpubl. data 2014).

The pingao/yarrow dune sedgeland comprises a number of areas with pingao (*Ficinia spiralis*) that have had marram (*Ammophila arenaria*) and sometimes other competing grasses removed. A dense short vegetation dominated by yarrow (*Achillea millefolium*), hare's tail grass (*Lagurus ovatus*) and sheep sorrel (*Rumex acetosella*) has developed here. There is one akeake (*Dodonaea viscosa*) tree close to the dune edge.

Marram grassland forms a mosaic with the managed areas of pingao amongst the dunes. Marram forms dense stands with a few associated grasses and herbs, but far less than in the pingao/yarrow dune sedgeland. The areas of marram and pingao have been accentuated through management and form a clear mosaic of areas with the marram occupying a larger area. There is one large ngaio (*Myoporum laetum*) close to the dune edge.

Where the stream flows through the sand dunes, there is a low hummocky dune system dominated by sand sedge (*Carex pumila*). A common associate is tall fescue (*Schedonorus arundinaceus*) back from the edge. Another small area of sand sedge grows at the opposite end of the beach.

Behind the active dunes, where the dunes have stabilised, there is a grassland of taller pasture species such as Yorkshire fog (*Holcus lanatus*), cocksfoot (*Dactylis*



*glomerata*) and tall fescue (*Schedonorus arundinaceus*), with occasional individuals or groups of native shrub and tree species including ngaio (*Myoporum laetum*), kanuka (*Kunzea robusta*) and cabbage trees (*Cordyline australis*), some of which may have been planted (Partridge unpubl. data 2014).

## Extent of Site of Ecological Significance

The site includes all of the dune vegetation within the fenced area including the pingao/yarrow dune sedgeland, marram dune grassland, sand sedge dune sedgeland and Yorkshire fog-cocksfoot grassland (as well as the small *Carex virgata/secta* sedgeland). It extends down the beach to mean high water springs.

## Assessment Summary

The Tumbledown Bay Dunes Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 4, 5 and 6).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Although highly modified by marram and other introduced plant species, it is the best remaining example of pingao sedgeland in the ecological district (and the Banks Ecological Region). The sedgeland also supports other indigenous sand dune and coastal species such as sand bindweed, sand sedge and knobby clubrush.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It supports the largest example of pingao sedgeland in the ecological district (and the Banks Ecological Region).



### Rarity/Distinctiveness

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion. The indigenous vegetation within the site is entirely on an Acutely Threatened land environment (F3.1a) where 9.9% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

A high proportion of the original indigenous vegetation communities that once occurred on dune systems in the ecological district have been displaced by introduced marram. However, there is insufficient information available to confirm that these communities have been reduced to less than 20% of their former extent in the ecological district or the Canterbury Region. Hilton et al. (2000) estimate the proportion of active dunelands in the Canterbury Region was been reduced by 64.5% between the 1950s and 1990s, but there is no information on the percentage reduction from its original extent.

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports a nationally At Risk-Declining plant species (de Lange et al. 2013), three plant species that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013), three Nationally Threatened bird species and three nationally At Risk freshwater fish species.

#### Plants

The nationally At Risk-Declining plant species (de Lange et al. 2013) at the site (Partridge unpubl. data 2014) is:

- Pingao (*Ficinia spiralis*)

Plant species that occur at the site (Partridge unpubl. data 2014) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- Sand bindweed *Calystegia soldanella*
- Sand sedge *Carex pumila*
- *Carex virgata* or *Carex secta*<sup>1</sup>

#### Birds

Nationally Threatened bird species (Robertson et al. 2012) that use the site (Crossland unpubl. data 2012) are:

- Pied cormorant (Threatened Nationally Vulnerable)
- Caspian tern (Threatened Nationally Vulnerable)

<sup>1</sup> Wilson (1992) recorded *Carex virgata* from the site but Partridge (2014) recorded *Carex secta*.



- Red-billed gull (Threatened Nationally Vulnerable)

Two nationally At Risk (Robertson et al. 2012) bird species have also been recorded using the site (Crossland unpubl. data 2012)<sup>2</sup>:

- White-fronted tern (At Risk - Declining and at risk in the ED)
- Variable Oystercatcher (At Risk – Recovering).

### Freshwater Fish

One nationally Threatened and four At Risk fish species (Goodman et al. 2014) migrate through the site between the marine environment and the un-named stream that drains the Tumbledown Bay catchment (Eivers et al. 2005).

- Lamprey (Threatened - Nationally Vulnerable)
- Longfin eel (At Risk – Declining)
- Koaro (At Risk – Declining)
- Inanga (At Risk – Declining)
- Bluegill bully (At Risk – Declining)

#### **5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There is one plant species that is at its southern national limit on Banks Peninsula (Partridge unpubl. data 2014):

- Akeake (*Dodonaea viscosa*), this species is rare at the site.

#### **6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

Sand dunes and dune vegetation are of restricted occurrence in the Akaroa ED as much of the coastline is steep coastal cliffs. This is reflected in the information provided for the Akaroa ED by Harding (2009) who estimated that the original extent of coastal sandfield in the ED (as a % of the ED) was <1%.

Pingao sedgeland is also of restricted occurrence within the Akaroa Ecological District. It is one of only two naturally occurring populations of this species in the Banks Ecological Region (Wilson 2001)<sup>3</sup>. The site also supports indigenous vegetation on active sand dunes. Active sand dunes are classified as an originally rare ecosystem (Williams et al. 2007).

<sup>2</sup> Although for mobile fauna such as birds, species classified as nationally At Risk do not meet the threshold for significance (Wildland Consultants 2013).

<sup>3</sup> The continued survival of the second population identified by Wilson (2001) needs to be confirmed.



## Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

The site is not significant under this criterion. It does not contain a high diversity of indigenous ecosystem or habitat types or indigenous plant taxa and does not have any particularly notable changes in species composition reflecting the existence of diverse natural features or ecological gradients.

## Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

The site is significant under this criterion.

The lower reaches of the un-named stream that drains the Tumbledown Bay catchment, and flows through the site, is an important corridor for at least eight species of migratory freshwater fish (longfin eel, shortfin eel, lamprey, koaro, banded kokopu, common bully, bluegill bully, and inanga) (Eivers et al. 2005). The ecological linkage between the coast and the catchment is essential for these fish.

From a terrestrial perspective, the site is connected to the coast, and has coastal cliffs on either side, but it is predominantly surrounded by grazed pasture, is not well buffered and does not provide an important link to other areas or indigenous vegetation or habitats.

9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.*

The site is not significant under this criterion. A small stream with some associated wetland vegetation, including *Carex virgata* or *C. secta*, occurs behind the dunes but it does not provide an important hydrological, biological or ecological role in the natural functioning of Tumbledown Bay stream or the coastal system.

10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

The site is significant under this criterion.

Riparian vegetation along the margins of lower Tumbledown Bay Stream provides high quality spawning habitat for inanga. Inanga (At Risk - Declining) (Goodman et al. 2014) spawn downstream of Te Oka Bay Road, approximately 45 m upstream of the beach (Golder Associates Ltd. 2012).



## Site Management

### Existing Protection Status

Unprotected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Displacement of pingao by marram and dune stabilisation (refer (Partridge 1995)) (Partridge unpubl. data 2014). Current management involves spraying and removal of all marram from the areas with pingao. The survival of pingao is reliant on this ongoing management (Partridge unpubl. data 2014)</li> </ul>	<ul style="list-style-type: none"> <li>Continue ongoing control of marram in areas with pingao.</li> <li>Continue planting locally sourced pingao at the site</li> <li>Long-term, consider feasibility of permanent removal of marram from the site.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about impacts of marram and about appropriate control. Assistance with marram control and pingao planting as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Loss of indigenous dune vegetation by coastal erosion.</li> </ul>	<ul style="list-style-type: none"> <li>None recommended</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Disturbance of birds by humans and dogs.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure levels of human disturbance are minimised, for example by erecting temporary fencing and signage around nest sites.</li> <li>Ensure that dogs are under control or on a leash.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about signage and visitor management matters. Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Trampling and damage of indigenous dune vegetation and disturbance of wildlife by humans.</li> </ul>	<ul style="list-style-type: none"> <li>Consider erecting signage</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about signage and visitor management matters. Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Stock. Although fenced, stock still have</li> </ul>	<ul style="list-style-type: none"> <li>Consider improving and/ extending the current</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about fencing</li> </ul>

access to the area (Partridge unpubl. data 2014).	fencing.	maintenance. Assistance as appropriate.
<ul style="list-style-type: none"> <li>Barriers to fish passage and damage to riparian margins and inanga spawning areas.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure no instream barriers to fish migration are constructed in the waterway.</li> <li>Consider improving and/ extending the current fencing to keep stock out.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners and CCC roading staff about management of waterways for fish passage and fencing. Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>There are very few exotic plants within the site that threaten its ecological values, however, establishment of other species from outside the site, such as horned poppy, pines and grey and crack willow, is a potential issue.</li> </ul>	<ul style="list-style-type: none"> <li>Consider ongoing surveillance for, and control if detected, of other biodiversity pest plants that are known to occur in the vicinity of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about monitoring pest plant occurrences.</li> </ul>

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<sup>4</sup> [www.ecan.govt.nz/publications/Plans/ecological-significance-indigenous-vege-canterbury.pdf](http://www.ecan.govt.nz/publications/Plans/ecological-significance-indigenous-vege-canterbury.pdf)



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**Assessment completed by:** Scott Hooson  
**Date:** 17 October 2014

**Statement completed by:** Scott Hooson  
**Date:** 17 October 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



## Appendix 1: Plant Species List

Sourced from Partridge unpubl. data (2012).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena novae-zelandiae</i>	piripiri
<i>Apium prostratum</i>	NZ celery
<i>Austroderia richardii</i>	toetoe
<i>Calystegia soldanella</i>	sand bindweed
<i>Carex pumila</i>	sand sedge
<i>Carex secta</i>	pukio
<i>Coprosma propinqua</i>	mikimiki
<i>Coprosma lucida</i>	shining karamu
<i>Cordyline australis</i>	ti kouka
<i>Dodonaea viscosa</i>	akeake
<i>Ficinia nodosa</i>	knobby clubrush
<i>Ficinia spiralis</i>	pingao
<i>Kunzea robusta</i>	kanuka
<i>Muehlenbeckia complexa</i>	scrambling pohuehue
<i>Myoporum laetum</i>	ngaio
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai
<i>Hebe salicifolia</i>	koromiko
<b>Exotic species</b>	
<i>Achillea millefolium</i>	yarrow
<i>Ammophila arenaria</i>	marram
<i>Beta vulgaris</i>	beet
<i>Bromus diandrus</i>	ripgut brome
<i>Cerastium glomeratum</i>	annual mouse-ear chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Crepis capillaris</i>	hawksbeard
<i>Dactylis glomerata</i>	cocksfoot
<i>Erythranthe guttata</i>	monkey musk
<i>Euphorbia lathyris</i>	caper spurge
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dove's foot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochaeris radicata</i>	catsear
<i>Lagurus ovatus</i>	haretail
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Rumex acetosella</i>	sheep's sorrel
<i>Schedonorus arundinaceus</i>	tall fescue
<i>Silene gallica</i>	catchfly
<i>Sisymbrium officinale</i>	hedge mustard
<i>Sonchus oleraceus</i>	sow thistle
<i>Stellaria media</i>	chickweed



<i>Trifolium repens</i>	white clover
<i>Trifolium subterraneum</i>	subclover
<i>Verbascum thapsus</i>	woolly mullein
<i>Vicia hirsuta</i>	hairy vetch
<i>Vicia sativa</i>	vetch
<i>Vulpia bromoides</i>	vulpia hair grass

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**Appendix 2: Bird Species List**

Birds recorded at Tumbledown Bay during Council monitoring, January 2007 to February 2012. Sourced from Crossland unpubl. data (2012).

Species	Count				
	2/01/2007	20/02/2007	18/01/2011	16/05/2011	22/02/2012
Black-backed gull	0	0	1	0	0
Caspian tern	0	4	0	0	0
Paradise shelduck	3	0	0	0	0
Pied cormorant	0	1	0	0	0
Red-billed gull	8	25	31	0	8
Spotted shag	0	0	60	0	0
Variable oystercatcher	4	4	2	2	5
White-fronted tern	4	0	1	0	0

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Hikuraki Bay Valley

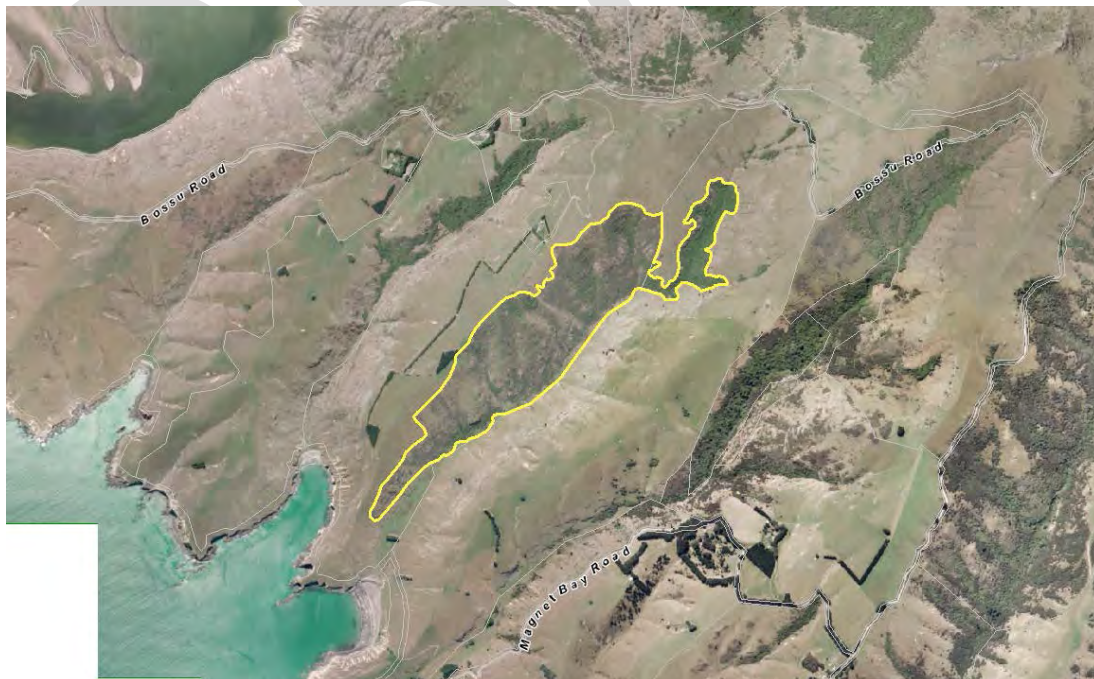
**Site number:** SES/A/9

**Physical address of site:** 2605 Bossu Road

#### **Summary of Significance:**

This site is significant because it is a large example of indigenous small-leaved shrubland and representative secondary growth podocarp-hardwood forest that occurs on an Acutely Threatened land environment. It supports a high diversity of indigenous plant and invertebrate species, including a number that are nationally At Risk, endemic to Banks Peninsula or uncommon within the ecological district or at their southern national or regional distributional limits. It also has igneous bluffs, scarps and rock outcrops which are an originally rare ecosystem. It is part of a series of forested gullies on the southern side of Banks Peninsula that are an important ecological network for indigenous fauna.

#### **Site Map**





## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 68.83

**Central point (NZTM):** E1580054, N5147348

## Site Description

The site is situated on the western side of Hikuraki Bay on the southern side of Banks Peninsula. The valley faces generally south-west and the altitudinal range of the site is from approximately 20 to 320 m above sea level. Hikuraki Stream flows through the site. Fifty-nine hectares of the site is protected by a Banks Peninsula Conservation Trust (BPCT) covenant. The Department of Conservation identified the site is a Recommended Area for Protection (Akaroa RAP 4 – Hikuraki) (Wilson 1992).

The main indigenous vegetation communities, as described by Wildland Consultants (2014a) are:

- (Matai-lowland totara)/mahoe - broadleaf - titoki forest on lowland hill slopes in a narrow gully
- Narrow leaved lacebark - mahoe - ngaio - kowhai secondary growth hardwood forest on lowland hill slopes
- Niniao - corokia - *Coprosma propinqua* - *C. crassifolia* - *C. virescens* scrub and shrubland on lowland hill slopes

These communities are described in more detail below (from Wildland Consultants 2014a).

The secondary growth podocarp-hardwood forest with remnant podocarps occupies a steep-sided, narrow, south-facing gully near the head of Hikuraki Bay, and a short section of a smaller side gully to the east. The top of the gully contains an impressive 12 m high waterfall. The vegetation consists of secondary growth podocarp-hardwood forest, with occasional emergent (remnant) podocarps (matai and lowland totara). Adults and juveniles of both podocarps are present. The main canopy species are mahoe, broadleaf, titoki, and narrow-leaved lacebark. The subcanopy is dominated by kawakawa. Supplejack is abundant, often forming thick, impenetrable thickets. Most of the understorey is accessible to stock and is relatively open, with few palatable species present in the seedling and shrub layers. Small-leaved coprosma/mikimiki and ongaonga are the most common understorey shrub species. The canopy along the margin of the true left side of the gully is rather patchy, and contains a wide variety of shrub species. This area also contains a sizeable population of fragrant tree daisy (*Olearia fragrantissima*), estimated to number more than 100 individuals (Walls 2001). A single nikau palm (and seedlings) is located part-way up the small side gully and *Plantago raoulii* and *Isolepis habra*, two uncommon ground cover species, grow nearby.



Riparian secondary growth podocarp-hardwood forest occurs along Hikuraki Bay Stream and in sheltered gullies. The most common canopy trees are narrow-leaved lacebark, mahoe, ngaio, and kowhai. Occasional secondary growth totara trees are also present. Canopy cover is relatively patchy, tending towards treeland rather than forest in some places. Native vines are abundant. A variety of native rushes and sedges grow in lightly shaded areas along the main stream.

Dense regenerating small-leaved 'grey' scrub and shrubland covers the majority of the site. Scattered hardwood trees such as narrow-leaved lacebark, mahoe and kanuka occur throughout the scrub and shrubland, forming a complex shrubland-scrub mosaic. The dominant shrub species are niniao (*Helichrysum lanceolatum*), *Corokia cotoneaster*, *Coprosma propinqua*, *C. crassifolia*, and *C. virescens*. Scattered rock outcrops occur throughout the site; these support a suite of specialist native plant species, such as the Banks Peninsula button daisy (*Leptinella minor*), 'hot' rock fern *Cheilanthes sieberi*, stonecrop *Crassula colligata*, and Banks Peninsula hebe (*Hebe strictissima*). Exposed ridges contain small open areas dominated by introduced pasture grasses as well as occasional silver tussock.

### Extent of Site of Ecological Significance

The site includes the forest in the upper part of the catchment and the scrub and forest on the western side of the valley.

### Assessment Summary

The Hikuraki Bay Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

### Assessment against Significance Criteria

#### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

The site contains vegetation that is representative and typical of the ecological district. The upper gully contains secondary growth podocarp-hardwood forest that has retained occasional emergent (remnant) podocarps (matai and lowland totara) and adults and juveniles of both podocarps are present. The understory is accessible to stock and is relatively open, with few palatable species present in



the seedling and shrub layers. Despite the modified understorey, the composition and structure of the canopy is representative. The small-leaved scrub and shrubland grows amongst exotic dominated grassland, but is fairly typical of this early successional community and supports a diverse range of indigenous plant species. Scattered rock outcrops occur throughout the site and support a suite of specialist native plant species and are representative of the diversity expected on rock outcrops in the ecological district.

The site also supports an assemblage of indigenous invertebrates that is typical of the vegetation communities, habitats and altitudinal sequence of the site (Wildland Consultants unpubl. data 2014b). Of the 125 species recorded only two are exotic (Wildland Consultants unpubl. data 2014b). A list of the invertebrate species recorded at the site is provided in Appendix 2.

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

At approximately 9 ha the secondary growth podocarp-hardwood forest is not a large example of this forest type. However, the area of small-leaved scrub and shrubland covers the majority of the site and is a large example of scrub and shrubland on lowland hill slopes in the context of the Akaroa Ecological District.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

It is entirely on an Acutely Threatened land environment (F3.1a) where <10% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

The forest within the site is also significant under this criterion because it has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and kanuka) in the ED is estimated to be 10% (17.8% including manuka and kanuka) (New Zealand Landcover Database (Version 4)).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports a number of indigenous plant and invertebrate species that are either nationally At Risk, endemic to Banks Peninsula or uncommon within the ecological district or region.



## Plants

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Wildland Consultants 2014a, Walls 2001) are:

- *Coprosma virescens* (At Risk - Declining) – abundant in the scrub and shrublands (Wildland Consultants 2014a)
- *Olearia fragrantissima* (At Risk - Declining) (Wildland Consultants 2014a, Walls 2001) - estimated at more than 100 individuals (Walls 2001)
- *Teucrium parvifolium* (At Risk - Declining) (Walls 2001)
- *Chenopodium allanii* (At Risk - Naturally Uncommon) (Wildland Consultants 2014a)
- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to Banks Peninsula) (Wildland Consultants 2014a)
- *Leptinella minor* (At Risk - Naturally Uncommon, endemic to Banks Peninsula) (Wildland Consultants 2014a)
- *Pseudopanax ferox* (At Risk - Naturally Uncommon) (Wildland Consultants 2014a, Walls 2001)

Plant species recorded from the site (Wildland Consultants 2014a) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Adiantum cunninghamii*
- *Blechnum novae-zelandiae*
- *Carex secta*
- *Carex virgata*
- *Epilobium pedunculare*
- *Epilobium rotundifolium*
- *Hydrocotyle novae-zeelandiae*
- *Isolepis habra*
- *Lastreopsis glabella*
- *Microlaena avenacea*
- *Microlaena polynoda* (also recorded by Walls (2001))
- *Plantago raoulii*
- *Rhopalostylis sapida* (adult and 15 seedlings)
- *Ucinia scabra*

## Invertebrates

Nationally At Risk invertebrate species recorded from the site (Wildland Consultants 2014b) are:

- *Zelleria sphenota* (Mistletoe miner) (At Risk - Declining)
- *Orthodera novaezealandiae* (praying mantis) (At Risk - Declining)

Invertebrates recorded from the site (Wildland Consultants 2014b) that are endemic to Banks Peninsula are:

- *Kikihia* new species (green cicada)
- *Mecodema howitti* (Banks Peninsula ground beetle)



Invertebrates recorded from the site (Wildland Consultants 2014b) that are uncommon in the Akaroa Ecological District are:

- *Euxoa admirationis*
- *Nola parvitis*

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are six species that are at their southern national or regional distributional limits on Banks Peninsula and one that is at its northern national limit (Wilson 2013). These species are (Wildland Consultants 2014a):

- *Alectryon excelsus* (southern national limit)
- *Dodonaea viscosa* (southern national limit)
- *Hedycarya arborea* (southern regional limit)
- *Passiflora tetrandra* (southern national limit)
- *Piper excelsum* (southern national limit)
- *Rhopalostylis sapida* (southern regional limit)
- *Olearia fragrantissima* (northern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

There are igneous bluffs, scarps and rock outcrops throughout the site. At a national scale, basic cliffs, scarps and tors are an originally rare ecosystem (Williams et al. 2007). Where indigenous vegetation occurs on these features within the site they are significant under this criterion.

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

The pattern of vegetation within the site reflects past vegetation clearance and subsequent regeneration, the altitudinal gradient, exposure, moisture availability, aspect and substrate. The resulting mosaic of forest, scrub, shrubland and areas of open grassland contains a high diversity of indigenous plants (Wildland Consultants 2014a). One hundred and eighteen plant species were recorded at the site in a recent botanical survey (Wildland Consultants 2014a).

The site also contains a diverse indigenous invertebrate fauna. A recent survey (which targeted moths and butterflies) found 125 indigenous invertebrate species,



of which 107 were moths and butterflies (Wildland Consultants unpubl. data 2014b).

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The site is not part of an ecological linkage or corridor, but it part of a series of forested gullies on the southern side of Banks Peninsula that are separated by farmed ridges with grazed silver tussock and pasture. These forested gullies are an important ecological network for common indigenous forest birds such as bellbird, fantail, grey warbler, New Zealand pigeon and silvereve that have all been recorded within the site (Wildland Consultants 2014a). The vegetation within the site also buffers the stream flowing through the valley floor from sedimentation and other land-use effects.

The secondary forest within the covenanted part of the site is well buffered from edge effects by the dense indigenous small-leaved scrub and shrublands.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site that meet this criterion.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion. It provides important habitat for a diverse range of indigenous invertebrates including species that are either nationally At Risk, endemic to Banks Peninsula or uncommon within the ecological district.

## Site Management

### Existing Protection Status

Fifty-nine hectares of the site are protected by a Banks Peninsula Conservation Trust (BPCT) covenant. The remainder is not legally protected. The covenant has been fenced to keep out stock and a management plan has been prepared. It is recommended that this management plan forms the basis for management within the covenanted area.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Stock. Stock have access to the podocarp-hardwood forest in the upper part of the gully outside of the BPCT covenant. There are few palatable species present in the seedling and shrub layers (Wildland Consultants 2014a).</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the podocarp-hardwood forest in the upper part of the gully to keep stock out and promote seedling recruitment and recovery of the understorey.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about impacts of stock upon ecosystems. Advice and guidance about stock management options. Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Pest animals. Possums and hares have been recorded within the site (Wildland Consultants 2014a).</li> </ul>	<ul style="list-style-type: none"> <li>Consider monitoring possum densities within the podocarp-hardwood forest. Control as required.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about pest animal monitoring and control. Assistance where appropriate. Discuss with BPCT in relation to covenant area.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants. There are a number of exotic species within the site but most are not a threat to the ecological values. Priority species for control are grey willow (a sapling on the stream bank at the southern downstream end of the site) and elderberry.</li> <li>Spur valerian is known to be present in the Tokoroa bay catchment and has the potential to spread to, and threaten ecological values</li> </ul>	<ul style="list-style-type: none"> <li>Remove grey willow and control elderberry in open shublands.</li> <li>Consider ongoing surveillance for pest plants to prevent establishment.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about grey willow and elderberry control. Assistance where appropriate.</li> <li>Advice and guidance to landowners about monitoring pest plants.</li> </ul>

<p>on rock outcrops within the site.</p> <ul style="list-style-type: none"><li>• Ongoing pest plant invasion of species such as sycamore, banana passionfruit, old mans beard and Darwin's barberry that are known to occur in the vicinity of the site, particularly into the podocarp/hardwood forest.</li></ul>		
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**Assessment completed by:** Scott Hooson  
**Date:** 12 January 2015

**Statement completed by:** Scott Hooson  
**Date:** 12 January 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2014a).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Adiantum cunninghamii</i>	maidenhair
<i>Alectryon excelsus</i>	titoki
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Austroderia richardii</i>	toetoe
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum novae-zealandiae</i>	kiokio
<i>Blechnum procerum</i>	small kiokio
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carmichaelia australis</i>	native broom, common broom
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carex forsteri</i>	cutty grass
<i>Carex geminata</i>	cutty grass, rautahi
<i>Carex secta</i>	niggerhead, pukio
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Carex virgata</i>	swamp sedge
<i>Chenopodium allanii</i>	
<i>Cheilanthes sieberi</i>	rock fern
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Corokia cotoneaster</i>	korokio
<i>Crassula colligata</i>	stonecrop
<i>Dichondra repens</i>	Mercury Bay weed, dichondra
<i>Dodonaea viscosa</i>	akeake
<i>Epilobium pedunculare</i>	willow herb
<i>Epilobium rotundifolium</i>	willow herb
<i>Euchiton audax</i>	native cudweed



<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Hebe salicifolia</i>	koromiko
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Helichrysum lanceolatum</i>	niniaio
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle moschata</i>	pennywort
<i>Hydrocotyle novae-zeelandiae</i>	pennywort
<i>Hypolepis ambigua</i>	pig fern
<i>Ileostylus micranthus</i>	green mistletoe
<i>Isolepis habra</i>	
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea ericoides</i>	kanuka
<i>Lagenifera pumila</i>	papataniwhaniwha
<i>Lastreopsis glabella</i>	smooth shield fern
<i>Leptinella dioica</i>	button daisy
<i>Leptinella minor</i>	Banks Peninsula button daisy
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Metrosideros diffusa</i>	white climbing rata
<i>Microlaena avenacea</i>	bush rice grass
<i>Microlaena polynoda</i>	bamboo rice grass
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Microtis unifolia</i>	onion orchid, maikaika
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Olearia fragrantissima</i>	fragrant tree daisy
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	native oxalis
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Phormium tenax</i>	flax, harakeke
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum eugeniioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Plantago raoulii</i>	a native plantain
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Pneumatopteris pennigera</i>	gully fern, pakau
<i>Poa cita</i>	silver tussock
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum oculatum</i>	shield fern



<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Pterostylis species</i>	green-hooded orchid
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Rhopalostylis sapida</i>	nikau
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Rytidosperma species</i>	danthonia
<i>Scandia geniculata</i>	climbing aniseed
<i>Schefflera digitata</i>	pate, seven-finger
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Sophora prostrata</i>	prostrate kowhai
<i>Stellaria decipiens</i>	chickweed
<i>Streblus heterophyllus</i>	small-leaved milk tree, turepo
<i>Thelymitra longifolia</i>	white sun orchid
<i>Uncinia scabra</i>	hook grass
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Wahlenbergia gracilis</i>	NZ harebell
<b>Exotic species</b>	
<i>Acaena agnipila</i>	Australian sheeps bur
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Aira caryophylla</i>	silvery hair grass
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Arrhenatherum elatius</i>	tall oat grass
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Juncus articulatus</i>	jointed rush
<i>Juncus bufonius</i>	toad rush
<i>Linum bienne</i>	pale flax
<i>Lolium perenne</i>	ryegrass
<i>Marrubium vulgare</i>	horehound
<i>Mimulus guttatus</i>	monkey musk
<i>Mycelis muralis</i>	wall lettuce
<i>Parentucellia viscosa</i>	tarweed
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Rytidosperma racemosum</i>	danthonia
<i>Sagina procumbens</i>	procumbent pearlwort
<i>Salix cinerea</i>	grey willow
<i>Sambucus nigra</i>	elderberry
<i>Silene gallica</i>	catchfly
<i>Sisymbrium officinale</i>	hedge mustard



<i>Solanum chenopodioides</i>	velvety nightshade
<i>Stellaria media</i>	chickweed
<i>Trifolium repens</i>	white clover
<i>Urtica urens</i>	nettle
<i>Verbascum thapsus</i>	woolly mullein
<i>Vicia sativa</i>	vetch
<i>Vittadinia gracilis</i>	purple fuzzweed

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## Appendix 2: Invertebrate Species List

Sourced from Wildland Consultants unpubl. data (2014).

\* = exotic species

ORDER/Family/genus/species	Common Name
<b>NEUROPTERA</b>	lacewings
<b>Hemerobiidae</b>	
<i>Drepanacra binocula</i>	
<b>HEMIPTERA</b>	
<b>Tibicinidae</b>	cicada
<i>Amphipsalta zelandica</i>	clapping cicada
<i>Kikihia new species</i>	
<b>Miridae</b>	
<i>Chinamiris virescens</i>	
<i>Bipuncticoris species</i>	
<b>ORTHOPTERA</b>	
<b>Tettigoniidae</b>	katydid
<i>Conocephalus bilineatus</i>	
<b>Gryllidae</b>	cricket
<i>Pteronemobius bigelowi</i>	
<b>Acrididae</b>	grasshoppers
<i>Phaulacridium marginale</i>	
<b>COLEOPTERA</b>	
<b>Carabidae</b>	ground beetles
<i>Mecodema howitti</i>	
<i>Megadromus antarcticus</i>	
<i>Neocicindella latecincta</i>	tiger beetle
<b>Cerambycidae</b>	
<i>Prionoplus reticularis</i>	huhu
<b>Coccinellidae</b>	
<i>Coccinella leonina</i>	ladybird
<b>Scarabaeidae</b>	chafers
<i>Costelytra zealandica</i>	
<i>Odontria striata</i>	striped chafer
<i>Odontria varicolorata</i>	
<b>DERMAPTERA</b>	earwig
<b>Labiduridae</b>	
<i>Anisolabis littorea</i>	
<b>HYMENOPTERA</b>	
<b>Formicidae</b>	ant
<i>Monomorium antarcticum</i>	
<b>Ichneumonidae</b>	wasp
<i>Netelia producta</i>	
<i>smaller orange species</i>	
<b>LEPIDOPTERA</b>	moths and butterflies
<b>Nepticulidae</b>	
<i>Stigmella ilsea</i>	



<i>Stigmella sophorae</i>	
<b>Tineidae</b>	
<i>Erechthias fulguritella</i>	
<b>Psychidae</b>	
<i>Liothula omnivora</i>	
<b>Glyphipterigidae</b>	
<i>Glyphipterix alchoessa</i>	
<i>Glyphipterix tungella</i>	
<b>Gracillariidae</b>	
<i>Conopomorpha cyanoaspila</i>	
<b>Elachistidae</b>	
<i>Cosmiotes ombrodoca</i>	
<b>Cosmopterigidae</b>	
<i>Microcolona limodes</i>	
<b>Batrachedridae</b>	
<i>Batrachedra agaura</i>	
<b>Lyonetiidae</b>	
<i>Bedellia psammitis</i>	
<b>Yponomeutidae</b>	
<i>Zelleria spenota</i>	
<b>Plutellidae</b>	
<i>Orthenches chlorocoma</i>	
<i>Plutella antiphona</i>	
<b>Carposinidae</b>	
<i>Heterocrossa gonosemana</i>	
<b>Gelechiidae</b>	
<i>Anisoplaca achyrota</i>	
<i>Isochasta paradesma</i>	
<b>Oecophoridae</b>	
<i>Gymnobathra parca</i>	
<i>Gymnobathra sarcoxantha</i>	
<i>Gymnobathra tholodella</i>	
<i>Izatha huttoni</i>	
<i>Izatha katadiktya</i>	
<i>Izatha convulsella</i>	
<i>Leptocroca scholaea</i>	
<i>Phaeosaces apocrypta</i>	
<i>Stathmopoda horticola</i>	
<i>Tingena melinella</i>	
<b>Tortricidae</b>	leaf rollers
<i>Capua semiferana</i>	
<i>Ctenopseustis obliquana</i>	
* <i>Cydia succedana</i>	
<i>Dipterina imbriferana</i>	
<i>Harmologa amplexana</i>	
<b>Thyrididae</b>	
<i>Morova subfasciata</i>	
<b>Crambidae</b>	
<i>Antiscopa epicomia</i>	
<i>Deana hybreasalis</i>	
<i>Eudonia cymatias</i>	
<i>Eudonia cataxesta</i>	
<i>Eudonia philerga</i>	





<i>Eudonia leptalea</i>	
<i>Eudonia sabulosella</i>	
<i>Orocrambus flexuosellus</i>	
<i>Orocrambus ramosellus</i>	
<i>Orocrambus vittellus</i>	
<i>Orocrambus vulgaris</i>	
<i>Scoparia chalicodes</i>	
<i>Scoparia minusculalis</i>	
<i>Udea flavidalis</i>	
<i>Udea marmarina</i>	
<i>Uresiphita maoralis</i>	
<b>GEOMETRIDAE</b>	
<i>Asaphodes abrogata</i>	
<i>Austrocidaria gobiata</i>	
<i>Austrocidaria similata</i>	
<i>Chloroclystis inductata</i>	
<i>Chloroclystis sphragitis</i>	
<i>Declana floccosa</i>	
<i>Declana leptomera</i>	
<i>Declana junctilinea</i>	
<i>Epiphyrne undosata</i>	
<i>Epyaxa lucidata</i>	
<i>Epyaxa rosearia</i>	
<i>Gellonia dejectaria</i>	
<i>Horisme suppressaria</i>	
<i>Homodotis megaspilata</i>	
<i>Helastia corcularia</i>	
<i>Helastia triphragma</i>	
<i>Hydriomena deltoidata</i>	
<i>Hydriomena rixata</i>	
<i>Ischalis fortinata</i>	
<i>Pasiphila urticae</i>	
<i>Pseudocoremia fasciculata</i>	
<i>Pseudocoremia indistincta</i>	
<i>Pseudocoremia pergrata</i>	
<i>Scopula rubraria</i>	
<i>Xyridacma veronicae</i>	
<b>Noctuidae</b>	
<i>Agrotis ipsilon</i>	
<i>Bityla defigurata</i>	
<i>Cosmodes elegans</i>	
<i>Euxoa admirationis</i>	
<i>Feredayia graminosa</i>	
<i>Graphania insignis</i>	
<i>Graphania lignana</i>	
<i>Graphania morosa</i>	
<i>Graphania mutans</i>	
<i>Graphania plena</i>	
<i>Graphania scutata</i>	
<i>Graphania ustistriga</i>	
<i>Meterana decorata</i>	
<i>Meterana levis</i>	
<i>Meterana octans</i>	



<i>Meterana ochthistis</i>	
<i>Meterana stipata</i>	
<i>Meterana tartarea</i>	
<i>Persectania aversa</i>	
<i>Proteuxoa comma</i>	
<i>Tmetolophota atristriga</i>	
<i>Tmetolophota propria</i>	
<b>Erebidae</b>	
<i>Celama parvitis</i>	
<i>Nyctemera annulata</i>	magpie moth
<i>Rhapha scotoscialis</i>	
<b>Lycaenidae</b>	coppers/ blues
<i>Lycaena "comon copper" complex</i>	
<i>Lycaena feredayi</i>	

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Barry's Bay Kahikatea

**Site number:** SES/A/10

**Physical address of site:** 5797 Christchurch Akaroa Road

#### Summary of Significance:

This site is significant because it is the only example of lowland kahikatea/hardwood forest on coastal alluvium in the ecological region. It is a very rare vegetation community and has two indigenous plant species that are "uncommon to rare or very local" within the ecological district and region and one at its southern national distributional limit.

#### Site Map



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 0.3

**Central point (NZTM):** E1593017, N5154793

## Site Description

This site is a small modified remnant stand of lowland kahikatea/hardwood forest in Barry's Bay. It occurs on coastal alluvium near sea level and immediately inland of the tidal flats at the head of Akaroa Harbour. The eastern side of the site is bounded by the Christchurch Akaroa Road and the remainder of the site is surrounded by pasture. Although very small, this is the only remaining kahikatea (*Dacrycarpus dacrydioides*) remnant near sea level on Banks Peninsula (Wilson unpubl. data).

The site contains at least 15 tall kahikatea with several younger matai (*Prumnopitys taxifolia*). The tall kahikatea are in good condition. Narrow-leaved lacebark (*Hoheria angustifolia*), mahoe (*Melicytus ramiflorus*), ngaio (*Myoporum laetum*) and kowhai (*Sophora microphylla*) are the main canopy species. There are many totara seedlings although there are no adult totara. Several uncommon trees and shrubs are present including pokaka (*Elaeocarpus hookerianus*), small-leaved milk tree (*Streblus heterophyllus*) and small-leaved māhoe (*Melicytus micranthus*). Seedlings and saplings of kahikatea and most of the trees and shrubs are plentiful. Native vines are common including native jasmine (*Parsonsia heterophylla*), native passion vine (*Passiflora tetrandra*), bush lawyer (*Rubus schmidelioides*), large-leaved pōhuehue (*Muehlenbeckia australis*) and scrub pōhuehue (*M. complexa*) (Jensen unpubl. data 2015).

With the agreement of the landowner the site was fenced off in 1990 to exclude stock. Currently there is healthy regeneration in the understorey but several weedy species are beginning to have an impact on regeneration. Two kahikatea trees were not included when the forest was fenced so they remain in the grazed paddock outside. Several crack willow (*Salix fragilis*) are present on the road edge and several weedy species are encroaching on the forest floor from the roadside drain (Jensen unpubl. data 2015).

Indigenous birds recorded at the site during the botanical survey were bellbird (*Anthornis melanura melanura*), grey warbler (*Gerygone igata*), South Island fantail (*Rhipidura fuliginosa fuliginosa*), New Zealand pigeon (*Hemiphaga novaeseelandiae novaeseelandiae*), shining cuckoo (*Chrysococcyx lucidus lucidus*) and New Zealand kingfisher (*Halcyon sancta vagans*) (Jensen unpubl. data 2015).

## Extent of Site of Ecological Significance

The boundary of this site extends around the outside of the kahikatea stand following the existing fence line.



## Assessment Summary

The Barry's Bay Kahikatea Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness criteria (criteria 1 and 2) and rarity/distinctiveness (criteria 3, 4 and 5).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

It supports remnant coastal kahikatea/hardwood forest on coastal alluvium adjacent to tidal flats. Although several weedy species are invading from the roadside the forest is in good condition with many seedlings and saplings of indigenous species. There are a wide range of native trees, shrubs, climbers and sedges typical of coastal lowland podocarp forest (Jensen unpubl. data 2015).

Although very small, this remnant is the best and only, example in the ecological region (Wilson 1992).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

Although very small, it is the only (and therefore largest) example of coastal kahikatea/hardwood forest on coastal alluvium in the ecological district and ecological region (Wilson 1992).

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

Coastal kahikatea/hardwood forest would originally have been widespread on alluvial landforms around the head of Akaroa Harbour. Now this is the only remaining example of its type in the ecological district and region (Wilson 1992). More generally, lowland podocarp/hardwood forest on alluvial landforms have



been reduced to a tiny fragment of its original extent within the ecological district and region and there are now only a handful of very small remnant lowland podocarp/hardwood forest remnants left on Banks Peninsula. Old-growth lowland podocarp forest is identified by (Wilson 1992) as being the highest priority for protection in the Akaroa ED.

This site also meets this criterion at the Level IV land environment scale. It is entirely on an Acutely Threatened land environment (F3.1a) where <10% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

Its indigenous plant species are “uncommon to rare or very local” within the ecological district and region (Wilson 2013). They are (Jensen unpubl. data 2015):

- Swamp sedge (*Carex virgata*)
- Small-leaved mahoe (*Melicytus micranthus*)
- Pokaka (*Elaeocarpus hookerianus*)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

It contains three plant species that are at their southern national or regional distributional limits on Banks Peninsula (Wilson 2013). They are (Jensen unpubl. data 2015):

- Native passion vine (*Passiflora tetrandra*) (southern national limit)
- Kawakawa (*Piper excelsum*) (southern national limit)
- Pigeonwood (*Hedycarya arborea*) (southern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is not significant under this criterion. It does not have an indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has**



***changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

It supports only one ecosystem type, but the diversity of indigenous plant taxa is high for the small area of the site.

### **Ecological Context**

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is not significant under this criterion. It is small and relatively isolated and does not provide any buffering function. Although it is adjacent to the tidal flats at Barry's Bay the Christchurch Akaroa Road means there is no longer an intact sequence between the two ecosystems.

- 9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. This small area of swamp forest is small and is no longer hydrologically connected to the Barry's Bay tidal flats. It is not significant under this criterion.

- 10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is not significant under this criterion. It provides habitat for a small number of indigenous forest bird species.

## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>The site's small size and vulnerability to edge effects.</li> </ul>	<ul style="list-style-type: none"> <li>Consider buffering the site with restoration plantings of appropriate, locally sourced plants.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the benefits of buffering. Assistance with sourcing and planting appropriate plants with landowner agreement.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity weeds: grey willow (<i>Salix cinerea</i>), crack willow (<i>Salix fragilis</i>), Japanese honeysuckle (<i>Lonicera japonica</i>), ivy (<i>Hedera helix</i>), convolvulus (<i>Convolvulus arvensis</i>) and stinking iris (<i>Iris foetidissima</i>).</li> <li>Weed invasion is likely to require ongoing management at this site because of its small size and location.</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling existing biodiversity weeds. Priorities for control are: grey willow, crack willow, Japanese honeysuckle, ivy, convolvulus and stinking iris.</li> <li>Consider regular, ongoing surveillance and control of biodiversity pest plants that are known to be in the area including banana passionfruit (<i>Passiflora mixta</i>), old mans beard (<i>Clematis vitalba</i>), sycamore (<i>Acer pseudoplatanus</i>), cotoneaster (<i>Cotoneaster</i> sp.) and Darwin's barberry (<i>Berberis darwinii</i>).</li> <li>Council to ensure that contractors undertaking roadside weed control do not damage the ecological values within the site.</li> <li>Council to ensure roadside weed control is complimentary with weed control within the</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about pest plant identification, monitoring and control.</li> <li>Assistance where appropriate.</li> </ul>



	site.	
<ul style="list-style-type: none"> <li>• Stock. The fence around the site is generally in good condition and stock proof (apart from gap in fence on road edge, although this is not of concern)</li> </ul>	<ul style="list-style-type: none"> <li>• Consider periodic inspections of the condition of the fence with maintenance as required.</li> </ul>	<ul style="list-style-type: none"> <li>• Assistance to landowner with monitoring of stock fence on regular basis. Guidance and assistance with any maintenance as required.</li> </ul>
<ul style="list-style-type: none"> <li>• Roadside maintenance and contraction.</li> </ul>	<ul style="list-style-type: none"> <li>• Council to ensure roading materials used adjacent to the site due not introduce new biodiversity pest plants.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Changes in hydrology</li> </ul>	<ul style="list-style-type: none"> <li>• Council to ensure that roading contractors undertaking construction or maintenance work do not alter the hydrology of the site. The wetland vegetation communities within the site, including kahikatea, require moist ground conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

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- Wilson, H.D. (1992). Banks Ecological Region: Port Hills, Herbert and Akaroa Ecological Districts. *Protected Natural Areas Programme Survey Report No 21*. Department of Conservation, Christchurch. 342 pp.
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**Assessment completed by:** Scott Hooson  
**Date:** 21 January 2015

**Statement completed by:** Scott Hooson  
**Date:** 21 January 2015

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Plant Species List

Sourced from (Jensen unpubl. data 2015).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Asplenium gracillimum</i>	
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carex geminata</i>	
<i>Carex forsteri</i>	
<i>Carex virgata</i>	
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamu
<i>Coprosma robusta</i> x <i>C propinqua</i>	
<i>Coprosma rotundifolia</i>	
<i>Cordyline australis</i>	cabbage tree
<i>Dacrycarpus dacrydioides</i>	kahikatea
<i>Elaeocarpus hookerianus</i>	pokaka
<i>Grisilinia littoralis</i>	broadleaf
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hypolepis ambigua</i>	pig fern
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus edgariae</i>	
<i>Kunzea robusta</i>	kanuka
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Melicope simplex</i>	poataniwha
<i>Melicytus micranthus</i>	small-leaved mahoe
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Podocarpus totara</i>	lowland totara
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax arboreus</i>	five finger
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Sophora microphylla</i>	kowhai
<i>Strebilus heterophyllus</i>	
<i>Urtica ferox</i>	stinging nettle
<b>Exotic species</b>	



<i>Acer pseudoplatanus</i>	sycamore
<i>Agrostis stolonifera</i>	creeping bent
<i>Calystegia sylvatica</i>	convolvulus
<i>Dactylis glomerata</i>	cocksfoot
<i>Galium aparine</i>	cleavers
<i>Hedera helix</i>	ivy
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypericum androsaemum</i>	tutsan
<i>Iris foetidissima</i>	stinking iris
<i>Lonicera japonica</i>	Japanese honeysuckle
<i>Prunus sp.</i>	wild plum
<i>Quercus robur</i>	oak
<i>Ranunculus repens</i>	buttercup
<i>Rubus fruticosus agg.</i>	blackberry
<i>Salix fragilis</i>	crack willow
<i>Sambucus nigra</i>	elderberry
<i>Schedonorus arundinaceus</i>	tall fescue

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Kinloch

**Site number:** SES/A/11

**Physical address of site:** 184 Kinloch Road, Little River

#### **Summary of Significance:**

The site is significant because it contains large areas of rare and representative indigenous lowland forest and representative montane shrubland and short grassland. It supports a number of plant and invertebrate species that are nationally At Risk, endemic, or uncommon and plant and invertebrate species at their distributional limits. It also contains an originally rare ecosystem and an altitudinal sequence extending from near sea level to 685 m. It is well buffered by kanuka forest.

#### **Site Map:**



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 257.73

**Central point (NZTM):** E1581633, N5149593

## Site Description

The site includes two steep, predominantly forested, north and northwest facing valleys between the eastern shore of Lake Forsyth/Wairewa, and the prominent rocky summit of Te Oka Peak. Streams in the bottom of each of the valleys drain into the lake. The altitudinal range of the site is from near sea level at the lake margin to the summit of Te Oka Peak at 685 m. The western valley and Te Oka Peak were identified by the Department of Conservation as a Recommended Area for Protection (Akaroa RAP 2 – Kinloch) (Wilson 1992).

Wilson (1992) and Wildland Consultants unpubl. data (2014a) describe the main vegetation communities at the site. They are:

- (Matai-lowland totara)/secondary growth hardwood forest on steep lowland hill slopes in the upper part of the western valley.
- Mixed secondary growth hardwood forest in the eastern valley.
- Secondary growth kanuka forest and treeland on north-facing lowland hill slopes.
- A mosaic of montane shrubland and open short tussock grassland.
- Silver tussockland on lowland and montane hill slopes

These communities are described in more detail below (from Wildland Consultants unpubl. data 2014a).

(Matai-lowland totara)/secondary growth hardwood forest occupies the steep upper part of the western valley, and consists of secondary growth hardwood forest with large emergent remnant podocarp trees (matai (*Prumnopitys taxifolia*) and lowland totara (*Podocarpus totara*)). All age classes of matai and totara are present, and juvenile matai are abundant. Mahoe (*Melicytus ramiflorus*) and narrow-leaved lacebark (*Hoheria angustifolia*) are the most common canopy species, followed by broadleaf (*Griselinia littoralis*), pigeonwood (*Hedycarya arborea*), kohuhu (*Pittosporum tenuifolium*), lemonwood (*Pittosporum eugenioides*), titoki (*Alectryon excelsus*), lowland ribbonwood (*Plagianthus regius*), and akiraho (*Olearia paniculata*). Many very large remnant broadleaf trees are present at the head of the valley, and fierce lancewood (*Pseudopanax ferox*) is also very common there. Akeake is common on the warmer true-left side of the valley, where the forest canopy is lower and patchier. Vines are frequent, particularly native jasmine (*Parsonsia capsularis* and *P. heterophylla*), large-leaved pohuehue (*Muehlenbeckia australis*), and *Clematis paniculata*. The understorey at the head of the valley is heavily browsed (goats are common) and quite bare, with relatively few palatable plant species. Most palatable seedlings (e.g. mahoe, broadleaf, pigeonwood, pate (*Schefflera digitata*)) are small and browsed. The most common understorey species



are unpalatable species such as *Coprosma virescens*, *C. crassifolia*, *C. rhamnoides*, *C. rotundifolia*, ongaonga (*Urtica ferox*), and the ferns round-leaved fern (*Pellaea rotundifolia*) and shield fern (*Polystichum oculatum*).

Mixed secondary growth hardwood forest grows in the eastern valley. Hardwood forest descends to a lower altitude in the eastern valley compared to the western valley. Narrow-leaved lacebark, mahoe and broadleaf are the most common canopy species, followed by ribbonwood, kohuhu, and titoki. Native vines, particularly large-leaved pohuehue and native jasmine are abundant, along with a dense understorey of *Coprosma* species in places. The most common understorey species are *Coprosma rhamnoides*, *C. crassifolia*, *C. rotundifolia*, ongaonga, and the ferns *Pellaea rotundifolia* and *Polystichum oculatum*. A permanent stream with a very shaded, natural streambed habitat rich in bryophytes and ferns is present. Two groves of silver tree fern (*Cyathea dealbata*) occur here and gully fern (*Pneumatopteris pennigera*) is also locally common.

Both valleys contain extensive areas of secondary growth kanuka (*Kunzea robusta*) forest, with occasional young hardwood trees such as mahoe. Kanuka forest mainly occurs towards the bottom of the western valley and it grows from the top to the bottom of the eastern valley, extending up to Te Oka Peak. The canopy is generally patchier in the eastern valley, suggesting a more recent expansion into exotic pasture grassland. The understorey is dominated by small-leaved coprosma/mikimiki species (*C. crassifolia*, *C. rhamnoides* and *C. virescens*), ongaonga, and ferns such as round-leaved fern, shield fern, and necklace fern (*Asplenium flabellifolium*). There are patches of dead (sprayed) kanuka trees at the bottom of both valleys. Occasional wilding radiata pines (*Pinus radiata*) are present in both valleys.

The two forested valleys are separated by a spur with a narrow strip of open grassland; dense silver tussock (*Poa cita*) grassland adjoins the forest on the western side of the fence, while the eastern side of the fence has closely grazed exotic pasture. Patchy silver tussock also occurs in amongst the kanuka on the eastern side of the eastern valley.

The steep north-facing slopes around the summit of Te Oka Peak support a mosaic of montane shrubland and short grassland dominated by silver tussock. A small patch of narrow-leaved snow tussock (*Chionochoa rigida*) persists on the summit. Woody vegetation is expanding out from the rocky areas, which are extensive. Matagouri (*Discaria toumatou*), korokio (*Corokia cotoneaster*), and mikimiki (*Coprosma propinqua*) are the most abundant shrub species. Bracken (*Pteridium esculentum*) is quite common. A variety of typical Banks Peninsula herbs (e.g. yellow rock daisy (*Brachyglottis lagopus*), slender everlasting daisy (*Helichrysum filicaule*) occur on the summit bluffs. Golden spaniard (*Aciphylla aurea*) is also present.

Indigenous birds recorded at the site are bellbird (*Anthornis melanura melanura*), grey warbler (*Gerygone igata*), South Island fantail (*Rhipidura fuliginosa fuliginosa*), Australasian harrier (*Circus approximans*), New Zealand pipit (*Anthus novaeseelandiae novaeseelandiae*) (At Risk – Declining) (Robertson et al. 2012) and New Zealand pigeon (*Hemiphaga novaeseelandiae novaeseelandiae*) (Wilson 1992, Wildland Consultants unpubl. data 2014a).



## Extent of Site of Ecological Significance

The site includes the matai-lowland totara/secondary growth hardwood forest, mixed secondary growth hardwood forest, secondary growth kanuka forest and treeland, montane shrubland, short tussock grassland and rock scarps and outcrops of Te Oka Peak and the indigenous silver tussock grassland on the upper slopes connecting the eastern and western valleys. Areas of isolated young kanuka treeland in exotic pasture grassland have been excluded as they do not provide an important buffering function. Areas of exotic grassland and kanuka treeland surrounded by kanuka forest have been included to maintain the integrity of the site.

## Assessment Summary

The Kinloch Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below). Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Although the structure of the forest has been modified by browsing the (matai-lowland totara)/secondary growth hardwood forest in the steep upper part of the western valley and the mixed secondary growth hardwood forest grows in the eastern valley are otherwise representative and typical of these forest communities in the ecological district. All age classes of matai and totara are present in the forest in the western valley the hardwood canopy in both valleys is diverse and characteristic.

Areas with more mature secondary kanuka forest in both valleys are moderately representative, but still meet this criterion. The canopy is almost entirely dominated by kanuka, but occasional hardwood trees such as mahoe, narrow-leaved lacebark, lowland ribbonwood, kohuhu and kowhai are now regenerating through it in places, and the understorey is dominated by indigenous shrubs, ferns and herbs. Younger kanuka on the eastern side of the eastern valley does not meet this criterion. It is generally patchier suggesting a more recent expansion into exotic pasture grassland.





The steep north-facing slopes around the summit of Te Oka Peak are representative of montane grassland, shrubland and rock bluff ecosystems. They support a mosaic of extensive indigenous shrublands and short tussock grassland and a typical range of indigenous herbs.

The site also supports a characteristic assemblage of indigenous invertebrates for the ecological district. A list of the invertebrate species recorded at the site is provided in Appendix 2.

**2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

Both valleys contain large areas dominated by indigenous forest. The eastern valley is a relatively large example of mixed secondary growth hardwood and kanuka forest. The western valley contains a large example of (matai-lowland totara)/secondary growth hardwood forest and kanuka forest.

**Rarity/Distinctiveness**

**3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The (matai-lowland totara)/secondary growth hardwood forest and mixed secondary growth hardwood forest are significant under this criterion. The forest within the site is also significant under this criterion because it has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and kanuka) in the ED is estimated to be 10% (17.8% including manuka and kanuka) (New Zealand Landcover Database (Version 4)).

The areas of kanuka dominated forest within the site are not significant under this criterion. This seral vegetation community has increased in extent following forest clearance and subsequent regeneration. Harding (2009) estimates that the original extent of kanuka scrub and forest in the ED (as a % of the ED) is estimated to have been <1%. Harding (2009) estimates the present combined extent of kanuka scrub/forest and inaka scrub in the ED is 23% and the combined extent of manuka and kanuka is estimated to be 7.6% (New Zealand Landcover Database (Version 4)).

**4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.***

The site is significant under this criterion.



A number of plant and invertebrate species have been recorded from the site that are either nationally At Risk, endemic, or uncommon either within the ecological district or region.

### Plants

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Wildland Consultants unpubl. data 2014a) are:

- *Coprosma virescens* (At Risk - Declining) (eastern and western valleys)
- Banks Peninsula hebe (*Hebe strictissima*) (At Risk - Naturally Uncommon and endemic to Banks Peninsula) (eastern and western valleys and Te Oka Peak)
- Banks Peninsula button daisy (*Leptinella minor*) (At Risk - Naturally Uncommon and endemic to Banks Peninsula) (western valley and Te Oka Peak)
- Fierce lancewood (*Pseudopanax ferox*) (At Risk - Naturally Uncommon) (eastern and western valleys)

Plant species recorded from the site (Wildland Consultants unpubl. data 2014a) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- Willow herb (*Epilobium pedunculare*) (western valley)
- Trembling brake (*Pteris tremula*) (western valley)
- Hook grass (*Uncinia scabra*) (eastern and western valleys)
- Colenso's hard fern (*Blechnum colensoi*) (eastern valley)
- Golden Spaniard (*Aciphylla aurea*) (Te Oka Peak)
- Lily of the valley shrub (*Gaultheria crassa*) (Te Oka Peak)

Wilson (1992) recorded a number of additional plant species within the site that are either At Risk nationally, or uncommon within the ecological region or ecological district.

### Invertebrates

Invertebrate species recorded from the site (Wildland Consultants unpubl. data 2014b) that are nationally Threatened or At Risk are:

- Mistletoe-mining moth (*Zelleria sphenota*) (At Risk - Declining)
- *Circoxena ditrocha* (At Risk - Naturally Uncommon)
- *Gadira petraula* (At Risk - Naturally Uncommon)
- Grass-mining moth (*Cosmiotes helonoma*) (At Risk - Relict)

Invertebrate species recorded from the site (Wildland Consultants unpubl. data 2014b) that are endemic to Banks Peninsula are:

- A ground beetle (*Megadromus guerinii*)
- Green cicada (*Kikihia* ‘new species’)
- A moth (*Asterivora* ‘new species’)
- A cockroach (*Celatoblatta peninsularis*)
- Ward's stonefly (*Zelandobius wardi*)

Invertebrate species recorded from the site (Wildland Consultants unpubl. data 2014b) that are uncommon within the ecological district are:



- *Reductoderces* new species – on the summit of Te Oka Peak

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are four plant species at their southern national limit on Banks Peninsula, one at its southern regional limit and one at its northern regional limit (Wildland Consultants unpubl. data 2014b). There is also an invertebrate species at its southern national limit (Wildland Consultants unpubl. data 2014b).

The species' at their southern national limit are:

- Titoki (*Alectryon excelsus*) (eastern and western valleys)
- Kawakawa (*Piper excelsum*) (eastern and western valleys)
- Akeake (*Dodonaea viscosa*) (relatively abundant in eastern valley (Wilson 1992), also in western valley)
- Trembling brake (*Pteris tremula*) (western valley)

Wilson (1992) also recorded native passion vine in the western valley.

The species at its southern regional limit is:

- Pigeonwood (*Hedycarya arborea*) (eastern and western valleys)

The species at its northern regional limit is:

- Narrow-leaved snow tussock (*Chionochloa rigida*) (Te Oka summit)

The invertebrate species at its southern national limit on Banks Peninsula is:

- *Gadira petraula* (Te Oka summit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

There are igneous scarps and rock outcrops below the summit of Te Oka Peak that were formed by the Akaroa Volcano. This igneous rock formation is comprised of basic hawaiite and benmoreite lava flows and tuff-agglomerate of the Te Oka Formation (Sewell et al. 1992). At a national scale, basic cliffs, scarps and tors are an originally rare ecosystem (Williams et al. 2007). The indigenous vegetation associated with this feature is significant under this criterion.



## Diversity and Pattern

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

The site contains an altitudinal sequence extending from near sea level to the summit of Te Oka Peak (685 m). It ranges from warm lowland (podocarp)/hardwood and hardwood forest on hill slopes, with species such as pigeonwood and kawakawa, to montane tussock grassland, shrubland and rock bluff ecosystems with species including snow tussock and regenerating thin barked totara (*Podocarpus cunninghamii*) (Wilson 1992, Wildland Consultants unpubl. data 2014a). The (podocarp)/hardwood, secondary hardwood forest and montane grassland, shrubland and rock bluff ecosystems are all relatively intact (although the kanuka forest is more modified).

The site also contains a high diversity of indigenous invertebrates reflecting its sunny aspect, relatively intact altitudinal sequence and range of vegetation types from snow tussock and rockland at the summit of Te Oka Peak, through dense old growth forest to kanuka forest and shrublands at Lake Forsyth. A recent survey (Wildland Consultants unpubl. data 2014b) (which targeted moths and butterflies) found 115 species, of which 90 were moths and butterflies. A list of the invertebrate species recorded at the site is provided in Appendix 2.

## Ecological Context

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The large forested gullies within the site provide an important buffering function to Lake Forsyth/Waiwera. This lake is in highly eutrophic state and reducing nutrient and sediment inputs is a high priority (Gray 2013). Maintaining forest cover on these slopes reduces these local inputs from these gullies, but management within the wider catchment is also essential to address water quality issues.

Kanuka forest provides an important buffering function to the more intact forest communities. Kanuka forest also plays an important role as an ecological corridor linking high value areas, for example the margins of Lake Forsyth/Waiwera and the (matai-lowland totara)/secondary growth hardwood forest in the upper part of the western valley. It also increases the connectivity between the eastern and western valley (although the two areas are not physically connected by kanuka forest).

- 9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. There are no wetlands within the site.



**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

It provides important habitat for a diverse range of indigenous invertebrates including species that are nationally At Risk, endemic to Banks Peninsula and uncommon in the ecological district (Wildland Consultants unpubl. data 2014b).

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## Site Management

### Existing Protection Status

Unprotected private land.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>There are very few biodiversity plants within the site. However, wilding pines (<i>Pinus radiata</i>) are present in both valleys. The source is probably a plantation adjacent to the site at the lower end of the eastern valley (Wildland Consultants unpubl. data 2014a).</li> <li>Ongoing invasion of pest plants via dispersal of seeds both by birds and wind.</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing the existing wilding pines to prevent further spread.</li> <li>Consider ongoing surveillance for, and control if detected, of biodiversity pest plants such as wilding pines (<i>Pinus species</i>), sycamore (<i>Acer pseudoplatanus</i>), banana passionfruit (<i>Passiflora mixta</i>), and old mans beard (<i>Clematis vitalba</i>) that are known to occur in the vicinity of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner / land manager about the benefits to biodiversity of pest plant control.</li> <li>Discussion about options, including any assistance available where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Stock. The understorey at the head of the western valley is heavily browsed and quite bare, with relatively few palatable plant species) (Wildland Consultants unpubl. data 2014a)</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the forested areas in the eastern and western valleys.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner / land manager about the benefits to biodiversity of managing stock away from certain areas.</li> <li>Discuss options and any available assistance.</li> </ul>
<ul style="list-style-type: none"> <li>Animal pests (goats, possums and rabbits) (Wildland Consultants unpubl. data 2014a). Goats are common in parts of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing goats from the site. Goats are a serious threat to the ecological values of the site. They also have the potential to spread onto neighbouring properties and into other areas with high ecological values. Not removing goats poses a significant threat to the success of the multi-agency Banks</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner / land manager about the benefits to biodiversity of goat control. Provide advice and guidance.</li> <li>In collaboration with agencies, offer assistance where available.</li> <li>Provide advice and guidance to landowner / land manager about benefits to biodiversity of</li> </ul>

	<p>Peninsula Feral Goat Eradication Programme.</p> <ul style="list-style-type: none"> <li>Consider monitoring possum and rabbit densities and undertaking control when required.</li> </ul>	<p>controlling possum and rabbit populations.</p> <ul style="list-style-type: none"> <li>Assistance available where appropriate.</li> </ul>
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**Assessment completed by:** Scott Hooson  
**Date:** 22 September 2014

**Statement completed by:** Scott Hooson  
**Date:** 22 September 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2014a).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena juvenca</i>	bidibidi, pipiripi
<i>Aciphylla aurea</i>	golden spaniard
<i>Alectryon excelsus</i>	titoki
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum colensoi</i>	Colenso's hard fern, peretao
<i>Brachyglottis lagopus</i>	groundsel
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carmichaelia australis</i>	native broom, common broom
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carex species</i>	cutty grass
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Chionochloa rigida</i>	narrow-leaved snow tussock
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Corokia cotoneaster</i>	korokio
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	Mercury Bay weed, dichondra
<i>Discaria toumatou</i>	matagouri, wild irishman
<i>Dodonaea viscosa</i>	akeake
<i>Epilobium pedunculare</i>	willow herb
<i>Euchiton audax</i>	native cudweed
<i>Gaultheria crassa</i>	lily of the valley shrub
<i>Geranium aff. microphyllum</i>	native geranium
<i>Griselinia littoralis</i>	broadleaf, kapuka



<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Helichrysum lanceolatum</i>	niñao
<i>Hierochloa redolens</i>	holy grass, karetu
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromera</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea ericoides</i>	kanuka
<i>Lagenophora strangulata</i>	parani
<i>Leptinella dioica</i>	button daisy
<i>Leptinella minor</i>	Banks Peninsula button daisy
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	native oxalis
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parietaria debilis</i>	NZ pellitory
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Phormium cookianum</i>	mountain flax, wharariki
<i>Phormium tenax</i>	flax, harakeke
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum eugenoides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Pneumatopteris pennigera</i>	gully fern, pakau
<i>Poa cita</i>	silver tussock
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus cunninghamii</i>	thin-barked totara
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum oculatum</i>	shield fern
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Pteridium esculentum</i>	bracken
<i>Pteris tremula</i>	trembling brake
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa



<i>Rytidosperma unarede</i>	danthonia
<i>Schefflera digitata</i>	pate, seven-finger
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Streblus heterophyllus</i>	small-leaved milk tree, turepo
<i>Uncinia scabra</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Vittadinia australis</i>	white fuzzweed
<b>Exotic Species</b>	
<i>Agrostis capillaris</i>	brown top
<i>Aira caryophylla</i>	silvery hair grass
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Anthosachne scabra</i>	blue wheatgrass
<i>Aphanes arvensis</i>	parsley piert
<i>Arenaria serpyllifolia</i>	sandwort
<i>Carduus tenuiflorus</i>	winged thistle
<i>Cerastium glomeratum</i>	chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Critesion murinum</i>	barley grass
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Echium vulgare</i>	vipers bugloss
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Lolium perenne</i>	ryegrass
<i>Marrubium vulgare</i>	horehound
<i>Mycelis muralis</i>	wall lettuce
<i>Orobanche minor</i>	broomrape
<i>Pinus radiata</i>	radiata pine, Monterey pine
<i>Polycarpon tetraphyllum</i>	allseed
<i>Ranunculus sceleratus</i>	celery-leaved buttercup
<i>Rumex acetosella</i>	sheeps sorrel
<i>Sambucus nigra</i>	elderberry
<i>Silybum marianum</i>	variegated thistle
<i>Solanum chenopodioides</i>	velvety nightshade
<i>Solanum nigrum</i>	black nightshade
<i>Stellaria media</i>	chickweed
<i>Trifolium repens</i>	white clover
<i>Urtica urens</i>	nettle
<i>Verbascum thapsus</i>	woolly mullein
<i>Vicia sativa</i>	vetch



## Appendix 2: Invertebrate Species List

Sourced from Wildland Consultants unpubl. data (2014b)

\* = exotic species

ORDER/Family/genus/species	Common Name
<b>MECOPTERA</b>	scorpionfly
<b>Nannochoristidae</b>	
<i>Nannochorista philpotti</i>	
<b>MEGALOPTERA</b>	dobsonfly
<b>Corydalidae</b>	
<i>Archichauliodes diversus</i>	
<b>NEUROPTERA</b>	lacewings
<b>Hemerobiidae</b>	
<i>Drepanacra binocula</i>	
<b>HEMIPTERA</b>	
<b>Tibicinidae</b>	cicada
<i>Amphipsalta zelandica</i>	clapping cicada
<i>Kikihia new species</i>	
<b>ORTHOPTERA</b>	
<b>Gryllidae</b>	cricket
<i>Pteronemobius bigelowi</i>	
<b>Acrididae</b>	grasshoppers
<i>Phaulacridium marginale</i>	
<b>Anastostomatidae</b>	ground weta
<i>Hemiandrus new species</i>	
<b>COLEOPTERA</b>	
<b>Carabidae</b>	ground beetles
<i>Megadromus guerinii</i>	
<i>Neocicindella latecincta</i>	tiger beetle
<b>Cerambycidae</b>	
<i>Prionoplus reticularis</i>	huhu
<b>Scarabaeidae</b>	chafers
<i>Costelytra zealandica</i>	grass grub
<i>Odontria striata</i>	striped chafer
<b>Tenebrionidae</b>	darkling beetle
<i>Artystona wakefieldi</i>	
<b>HYMENOPTERA</b>	
<b>Formicidae</b>	ant
<i>Monomorium antarcticum</i>	
<b>Ichneumonidae</b>	
<i>Netelia producta</i>	
<b>Pompilidae</b>	spider wasp
<i>Priocnemis crawi</i>	
<b>Vespulidae</b>	
<i>Vespula vulgaris</i>	common wasp
<b>LEPIDOPTERA</b>	
<b>Psychidae</b>	



<i>Reductoderces species</i>	
<i>Liothula omnivora</i>	
<b>Blastodacnidae</b>	
<i>Circoxena ditrocha</i>	
<b>Glyphipterigidae</b>	
<i>Glyphipterix alchyoessa</i>	
<i>Glyphipterix triselena</i>	
<i>Glyphipterix codonias</i>	
<i>Glyphipterix cionophora</i>	
<b>Elachistidae</b>	
<i>Cosmiotes helonoma</i>	
<i>Cosmiotes ombrodoca</i>	
<b>Yponomeutidae</b>	
<i>Zelleria spenota</i>	
<b>Depressariidae</b>	
* <i>Agonopterix umbellana</i>	
<i>Eutorna symmorpha</i>	
<b>Oecophoridae</b>	
<i>Barea exarcha</i>	
<i>Hierodoris atychioides</i>	
<b>Pterophoridae</b>	plumemoth
<i>Pterophorus innotatalis</i>	
<b>Choreutidae</b>	jets
<i>Asterivora new species</i>	
* <i>Tebenna micalis</i>	
<b>Tortricidae</b>	leaf rollers
<i>Apoctena flavescens</i>	
<i>Capua semiferana</i>	
* <i>Capua intractana</i>	
<i>Catamacta gavisana</i>	
<i>Cryptaplasma querula</i>	
<i>Ctenopseustis obliquana</i>	
* <i>Cydia succedana</i>	
* <i>Epiphyas postvittana</i>	
<i>Harmologa amplexana</i>	
<i>Harmologa oblongana</i>	
<i>Harmologa new species</i>	
<i>Merophyas leucaniana</i>	
<b>Thyrididae</b>	
<i>Morova subfasciata</i>	
<b>Crambidae</b>	
<i>Antiscopa epicomia</i>	
<i>Antiscopa elaphra</i>	
<i>Deana hybreasalis</i>	
<i>Eudonia cymatias</i>	
<i>Eudonia philerga</i>	
<i>Eudonia leptalea</i>	
<i>Eudonia octophora</i>	
<i>Eudonia steropaea</i>	
<i>Eudonia sabulosella</i>	
<i>Eudonia submarginalis</i>	
<i>Gadira petraula</i>	
<i>Orocrambus cyclopicus</i>	



<i>Orocrambus enchophorus</i>	
<i>Orocrambus flexuosellus</i>	
<i>Orocrambus ramosellus</i>	
<i>Orocrambus vittellus</i>	
<i>Orocrambus vulgaris</i>	
<i>Udea flavidalis</i>	
<i>Udea marmarina</i>	
<b>GEOMETRIDAE</b>	
<i>Austrocidaria gobiata</i>	
<i>Austrocidaria similata</i>	
* <i>Chloroclystis filata</i>	
<i>Chloroclystis inductata</i>	
<i>Chloroclystis sphragitis</i>	
<i>Declana floccosa</i>	
<i>Declana junctilinea</i>	
<i>Epiphyrne undosata</i>	
<i>Gellonia dejectaria</i>	
<i>Homodotis megaspilata</i>	
<i>Helastia cinerearia</i>	
<i>Ischalis fortinata</i>	
<i>Pasiphila muscosata</i>	
<i>Pasiphila malachita</i>	
<i>Pasiphila new species</i>	
<i>Pasiphila urticae</i>	
<i>Poecilasthena schistaria</i>	
<i>Pseudocoremia leucelaea</i>	
<i>Pseudocoremia ochrea</i>	
<i>Scopula rubraria</i>	
<i>Xyridacma veronicae</i>	
<b>Noctuidae</b>	
<i>Agrotis ipsilon</i>	
<i>Bityla defigurata</i>	
<i>Cosmodes elegans</i>	
<i>Feredayia graminosa</i>	
<i>Graphania insignis</i>	
<i>Graphania lignana</i>	
<i>Graphania morosa</i>	
<i>Graphania mutans</i>	
<i>Graphania phricias</i>	
<i>Graphania plena</i>	
<i>Graphania scutata</i>	
<i>Graphania ustistriga</i>	
<i>Meterana decorata</i>	
<i>Meterana levis</i>	
<i>Meterana ochthistis</i>	
<i>Meterana tartarea</i>	
<i>Persectania aversa</i>	
<i>Proteuxoa comma</i>	
<i>Tmetolophota atristriga</i>	
<i>Tmetolophota propria</i>	
<i>Tmetolophota sulcana</i>	
<b>Erebidae</b>	
<i>Rhapsa scotoscialis</i>	



<b>Lycaenidae</b>	coppers/ blues
<i>Lycaena "common copper" complex</i>	
<i>Zizina oxleyi</i>	
<b>Nymphalidae</b>	admirals
<i>Vanessa gonerilla</i>	red admiral
<i>Vanessa itea</i>	yellow admiral
<b>Pieridae</b>	white butterfly
<i>*Pieris rapae</i>	
<b>PLECOPTERA</b>	stonefly
<b>Gripopterygidae</b>	
<i>Zelandobius wardi</i>	
<b>ODONATA</b>	
<b>Coenagrionidae</b>	damselfly
<i>Xanthocnemis zelandica</i>	
<b>Corduliidae</b>	
<i>Procordulia smithii</i>	
<b>MANTODEA</b>	praying mantis
<i>Orthodera novaezelandiae</i>	
<b>PHASMIDA</b>	stick insects
<i>Clitarchus hookeri</i>	
<b>BLATTODEA</b>	cockroach
<b>Blattidae</b>	
<i>Celatoblatta peninsularis</i>	
<b>DERMATERA</b>	earwig
<i>Forficulidae</i>	
<i>*Forficula auricularia</i>	European earwig

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Le Bons Estuary

**Site number:** SES/A/12

#### **Summary of Significance:**

Le Bons Estuary is significant because it includes the second largest example of native saltmarsh vegetation in Akaroa Ecological District. It has indigenous saltmarsh vegetation and habitats on a Chronically Threatened land environment and within an originally rare ecosystem. It supports a diverse range of saltmarsh vegetation communities and provides important habitat for a number of indigenous plant, bird, fish and invertebrate species, including species that are either nationally Threatened or At Risk, endemic, uncommon within the ecological district or region. It has direct linkages to freshwater, marine and terrestrial systems and is part of an important network of coastal habitats for indigenous bird species and a corridor for a number of indigenous migratory fish.

#### **Site Map**



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 20.17

**Central point (NZTM):** E1607592, N5156189

## Site Description

The site is a long narrow tidal estuary and tidal river formed by Le Bons Stream which flows into the top of the estuary. The estuary is situated on the south-eastern (true right) side of Le Bons Bay. With the exception of Okains Estuary, it has the best saltmarsh vegetation in the Akaroa Ecological District.

Most of the site is unvegetated tidal sand and mudflats below mean high water springs, but there are areas of saltmarsh vegetation on the estuary margins and in the upper tidal reaches of Le Bons Stream. The saltmarsh vegetation communities are diverse and include (Grove 2009, Partridge unpubl. data 2011):

- Marsh ribbonwood shrubland
- Sea rush rushland
- Oioi restiad rushland
- Three-square reedland
- *Carex littorosa* sedgeland
- Tall fescue grassland
- Glasswort-sea primrose herbfield
- Sea primrose turfand

A full list of the plant species recorded at the site by Partridge unpubl. data (2011) is provided in Appendix 1.

## Extent of Site of Ecological Significance

The site includes all of the saltmarsh vegetation and estuarine vegetation above mean high water springs.

The Christchurch City Council's seaward boundary extends only as far as mean high water springs, but the tidal mudflats below this are also of high ecological significance, and should be managed as part of the site given the high level of connectivity between the terrestrial and estuarine environments.

## Assessment Summary

The Le Bons Estuary Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and



advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8, 9 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

After Okains Estuary, Le Bons Estuary has the next best example of native saltmarsh vegetation in Akaroa Ecological District. The vegetation communities are relatively intact and contain a very high proportion of indigenous species and the estuary's hydrological processes are still intact (Grove 2009).

The site also supports a moderately representative assemblage of coastal wetland bird species (Crossland unpubl. data 2014a). A moderately high proportion of the species in the "Banks Peninsula estuaries/coastal wetlands bird species assemblage" (Crossland unpubl. data 2014b) occur at the site (Appendix 2). The results of bird monitoring by Council staff (Crossland unpubl. data 2014a) are provided in Appendix 3.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

Le Bons Estuary is small at the national or regional context. However, within the context of the ecological district (at which scale this criterion is assessed), where there are only three areas supporting sizeable areas of estuarine saltmarsh vegetation, the site is a relatively large example of its type.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

The majority of the indigenous saltmarsh vegetation and habitats are on a Chronically Threatened land environment (J2.1d) where 10-20% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).



**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports several indigenous plant, bird and fish species that are nationally Threatened, nationally At Risk, endemic or uncommon within the ecological district or region.

**Plants**

Nationally At Risk plant species (de Lange et al. 2013) recorded at the site by Wilson unpubl. data n.d (not recorded by (Partridge unpubl. data 2011)) are:

- Sea sedge (*Carex litorosa*) (At Risk – Declining)
- Walkers saltgrass (*Puccinellia walkeri*) (At Risk - Naturally Uncommon)
- New Zealand musk (*Thyridia repens*) (At Risk - Naturally Uncommon)

Plant species that occur in the estuary (Partridge unpubl. data 2011, Wilson unpubl. data n.d) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- Shore primrose (*Samolus repens*) (Partridge unpubl. data 2011, Wilson unpubl. data n.d)
- *Carex flagellifera* (Partridge unpubl. data 2011)
- Sea rush (*Juncus kraussii* var. *australiensis*) (Partridge unpubl. data 2011, Wilson unpubl. data n.d)
- Oioi (*Apodasmia similis*) (Partridge unpubl. data 2011, Wilson unpubl. data n.d)
- Remuremu (*Selliera radicans*) (Partridge unpubl. data 2011, Wilson unpubl. data n.d)
- Suaeda (*Suaeda novae-zelandiae*) (Partridge unpubl. data 2011, Wilson unpubl. data n.d)
- Slender clubrush (*Isolepis cernua*) (Wilson unpubl. data n.d.)

**Birds**

The site provides habitat for several nationally Threatened and At Risk (Robertson et al. 2012) bird species, some of which are also uncommon in the ED.

Nationally Threatened (Robertson et al. 2012) bird species recorded from the site (Crossland unpubl. data 2014a) are:

- Pied cormorant (Threatened - Nationally Vulnerable)
- Red-billed gull (Threatened - Nationally Vulnerable, uncommon in ED)

The site also supports a number of nationally At Risk (Robertson et al. 2012) bird species (Crossland unpubl. data 2014a)<sup>1</sup>:

<sup>1</sup> Although for mobile fauna such as birds, species classified as nationally At Risk do not meet the threshold for significance (Wildland Consultants 2013).



- Pied stilt (At Risk – Declining, uncommon in ED)
- South Island pied oystercatcher (At Risk – Declining)
- Black cormorant (At Risk - Naturally Uncommon, uncommon in ED)
- Variable oystercatcher (At Risk – Recovering)

## Fish

Four At Risk - Declining (Goodman et al. 2014) fish species migrate through the site between the marine environment and Le Bons Stream.

- Longfin eel (*Anguilla dieffenbachia*)
- Torrentfish (*Cheimarrichthys fosteri*)
- Bluegill bully (*Gobiomorphus hubbsi*)
- Redfin bully (*Gobiomorphus huttoni*)

### 5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

The site is not significant under this criterion. There are no species at distributional limits.

### 6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

The site is significant under this criterion.

It supports indigenous vegetation and associations of indigenous species that occur within an estuary. Estuaries are originally rare ecosystems (Williams et al. 2007).

Estuaries are of restricted occurrence in the Akaroa Ecological District (the only others are at Okains Bay and at the Head of Akaroa Harbour) (Wilson 1992) and in Canterbury (Grove 2009). Many of the vegetation associations that occur here are also of restricted occurrence in the ecological region.

## Diversity and Pattern

### 7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

The site is significant under this criterion.

It supports a diverse range of saltmarsh vegetation communities including, marsh ribbonwood shrubland, sea rush rushland, oioi restiad rushland, three-square reedland, *Carex littorosa* sedgeland, tall fescue grassland, glasswort-sea primrose herbfield and sea primrose turfand (Grove 2009, Partridge unpubl. data



2011). The distribution of these communities reflects inundation and salinity gradients.

### Ecological Context

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The estuary has direct linkages to Le Bons Stream, and the marine and terrestrial systems Grove and Parker (2013). It is an important corridor for a number of indigenous migratory fish.

- 9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is significant under this criterion.

The estuary and its saltmarsh communities play an important role in the natural functioning of the estuarine and coastal systems at Le Bons Bay. The estuary's hydrological processes are intact, the saltmarsh vegetation provides a role in trapping and retaining sediment and nutrients and it provides important habitat for indigenous fauna (see criteria 10).

- 10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

Le Bons Stream is an important habitat for nationally Threatened and At Risk freshwater fish including a number of species that migrate through the estuary (Department of Conservation 2012).

## Site Management

### Existing Protection Status

No formal protection above mean high water springs, however much of the site is below mean high water springs. Environment Canterbury (ECan) has the statutory role of monitoring and managing coastal habitats (below mean high water springs) in the Canterbury region.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Stock access to the estuary (Grove and Parker 2013, Partridge unpubl. data 2011)</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the estuary margins where stock currently have access</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about impacts of stock on biodiversity.</li> <li>Contact ECan to discuss collaborative approach and assistance to landowners.</li> </ul>
<ul style="list-style-type: none"> <li>Intensification of land use within the catchment (Grove and Parker 2013), resulting in increased sedimentation and nutrient enrichment.</li> </ul>	<ul style="list-style-type: none"> <li>Consider catchment wide solutions to reduce erosion and methods of reducing nutrient inputs (potential sources: fertiliser, stock access to waterways etc.) such as farm management plans, revegetation and appropriate planting of riparian buffers.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to potential catchment-wide initiative to address impacts of erosion and nutrient inputs upon biodiversity/ecosystems.</li> </ul>
<ul style="list-style-type: none"> <li>Increased abstraction from Le Bons Stream (Grove and Parker 2013)</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Reclamation, habitat loss and modification of the estuary margins (Grove and Parker 2013)</li> </ul>	<ul style="list-style-type: none"> <li>Consider improving the condition of the saltmarsh habitat on the margins of the estuary. Ensuring an appropriate buffer between the estuary and grazed pasture would be beneficial.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

	<ul style="list-style-type: none"><li>• Consider the potential for restoring and expanding estuarine habitat in areas that have previously been reclaimed.</li></ul>	
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**Assessment completed by:** Scott Hooson  
**Date:** 31 October 2014

**Statement completed by:** Scott Hooson  
**Date:** 31 October 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



## Appendix 1: Plant Species List

Sourced from Partridge unpubl. data (2011).

Note: additional species were recorded by Wilson unpubl. data (n.d.).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Apium prostratum</i>	NZ celery
<i>Apodasmia similis</i>	oioi
<i>Carex flagellifera</i>	mania
<i>Cotula coronopifolia</i>	bachelor's button
<i>Juncus kraussii</i> subsp. <i>australiensis</i>	sea rush
<i>Leptinella dioica</i> subsp. <i>dioica</i>	cotula
<i>Phormium tenax</i>	harakeke, flax
<i>Plagianthus divaricatus</i>	coastal ribbonwood
<i>Puccinellia stricta</i>	salt grass
<i>Samolus repens</i>	shore primrose
<i>Sarcocornia quinqueflora</i>	glasswort
<i>Selliera radicans</i>	remuremu
<i>Senecio glomeratus</i>	NZ groundsel
<i>Spergularia media</i>	sea spurge
<i>Suaeda novae-zelandiae</i>	suaeda
<b>Exotic Species</b>	
<i>Agrostis stolonifera</i>	creeping bent
<i>Atriplex prostrata</i>	orache
<i>Centaureum erythraea</i>	centaury
<i>Hypochaeris radicata</i>	catsear
<i>Lepidium africanum</i>	peppercress
<i>Lotus pedunculatus</i>	lotus
<i>Plantago coronopus</i>	buck's horn plantain
<i>Ranunculus repens</i>	creeping buttercup
<i>Rumex crispus</i>	curled dock
<i>Schedonorus arundinaceus</i>	tall fescue



## Appendix 2: Indigenous Banks Peninsula Estuaries/Coastal Wetlands Bird Species Assemblage

Comparison of bird species recorded at Le Bons Bay (Crossland unpubl. data 2014a) with the "Banks Peninsula Estuaries/Coastal Wetlands Bird Species Assemblage" (Crossland 2014b).

Species recorded at the study site are marked with a tick ✓.

	Common name	Scientific Name
	Arctic Skua	<i>Stercorarius parasiticus</i>
	Australasian Gannet	<i>Morus serrator</i>
✓	Australasian Harrier	<i>Circus approximans</i>
✓	Black Cormorant	<i>Phalacrocorax carbo novaehollandiae</i>
	Black Swan	<i>Cygnus atratus</i>
✓	Black-backed Gull	<i>Larus dominicanus dominicanus</i>
	Black-billed Gull	<i>Larus bulleri</i>
	Black-fronted Tern	<i>Sterna albobriata</i>
✓	Caspian Tern	<i>Sterna caspia</i>
	Eastern Bar-tailed Godwit	<i>Limosa lapponica baueri</i>
✓ *	Grey Duck	<i>Anas superciliosa superciliosa</i>
	Grey Teal	<i>Anas gracilis</i>
	Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>
✓	Little Cormorant	<i>Phalacrocorax melanoleucos brevirostris</i>
	Marsh Crake	<i>Porzana pusilla affinis</i>
✓	New Zealand Kingfisher	<i>Halcyon sancta vagans</i>
	New Zealand Shoveler	<i>Anas rhynchos</i>
✓	Paradise Shelduck	<i>Tadorna variegata</i>
✓	Pied Cormorant	<i>Phalacrocorax varius varius</i>
✓	Pied Stilt	<i>Himantopus himantopus leucocephalus</i>
	Pomarine Skua	<i>Stercorarius pomarinus</i>
✓	Pukeko	<i>Porphyrio porphyrio melanotus</i>
✓	Red-billed Gull	<i>Larus novaehollandiae scopulinus</i>
	Reef Heron	<i>Egretta sacra sacra</i>
✓	South Island Pied Oystercatcher	<i>Haematopus ostralegus finschi</i>
	Spotted Shag	<i>Stictocorax punctatus</i>
✓	Spur-winged Plover	<i>Vanellus miles</i>
✓	Variable Oystercatcher	<i>Haematopus unicolor</i>
✓	Welcome Swallow	<i>Hirundo tahitica neoxena</i>
✓	White-faced Heron	<i>Ardea novaehollandiae novaehollandiae</i>
	White-fronted Tern	<i>Sterna striata</i>
	New Zealand Pipit	<i>Anthus novaeseelandiae novaeseelandiae</i>

\* Mallard, grey duck or mallard/grey duck hybrids have been recorded at the site.



### Appendix 3: Bird Species List

Indigenous birds recorded during Christchurch City Council Waterbird Monitoring at Le Bons Bay June 2006 – February 2014 (Crossland unpubl. data 2014a).

Species	28/06/2006	26/12/2006	16/02/2014
Australasian harrier	0	0	2
Black cormorant	1	0	0
Black-backed gull	4	0	5
Little cormorant	0	1	2
Mallard/grey duck	0	8	0
Kingfisher	0	0	3
Paradise shelduck	26	0	34
Pied cormorant	1	0	1
Pied stilt	4	0	0
Pukeko	14	0	11
Red-billed gull	2	10	5
Spur-winged plover	4	0	9
South Island pied oystercatcher	1	0	0
Variable oystercatcher	0	2	8
White-faced heron	4	4	4
Welcome swallow	0	0	21

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Okains Estuary

**Site number:** SES/A/13

#### Summary of Significance:

Okains Estuary is significant because it is the best and largest example of native saltmarsh vegetation in Akaroa Ecological District. It has indigenous saltmarsh vegetation and habitats on a Chronically Threatened land environment and within an originally rare ecosystem and supports a diverse range of saltmarsh vegetation communities. It provides important habitat for a number of indigenous plant, bird, fish and invertebrate species, including species that are either nationally Threatened or At Risk, endemic, uncommon within the ecological district or region or at their distributional limits. It has direct linkages to freshwater, marine and terrestrial systems and is part of an important network of coastal habitats for indigenous bird species and a corridor for a number of indigenous migratory fish.

#### Site Map



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 69.85

**Central point (NZTM):** E1603757, N5161314

## Site Description

The site is a long narrow tidal estuary and tidal river formed by Opara Stream which flows into the estuary. The estuary is situated on the northern (true left) side of Okains Bay. It was identified as a Recommended Area for Protection (Akaroa RAP 37 – Okains Estuary) by the Department of Conservation (Wilson 1992) and has the best saltmarsh vegetation in the Akaroa Ecological District.

Most of the site is unvegetated tidal sand and mudflats below mean high water springs, but there are extensive areas of saltmarsh vegetation on the estuary margins and in the upper tidal reaches of Opara Stream. The saltmarsh vegetation is diverse (Grove and Parker 2013) and includes:

- Marsh ribbonwood shrubland
- Three-square reedland
- Sea rush rushland
- Oioi restiad rushland
- Creeping bent grassland
- Glasswort herbfield
- *Puccinellia stricta* grassland, and
- Sea primrose turfand

## Extent of Site of Ecological Significance

The site includes all of the saltmarsh vegetation and estuarine vegetation above mean high water springs.

The Christchurch City Council's seaward boundary extends only as far as mean high water springs, but the tidal mudflats below this are also of high ecological significance, and should be managed as part of the site given the high level of connectivity between the terrestrial and estuarine environments.

## Assessment Summary

The Okains Estuary Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is



ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8, 9 and 10).

## **Assessment against Significance Criteria**

### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Wilson (1992) described Okains Estuary is the best example of native saltmarsh vegetation in Akaroa Ecological District. The vegetation communities are relatively intact and contain a very high proportion of indigenous species. The estuary's hydrological processes are intact (Grove 2009) and the site supports representative assemblages of estuarine birds and estuarine and freshwater fish. Bolton-Richie (2008) considered the invertebrate taxa of the estuary to be typical of South Island estuarine environments.

The site also supports a representative assemblage of coastal wetland bird species (Crossland unpubl. data 2014a). A reasonably high proportion of the species in the "Banks Peninsula estuaries/coastal wetlands bird species assemblage" (Crossland unpubl. data 2014b) occur at the site (Appendix 1). The results of bird monitoring by Council staff (Crossland unpubl. data 2014a) are provided in Appendix 2.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It is the largest example of estuarine saltmarsh vegetation in the Akaroa Ecological District (smaller less diverse areas exist at Le Bons Bay and at the Head of Akaroa Harbour) (Wilson 1992). It is the second largest example in the Banks Ecological Region. Only the remaining areas at the head of Lyttelton Harbour are larger.

### **Rarity/Distinctiveness**

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.





The site has indigenous saltmarsh vegetation and habitats on a Chronically Threatened land environment (J2.1d) where 10-20% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports several indigenous plant, bird, fish and invertebrate species that are either nationally Threatened, nationally At Risk, endemic or uncommon within the ecological district or region.

**Plants**

Nationally At Risk plant species (de Lange et al. 2013) at the site (Wilson unpubl. data no date, 1992) are:

- Sea sedge (*Carex litorosa*) (At Risk – Declining)
- New Zealand musk (*Thyridia repens*) (At Risk - Naturally Uncommon)
- Walkers saltgrass (*Puccinellia walkeri*) (At Risk - Naturally Uncommon)

Plant species that occur in the estuary or on its north-western shore (Wilson unpubl. data no date, 1992) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Carex flagellifera*
- Willow herb *Epilobium cinereum*
- Slender clubrush (*Isolepis cernua*)
- Sea rush (*Juncus kraussii* var. *australiensis*)
- Oioi (*Apodasmia similis*)
- Shore primrose (*Samolus repens*)
- Remuremu (*Selliera radicans*)
- Suaeda (*Suaeda novae-zelandiae*)

**Birds**

Okains Estuary and coastal area provides habitat for several indigenous wetland and coastal birds that are nationally Threatened or At Risk (Robertson 2012). Some of these are also at risk or uncommon in the Akaroa Ecological District (Crossland unpubl. data 2014a):

The site provides habitat for several nationally Threatened and At Risk (Robertson et al. 2012) bird species, some of which are also uncommon in the ED.

- Caspian tern (*Sterna caspia*) (Threatened - Nationally Vulnerable, uncommon in ED)
- Pied cormorant (*Phalacrocorax varius varius*) (Threatened - Nationally Vulnerable)
- Red-billed gull (*Larus novaehollandiae scopulinus*) (Threatened - Nationally Vulnerable, uncommon in ED)



The site also supports a number of nationally At Risk (Robertson et al. 2012) bird species (Crossland unpubl. data 2014)<sup>1</sup>:

- Pied stilt (*Himantopus himantopus leucocephalus*) (At Risk – Declining)
- South Island pied oystercatcher (*Haematopus unicolor*) (At Risk – Declining)
- White-fronted tern (*Sterna striata*) (At Risk - Declining and At Risk in ED)
- Black cormorant (*Phalacrocorax carbo novaehollandiae*) (At Risk - Naturally Uncommon, uncommon in ED)
- Variable oystercatcher (*Haematopus ostralegus finschi*) (At Risk – Recovering).

## Fish

Opara Stream (upstream) supports five nationally At Risk – Declining (Goodman et al. 2014) fish species (EOS Ecology unpubl. data 2014) that migrate through the estuary between the marine environment and Opara Stream:

- Longfin eel (*Anguilla dieffenbachii*)
- Inanga (*Galaxias maculatus*)
- Torrentfish (*Cheimarrichthys fosteri*)
- Bluegill bully (*Gobiomorphus hubbsi*)
- Redfin bully (*Gobiomorphus huttoni*)

### 5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

The site is not significant under this criterion. It does not contain indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.

### 6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

The site is significant under this criterion.

It supports indigenous vegetation and associations of indigenous species that occur within an estuary. Estuaries are originally rare ecosystems (Williams et al. 2007).

Estuaries are of restricted occurrence in the Akaroa Ecological District (the only others are at exist at Le Bons Bay and at the Head of Akaroa Harbour) (Wilson 1992) and in Canterbury (Grove 2009). Many of the vegetation associations that occur here are also of restricted occurrence in the ecological region.

<sup>1</sup> Although for mobile fauna such as birds, species classified as nationally At Risk do not meet the threshold for significance (Wildland Consultants 2013).



## Diversity and Pattern

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

It supports a diverse range of saltmarsh vegetation communities including marsh ribbonwood shrubland, three-square reedland, sea rush rushland, oioi restiad rushland, creeping bent grassland, glasswort herbfield, *Puccinellia stricta* grassland and sea primrose turf land (Grove and Parker 2013). The distribution of these communities reflects inundation and salinity gradients.

## Ecological Context

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is significant under this criterion.

The estuary has direct linkages to the Opara Stream, and the associated marine and terrestrial ecosystems (Grove and Parker 2013). It is an important corridor for a number of indigenous migratory fish. The indigenous vegetation on the north-western side of the estuary is included in the site because it buffers the estuary and reduces sediment and nutrient inputs.

- 9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is significant under this criterion.

The estuary and its saltmarsh communities play an important role in the natural functioning of the estuarine and coastal systems at Okains Bay. The estuary's hydrological processes are intact, the saltmarsh vegetation provides a role in trapping and retaining sediment and nutrients and it provides important habitat for indigenous fauna (see criteria 10).

- 10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

The estuary is one of only two inter-tidal estuarine habitats on Banks Peninsula and provides important feeding and wintering habitat for low numbers of coastal and wetland bird species (see Appendix 1). The site is listed as an important habitat for nationally Threatened and At Risk freshwater fish within the Canterbury Region (longfin eel, koaro (*Galaxias brevipinnis*), inanga, torrentfish, lamprey (*Geotria australis*), bluegill bully, and redfin bully) and as an important inanga spawning site (Department of Conservation 2012). It is also an important



habitat for a diverse range of invertebrates. Thirty four invertebrate taxa were recorded on and in the sediments by Bolton-Richie (2008).

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## Site Management

### Existing Protection Status

A very small area of public conservation land (Okains Bay Conservation Area, conservation unit no. N36148) on the southern side of the estuary is within the site.

Environment Canterbury (ECan) has the statutory role of monitoring and managing coastal habitats (below mean high water springs) in the Canterbury region. Monitoring and management recommendations of relevance to ECan’s statutory role are contained in Bolton-Ritchie (2008).

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Sedimentation and nutrient enrichment from the surrounding land (Bolton-Ritchie 2008, Grove and Parker 2013).</li> </ul>	<ul style="list-style-type: none"> <li>Consider catchment wide solutions to reduce erosion and methods of reducing nutrient inputs (potential sources: fertiliser, stock access to waterways etc.) such as farm management plans, revegetation and appropriate planting of riparian buffers.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to potential catchment-wide initiative to address impacts of erosion and nutrient inputs upon biodiversity/ecosystems</li> </ul>
<ul style="list-style-type: none"> <li>Recreational vehicles (Bolton-Ritchie 2008, Grove and Parker 2013).</li> </ul>	<ul style="list-style-type: none"> <li>Appropriate signage, education and appropriate physical barriers (such as bollards) to prevent vehicles accessing the estuary.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about management of public access. Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Reclamation, habitat loss and modification of the estuary margins (roads, culverts, channels, fences) (Bolton-Ritchie 2008, Grove and Parker 2013).</li> </ul>	<ul style="list-style-type: none"> <li>Consider improving the condition of the saltmarsh habitat on the margins of the estuary. Ensuring an appropriate buffer between the estuary and grazed pasture would be beneficial.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>



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**Assessment completed by:** Scott Hooson  
**Date:** 22/10/2014

**Statement completed by:** Scott Hooson  
**Date:** 22/10/2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



## Appendix 1: Indigenous Banks Peninsula Estuaries/Coastal Wetlands Bird Species Assemblage

Comparison of bird species recorded at Okains Bay (Crossland unpubl. data 2014a) with the “Banks Peninsula Estuaries/Coastal Wetlands Bird Species Assemblage” (Crossland 2014b).

Species recorded at the study site are marked with a tick ✓.

	Common name	Scientific Name
	Arctic Skua	<i>Stercorarius parasiticus</i>
	Australasian Gannet	<i>Morus serrator</i>
✓	Australasian Harrier	<i>Circus approximans</i>
✓	Black Cormorant	<i>Phalacrocorax carbo novaehollandiae</i>
	Black Swan	<i>Cygnus atratus</i>
✓	Black-backed Gull	<i>Larus dominicanus dominicanus</i>
	Black-billed Gull	<i>Larus bulleri</i>
	Black-fronted Tern	<i>Sterna albobriata</i>
✓	Caspian Tern	<i>Sterna caspia</i>
	Eastern Bar-tailed Godwit	<i>Limosa lapponica baueri</i>
✓ *	Grey Duck	<i>Anas superciliosa superciliosa</i>
	Grey Teal	<i>Anas gracilis</i>
	Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>
✓	Little Cormorant	<i>Phalacrocorax melanoleucos brevirostris</i>
	Marsh Crake	<i>Porzana pusilla affinis</i>
✓	New Zealand Kingfisher	<i>Halcyon sancta vagans</i>
	New Zealand Shoveler	<i>Anas rhynchotis</i>
✓	Paradise Shelduck	<i>Tadorna variegata</i>
✓	Pied Cormorant	<i>Phalacrocorax varius varius</i>
✓	Pied Stilt	<i>Himantopus himantopus leucocephalus</i>
	Pomarine Skua	<i>Stercorarius pomarinus</i>
✓	Pukeko	<i>Porphyrio porphyrio melanotus</i>
✓	Red-billed Gull	<i>Larus novaehollandiae scopulinus</i>
	Reef Heron	<i>Egretta sacra sacra</i>
✓	South Island Pied Oystercatcher	<i>Haematopus ostralegus finschi</i>
✓	Spotted Shag	<i>Stictocarbo punctatus</i>
✓	Spur-winged Plover	<i>Vanellus miles</i>
✓	Variable Oystercatcher	<i>Haematopus unicolor</i>
✓	Welcome Swallow	<i>Hirundo tahitica neoxena</i>
✓	White-faced Heron	<i>Ardea novaehollandiae novaehollandiae</i>
✓	White-fronted Tern	<i>Sterna striata</i>
	New Zealand Pipit	<i>Anthus novaeseelandiae novaeseelandiae</i>

\* Mallard, grey duck or mallard/grey duck hybrids have been recorded at the site.





## Appendix 2: Bird Species List

Indigenous birds recorded during Christchurch City Council Waterbird Monitoring at Okains Bay, December 1989 – March 2014 (Crossland unpubl. data 2014a).

Species Name	Common Name
Australasian harrier	<i>Circus approximans</i>
Black cormorant	<i>Phalacrocorax carbo novaehollandiae</i>
Black-backed gull	<i>Larus dominicanus dominicanus</i>
Caspian tern	<i>Sterna caspia</i>
Cattle egret	
Little cormorant	<i>Phalacrocorax melanoleucos brevirostris</i>
*Mallard/grey duck	<i>Anas superciliosa superciliosa/ Anas platyrhynchos platyrhynchos</i>
New Zealand kingfisher	<i>Halcyon sancta vagans</i>
Paradise shelduck	<i>Tadorna variegata</i>
Pied cormorant	<i>Phalacrocorax varius varius</i>
Pied stilt	<i>Himantopus himantopus leucocephalus</i>
Pukeko	<i>Porphyrio porphyrio melanotus</i>
Red-billed gull	<i>Larus novaehollandiae scopulinus</i>
South Island pied oystercatcher	<i>Haematopus ostralegus finschi</i>
Spotted shag	<i>Stictocarbo punctatus</i>
Spur-winged plover	<i>Vanellus miles</i>
Variable oystercatcher	<i>Haematopus unicolor</i>
Welcome swallow	<i>Hirundo tahitica neoxena</i>
White-faced heron	<i>Ardea novaehollandiae novaehollandiae</i>
White-fronted tern	<i>Sterna striata</i>

\* Mallard (introduced), grey duck (indigenous) or mallard/grey duck hybrids have been recorded at the site.



## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Okuti Valley

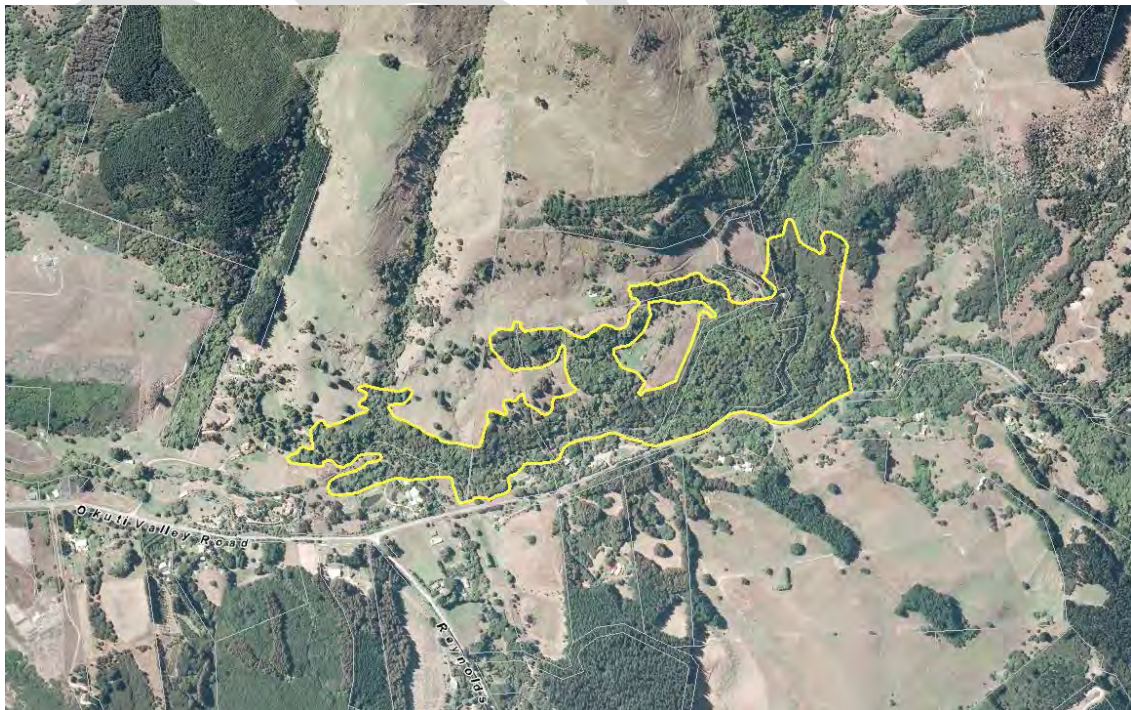
**Site number:** SES/A/14

**Physical address of site:** Okuti Valley, Little River

#### **Summary of Significance:**

This site is significant because it contains very rare and highly representative indigenous forest that is one of the best remnants of original podocarp/hardwood forest on lowland hill slopes on Banks Peninsula. It supports a high diversity of plant taxa including five indigenous plant species that are Threatened or At Risk nationally (including one Nationally Critical species), several that are uncommon within the ecological region or ecological district and four that are at their southern regional or national distributional limits on Banks Peninsula. The site is a part of a network of forest patches in the Okuti Valley and provides important habitat for indigenous forest birds. The Okuti River, which flows through the site provides breeding habitat for a nationally Threatened fish species.

#### **Site Map:**



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 45.33

**Central point (NZTM):** E1586598, N5152082

## Site Description

The site is an area of indigenous forest on the gently sloping south-facing slopes of the Okuti Valley and on the northern side of the Okuti Valley Road. The Okuti River is on the southern boundary. The altitudinal range of the site is from approximately 50 to 200 metres above sea level. It includes the 4.3 ha Okuti Valley Scenic Reserve (DOC) (conservation unit N36139) and part of the 5 ha Manaia Banks Peninsula Conservation Trust covenant.

Wildland Consultants unpubl. data (2012) describe the main vegetation communities within the site. They are:

- Remnant (lowland totara)-(matai)-(kahikatea)/hardwood forest and mixed secondary hardwood forest on south-facing slopes and terraces above the Okuti River.
- Secondary growth (lowland totara)-(matai)-(kahikatea)/hardwood forest on south-facing slopes and terraces next to and above the Okuti River.
- Secondary growth kanuka forest on south-facing slopes.

These communities are described in more detail below (from Wildland Consultants unpubl. data 2012).

The Okuti Valley Scenic Reserve (DOC) protects remnant (lowland totara)-(matai)-(kahikatea)/hardwood forest. The reserve occupies the south-facing slopes above the Okuti River, rising up from the river to a terrace before climbing steeply up to another terrace at Reserve Road. The reserve contains one of the best remnants of lowland podocarp-hardwood forest on Banks Peninsula (Wilson 1987a). Kahikatea (*Dacrycarpus dacrydioides*), matai (*Prumnopitys taxifolia*) and lowland totara (*Podocarpus totara*) occur here and all are regenerating well, with a full range of age classes represented, from seedlings and saplings to large adult trees. The reserve has been fenced for over 80 years and a diverse range of palatable species are present in the understorey and subcanopy. For example, kawakawa (*Piper excelsum*), silver tree fern (*Cyathea dealbata*) and *Asplenium gracillimum* are particularly abundant. At least three species of hook grass are present, including *Uncinia banksii*, which is rare on Banks Peninsula (Wilson 1992). Several small areas of open wetland occur within the reserve, and these contain typical species such as *Carex secta*, swamp kiokio (*Blechnum minus*), common duckweed (*Lemna disperma*) and cabbage tree (*Cordyline australis*).

The main vegetation type within the site is mixed secondary growth hardwood forest with emergent podocarps (kahikatea, totara and matai). The forest occupies the river flats along the Okuti River and the slopes and terraces on the south-facing side of the valley. Very large old-growth specimens of all three podocarps occur throughout the



area, as well as juveniles of all three species. Very large totara trees occur all along the northern site boundary on the upper terrace, and there are two very large pokaka trees (*Elaeocarpus hookerianus*) (both over 1 m dbh) and several other big podocarps in this area. The most common canopy species are kowhai (*Sophora microphylla*), mahoe (*Melicactus ramiflorus*), kanuka (*Kunzea robusta*), narrow-leaved lacebark (*Hoheria angustifolia*) and five-finger (*Pseudopanax arboreus*). Kanuka forms the main canopy on the steeper slopes. Forest is still colonising pasture within the site in some places, and bracken occurs in some of these canopy gaps. Native vines, particularly large-leaved pohuhue (*Muehlenbeckia australis*), are abundant throughout the site. Most of the forest is fenced, however sheep and cattle have access to some areas, and some fences on the northern boundary are no longer stock-proof. The composition and condition of the understorey vegetation is quite variable, depending on the age of the canopy and presence of stock. A number of exotic trees have been planted (e.g. Eucalypts (*Eucalyptus globulus*), Lawson cypress (*Chamaecyparis lawsoniana*), radiata pine (*Pinus radiata*), wattle (*Acacia* sp.), apple (*Malus × domestica*), pear (*Pyrus communis*)), and some of these species are now spreading (e.g. Lawson cypress). The southern boundary of the site is adjacent to a number of dwellings and gardens, which contain a wide variety of exotic plants. Many of the garden plants are known to be invasive (and pose a threat to native biodiversity), and some have already started to spread into the adjoining forest (e.g. rowan (*Sorbus aucuparia*), sycamore (*Acer pseudoplatanus*), periwinkle (*Vinca major*)).

The secondary growth kanuka is dominated by kanuka, with lesser amounts of mahoe, five-finger and kowhai. Occasional young totara are present. There are several species of native vines, with large-leaved pohuehue and New Zealand bindweed (*Calystegia tuguriorum*) being the most abundant. There is stock-proof fencing around part of the forest but there appears to be intermittent/light grazing. The most common understorey plants are unpalatable species such as small-leaved coprosma/mikimiki (mainly *Coprosma areolata* and *C. rotundifolia*, which are both locally abundant), ongaonga (*Urtica ferox*), and the ferns ground spleenwort (*Asplenium appendiculatum*) and Hooker's spleenwort (*A. hookerianum*).

Several small areas of open wetland occur within the reserve, and there is another small wetland on the northern boundary of the Okuti Valley Scenic Reserve.

Indigenous birds recorded at the site are bellbird (*Anthornis melanura melanura*), grey warbler (*Gerygone igata*), New Zealand pigeon (*Hemiphaga novaeseelandiae novaeseelandiae*), South Island fantail (*Rhipidura fuliginosa fuliginosa*), silvereye (*Zosterops lateralis lateralis*) and Australasian harrier (*Circus approximans*) (Wilson 1992, Hutchison 2011).

### **Extent of Site of Ecological Significance**

The site includes the indigenous remnant podocarp/hardwood forest and mixed secondary hardwood forest, secondary growth podocarp/hardwood forest and secondary growth kanuka forest. It includes the Okuti Valley Scenic Reserve and the indigenous forest within the BPCT covenant. It also includes small areas of regenerating bracken that buffer the margins of the site. The Okuti River and areas of indigenous riparian vegetation are included within the site, but planted amenity gardens associated with dwellings are excluded from the site.



The boundaries of this site logically extend beyond the mapped site boundaries to include connected areas of what appears (from aerial photographs) to be indigenous forest. However, these areas were not surveyed and there is no up-to-date information to assess their significance. An ecological survey of these potential extensions to the site is recommended.

Large remnant podocarp trees (particularly lowland totara) grow in pasture outside the site boundaries, these trees are ecologically important and they are worthy of protection via alternative methods.

## Assessment Summary

The Okuti Valley Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 5), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The areas of remnant and secondary (lowland totara)-(matai)-(kahikatea)/hardwood forest within the site meet this criterion. They are representative of this vegetation type within the Akaroa Ecological District.

Wilson (1987a) commented that the Scenic Reserve and forest adjacent to it “must rank as one of the best remnants of lowland hillslope original podocarp/hardwood”. Kahikatea, matai and totara occur here and all are regenerating well, with a full range of age classes represented, from seedlings and saplings to large adult trees. The reserve has been fenced for over 80 years and a diverse range of palatable species are present in the understorey and subcanopy (Wildland Consultants unpubl. data 2012).

The secondary (lowland totara)-(matai)-(kahikatea)/hardwood forest is less intact but still meets this criterion. Within this vegetation community forest is still colonising pasture within the site in some places, and bracken (*Pteridium esculentum*) occurs in some of these canopy gaps. Most of the forest is fenced, however sheep and cattle have access to some areas and the composition and condition of the understorey vegetation is variable, depending on the age of the



canopy and presence of stock and a number of exotic trees have been planted. Despite this modification, very large old-growth specimens of all three podocarps, and juveniles of all three species occur throughout this vegetation community. With the exception of exotic tree and weed species, and stock damage in parts, the structure and composition of the forest is representative relative to other areas of secondary lowland podocarp/hardwood forest in the ecological district.

The areas of secondary growth kanuka forest are not significant under this criterion. They consist largely of kanuka (with lesser amounts of mahoe, five-finger and kowhai). The structure and composition of the understorey has been modified by grazing and the most common understorey plants are unpalatable species.

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

It is the largest example of remnant lowland podocarp/hardwood forest on an alluvial landform and hill slopes in the ecological district. It is also one of only four or five lowland old-growth podocarp/hardwood forest remnants remaining on alluvial landforms on Banks Peninsula, all of which are 7 ha or less (Willems 1999).

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

Old growth forest (of any type) has been reduced to approximately 800 ha or <1% of its original extent on Banks Peninsula (Wilson 2009) and old-growth lowland podocarp/hardwood forest on alluvial landforms has been reduced to a tiny area of its original extent within the Akaroa ED and the Banks ER. There are now only five very small remnant lowland podocarp/hardwood forest remnants left on valley floor alluvium on Banks Peninsula (Wilson 1992). This forest type is identified by (Wilson 1992) as being the highest priority for protection in the Akaroa ED.

The secondary indigenous forest within the site is also significant under this criterion. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and kanuka) in the ED is estimated to be 10% (17.8% including manuka and kanuka) (New Zealand Landcover Database (Version 4)).

Several small areas of open wetland occur within the reserve, and there is another small wetland on the northern boundary of the Okuti Valley Scenic Reserve. Wetlands have been reduced to less than 20% of their former extent at the regional and freshwater biogeographic unit scales. Ausseil et al. (2008) estimate that wetlands have been reduced to 10.6% of their original extent in the Canterbury Region and 7.0% in the Canterbury freshwater biogeographic unit.



On Banks Peninsula, most of the original wetlands have been cleared and drained and only remnants remain.

This site also meets this criterion at the Level IV land environment scale. The entire site is on an Acutely Threatened land environments where <10% indigenous vegetation is left on these land environments nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has five indigenous plant species that are Threatened or At Risk nationally (including one Nationally Critical species), and several that are uncommon within the ecological region or ecological district. Breeding sites of a threatened freshwater fish species have recently been discovered in the Okuti River catchment.

**Plants**

The nationally Threatened and At Risk plant species (de Lange et al. 2013) recorded from the site (Wildland Consultants unpubl. data 2012) are:

- Banks Peninsula fork fern (*Tmesipteris horomaka*) Banks Peninsula fork fern (Threatened Nationally Critical and endemic to Banks Peninsula)
- White mistletoe (*Tupeia antarctica*) (At Risk - Declining)
- New Zealand verbena (*Teucrium parvifolium*) (At Risk - Declining) (one plant beside Okuti Valley stream (Boot 1998)
- Climbing groundsel (*Brachyglottis sciadophila*) (At Risk - Declining)
- *Coprosma virescens* (At Risk - Declining)

Plant species recorded from the site (Hutchison 2008, Wildland Consultants unpubl. data 2012) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Carex secta*
- Pokaka (*Elaeocarpus hookerianus*)
- Water fern (*Histiopteris incisa*)
- Common duckweed (*Lemna dispema*)
- Bush rice grass (*Microlaena avenacea*)
- Rōhutu (*Neomyrtus pedunculatus*)
- Hook grass (*Uncinia banksii*)
- Hook grass (*Uncinia scabra*)
- *Isolepis distigmata* (this species was presumed locally extinct for 80 years and this is currently the only known site on Banks Peninsula).
- Smooth shield fern (*Lastreopsis glabella*)
- *Myriophyllum* sp. (both common water milfoil (*Myriophyllum propinquum*) and water milfoil (*Myriophyllum triphyllum*) are uncommon to rare or very local on Banks Peninsula)

**Freshwater fish**



Breeding sites of lamprey (*Geotria australis*) (Threatened Nationally Vulnerable) (Goodman et al. 2014) have recently been discovered in the Okuti River catchment (NIWA website). These are the first breeding sites ever found for this species. The Okuti River is within the site near its southern boundary.

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are three plant species that are at their southern national limit on Banks Peninsula and one species at its southern regional limit (Wildland Consultants unpubl. data 2012).

The species' at their southern national limit are:

- Titoki (*Alectryon excelsus*)
- Native passion vine (*Passiflora tetrandra*)
- Kawakawa (*Piper excelsum*)

The species at its southern regional limit is:

- Pigeonwood (*Hedycarya arborea*)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is not significant under this criterion. It does not have indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

Although the site does not contain a high diversity of indigenous ecosystem or habitat types, the remnant and secondary (lowland totara)-(matai)-(kahikatea)/hardwood forest supports a diverse range of indigenous plant taxa (Wilson 1987a, 1987b, Wildland Consultants unpubl. data 2012).

**Ecological Context**

**8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**





The site is significant under this criterion.

It is part of a network of forest patches in the Okuti Valley and its moderate to large size and relative intactness means it is likely to be important part of this network. Secondary kanuka forest in the eastern part of the site has been included within the site boundary because it buffers the more intact forest (including the Scenic Reserve) and increases the overall size of the forest patch. It also provides a link between the high value forest within the site and a forested gully and tributary catchment above and north of the site. Areas of bracken fernland on the forest margins have been included because they play a role in buffering the forest. Riparian forest within the site buffers and shades the Okuti River and the lower reaches of its northern tributary.

**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The small areas of wetland within the site are not significant under this criterion.

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

The presence of relatively intact indigenous forest, including remnant podocarp trees means this site provides important seasonal feeding habitat for indigenous frugivorous forest birds. Several forest bird species, including New Zealand pigeon have been recorded using the site (Wilson 1992, Hutchison 2011).

The Okuti River is within the site on its southern boundary. It provides important breeding habitat for the Threatened - Nationally Vulnerable lamprey (NIWA website).

## Site Management

### Existing Protection Status

Partially protected. The Okuti Valley Scenic Reserve (DOC) (conservation unit N36139) protects a 4.3 ha of lowland podocarp/hardwood forest and a Banks Peninsula Conservation Trust covenant protects 5 ha of remnant and secondary growth podocarp-hardwood forest and exotic grassland.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Stock (cattle and sheep). Some fences on the northern boundary of the Scenic Reserve are no longer stock-proof (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>• Consider repairing fences that are no longer stock-proof with ongoing maintenance to ensure they remain stock-proof.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with landowners about the impacts of stock on biodiversity/ecosystems. Advice and guidance about options. Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>• Biodiversity pest plants:                             <ul style="list-style-type: none"> <li>○ A large number of biodiversity pest plants occur within the site e.g. sycamore, lawson cypress, hawthorn (<i>Crataegus monogyna</i>), rowan, ash (<i>Fraxinus excelsior</i>), spindleberry (<i>Euonymus europaeus</i>), sweet cherry (<i>Prunus avium</i>), cherry plum (<i>Prunus cerasifera</i>), sweet briar (<i>Rosa rubiginosa</i>), crack willow (<i>Salix fragilis</i>), grey willow (<i>S. cinerea</i>), periwinkle, radiata pine etc. Some of these weeds are a serious threat to the ecological values of the site.</li> <li>○ Spread of planted exotic trees (e.g. eucalypts, Lawson cypress, radiata pine, wattle, apple, pear) (Wildland Consultants</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Consider actively controlling high priority biodiversity pest plants with ongoing surveillance and further control as and when required.</li> <li>• Consider removing the most invasive tree and garden plant species from adjacent gardens and monitor (and control) the spread of any weeds into the site. These species could include grey willow, periwinkle, Chilean rhubarb (<i>Gunnera tinctoria</i>), darwins barberry (<i>Berberis darwinii</i>), rowan, hawthorn, banana passionfruit (<i>Passiflora mixta</i>) and sycamore.</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowners about pest plant identification, monitoring and control options.</li> <li>• Assistance where appropriate.</li> </ul>

<p>unpubl. data 2012).</p> <ul style="list-style-type: none"> <li>○ Spread of garden plants. There are lots of serious weeds in adjacent gardens immediately to the south of the site (e.g. Darwin's barberry and purple loosestrife (<i>Lythrum salicaria</i>)). Some have already started to spread into the adjoining forest (e.g. rowan, sycamore, periwinkle) (Wildland Consultants unpubl. data 2012).</li> </ul>		
<ul style="list-style-type: none"> <li>• Human disturbance to indigenous forest ecosystems</li> </ul>	<ul style="list-style-type: none"> <li>• Other than control of exotic weeds (and potentially animal pests), it is recommended that human disturbance within the site should be minimised.</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowners about impacts of human disturbance on ecosystems and management options.</li> </ul>
<ul style="list-style-type: none"> <li>• Non-local and hybrid natives.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider removing those species that are potentially invasive and could threaten the ecological values and genetic integrity of the species native to the site.</li> </ul>	<ul style="list-style-type: none"> <li>• Provision of ecological advice and information packages for planting (e.g. 'Plant Me Instead').</li> </ul>
<ul style="list-style-type: none"> <li>• Dwellings and amenity gardens adjacent to the site.</li> </ul>	<ul style="list-style-type: none"> <li>• Planted amenity gardens associated with dwellings are excluded from the site.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Existing access ways. There is a driveway and several walking tracks (and boardwalks) within the site.</li> </ul>	<ul style="list-style-type: none"> <li>• Landowners will continue to be able to use and maintain existing access ways and tracks within the site.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure that landowners are aware that existing access can be used and maintained.</li> </ul>
<ul style="list-style-type: none"> <li>• Loss of <i>Isolepis distigmata</i> in small unprotected wetland area on private land.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure the wetland is not modified by land-use change or management and that the hydrology of the wetland is not altered.</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowners about the wetland ecosystem and options for management. Assistance where appropriate.</li> </ul>

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**Assessment completed by:** Scott Hooson  
**Date:** 18 September 2014

**Statement completed by:** Scott Hooson  
**Date:** 18 September 2014

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.

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## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2012).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Alectryon excelsus</i>	titoki
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum discolor</i>	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum minus</i>	swamp kiokio
<i>Blechnum novae-zealandiae</i>	kiokio
<i>Blechnum penna-marina</i>	little hard fern
<i>Blechnum procerum</i>	small kiokio
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carex geminata</i>	cutty grass, rautahi
<i>Carex secta</i>	niggerhead, pukio
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma propinqua X robusta</i>	
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Cyathea smithii</i>	Smith's tree fern, katote
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dicksonia squarrosa</i>	wheki, rough tree fern
<i>Elaeocarpus hookerianus</i>	pokaka
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Hebe salicifolia</i>	koromiko



<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Helichrysum lanceolatum</i>	niñiao
<i>Histiopteris incisa</i>	water fern
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Hypolepis ambigua</i>	pig fern
<i>Hypolepis rufobarbata</i>	sticky pig fern
<i>Ileostylus micranthus</i>	green mistletoe
<i>Isolepis distigmata</i>	
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea ericoides</i>	kanuka
<i>Lagenifera strangulata</i>	parani
<i>Lastreopsis glabella</i>	smooth shield fern
<i>Lemna minor</i>	common duckweed
<i>Leucopogon fraseri</i>	dwarf heath, patotara
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Macropiper excelsum</i>	kawakawa
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Metrosideros diffusa</i>	white climbing rata
<i>Microlaena avenacea</i>	bush rice grass
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Microtis unifolia</i>	onion orchid, maikaika
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Neomyrtus pedunculata</i>	rohutu, myrtle
<i>Nothofagus fusca</i>	red beech
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Phormium tenax</i>	flax, harakeke
<i>Pittosporum eugenoides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Pneumatopteris pennigera</i>	gully fern, pakau
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum neozelandicum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pteridium esculentum</i>	bracken
<i>Pterostylis species</i>	green-hooded orchid
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rytidosperma unarede</i>	danthonia



<i>Schefflera digitata</i>	pate, seven-finger
<i>Senecio glomeratus</i>	groundsel
<i>Senecio minimus</i>	native fireweed
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai, weeping kowhai
<i>Stellaria decipiens</i>	chickweed
<i>Streblus heterophyllus</i>	small-leaved milk tree, turepo
<i>Thelymitra species</i>	sun orchid
<i>Tmesipteris horomaka</i>	fork fern
<i>Tupeia antarctica</i>	white mistletoe, pirita, tupia
<i>Uncinia banksii</i>	hook grass
<i>Uncinia leptostachya</i>	hook grass
<i>Uncinia scabra</i>	hook grass
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species</b>	
<i>Acer pseudoplatanus</i>	sycamore
<i>Acacia species</i>	wattle
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Chamaecyparis lawsoniana</i>	Lawson cypress
<i>Chamaecytisus palmensis</i>	tree lucerne
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Crataegus monogyna</i>	hawthorn
<i>Critesion murinum</i>	barley grass
<i>Crocsmia x crocosmiiflora</i>	monbretia
<i>Cytisus scoparius</i>	scotch broom
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Eucalyptus globulus</i>	eucalypt, blue gum
<i>Euonymus europaeus</i>	spindle tree
<i>Euphorbia peplus</i>	petty spurge, milkweed
<i>Fraxinus excelsior</i>	ash
<i>Galium aparine</i>	cleavers
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Juncus acuminatus</i>	sharp-fruited rush
<i>Juncus effusus</i>	soft rush
<i>Lotus pedunculatus</i>	lotus
<i>Malus × domestica</i>	apple
<i>Mimulus guttatus</i>	monkey musk
<i>Mycelis muralis</i>	wall lettuce
<i>Myosotis sylvatica</i>	garden forget-me-not
<i>Petroselinum crispum</i>	wild parsley
<i>Pinus radiata</i>	radiata pine, Monterey pine
<i>Prunus avium</i>	sweet cherry
<i>Prunus cerasifera</i>	cherry plum
<i>Prunella vulgaris</i>	selfheal





<i>Pyrus communis</i>	pear
<i>Ranunculus repens</i>	creeping buttercup
<i>Rosa rubiginosa</i>	sweet briar, briar rose
<i>Rubus fruticosus</i>	blackberry
<i>Rumex obtusifolius</i>	broad-leaved dock
<i>Salix cinerea</i>	grey willow
<i>Salix fragilis</i>	crack willow
<i>Sambucus nigra</i>	elderberry
<i>Solanum chenopodioides</i>	velvety nightshade
<i>Solanum nigrum</i>	black nightshade
<i>Sonchus oleraceus</i>	puha, smooth sow thistle
<i>Sorbus aucuparia</i>	rowan
<i>Stachys sylvatica</i>	hedge woundwort
<i>Stellaria media</i>	chickweed
<i>Trifolium pratense</i>	red clover
<i>Trifolium repens</i>	white clover
<i>Ulex europaeus</i>	gorse
<i>Vicia sativa</i>	vetch
<i>Vinca major</i>	periwinkle

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

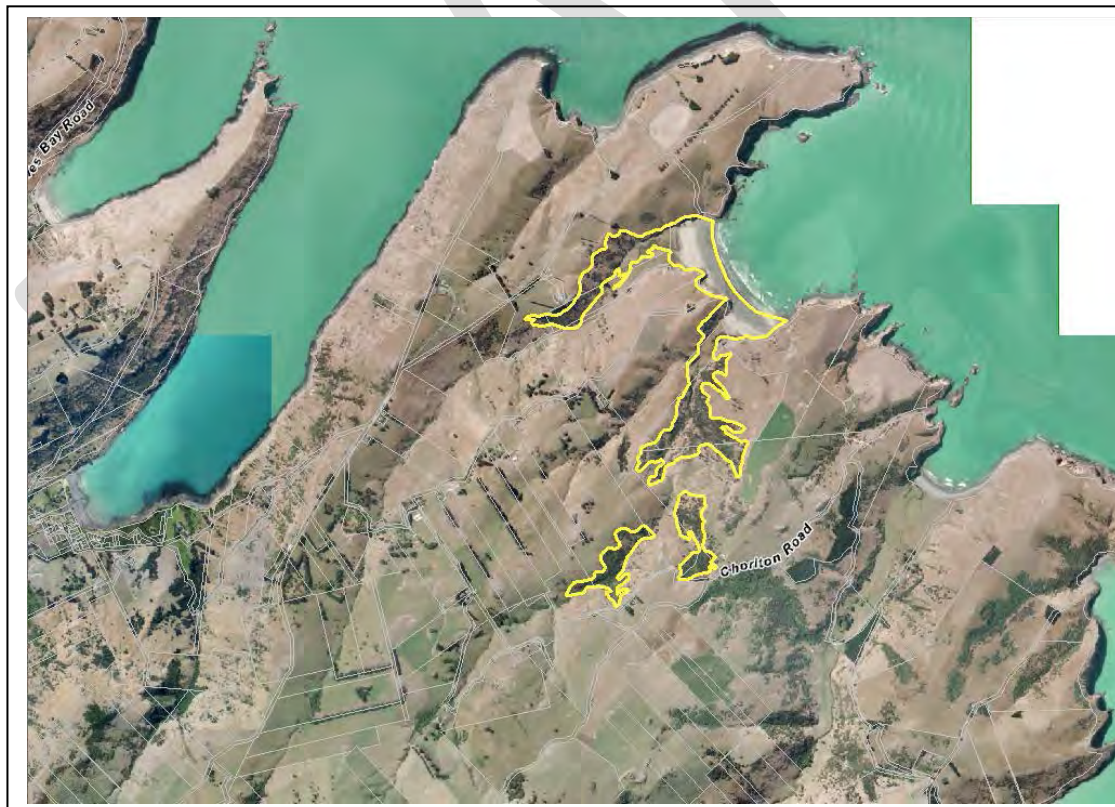
**Site name:** Raupō Bay

**Site number:** SES/A/15

#### Summary of Significance:

The site is significant because it supports indigenous vegetation, including rare forest and non-tidal saltmarsh wetland communities on an Acutely Threatened land environment. Some of these vegetation communities are representative. It has plant species that are nationally Threatened or At Risk, uncommon within the ecological region or ecological district and endemic to Banks Peninsula. The stream draining the northern valley supports two nationally At Risk fish species.

#### Site Map





## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 60.8

**Central point (NZTM):** E1602985, N5165168

## Site Description

This site has a broad sandy bay with a valley entering it from the northern end and a smaller valley entering it at the southern end. Raupō Stream flows through the northern valley and an un-named stream flows through the southern valley. There are two small estuarine wetlands/lagoons formed by sand dunes impounding Raupō Stream and the unnamed stream in the southern valley (Environment Canterbury 2010). The altitude of the site ranges from sea level up to about 200 m. The Department of Conservation identified the site as an RAP (RAP A41 – Raupō Bay) in the Banks Ecological Region PNA Programme Report (Wilson 1992).

There are a diverse range of indigenous vegetation communities and habitats within the site including:

- Coastal karaka / narrow-leaved lacebark - mahoe - ngaio / *Coprosma virescens* - *Coprosma crassifolia*, *Melicope simplex* scrub with a variety of native hardwood species, and emergent karaka on the south-facing slopes of the northern valley.
- Lowland ribbonwood – narrow leaved lacebark – kowhai / ongaonga secondary hardwood forest and scrub on the south-facing slopes below the rocky bluffs in the northern valley (Wildlands unpubl. data 2012).
- Mixed mahoe - narrow-leaved lacebark – kaikomako / *Coprosma virescens* - *Coprosma crassifolia* – kawakawa / ongaonga scrub secondary hardwood forest with emergent matai and totara in a gully at the head of Little Raupō Bay.
- Secondary forest and treeland dominated by kanuka, with lesser amounts of kowhai and narrow-leaved lacebark, and a subcanopy of small-leaved shrubs on the dry, north-facing slopes of Little Raupō Bay.
- Coastal mahoe - narrow-leaved lacebark – kaikomako / *Coprosma virescens* - *Coprosma crassifolia* / ongaonga scrub with a variety of hardwood species including kanuka, and occasional totara on the south-facing slopes of Little Raupō Bay.
- Ngaio treeland on the hill slopes of both valleys.
- Marram – sweet vernal – browntop grassland on the foredunes in both bays as well as the exotic grassland on the north-western side of the stream in the northern valley.

Coastal wetland vegetation communities within the site (ECan 2010) include:

- Sea rush rushland with marram grass, marsh ribbonwood, knobby club-rush and exotic herbs and grasses.

- *Bolboschoenus caldwellii* reedland with three square, bachelors buttons and jointed rush.
- Knobby club-rush rushland with oioi, tall fescue, sea rush and exotic herbs and grasses.
- *Carex pumila* sedgeland with sickle grass, tall fescue, orache and bachelors buttons.
- Three square reedland with oioi, tall fescue and bachelors buttons.

Karaka (*Corynocarpus laevigatus*) (a native tree that is uncommon on Banks Peninsula and almost certainly introduced and cultivated by Maori) is scattered in small groves and individual trees about Raupō Bay and for some distance up the valley. On all of Banks Peninsula Wilson (1992) considered that only North West Bay has a comparable population.

Freshwater fish species recorded from Raupō Stream (EOS unpubl. data 2014) are longfin eel (*Anguilla dieffenbachii*) and inanga (*Galaxias maculatus*) (At Risk - Declining) and shortfin eel (*Anguilla australis*), common bully (*Gobiomorphus cotidianus*) (Not Threatened) (Goodman et al. 2014).

### Extent of Site of Ecological Significance

The site includes the indigenous dominated secondary forest, treeland and scrub in both the northern and southern valleys and the mixed hardwood forest with emergent matai (*Prumnopitys taxifolia*) and lowland totara (*Podocarpus totara*) in the gully at the head of the southern valley. It also includes the saltmarsh wetland communities, active sand dunes and dune slacks and the sandy beaches down to mean high water springs. The marram – sweet vernal – browntop grassland on the north-western side of the stream in the northern bay and areas of exotic grassland surrounding the impounded stream in the southern valley have been included within the site because their exclusion would fragment the site and reduce its ecological integrity. Minor areas of exotic grass have been included within the site for the same reason.

### Assessment Summary

The Raupo Bay Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 8 and 10).

### Assessment against Significance Criteria

#### Representativeness

1. ***Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the***



***best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The mixed canopy secondary hardwood forest in the top of the eastern gully has a number of emergent matai and totara trees. Both the forest canopy and subcanopy is reasonably dense and diverse, with a wide variety of species (Wildlands unpubl. data 2012).

The coastal scrub with emergent karaka, secondary hardwood forest and scrub on the south-facing slopes in the northern bay and the coastal forest and scrub on the south-facing slopes of the southern bay, although grazed, are compositionally typical of these vegetation communities within the ecological district and are moderately representative of the original vegetation communities that would have occurred here.

The kanuka (*Kunzea robusta*) dominated forest and treeland on the dry, north-facing slopes of Little Raupo Bay is more modified. The understorey below the kanuka is grazed and open with few palatable species. This vegetation community does not meet the threshold for significance under this criterion.

The wetlands are also representative. They retain their key hydrological functions and the saltmarsh vegetation in shallow water and riparian areas is dominated by indigenous species, although the larger northern wetland is heavily grazed and exotic herb and grass species are common (ECan 2010) they are one of the best examples of their type in the ecological district.

***2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is not significant under this criterion. None of the indigenous vegetation or habitats are particularly large examples of their type in the Akaroa Ecological District.

**Rarity/Distinctiveness**

***3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

The extent of any forest type other than kanuka scrub/forest has been substantially reduced in the ED and the Region. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). Harding (2009) estimates that the original extent of podocarp/hardwood forest and coastal hardwood forest and in the ED (as a % of the ED) was been between 51 - 75% and 1 – 5 and respectively). The present extent of all indigenous forest (excluding manuka and kanuka) in the ED is estimated to be 10% (17.8% including manuka and kanuka) (New Zealand Landcover Database (Version 4)).



This site also meets this criterion at the Level IV land environment scale. It supports indigenous vegetation that is entirely on an Acutely Threatened land environment (F3.1a) where <10% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has several indigenous plant species that are nationally Threatened or At Risk, or uncommon within the ecological region or ecological district or endemic to Banks Peninsula and two nationally At Risk fish species.

**Plants**

Nationally Threatened and At Risk plant species (de Lange et al. 2013) recorded from the site (Wildlands unpubl. data 2012, Walls 2001) are:

- Wind grass (*Anemanthele lessoniana*) (Threatened – Nationally Vulnerable)
- Climbing groundsel (*Brachyglottis sciadophila*) (At Risk Declining)
- Fragrant tree daisy (*Olearia fragrantissima*) (At Risk Declining)
- *Chenopodium allanii* (At Risk – Naturally Uncommon)
  
- Banks Peninsula hebe (*Hebe strictissima*) (At Risk – Naturally Uncommon, endemic to Banks Peninsula)
- Fierce lancewood *Pseudopanax ferox* (At Risk – Naturally Uncommon)
- yellow rock groundsel (*Senecio glaucophyllus subsp. basinudus*) (At Risk – Naturally Uncommon)

Plant species recorded from the site (Wildlands unpubl. data 2012) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Australina pusilla*
- Shore bindweed (*Calystegia soldanella*)
- Sand sedge (*Carex pumila*)
- Willow herb (*Epilobium pedunculare*)
- Cud weed (*Euchiton sphaericus*)
- Black orchid (*Gastrodia cunninghamii*)
- Shining broadleaf (*Griselinia lucida*) (uncommon in the ecological region (Wilson 1992))
- Sea rush (*Juncus kraussii var. australiensis*)
- Common duckweed (*Lemna disperma*)
- Bamboo grass (*Microleana polynoda*) (uncommon in ecological region and Canterbury (Wilson 1992))
- Leatherleaf fern (*Pyrrosia eleagnifolia*)
- Remuremu (*Selliera radicans*)
- Climbing shore spinach (*Tetragonia implexicoma*)
- Hook grass (*Uncinia banksii*)

**Fish**



Two nationally At Risk fish species (Goodman et al. 2014) occur in Raupo Bay Stream which flows through the site (EOS unpubl. data 2014). They are:

- Longfin eel (*Anguilla dieffenbachii*) (At Risk – Declining)
- Inanga (*Galaxias maculatus*) (At Risk – Declining)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are seven species that are at their southern national or regional distributional limits or northern national distributional limit on Banks Peninsula (Wilson 2013). These species are (Walls 2001, Wildlands unpubl. data 2012):

- Titoki (*Alectryon excelsus*) (southern national limit)
- Kawakawa (*Piper excelsum*) (southern national limit)
- Shining spleenwort (*Asplenium oblongifolium*) (southern national limit)
- Native passion vine (*Passiflora tetrandra*) (southern national limit)
- Shining broadleaf (*Griselinia lucida*) (southern regional limit)
- Pigeonwood (*Hedycarya arborea*) (southern regional limit)
- Fragrant tree daisy (*Olearia fragrantissima*) (northern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

Non-tidal/lagoon saltmarsh wetland communities are of restricted occurrence in the Akaroa ED. The only other examples are non-tidal estuarine wetlands are those at Wairewa (Lake Forsyth). There are saltmarsh wetland communities at the head of Akaroa Harbour and within the small tidal estuaries of Le Bons and Okains Bays but they are tidal.

There are active sand dunes and dune slacks within the site. Both of these are originally rare ecosystems<sup>1</sup> (Williams et al. 2007).

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

There is a diverse range of indigenous ecosystem types within the site. They include coastal rockland and sandfield, sand dune grasslands, saltmarsh

<sup>1</sup> Although Williams *et al.* (2007) note that the rarity of active sand dunes at a national scale may be questionable.



herbfield, reedland and rushland in non-tidal riparian salt marsh and supra-tidal dune slack, streams, coastal scrub and treeland and a range of scrub, treeland and secondary hardwood forest types on lowland hill slopes. These vegetation communities support a very high diversity of indigenous plant taxa. Over 110 species were recorded in a recent botanical survey (Wildland Consultants unpubl. data 2012).

There is an ecological sequence from the marine environment to the coastal dunes and coastal wetlands and the mosaic of terrestrial scrub, treeland and forest ecosystems.

### **Ecological Context**

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

Within the wider environment the site is relatively isolated, but forest and treeland within the southern valley of Little Raupo Bay provide a potentially important ecological linkage to remnant old growth podocarp forest in Donaldson's Bush to the south-east. The scrub, treeland and secondary forest within the site is also likely to play a role in buffering the coastal wetlands and coast.

Raupo Stream supports at least four species of migratory freshwater fish (longfin eel, shortfin eel, common bully and inanga) (EOS unpubl. data 2014). The ecological linkage between the coast and the catchment is essential for these fish.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. The small size of the two estuarine wetlands/lagoons impounded behind the sand dunes at the northern and southern end of Raupō Bay means they are unlikely to play an important hydrological, biological or ecological role in the natural functioning of other areas and ecosystems in the wider area, including the coastal system.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess the site against this criterion.



## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Stock (Wildland Consultants unpubl. data 2012)</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing. Priorities areas are the wetland and saltmarsh communities but fencing the more intact indigenous scrub, treeland and forest sites would also be beneficial. Consider removing cattle from the wetland and saltmarsh communities as a high priority.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about the benefits to biodiversity/ecosystems of managing stock access to the site and advice about options.</li> <li>Collaborate with ECan re: possible fencing. Assistance as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Lack of recruitment of fragrant tree daisy (<i>Olearia fragrantissima</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the area surrounding the <i>Olearia</i> in the eastern gully to exclude stock, re-planting their progeny and monitoring as recommended by Walls (2001).</li> </ul>	<ul style="list-style-type: none"> <li>As first point above.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants: banana passionfruit (<i>Passiflora mixta</i>), hawthorn (<i>Crataegus monogyna</i>), sweet briar (<i>Rosa rubiginosa</i>), plum (<i>Prunus xdomestica</i>), crack willow (<i>Salix fragilis</i>), wallflower (<i>Cheiranthus cheiri</i>), taupata (<i>Coprosma repens</i>), macrocarpa (<i>Cupressus macrocarpa</i>), radiata pine (<i>Pinus radiata</i>) (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling biodiversity pest plants within the site with ongoing surveillance.</li> <li>Remove crack willow from the upper part of the southern catchment.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about monitoring of pest plants and options for control.</li> <li>Assistance where appropriate.</li> </ul>

<ul style="list-style-type: none"><li>• Mature crack willow have the potential to spread down the stream in the southern catchment.</li></ul>		
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**Assessment completed by:** Scott Hooson  
**Date:** 27 November 2014

**Statement completed by:** Scott Hooson  
**Date:** 27 November 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2012).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena juvenca</i>	bidibidi, piri-piri
<i>Alectryon excelsus</i>	titoki
<i>Anemanthele lessoniana</i>	wind grass
<i>Apium prostratum</i>	NZ celery
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Asplenium oblongifolium</i>	shining spleenwort, huruhuruwhenua
<i>Australina pusilla</i>	
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Calystegia soldanella</i>	shore bindweed
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carmichaelia australis</i>	native broom, common broom
<i>Carex forsteri</i>	cutty grass
<i>Carex pumila</i>	sand sedge
<i>Chenopodium allanii</i>	
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Corokia cotoneaster</i>	korokio
<i>Corynocarpus laevigatus</i>	karaka
<i>Crassula sieberiana</i>	stone crop
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	Mercury Bay weed, dichondra
<i>Disphyma australe</i>	NZ iceplant
<i>Echinopogon ovatus</i>	hedgehog grass
<i>Epilobium pedunculare</i>	willowherb
<i>Euchiton sphaericus</i>	cudweed
<i>Ficinia nodosa</i>	club rush, wiwi
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Fuchsia perscandens</i>	climbing fuchsia
<i>Fuchsia excorticata x perscandens</i>	scrubby fuchsia
<i>Geranium aff. microphyllum</i>	native geranium
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Griselinia lucida</i>	shining broadleaf, puka
<i>Haloragis erecta</i>	toatoa



<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum lanceolatum</i>	niniao
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle moschata</i>	pennywort
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Juncus kraussii</i>	sea rush
<i>Korthalsella lindsayi</i>	dwarf mistletoe
<i>Kunzea ericoides</i>	kanuka
<i>Lemna minor</i>	common duckweed
<i>Lilaeopsis novae-zelandiae</i>	
<i>Linum monogynum</i>	NZ linen flax
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Macropiper excelsum</i>	kawakawa
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Microtis unifolia</i>	onion orchid, maikaika
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Olearia fragrantissima</i>	fragrant tree daisy
<i>Oxalis exilis</i>	native oxalis
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parietaria debilis</i>	NZ pellitory
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Pittosporum eugeniioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Plagianthus divaricatus</i>	saltmarsh ribbonwood
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Poa cita</i>	silver tussock
<i>Poa imbecilla</i>	weak poa
<i>Poa matthewsii</i>	
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum neozelandicum subsp. zerophyllum</i>	shield fern
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pteridium esculentum</i>	bracken
<i>Pyrrosia eleagnifolia</i>	leatherleaf fern
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa



<i>Rytidosperma clavatum</i>	danthonia, bristle grass
<i>Rytidosperma unarede</i>	danthonia
<i>Scandia geniculata</i>	climbing aniseed
<i>Schefflera digitata</i>	pate, seven-finger
<i>Schoenoplectus pungens</i>	three-square
<i>Selliera radicans</i>	selliera
<i>Senecio glaucophyllus</i> subsp. <i>basinudus</i>	groundsel
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Sophora prostrata</i>	prostrate kowhai
<i>Streblus heterophylla</i>	milk tree, turepo
<i>Tetragonia implexicoma</i>	climbing shore spinach
<i>Uncinia banksii</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Wahlenbergia gracilis</i>	violet harebell
<b>Exotic Species</b>	
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Agrostis stolonifera</i>	creeping bent
<i>Aloe arborescens</i>	tree aloe
<i>Ammophila arenaria</i>	marram grass
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Anthosachne scabra</i>	blue wheatgrass
<i>Atriplex prostrata</i>	orache
<i>Bellis perennis</i>	daisy
<i>Bromus hordeaceus</i>	soft brome
<i>Carpobrotus edulis</i>	ice plant
<i>xCarpophyma mutabilis</i>	ice plant hybrid
<i>Carduus tenuiflorus</i>	winged thistle
<i>Cheiranthus cheiri</i>	wallflower
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Coprosma repens</i>	taupata
<i>Cotula coronopifolia</i>	bachelors button
<i>Crataegus monogyna</i>	hawthorn
<i>Critesion marimum</i>	salt barley grass
<i>Cupressus macrocarpa</i>	macrocarpa, Monterey cypress
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Euphorbia peplus</i>	petty spurge, milkweed
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Isolepis cernua</i> var. <i>platycarpa</i>	
<i>Juncus bufonius</i>	toad rush
<i>Lampranthus spectabilis</i>	trailing ice plant



<i>Lolium perenne</i>	ryegrass
<i>Mimulus guttatus</i>	monkey musk
<i>Passiflora mixta</i>	banana passionfruit
<i>Pinus radiata</i>	radiata pine, Monterey pine
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Plantago major</i>	broad-leaved plantain
<i>Polycarpon tetraphyllum</i>	allseed
<i>Prunus xdomestica</i>	plum
<i>Prunus species</i>	
<i>Prunella vulgaris</i>	selfheal
<i>Ranunculus repens</i>	creeping buttercup
<i>Ranunculus sceleratus</i>	celery-leaved buttercup
<i>Rosa rubiginosa</i>	sweet briar, briar rose
<i>Rumex acetosella</i>	sheeps sorrel
<i>Rytidosperma racemosum</i>	danthonia
<i>Salix fragilis</i>	crack willow
<i>Schedonorus arundinaceus</i>	tall fescue
<i>Sedum acre</i>	stonecrop
<i>Senecio elegans</i>	purple groundsel
<i>Silene gallica</i>	catchfly
<i>Silybum marianum</i>	variegated thistle
<i>Solanum chenopodioides</i>	velvety nightshade
<i>Sonchus oleraceus</i>	puha, smooth sow thistle
<i>Torilis arvensis</i>	hedgehog parsley
<i>Trifolium repens</i>	white clover
<i>Verbascum thapsus</i>	woolly mullein
<i>Vicia sativa</i>	vetch
<i>Vulpia bromoides</i>	vulpia hair grass





## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** View Hill

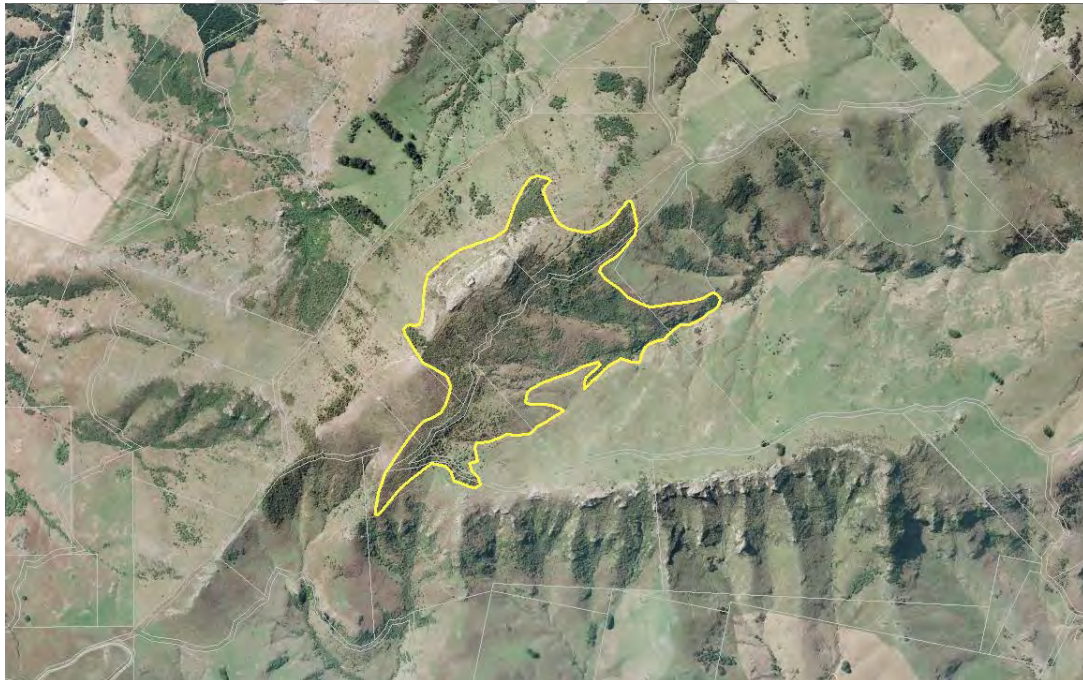
**Site number:** SES/A/16

**Physical address of site:** 144 View Hill Road, Okains Bay

#### **Summary of Significance:**

The site is significant because it contains a diverse mosaic of a number of primary and successional indigenous vegetation types some of which are rare, or originally rare, at a national scale. It supports indigenous plant species that are nationally At Risk, endemic and uncommon within the ecological region or ecological district and is an important part of an ecological network for indigenous fauna in the head of the Stony Beach Stream and West Peak area.

#### **Site Map**



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 74.77

**Central point (NZTM):** E1599668, N5161291

## Site Description

This site encompasses the exposed rocky ridgeline and summit of View Hill and the steep gullies and slopes on the south-eastern side of the summit in the head of Stony Beach Stream. The elevation of the site extends from 762 m above sea level at the summit of View Hill to approximately 440 at the bottom of the site in Stony Beach Stream.

The area is a mosaic of forest, treeland, scrub and shrubland over grassland. Many large thin-barked totara (*Podocarpus cunninghamii*) are emergent over vigorously regenerating forest and there are many young regenerating totara on the bush margins. Dense pockets of forest and scrub merge into shrubland with grassy openings and leads kept open by stock. Dense forest and scrub occupy the gullies and across the upper slopes with shrubland / grassland on the open spurs leading down to Stony Beach Stream. Although grazed by cattle and sheep, many places are impenetrable with a dense understory of ferns and shrubs. Small wetland / seeps have pedestalled *Carex secta* but are very pugged by stock. The rock outcrop on the summit of View Hill has dense windshorn broadleaf (*Griselinia littoralis*), thin-barked totara, mountain flax (*Phormium cookianum*) and horopito (*Pseudowintera colorata*). Tiny patches of specialist indigenous plants have colonised the exposed rockland habitats on top of View Hill. Banks Peninsula hebe (*Hebe strictissima*) is common on the main ridge and around the summit rocks and dense New Zealand holly (*Olearia ilicifolia*) is dominant in the forest below the summit. A few wilding pines on the summit rock outcrop are the only woody weeds present (Jensen unpubl. data 2014).

## Extent of Site of Ecological Significance

The site includes the areas of indigenous forest, treeland, scrub and shrubland, the outcropping rock and scarps on the summit of View Hill and the *Carex secta* seepages above Stony Beach Stream.

## Assessment Summary

The View Hill Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1 and 2),



rarity/distinctiveness (criteria 3, 4 and 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 8).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

It contains good quality examples of several indigenous vegetation communities including old growth mountain totara forest, sup-alpine scrub, and shrubland as well as successional scrub, herbfields and grasslands associated with cliffs, scarps and rock outcrops on the ridgeline and summit of View Hill. Many parts of the site have a dense understory of ferns and shrubs (Jensen unpubl. data 2014).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

It is comprised of a mosaic of forest, treeland, scrub and shrubland over grassland. It is a moderately large example of montane vegetation of this type.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The forest and wetland ecosystems within the site are significant under this criterion.

The site contains old-growth mountain totara forest and regenerating secondary forest (Jensen unpubl. data 2014). The extent of any forest type other than kanuka (*Kunzea robusta*) scrub/forest has been substantially reduced in the ecological district and ecological region. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and/or kanuka) is estimated to be 10% of the ecological district (New Zealand Landcover Database (Version 4)) and the present extent of old growth forest is estimated to be approximately 800 ha or <1% of its original extent (Wilson 2009).

There are *Carex secta* dominated seepages in an area on the lower slopes above Stony Beach Stream (Jensen unpubl. data 2014). Wetland ecosystems



have been reduced to less than 20% of their former extent at the regional and freshwater biogeographic unit scales. Ausseil *et al.* (2008) estimate that wetlands have been reduced to 11 % of their original extent in the Canterbury Region and 7% in the Canterbury freshwater biogeographic unit.

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has three indigenous plant species that are nationally At Risk (one is also endemic to Banks Peninsula) and several that are uncommon within the ecological region or ecological district.

Nationally At Risk plant species (de Lange *et al.* 2013) recorded from the site (Jensen unpubl. data 2014) are:

- Climbing groundsel (*Brachyglottis sciadophila*) (At Risk – Declining, and rare in Canterbury (Wilson 1992))
- Bloodwood (*Coprosma wallii*) (At Risk – Declining)
- Banks Peninsula hebe (*Hebe strictissima*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula). This species is common on the main ridge and around the summit rocks (Jensen unpubl. data 2014).

Plant species recorded from the site (Jensen unpubl. data 2014) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Carex secta*
- myrrh (*Chaerophyllum ramosum*)
- willow herb (*Epilobium pedunculare*)
- *Scleranthus uniflorus*
- native fireweed (*Senecio wairauensis*)
- Comb fern (*Notogrammitis heterophylla*)
- Leatherleaf fern (*Pyrrosia eleagnifolia*)
- New Zealand holly (*Olearia ilicifolia*)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is not significant under this criterion. None of the indigenous vegetation communities or indigenous species recorded at the site are at their distribution limits.

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion. It contains two originally rare ecosystems.

There are igneous bluffs, scarps and rock outcrops along the ridgeline and summit of View Hill that were formed by the Akaroa Volcano. This igneous rock

formation is comprised of basic hawaiite and benmoreite lava flows and tuff-agglomerate of the Te Oka Formation (Sewell et al. 1992). At a national scale, basic cliffs, scarps and tors are an originally rare ecosystem (Williams et al. 2007). Where indigenous vegetation occurs on these features within the site they are significant under this criterion.

Seepages and flushes are also an originally rare ecosystem (Williams et al. 2007). The *Carex secta* seepages on the lower slopes of the site are significant under this criterion.

### Diversity and Pattern

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

It is a diverse mosaic of a number of primary and successional indigenous vegetation types including forest, treeland, scrub, shrubland, grassland, rockland and seepages (Jensen unpubl. data 2014). These have been modified to varying degrees by human activity and land-use and the existing vegetation pattern is primarily a result of human modification, rather than a reflection of the existence of diverse natural features or ecological gradients. However, the vegetation communities at higher altitude (thi-barked totara forest, scrub, and shrubland, herbfield and grassland communities) amongst the exposed rockland on the summit of View Hill are significant under this criterion. They represent a truncated altitudinal sequence from old growth montane podocarp forest on the south facing slopes of View Hill to the sup-alpine scrub, shrubland, herbfield and rockland communities at the summit.

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

It contains a relatively large area of indigenous dominated vegetation in close proximity to several other areas of indigenous forest and shrubland, many of which are connected via indigenous dominated shrublands. The site, therefore, is an important part of an ecological network for indigenous fauna in the head of Stony Beach Stream and West Peak area. Treeland, scrub and shrublands provide an important role in connecting and buffering the ecological values within the site.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. The area has a series of seepage wetlands that are dominated by *Carex secta* (Jensen unpubl. data 2014).



However, they do not provide wider benefits to areas and ecosystems beyond their immediate boundaries because they are small and modified.

- 10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess this site against this criterion.

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## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants. There are wilding pines on the rocky summit (Jensen unpubl. data 2014).</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing these trees to prevent further spread.</li> <li>Ongoing control and monitoring of any other biodiversity pest plants such as sycamore and banana passion fruit.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowners about impacts of wilding pines on biodiversity / ecosystems.</li> <li>Assistance where appropriate to remove wilding pines.</li> <li>Advice and guidance for landowners about impacts of other pest plants on biodiversity / ecosystems. Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>A farm track runs through the middle of the site.</li> </ul>	<ul style="list-style-type: none"> <li>The landowner will continue to be able to use and maintain this access way.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the landowners know that access tracks can continue to be used and maintained.</li> </ul>
<ul style="list-style-type: none"> <li>Stock, particularly cattle, in the areas of forest and <i>Carex secta</i> seepages.</li> </ul>	<ul style="list-style-type: none"> <li>The forest and seepage areas would benefit from the removal of stock, particularly cattle. Fencing could be considered but is likely to be challenging in the steeper parts of the site due to the topography and rocky nature of the ridge and summit of View Hill.</li> <li>Fencing to exclude stock would likely see development of dense grass swards in areas</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about the impacts of stock on biodiversity / ecosystems and the options for stock management which may be considered.</li> <li>Assistance where appropriate.</li> </ul>

	<p>of current pasture, which would inhibit natural regeneration. A staged approach could be considered with exclusion of cattle, but allowing sheep, until the indigenous vegetation cover is more dense.</p>	
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**Date:** 1 September 2014

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**Date:** 1 September 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List

Sourced from Jensen unpubl. data (2014).

N.B. exotic species were not recorded during this survey.

Scientific Name	Common Name
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum discolor</i>	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum procerum</i>	small kiokio
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Carex secta</i>	niggerhead, pukio
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Chaerophyllum ramosum</i>	myrrh
<i>Clematis foetida</i>	yellow clematis
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma rubra</i>	mikimiki
<i>Coprosma wallii</i>	bloodwood, mikimiki
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Cyathea smithii</i>	Smith's tree fern, katote
<i>Dichelachne crinita</i>	plume grass
<i>Epilobium pedunculare</i>	willow herb
<i>Epilobium pubens</i>	willow herb
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Geranium brevicaule</i>	short-flowered cranesbill
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Hebe salicifolia</i>	koromiko
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Helichrysum lanceolatum</i>	niniaio
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle moschata</i>	pennywort
<i>Hypolepis millefolium</i>	thousand-leaved fern



<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea robusta</i>	kanuka
<i>Leptopteris hymenophylloides</i>	crepe fern, heruheru
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Myrsine australis</i>	red mapou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Notogrammitis heterophylla</i>	comb fern
<i>Olearia ilicifolia</i>	NZ holly, hakeke
<i>Olearia paniculata</i>	akiraho
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Phormium cookianum</i>	mountain flax, wharariki
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Poa cita</i>	silver tussock, wi
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus cunninghamii</i>	mountain totara, thin-barked totara
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Pseudopanax colensoi</i>	mountain five-finger
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pteridium esculentum</i>	bracken, rarahū, rauaruhe
<i>Pyrrosia eleagnifolia</i>	leatherleaf fern
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Raoulia glabra</i>	mat daisy
<i>Raukawa anomalus</i>	
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rytidosperma gracile</i>	danthonia
<i>Schefflera digitata</i>	pate, seven-finger
<i>Scleranthus uniflorus</i>	
<i>Senecio wairauensis</i>	native fireweed
<i>Stellaria decipiens</i>	native chickweed
<i>Thelymitra longifolia</i>	white sun orchid
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Stony Bay Shearwater Colony

**Site number:** SES/A/17

**Physical address of site:** 1288 Stony Bay Road, Akaroa

#### Summary of Significance:

The site is significant because it provides important habitat for sooty shearwater (At Risk - Declining) and Central Canterbury spotted skink (Threatened - Nationally Vulnerable). It supports the only known breeding colony of sooty shearwater on the mainland in Canterbury and probably the second largest colony in Canterbury after Motunau Island. It has a predator-proof fence surrounding it and provides shearwaters and spotted skink with a refuge from predation.

#### Site Map



## **Additional Site Information**

**Ecological District:** Akaroa

**Area of SES (ha):** 0.37

**Central point (NZTM):** E1603521 N5143363

## **Site Description**

This site is located at the top of steep coastal sea cliffs south of Stony Bay, on the eastern side of Banks Peninsula between Short Reef Point and Redcliffe Point. A small colony of approximately 100 sooty shearwaters nests in burrows on the cliff edge (Banks Peninsula Conservation Trust (BPCT) website). This colony is the last known mainland colony of sooty shearwater (*Puffinus griseus*) in Canterbury (Wilson 2000).

The landowners designed and built a fence around the colony in 1998 when they noticed the decline in the sooty shearwater population. Without this intervention the colony would have ceased to exist (Spencer 2010). A stoat invaded the fenced-off area in 2004 and killed every chick. A second stoat attacked the colony in 2007. These losses prompted a major fundraising effort by the BPCT and in 2010, the Trust, DOC and the Council completed a professional predator proof fence (Pestproof Fences) around the colony. Shortly after completion the September 2010 Canterbury earthquake caused significant damage to the fence, with the front breaking off the cliff and slipping through the colony. Major repair work to the fence was completed in October 2014 (BPCT website, Spencer 2010).

## **Extent of Site of Ecological Significance**

The site includes the area inside the predator-proof fence.

## **Assessment Summary**

The Stony Bay Sooty Shearwater Colony Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 2), rarity/distinctiveness (criteria 3, 4 and 5), and ecological context criteria (criterion 10).



## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is not significant under this criterion. Currently, it is important as a breeding site for a single species of seabird (sooty shearwater). However, the project is being expanded beyond a single-species focus with the goal of restoring a more representative coastal ecosystem (Spencer 2010).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

It is the only, and therefore largest, example of a sooty shearwater colony on the mainland in Canterbury. It is also likely to be the largest breeding colony for sooty shearwater in the Akaroa Ecological District and the Banks Ecological Region<sup>1</sup>. The only breeding colony of sooty shearwater in Canterbury that is larger is on Motunau Island (Wilson 2008).

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

Petrels (including sooty shearwaters) once bred in large numbers on ridges and headlands in many parts of New Zealand's mainland (Worthy and Holdaway 2002), including Banks Peninsula. In Canterbury, they are now restricted to this site, Motunau Island in North Canterbury and possibly several small rock stacks and islets around the Banks Peninsula coastline (Wilson 2008).

- 4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports one nationally At Risk bird species and one nationally Threatened lizard species.

<sup>1</sup> The presence of sooty shearwaters on rock stacks and islets around Banks Peninsulas coastline has not been confirmed. Wilson (2008) reported a few large, sooty shearwater-sized burrows on two islets but concluded that even if shearwaters do breed on them the population must be small (up to 5 pairs at Island Nook and ≤10 pairs at Island Bay).



### Birds

The site provides important breeding habitat for one nationally At Risk bird species (Robertson et al. 2012):

- Sooty shearwater (*Puffinus griseus*) (At Risk – Declining) – this is the only known remaining mainland colony in Canterbury (Wilson 2008).

### Lizards

The site supports one Nationally Threatened lizard species (Hitchmough et al. 2013):

- Central Canterbury spotted skink (*Oligosoma aff. lineocellatum* "central Canterbury") (Threatened - Nationally Vulnerable) - there have been several sightings inside and around the predator-proof fence designed to protect sooty shearwaters (Anita Spencer, pers. comm. *in*: Lettink et al. 2008).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

This site, and possibly a small number of rock stacks and islets around the Banks Peninsula coastline (Wilson 2008), is the southern breeding distributional limit for sooty shearwater in Canterbury (Crossland 2014).

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

There is insufficient information available to assess the site against this criterion. Although sooty shearwaters are of restricted occurrence in Canterbury this is as a result of a substantial reduction in their population and extent following human arrival in New Zealand (i.e. criterion 3). The site contains seabird burrowed soils and has seabird guano deposits, both are ecosystems that are classified as originally rare ecosystems (although the authors note that their rarity at a national scale may be questionable) (Williams et al. 2007). It is unknown whether the physical environment (e.g. soil structure) and vegetation composition and structure at the site reflects the presence of seabirds (the biotic drivers) to a great enough extent to consider it an originally rare ecosystem.

### Diversity and Pattern

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is not significant under this criterion. It does not contain a high diversity of indigenous ecosystem or habitat types or indigenous taxa.





## Ecological Context

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is not significant under this criterion. It does not provide or contribute to an important ecological linkage or network, or provide an important buffering function.

- 9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site.

- 10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

It is very important because it provides breeding habitat for the last known colony of sooty shearwater on the mainland in Canterbury (Wilson 2000, 2008, Spencer 2010)<sup>2</sup>. It has a predator-proof fence surrounding it and provides breeding sooty shearwaters with a refuge from predation. The predator-proof fence has resulted in a significant increase in the population at the site. The population has grown from just one breeding pair in 1998 (Spencer 2010) to approximately 100 birds in 2014 (BPCT website). Thirty-two chicks fledged in 2013/2014 (BPCT website).

There have been several sightings of Central Canterbury spotted skinks (Threatened - Nationally Vulnerable) inside and around the predator-proof fence designed to protect sooty shearwaters (Anita Spencer, pers. comm. In: Lettink et al. 2008). Spotted skinks are very rare on the Canterbury mainland and have only been recorded from a small number of locations west of Christchurch and on south-eastern Banks Peninsula and Kaitorete Spit (Lettink et al. 2008).

<sup>2</sup> A pair of sooty shearwater have recently been discovered breeding in nearby Flea Bay (BPCT website)

## Site Management

### Existing Protection Status

The site is not legally protected, but it is located on unformed legal road.

Threats and risks	Management recommendations	Support package options N/A
<ul style="list-style-type: none"> <li>Predation by pest animals</li> </ul>	<ul style="list-style-type: none"> <li>Continue regular monitoring of the predator-proof fence with maintenance as required to ensure it remains predator-proof.</li> <li>Ensure there is ongoing long-term financial support for the project.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Decline in the sooty shearwater population.</li> </ul>	<ul style="list-style-type: none"> <li>Continue monitoring sooty shearwater nesting success and population trends at the site.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Overcrowding within the existing fenced area</li> </ul>	<ul style="list-style-type: none"> <li>It maybe necessary to extend the predator-proof fence in the future to provide additional secure breeding habitat for sooty shearwaters, and potentially other seabird species (see below)</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Continue to expand the project beyond a single-species (sooty shearwater) focus to include restoration of a coastal ecosystem that will support other rare species including lizards and indigenous plants (Spencer 2010).</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Consider whether the site could potentially be</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>

	<p>managed to support breeding populations of other seabird species. For example, installing nest boxes suitable for fairy prions (<i>Pachyptila turtur</i>) and broadcasting calls to attract them to breed within the fenced refuge. This would re-establish fairy prions as a breeding species on the Banks Peninsula mainland and reduce crowding on the islets of the coastline (Wilson 2008).</p>	
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**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Goughs Bay

**Site number:** SES/A/18

#### **Summary of Significance:**

The site is significant because it supports a representative and diverse assemblage of coastal wetland bird species and is one of a small number of bays on Banks Peninsula that are the northern national breeding limit for yellow-eyed penguins. It is part of a network of coastal wetland habitats around Banks Peninsula's coastline that are important 'stepping stones' for indigenous coastal and wetland birds, it provides key feeding, breeding and resting habitat for a wide range of coastal and water bird species and is high quality spawning habitat for inanga.

#### **Site Map**





## **Additional Site Information**

**Ecological District:** Akaroa

**Area of SES (ha):** 20.29

**Central point (NZTM):** E1607361, N5149466

## **Site Description**

This site is located on the coast at the mouth of Goughs Bay and is at or near sea level. It has a broad sandy beach with active dunes dominated by marram (*Ammophila arenaria*). A brackish wetland formed by tidal saltwater intrusion into Goughs Stream provides habitat for a range of coastal and wetland bird species and is an inanga (*Galaxias maculatus*) spawning site.

## **Extent of Site of Ecological Significance**

The site includes the Goughs Bay beach, the coastal scrub on the small headland on the northern side of the bay where yellow-eyed penguins (*Megadyptes antipodes*) are known to nest, the lower reaches of Goughs Bay stream, extending far upstream to incorporate a known inanga spawning site, and associated wetlands and wet pasture that provide feeding and breeding habitat for wetland birds.

## **Assessment Summary**

The Goughs Bay Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1), rarity/distinctiveness (criteria 4, and 5), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## **Assessment against Significance Criteria**

### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.



It supports a representative assemblage of coastal wetland bird species (Crossland unpubl. data 2015). A high proportion of the species in the “Banks Peninsula estuaries/coastal wetlands bird species assemblage” (Crossland unpubl. data 2014) occur at the site (Appendix 1). A full list of the species recorded by Council staff at the site (Crossland unpubl. data 2015) is provided in Appendix 2.

**2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site has not been assessed against this criterion.

**Rarity/Distinctiveness**

**3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion. The site is entirely on Acutely and Chronically Threatened land environments (F3.1a and J2.1d) where 9.9% and 10.4% indigenous vegetation, respectively, is left on these land environments nationally (Walker et al. 2007).

The site has a brackish wetland formed by tidal saltwater intrusion into Goughs Stream. Wetland ecosystems have been reduced to less than 20% of their former extent at the ecological district, regional and freshwater biogeographic unit scales. Ausseil et al. (2008) estimate that wetlands have been reduced to 10.6% of their original extent in the Canterbury Region and 7.0% in the Canterbury freshwater biogeographic unit.

A high proportion of the original indigenous vegetation communities that once occurred on dune systems in the ecological district have been displaced by introduced marram. However, there is insufficient information available to confirm that these communities have been reduced to less than 20% of their former extent in the ecological district or the Canterbury Region. Hilton et al. (2000) estimate the proportion of active dunelands in the Canterbury Region was been reduced by 64.5% between the 1950s and 1990s, but there is no information on the percentage reduction from its original extent.

**4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.***

The site is significant under this criterion.

It supports a number of nationally Threatened bird species and one At Risk freshwater fish species.

**Birds**





Bird species (Crossland unpubl. data 2015) that are nationally Threatened (Robertson et al. 2012) are:

- Caspian tern (*Sterna caspia*) (Threatened - Nationally Vulnerable, uncommon in the ED)
- Pied cormorant (*Phalacrocorax varius varius*) (Threatened - Nationally Vulnerable)
- Red-billed gull (*Larus novaehollandiae scopulinus*) (Threatened - Nationally Vulnerable, uncommon in the ED)
- Yellow-eyed penguin (*Megadyptes antipodes*) (Threatened - Nationally Vulnerable, Threatened in the ED) – breed in coastal scrub at the northern end of the site
- White-flipped penguin (*Eudyptula minor albosignata*) (Threatened - Nationally Vulnerable, at risk in the ED) - breeds in the sand dunes at the site

It also supports a number of nationally At Risk (Robertson et al. 2012) bird species (Crossland unpubl. data 2015)<sup>1</sup>:

- Pied stilt (*Himantopus himantopus leucocephalus*) (At Risk – Declining, uncommon in the ED)
- Black cormorant (*Phalacrocorax carbo novaehollandiae*) (At Risk - Naturally Uncommon, uncommon in the ED)
- Variable oystercatcher (*Haematopus unicolor*) (At Risk – Recovering)
- White-fronted tern (*Sterna striata*) (At Risk – Declining, At Risk in the ED)

#### Fish

The lower reaches of Goughs Stream provide spawning habitat for inanga (*Galaxias maculatus*) (At Risk - Declining).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

Two bird species are at their distributional limits at the site (Crossland unpubl. data 2015):

- Yellow-eyed penguin - Goughs Bay is one of a small number of bays on Banks Peninsula where yellow-eyed penguins breed (Beggs 2012). Banks Peninsula is the northern national breeding limit for this species.
- White-flipped penguin (Banks Peninsula is the southern national breeding limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is not significant under this criterion.

<sup>1</sup> Although for mobile fauna such as birds, species classified as nationally At Risk do not meet the threshold for significance (Wildland Consultants 2013).



## Diversity and Pattern

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

It supports a diverse range of coastal and wetland bird species. Twenty-one indigenous coastal and wetland bird species have been recorded from the site by Council Staff between February 2007 and January 2015 (Crossland unpubl. data 2015).

## Ecological Context

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is significant under this criterion.

It is part of a network of coastal wetland habitats around Banks Peninsula's coastline that are important 'stepping stones' for indigenous bird species including wetland species.

- 9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

There is insufficient information available to assess the site against this criterion.

- 10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

It provides key feeding, breeding and resting habitat for small numbers of a wide range of coastal and wetland bird species including nationally Threatened and At Risk species and species that are threatened and uncommon in the ecological district.

Coastal scrub within the site also provides breeding habitat for yellow-eyed penguin (Threatened - Nationally Vulnerable, and threatened in the ED) (Beggs 2012) and the bay is one of only a small number on Banks Peninsula where the species (Threatened - Nationally Vulnerable) breeds (Beggs 2012). Yellow-eyed penguins have a very small breeding population on Banks Peninsula and the species is vulnerable to local extinction. The sand dunes provide breeding habitat for a recently discovered population of white-flipped penguin which have a conservation status of Threatened - Nationally Vulnerable. The wetlands also



provide breeding habitat for pied stilts and grey teal (*Anas gracilis*) and the stream is a nursery area for fur seal pups (Crossland 2015).

The riparian vegetation along the margins of lower Goughs Stream provides high quality spawning habitat for inanga. Inanga (At Risk - Declining) (Goodman et al. 2014) spawn in a 150 m reach approximately 650 m upstream of the beach (Golder Associates Ltd. 2012).

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## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Stock.</li> </ul>	<ul style="list-style-type: none"> <li>Landowners will be able to continue to graze the exotic wet pasture within the site.</li> <li>Consider fencing lower Goughs Stream and its associated ephemeral marshes to reduce disturbance to nesting birdlife, enhance the condition of the wetland habitat and riparian margins, improve water quality and protect inanga spawning habitat. Ensuring an appropriate buffer between the stream and grazed pasture would be beneficial.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about the benefits of reducing impacts of stock on ecosystems.</li> <li>Collaborate with other groups and agencies to assist with fencing, with landowner agreement.</li> </ul>
<ul style="list-style-type: none"> <li>Pest animals preying on yellow-eyed penguins and other indigenous fauna.</li> </ul>	<ul style="list-style-type: none"> <li>Pest animals have been controlled during the breeding and moulting seasons to reduce the threat of predation on species such as yellow-eyed penguins that breed in the bay. It is recommended that this control work continues and be expanded to include sand dune habitat for the benefit of nesting and moulting white-flipped penguins. This will also have benefits for other birds and indigenous fauna within the site.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about pest control. Assistance where appropriate.</li> </ul>

<ul style="list-style-type: none"> <li>• Low/lack of recruitment of yellow-eyed penguins.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider/continue monitoring the breeding success of this species at this site and other bays where this species has been known to nest.</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowner about monitoring of penguins.</li> <li>• Collaboration with other groups and agencies to assist landowner.</li> </ul>
<ul style="list-style-type: none"> <li>• Disturbance of nesting birds by humans and dogs</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage reduced levels of human disturbance and that dogs are under control or on a leash.</li> <li>• Consider fencing the stream margins and ephemeral marshes to benefit nesting birdlife and inanga</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowner about management of access, including signage, with assistance where possible.</li> </ul>

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**Assessment completed by:** Scott Hooson  
**Date:** 21 January 2015

**Statement completed by:** Scott Hooson  
**Date:** 21 January 2015

**Statement updated by:** XXX  
**Date:** XXX

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## Appendix 1: Indigenous Banks Peninsula Estuaries/Coastal Wetlands Bird Species Assemblage

Comparison of bird species recorded at Goughs Bay (Crossland unpubl. data 2015) with the “Banks Peninsula Estuaries/Coastal Wetlands Bird Species Assemblage” (Crossland 2014).

Species recorded at the study site are marked with a tick ✓.

	Common name	Scientific Name
	Arctic Skua	<i>Stercorarius parasiticus</i>
	Australasian Gannet	<i>Morus serrator</i>
✓	Australasian Harrier	<i>Circus approximans</i>
✓	Black Cormorant	<i>Phalacrocorax carbo novaehollandiae</i>
	Black Swan	<i>Cygnus atratus</i>
✓	Black-backed Gull	<i>Larus dominicanus dominicanus</i>
	Black-billed Gull	<i>Larus bulleri</i>
	Black-fronted Tern	<i>Sterna albobriata</i>
✓	Caspian Tern	<i>Sterna caspia</i>
	Eastern Bar-tailed Godwit	<i>Limosa lapponica baueri</i>
✓ *	Grey Duck	<i>Anas superciliosa superciliosa</i>
✓	Grey Teal	<i>Anas gracilis</i>
	Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>
✓	Little Cormorant	<i>Phalacrocorax melanoleucos brevirostris</i>
	Marsh Crane	<i>Porzana pusilla affinis</i>
✓	New Zealand Kingfisher	<i>Halcyon sancta vagans</i>
	New Zealand Shoveler	<i>Anas rhynchotis</i>
✓	Paradise Shelduck	<i>Tadorna variegata</i>
✓	Pied Cormorant	<i>Phalacrocorax varius varius</i>
✓	Pied Stilt	<i>Himantopus himantopus leucocephalus</i>
	Pomarine Skua	<i>Stercorarius pomarinus</i>
✓	Pukeko	<i>Porphyrio porphyrio melanotus</i>
✓	Red-billed Gull	<i>Larus novaehollandiae scopulinus</i>
	Reef Heron	<i>Egretta sacra sacra</i>
	South Island Pied Oystercatcher	<i>Haematopus ostralegus finschi</i>
✓	Spotted Shag	<i>Stictocorbo punctatus</i>
✓	Spur-winged Plover	<i>Vanellus miles</i>
✓	Variable Oystercatcher	<i>Haematopus unicolor</i>
✓	Welcome Swallow	<i>Hirundo tahitica neoxena</i>
✓	White-faced Heron	<i>Ardea novaehollandiae novaehollandiae</i>
✓	White-fronted Tern	<i>Sterna striata</i>
	New Zealand Pipit	<i>Anthus novaeseelandiae novaeseelandiae</i>

\* Mallard/grey duck hybrids have been recorded at the site (Crossland unpubl. data 2015).

## Appendix 2: Indigenous Bird Species List

Indigenous bird species recorded at Goughs Bay during Council monitoring, February 2007 to January 2015. Sourced from Crossland unpubl. data (2015).

Species	21/02/2007	16/12/2010	22/12/2010	8/12/2011	23/01/2012	29/10/2012	13/01/2014	22/10/2014	10/11/2014	8/12/2014	6/01/2015
Yellow-eyed penguin	?	?	?	3	2	?	?	1	1	1	2
Black cormorant	0	0		0	2	0	1	0	1	1	0
Pied cormorant	4	0		0	0	0	0	0	0	0	0
Little cormorant	0	0		1	2	0	2	0	0	0	0
Spotted shag	0	0		0	2	0	0	0	0	0	0
White-faced heron	0	2		2	2	3	1	0	2	2	0
Paradise shelduck	0	n.c.		2	10	14	6	10	7	15	10
Grey teal	0	0		5	8	6	4	8	2	6	0
Harrier	0	0		1	1	3	0	0	0	0	0
Mallard/grey hybrid	0	n.c.		15	3	4	3	14	10	19	6
Pukeko	0	n.c.		0	3	7	3	0	7	3	7
Variable oystercatcher	2	2	2	2	2	2	0	2	2	2	1
Pied stilt	0	0		11	8	6	5	6	15	6	0
Spur-winged plover	0	8	24	4	17	9	35	2	11	4	4
Caspian tern	0	0		0	1	0	0	0	0	0	4
White-fronted tern	52	n.c.		0	0	0	0	0	0	4	0
Black-backed gull	0	n.c.		2	78	0	21	17	21	27	21
Red-billed gull	4	n.c.		0	0	0	2	0	0	2	2
NZ kingfisher	0	0		0	0	0	0	0	1	0	0
Welcome swallow	0	n.c.		0	0	4	10	2	10	6	0

n.c = no count





## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Wainui/Carews Peak

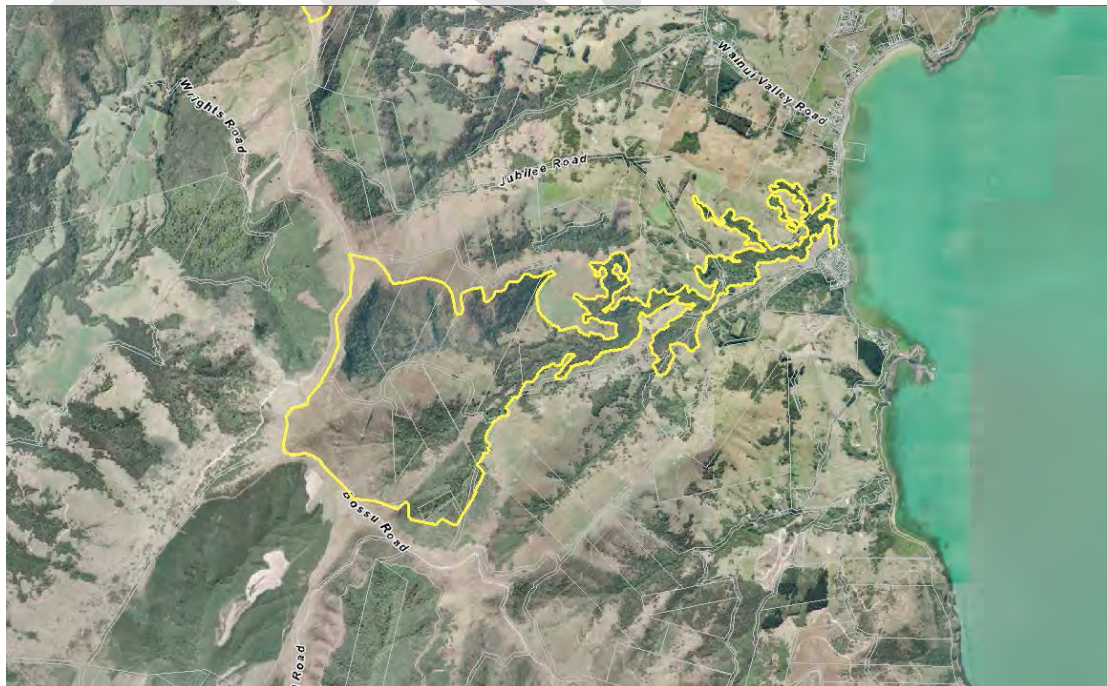
**Site number:** SES/A/20

**Physical address of site:** Bossu Road, Wainui

#### **Summary of Significance:**

The site is significant because it contains a range of representative, rare and distinctive indigenous vegetation communities including originally rare ecosystems. It supports a diverse range of vegetation communities and habitats and has a continuous altitudinal sequence from near sea level to almost 800m. It supports a nationally Threatened plant species, six nationally At Risk plant species, an outstanding number of plant species that are uncommon within the ecological region or ecological district, three nationally At Risk fish species, four nationally Threatened or At Risk aquatic invertebrates (most of which are endemic to Banks Peninsula) and seven species at their distributional limits on Banks Peninsula. The site is an important ecological linkage from the coast at Akaroa Harbour over the summit of Carews Peak into the upper Peraki Valley catchment. It also provides important habitat for indigenous forest birds, fish and aquatic invertebrates.

#### **Site Map**



## **Additional Site Information**

**Ecological District:** Akaroa

**Area of SES (ha):** 195.16

**Central point (NZTM):** E1590059, N5147114

## **Site Description**

The site is located on the southern side of Akaroa Harbour above Wainui Township. It includes the area around the summit of Carews Peak, the headwaters of the Carews Stream catchment and the steep gullies extending down to sea level at Akaroa Harbour at Wainui. The valley faces in a generally north-east direction and its altitudinal range is from sea level to 794 m at the summit of Carews Peak. The site was identified by the Department of Conservation as a Recommended Area for Protection (Akaroa RAP 11 – Carews Peak) (Wilson 1992). It is understood that the upper half of the site has been purchased by the Nature Heritage Fund and will be administered by the Department of Conservation.

The main vegetation communities within the site (Wilson 1992, Shanks and turney 2013, Wildland Consultants unpubl. data 2012) are:

- Matai - lowland totara - kahikatea/mixed hardwood forest on lowland hill slopes
- Thin-bark totara/mixed hardwood forest on montane hill slopes
- Mixed broadleaved second-growth hardwood forest on lowland and montane hill slopes
- Kanuka-dominant second-growth hardwood forest on lowland hill slopes
- Broadleaved hardwood treeland on lowland hill slopes
- Short tussockland on lowland and montane hill slopes
- Fernland on lowland and montane hill slopes
- Snow tussock tussockland on montane hill slopes
- Small leaved indigenous shrublands on lowland and montane hill slopes
- Freshwater lowland and montane marsh, swamp, flush and emergent aquatic vegetation
- Scattered plants on montane rock

## **Extent of Site of Ecological Significance**

The upper (western) boundary of the site is Bossu Road. The site includes Carews Peak and its surrounding tussocklands, grasslands, rock bluff communities and shrublands. It includes the indigenous montane and lowland forest and shrublands on the hill slopes and in the gullies in the upper catchment and the wetland communities in the small basin between 240 and 280 m above sea level. A large area of exotic grassland on a prominent north-facing slope in the middle of the upper catchment is excluded from the site. The site includes the matai - lowland totara - kahikatea/mixed hardwood forest and mixed broadleaved second-growth hardwood forest in the gullies in the lower part of the site. Large exotic trees on the margins of

the forested gullies and curtilage areas associated with residential dwellings in the lower part of the site are excluded.

## Assessment Summary

The Wainui/Carews Peak Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below). Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site contains a range of indigenous vegetation communities that are representative of those that would have occurred in the ecological district at a baseline of 1840. These include small areas of old-growth podocarp forest (montane thin-barked totara (*Podocarpus cunninghamii*) forest and remnant lowland matai (*Prumnopitys taxifolia*) - lowland totara (*Podocarpus totara*) – kahikatea (*Dacrycarpus dacrydioides*)/mixed hardwood forest), rock bluff communities, snow tussock (*Chionachloa rigida*) grasslands, wetlands and streams. Indigenous vegetation communities that have been protected from stock, either in the Scenic Reserves or areas protected by the steep terrain are particularly intact. Generally natural ecological processes are functioning well and indigenous vegetation communities are regenerating and expanding, particularly in the upper part of the site (Shanks and Turney 2013).

The snow tussock tussocklands that occur on the upper slopes of Carews Peak are representative of the sub-alpine vegetation that occupied exposed, higher altitude sites in the ecological district. It also contains small areas of montane herbfield (Shanks and Turney 2013).

Igneous bluffs and scarps on the upper slopes of the site support highly specialised montane and sub-alpine rock bluff communities that have a number of nationally Threatened and At Risk uncommon and endemic plant species. These communities are representative of the communities that would have occurred on these sites at a baseline of 1840.

Secondary hardwood forest and shrubland (mixed broadleaved hardwood forest, kanuka (*Kunzea robusta*) forest and small-leaved indigenous shrublands) are the dominant cover within the site. Although secondary, and modified by past (and in the lower part of the site current grazing (Wildland Consultants 2012) their composition is diverse and there are few exotic species. These communities are



representative of the range of serial vegetation communities that would have present in the ecological district.

The peat wetland within the site is one of the best examples of a palustrine and riverine marsh in the ecological region (Shanks and Turney 2013) and the only example of a peat wetland (Wilson 1992). Although the structure and composition of the vegetation has been modified by stock grazing and trampling, the vegetation cover is predominantly indigenous (wi (*Juncus edgarie*) rushland and bog rush (*Schoenus pauciflorus*)) (Parker 2013, Grove and Parker 2013).

Carews Peak Stream supports a representative assemblage of aquatic invertebrates including a high proportion of sensitive mayfly, stonefly and caddisfly (EPT: Ephemeroptera, Plecoptera, Trichoptera) species, with an average of 53% of taxa being EPT and the abundance of EPT individuals an average of 42% (EOS unpubl. data 2014).

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

It is a large example of a diverse mosaic of indigenous dominated vegetation communities.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The indigenous forest in the lower half of the site is significant at the Level 4 land environment scale. The forest below Jubilee Road is on an Acutely Threatened land environment (F3.1a) where 9.9% indigenous vegetation is left on this land environment nationally (Walker et al. 2007.) The remainder of the forest in the lower half of the site, and a small area of tussockland between Bossu Road and Carews Peak are on Chronically Threatened land environments (F3.1b and F3.3b respectively) where 12.2 and 17.6% indigenous vegetation is left on these land environments nationally (Walker et al. 2007).

The old growth montane thin-barked totara forest, matai - lowland totara - kahikatea/mixed hardwood forest and regenerating secondary forest ecosystems are significant under this criterion because they have been reduced to less than 20% of their former extent in the ecological district. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). Following human arrival the extent of forest in the ecological district (and region) was greatly reduced. The present extent of all indigenous forest in the ED is estimated to be 10% (17.8% including manuka and kanuka) (New Zealand Landcover Database (Version 4)). The present extent of old growth forest is estimated to be approximately 800 ha or <1% of its original extent (Wilson 2009).



Wetlands within the site are also significant under this criterion. There is a complex of three small mesotrophic marsh and shallow water wetlands in a small basin at approximately 260 – 280 m above sea level. Wetland ecosystems have been reduced to less than 20% of their former extent at the regional and freshwater biogeographic unit scales. Ausseil *et al.* (2008) estimate that wetlands have been reduced to 10.6% of their original extent in the Canterbury Region and 7.0% in the Canterbury freshwater biogeographic unit.

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has one nationally Threatened plant species, six nationally At Risk plant species, an outstanding number of plant species that are uncommon within the ecological region or ecological district, three nationally At Risk fish species and four nationally Threatened or At Risk aquatic invertebrates (most of which are endemic to Banks Peninsula).

**Plants**

Nationally Threatened and At Risk plant species (de Lange *et al.* 2013) recorded from the site are:

- Banks Peninsula fork fern (*Tmesipteris horomaka*) (Threatened - Nationally Critical and endemic to Banks Peninsula) – on 7 host tree ferns (Shanks and Turney 2013)
- White mistletoe (*Tupeia antarctica*) (At Risk – Declining) - common on tree lucerne near Wainui Main Road. Likely to be one of the largest populations of this mistletoe on the Peninsula (Wildland Consultants unpubl. data 2012)
- Sand coprosma (*Coprosma acerosa*) (At Risk – Declining) (Wilson unpubl. data n.d.) (rare in the ecological region (Wilson 1992))
- Banks Peninsula sun hebe (*Heliohebe lavaudiana*) (At Risk - Declining, endemic to Banks Peninsula) (Shanks and Turney 2013)
- Climbing groundsel (*Brachyglottis scaidophila*) (At Risk – Declining) (Wilson unpubl. data n.d.) (rare in Canterbury (Wilson 1992))
- Grassland speargrass (*Aciphylla subflabellata*) (At Risk – Declining) (Shanks and Turney 2013)
- Banks Peninsula hebe (*Hebe strictissima*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula) (Shanks and Turney 2013)

A large number (over 45) of plant species have been recorded from within the site<sup>1</sup> that are 'uncommon to rare or very local' on Banks Peninsula (Wilson 2013). They are:

- Spleenwort (*Asplenium trichomanes*) (Shanks and Turney 2013)
- Water fern (*Azolla rubra*) (Wilson unpubl. data n.d.)
- Common maidenhair (*Adiantum cunninghamii*) – in the forested areas below Jubilee Road (Wildland Consultants unpubl. data 2012)
- Bidibidi (*Acaena caesiiglauca*) (Shanks and Turney 2013)

<sup>1</sup> The reference for the most recent record is provided, rather than the references for all records.



- Golden Spaniard (*Aciphylla aurea*) (and *Aciphylla aurea x subflabellata*) (Shanks and Turney 2013)
- Colenso's hard fern (*Blechnum colensoi*) (Shanks and Turney 2013)
- Kiokio (*Blechnum novae-zelandiae*) (Shanks and Turney 2013)
- Triangular hard fern (*Blechnum vulcanicum*) (Shanks and Turney 2013)
- *Carex secta* – in the forested areas below Jubilee Road (Wildland Consultants unpubl. data 2012)
- Swamp sedge (*Carex virgata*) (Shanks and Turney 2013)
- *Carex sinclairii* (Shanks and Turney 2013)
- Slender mountain daisy (*Celmisia gracilentia*) (Wilson unpubl. data n.d.)
- *Colobanthus strictus* (Shanks and Turney 2013)
- Mountain cabbage tree (*Cordyline indivisa*) (Kelly 1972)
- Tutu (*Coriaria sarmentosa*) (Wilson unpubl. data n.d.)
- Willow herb (*Epilobium brunnescens*) (Shanks and Turney 2013)
- Mountain aniseed (*Gingidia montana*) (Wilson unpubl. data n.d.)
- Filmy fern (*Hymenophyllum demissum*) (Shanks and Turney 2013)
- Filmy fern (*Hymenophyllum flabellatum*) (Shanks and Turney 2013)
- Filmy fern (*Hymenophyllum sanguinolentum*) 'Canterbury' (Kelly 1972)
- Filmy fern (*Hymenophyllum minimum*) (Shanks and Turney 2013)
- Filmy fern (*Hymenophyllum multifidum*) (Shanks and Turney 2013)
- Pennywort (*Hydrocotyle novae-zeelandiae*) (Shanks and Turney 2013)
- Flat-leaved rush (*Juncus planifolius*) (Shanks and Turney 2013)
- Dwarf rush (*Juncus novae-zelandiae*) (Shanks and Turney 2013)
- *Kelleria dieffenbachii* (Shanks and Turney 2013)
- Pratia (*Lobelia angulata*) (Shanks and Turney 2013)
- Alpine clubmoss (*Lycopodium fastigiatum*) (Kelly 1972)
- Porcupine shrub (*Melicytus* sp. aff *alpinus*<sup>2</sup>)
- Bush rice grass (*Microlaena avenacea*) (Kelly 1972)
- Common water milfoil (*Myriophyllum propinquum*) (Wilson unpubl. data n.d.)
- Nertera (*Nertera depressa*) (Shanks and Turney 2013)
- Comb fern (*Notogrammitis heterophylla*) (Shanks and Turney 2013)
- Shrub daisy (*Olearia bullata*) (Wilson unpubl. data n.d.)
- Mountain foxglove (*Ourisia macrophylla* subsp. *lactea*) (Shanks and Turney 2013)
- Ring fern (*Paesia scaberula*) (Shanks and Turney 2013)
- Dwarf mountain heath (*Pentachondra pumila*) (Wilson unpubl. data n.d.)
- Blue tussock (*Poa colensoi*) (Wilson unpubl. data n.d.)
- Shield fern (*Polystichum neozelandicum* subsp. *zerophyllum*) (Shanks and Turney 2013)
- Trembling brake (*Pteris tremula*) – in the forested areas below Jubilee Road (Wildland Consultants unpubl. data 2012)
- Green-hooded orchid (*Pterostylis banksii*) (Wilson unpubl. data n.d.)
- Swamp buttercup (*Ranunculus macropus*) (At Risk - Data Deficient (de Lange et al. 2013)) (Shanks and Turney 2013, Grove and Parker 2013)
- *Schizeilema trifoliolatum* (Wilson unpubl. data n.d.)
- *Scleranthus brockiei* (Wilson unpubl. data n.d.)
- *Scleranthus uniflorus* (Wilson unpubl. data n.d.)
- Sphagnum (*Sphagnum cristatum*<sup>3</sup>) - the only known locality on Banks Peninsula (Grove and Parker 2013, Shanks and Turney 2013)

<sup>2</sup> *Melicytus* "Banks Peninsula" in Shanks and Turney (2013).



- Fork fern (*Tmesipteris elongata*) (Wilson unpubl. data n.d.) (rare in Canterbury (Wilson 1992)).
- Forest violet (*Viola filicaulis*) (Kelly 1972)

### Fish

Three nationally At Risk-Declining fish species (Goodman et al. 2014) have been recorded from the lower and mid reaches of Carews Peak Stream (EOS unpubl. data 2014):

- Longfin eel (*Anguilla dieffenbachia*)
- Kaoro (*Galaxias brevipinnis*)
- Blue gilled bully (*Gobiomorphus hubbsi*)

### Aquatic invertebrates

Nationally Threatened and/or endemic aquatic invertebrates (Grainger et al. 2014), most of which are endemic to Banks Peninsula, that have been recorded from the lower and mid reaches of Carews Peak Stream (EOS unpubl. data 2014) are:

- *Nesameletus vulcanus* (mayfly) (Threatened - Nationally Vulnerable, endemic to Banks Peninsula)
- *Costachorema peninsulae* (caddisfly) (Threatened - Nationally Vulnerable, endemic to Banks Peninsula)
- *Hydrobiosis styx* (caddisfly) (Threatened - Nationally Vulnerable)
- *Neocurupira chiltoni* (net-winged midge) (endemic to Banks Peninsula)

### 5. **The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are five species at their southern national distributional limits on Banks Peninsula, one species at its southern regional limit on Banks Peninsula and one species at its northern national limit on Banks Peninsula:

- Titoki (*Alectryon excelsus*) (southern regional limit) (Wildland Consultants unpubl. data 2012)
- Shining spleenwort (*Asplenium oblongifolium*) (southern national limit) (Wildland Consultants unpubl. data 2012)
- Narrow-leaved snow tussock (*Chionochoa rigida*) (northern national limit) (Shanks and Turney 2013)
- Kawakawa (*Piper excelsum*) (southern national limit) (Wildland Consultants unpubl. data 2012)
- Native passion vine (*Passiflora tetrandra*) (southern national limit) (Wildland Consultants unpubl. data 2012)
- Trembling brake (*Pteris tremula*) (southern national limit) (Wildland Consultants unpubl. data 2012)
- Turpentine scrub (*Dracophyllum acerosum*) (southern national limit) (Wildland Consultants unpubl. data 2012)

<sup>3</sup> Referred to as *Sphagnum falcatulum* by Wilson unpubl. data (no date) and Shanks and Turney (2013).



- 6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

It contains several vegetation communities that are either distinctive, of restricted occurrence, or occur within an originally rare ecosystem.

The steep upper slopes of the site, particularly the bluffs support tall snow tussock grassland. Snow tussock grassland is of restricted occurrence on Banks Peninsula and only occurs on the tops of the highest peaks. It is also at its northern national distributional limit on Banks Peninsula.

There are igneous bluffs and scarps on the upper slopes of the site, particularly on the steep eastern side of Carews Peak above Carews Peak Scenic Reserve. At a national scale, basic cliffs, scarps and tors are an originally rare ecosystem (Williams et al. 2007). Where indigenous vegetation occurs on these features within the site they are significant under this criterion.

The site also contains a very distinctive peat wetland that is the only example of its type in the Banks Ecological Region (Wilson 1992). It is of scientific interest (Shanks and Turney 2013) and contains an unusual assemblage of wetland plants including a number of uncommon species such as *Sphagnum* (not known to occur elsewhere on Banks Peninsula), swamp buttercup, and water fern. Palustrine wetlands are also of restricted occurrence in the Akaroa ED (Grove and Parker 2013).

### Diversity and Pattern

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

It is of particular importance because it has a continuous altitudinal sequence from near sea level to the summit of Carews Peak at 794 m above sea level. It incorporates coastal, lowland, montane and sub-alpine ecosystems. The diversity and pattern of the vegetation communities and plant taxa across the site reflects this gradient. For example lowland matai - lowland totara - kahikatea/mixed hardwood forest contains warm temperate species such as ngaio (*Myoporum laetum*), native passion vine, shining spleenwort, titoki and kawakawa (Wildland Consultants unpubl. data) while remnant old-growth montane thin-barked totara grows in Peraki Saddle Scenic Reserve and montane/sub-alpine communities such as snow tussock grassland surrounding Carews Peak contain narrow-leaved snow tussock, dwarf mountain heath, turpentine scrub, bush snowberry (*Gaultheria antipoda*), snowberry (*G. depressa*) and golden Spaniard (Shanks and Turney 2013, Wilson unpubl. data n.d.). The site also incorporates a high degree of topographical and climatic variation which adds to the diversity of the vegetation and habitats (Shanks and Turney 2013). A list of the plant taxa





recorded downstream of where Jubilee Road crosses Carews Peak Stream is provided in Appendix 1. A list of species recorded in the upper part of the catchment purchased by the Nature Heritage Fund (including the Scenic Reserves) is provided in Shanks and Turney (2013).

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The continuous altitudinal sequence from the coast at Akaroa Harbour to the summit of Carews Peak means the site is an important ecological linkage for the movement and dispersal of plant taxa and fauna. Within the site this sequence links forest, shrublands, snow tussock grasslands, wetland, stream and rock bluff communities. The site also provides an important linkage from Carews Peak over the saddle to the Peraki Saddle Scenic Reserve and into the extensive high value indigenous dominated vegetation communities in the upper Peraki Valley catchment.

Because of the size, relative intactness and diversity of indigenous vegetation communities and habitats the site is very important in maintaining ecological processes in the surrounding environment. The forests and shrublands are well buffered and are expanding and plant/pollinator/disperser relationships are operating and regeneration is occurring (Shanks and Turney 2013). The site also provides seasonal habitat and food sources for a range of indigenous bird species. For example extensive areas of tree fuchsia forest provide an important seasonal food source for tui and bellbirds and mature podocarp trees provide a seasonal food source for New Zealand pigeon (Shanks and Turney 2013).

Carews Peak Stream supports at least six species of migratory freshwater fish (longfin eel, shortfin eel (*Anguilla australis*), koaro, common bully (*Gobiomorphus cotidianus*), bluegill bully, and banded kokopu (*Galaxias fasciatus*)) (EOS unpubl. data 2014). The ecological linkage between the coast and the catchment is essential for these fish.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. Although they are of ecological importance, within the context of the wider landscape the relatively small, modified wetlands within the site are unlikely to play an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.



The size and relative intactness of the indigenous habitats within the site means it provides important permanent and seasonal habitat for indigenous forest birds. Shanks and Turney (2013) recorded New Zealand pigeon (*Hemiphaga novaeseelandiae novaeseelandiae*), bellbird (*Anthornis melanura melanura*), grey warbler (*Gerygone igata*), brown creeper (*Mohua novaeseelandiae*), South Island fantail (*Rhipidura fuliginosa fuliginosa*), South Island tomtit (*Petroica macrocephala macrocephala*) and silvereye (*Zosterops lateralis lateralis*) at the site in June and July 2013. Extensive areas of tree fuchsia forest provide an important seasonal food source for tui and bellbirds (Shanks and Turney 2013) and mature podocarp trees provide a seasonal food source for New Zealand pigeon.

Carews Peak Stream is listed as a key habitat for nationally threatened freshwater fish within the Canterbury Region including inanga, longfin eel, torrentfish (*Cheimarrichthys fosteri*), bluegill bully, redfin bully (*Gobiomorphus huttoni*), and koaro (Department of Conservation 2012).

The site also provides important habitat for indigenous aquatic invertebrates including several nationally Threatened and/or endemic aquatic invertebrates (EOS unpubl. data 2014). Maintaining continuous riparian cover within the catchment is important for the ongoing survival of indigenous aquatic invertebrates (Fraser 2006).

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## Site Management

### Existing Protection Status

It is understood that the upper half of the site has been purchased by the Nature Heritage Fund and will be administered by the Department of Conservation. The remaining lower part of the site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Domestic stock, particularly cattle. Damage to indigenous vegetation communities, wetlands and stream banks.</li> </ul>	<ul style="list-style-type: none"> <li>It is understood that the Department of Conservation has, or will, maintain existing fences to a stock proof standard and fence-off the upper half of the site purchased for conservation purposes (Shanks and Turney 2013).</li> <li>Consider fencing forested areas in the remaining unprotected parts of the site to promote understorey development.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about benefits to biodiversity of stock management options to protect understorey development.</li> <li>Assistance available where appropriate and with landowner's agreement.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants:</li> <li>Yellow passionfruit (<i>Passiflora pinnatistipula</i>) (many plants on edges at lower end of valley), sycamore (many trees at lower end of valley near houses), English ivy (<i>Hedera helix</i>) and German ivy (<i>Delairea odorata</i>), periwinkle (<i>Vinca major</i>) (near buildings and along drive at lower end of valley), hawthorn (<i>Crataegus monogyna</i>) (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling existing biodiversity weeds in the indigenous forest in the lower part of the site. Priorities for control are: sycamore, banana passionfruit, ivy, and periwinkle.</li> <li>Remove the single pine from the upper part of the catchment to prevent further spread.</li> <li>Consider controlling willows. Control of grey willows is the highest priority for management.</li> <li>Consider regular, ongoing surveillance for</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about pest plant monitoring and control.</li> <li>Assistance available where possible.</li> <li>Advice and guidance as required for landowner about protection and enhancement of biodiversity.</li> </ul>

<ul style="list-style-type: none"> <li>• Crack willow (<i>Salix fragilis</i>) and grey willow (<i>S. cinerea</i>) are present in the wetland (Parker unpubl. data 2013, Shanks and Turney 2013).</li> <li>• There are few weeds in the upper part of the catchment (Shanks and Turney 2013).</li> <li>• There is a single pine in forest below the western boundary in the upper part of the catchment (Shanks and Turney 2013).</li> <li>• Gorse (<i>Ulex europaeus</i>) is present in the upper part of the catchment including in grassland and tussockland communities around Carews Peak (Shanks and Turney 2013).</li> </ul>	<p>biodiversity pest plants throughout the site.</p> <ul style="list-style-type: none"> <li>• Retain gorse as a nurse crop and buffer to forested areas but consider ongoing control on rock-outcrops and tussock grasslands (Shanks and Turney 2013).</li> </ul>	
<ul style="list-style-type: none"> <li>• Animal pests. Possums.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider monitoring possum densities throughout the site (in conjunction with the Department of Conservation) and undertake control as required.</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowner about monitoring and control of possums, in collaboration with DOC and ECan.</li> <li>• Assistance available where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>• Damage to white mistletoe (<i>Tupeia antarctica</i>) near the junction of Jubilee Road with Wainui Main Road by possums, stock and road maintenance activities (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>• Consider monitoring possum densities throughout the site (in conjunction with the Department of Conservation) and undertake control as required.</li> <li>• Consider fencing areas where domestic stock have access to this species.</li> <li>• Council to ensure that damage to indigenous roadside vegetation beyond the road envelope is minimised during Council roadside trimming/mowing and maintenance.</li> </ul>	
<ul style="list-style-type: none"> <li>• Decline or loss of Banks Peninsula fork fern (<i>Tmesipteris horomaka</i>) (Threatened -</li> </ul>	<ul style="list-style-type: none"> <li>• Department of Conservation are proposing to monitor of this population once every three</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

Nationally Critical) population.	years in conjunction with their monitoring of the species in other reserves (Shanks and Turney 2013).	
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**Date:** 10 March 2015

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**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Plant Species List for Forest Downstream of Jubilee Road

Sourced from Wildland Consultants unpubl. data (2012).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Adiantum cunninghamii</i>	maidenhair
<i>Alectryon excelsus</i>	titoki
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Asplenium oblongifolium</i>	shining spleenwort, huruhuruwhenua
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum minus</i>	swamp kiokio
<i>Blechnum penna-marina</i>	little hard fern
<i>Blechnum procerum</i>	small kiokio
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carex species</i>	
<i>Carex secta</i>	niggerhead, pukio
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Clematis paniculata</i>	puawananga
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coriaria arborea</i>	tree tutu
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dicksonia squarrosa</i>	wheki, rough tree fern
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Haloragis erecta</i>	toatoa
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum lanceolatum</i>	ninia
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Hypolepis ambigua</i>	pig fern
<i>Juncus edgariae</i>	leafless rush, wi





<i>Kunzea ericoides</i>	kanuka
<i>Lagenifera strangulata</i>	parani
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Macropiper excelsum</i>	kawakawa
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rata
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Pneumatopteris pennigera</i>	gully fern, pakau
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum neozelandicum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pteridium esculentum</i>	bracken
<i>Pteris tremula</i>	trembling brake
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Schefflera digitata</i>	pate, seven-finger
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai, weeping kowhai, small-leaved kowhai
<i>Streblus heterophyllus</i>	small-leaved milk tree, turepo
<i>Tupeia antarctica</i>	white mistletoe, pirita, tupia
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species</b>	
<i>Acer pseudoplatanus</i>	sycamore
<i>Chamaecytisus palmensis</i>	tree lucerne
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Coprosma repens</i>	taupata
<i>Crataegus monogyna</i>	hawthorn
<i>Cupressus macrocarpa</i>	macrocarpa, Monterey cypress
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Eucalyptus species</i>	eucalypt, gum tree
<i>Hedera helix</i>	ivy, english ivy
<i>Holcus lanatus</i>	Yorkshire fog
<i>Juglans regia</i>	walnut



<i>Mimulus guttatus</i>	monkey musk
<i>Passiflora pinnatistipula</i>	yellow passionfruit
<i>Pinus radiata</i>	radiata pine, Monterey pine
<i>Prunella vulgaris</i>	selfheal
<i>Ranunculus repens</i>	creeping buttercup
<i>Rosa rubiginosa</i>	sweet briar, briar rose
<i>Rubus fruticosus</i>	blackberry
<i>Rumex obtusifolius</i>	broad-leaved dock
<i>Salix fragilis</i>	crack willow
<i>Sambucus nigra</i>	elderberry
<i>Senecio mikanioides</i>	German ivy
<i>Vinca major</i>	periwinkle

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Grehan Valley

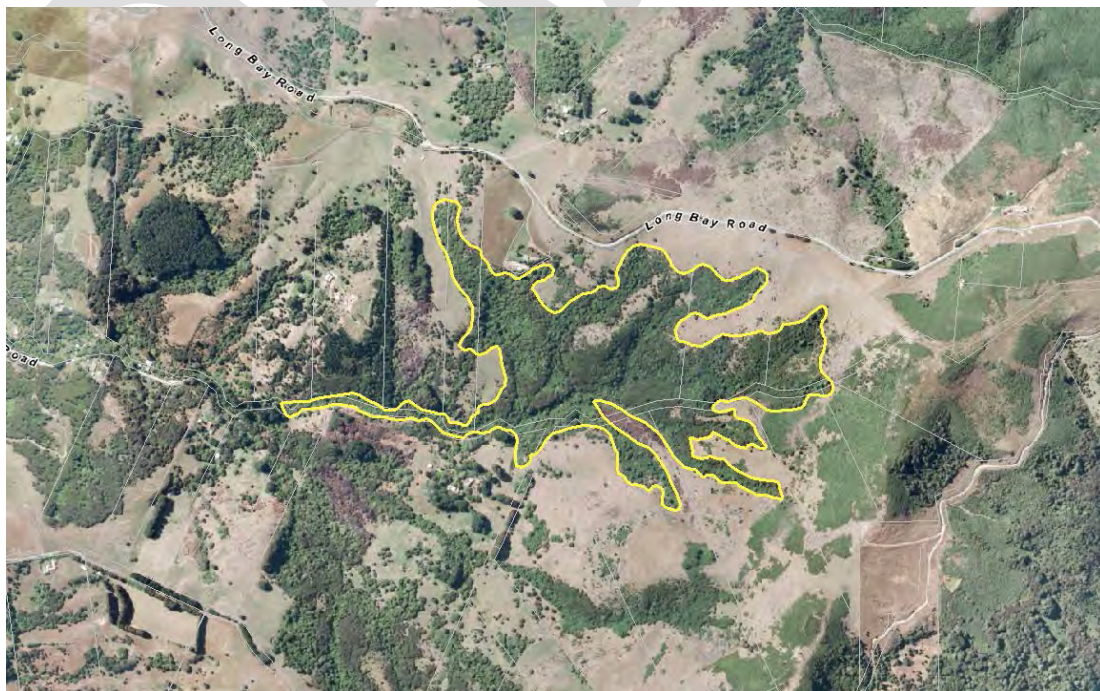
**Site number:** SES/A/21

**Physical address of site:** Grehan Valley, Long Bay Road, Akaroa

#### Summary of Significance:

The site is significant because it contains a large example of diverse, representative mixed broad-leaved second-growth hardwood forest with large remnant podocarp trees. It supports one nationally At Risk plant species, two that are uncommon within the ecological region or ecological district, one nationally At Risk fish species and six nationally Threatened or At Risk aquatic invertebrates, most of which are endemic to Banks Peninsula and two plant species at their distributional limits on Banks Peninsula. The site also provides a very important ecological linkage between indigenous vegetation and habitats on the west facing slopes of Akaroa Harbour with Hinewai Reserve. Riparian forest buffers the headwaters of Grehan Stream which has high aquatic ecology values.

#### Site Map



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 17.48

**Central point (NZTM):** E1600451, N5149879

## Site Description

The site is located at the head of Grehan Valley, above Akaroa and south of Long Bay Road. The forested site encompasses the two northern-most branches of Grehan Stream that flow from the moderately steep west facing gullies and hill slopes. The altitudinal range of the site extends from approximately 140 to 540 m above sea level. The site was identified by the Department of Conservation as a Recommended Area for Protection (Akaroa RAP 28 – Grehan) (Wilson 1992).

The main vegetation communities within the site (Wilson 1992, Wildland Consultants unpubl. data 2012) are:

- Mixed broad-leaved second-growth hardwood forest on lowland and montane hill slopes
- (Kahikatea-lowland totara-matai)/mixed hardwood forest on lowland hill slopes
- (Thin-barked totara)/mixed hardwood forest on montane hill slopes
- Kanuka second-growth forest on lowland hill slopes.

All four of the common Banks Peninsula podocarps occur at the site (kahikatea (*Dacrycarpus dacrydioides*), lowland totara (*Podocarpus totara*), thin-bark totara (*Podocarpus cunninghamii*) and matai (*Prumnopitys taxifolia*)), and large, remnant trees of all four species are present (some up to 150 cm dbh) (Wildland Consultants unpubl. data 2012). There is relatively high diversity of common indigenous hardwood tree species and ferns at the site and an abundance of tree ferns (*Cyathea dealbata*, *C. smithii*). Of particular note is the presence of an adult tree and seedlings and saplings of raukawa (*Raukawa edgerleyi*) growing on tree ferns. This tree species is known from only one other site on Banks Peninsula. Leathery shield fern (*Rumohra adiantiformis*), which is rare on Banks Peninsula (Wilson 1992) is also present (Wildland Consultants unpubl. data 2012).

## Extent of Site of Ecological Significance

The site includes the indigenous forest in gullies and hill slopes within the site and the riparian margins of Grehan Stream down stream to approximately 140 m above sea level.



## Assessment Summary

The Grehan Valley Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 8).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

The forest canopy is diverse, in good condition and representative of mixed second-growth hardwood forest in the Akaroa Ecological District. The main canopy species are tree fuchsia (*Fuchsia excorticata*), kanuka (*Kunzea robusta*), mahoe (*Melicytus ramiflorus*), five-finger (*Pseudopanax arboreus*) and narrow-leaved lacebark (*Hoheria angustifolia*). A few adults of all four of the common indigenous podocarp species are also present within the site. The site is grazed by stock (sheep), and the understorey in the more accessible areas has been affected with the result that there are fewer palatable species present. However, there is good regeneration of a diverse range of indigenous plant species in many areas, particularly alongside the main stream channels.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

It is a relatively large example of second-growth broad-leaved hardwood forest in the Akaroa Ecological District.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.



The lower half of the site is on a Chronically Threatened land environment (F3.1b) where <12.2% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

The forest within the site is also significant under this criterion because it has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and kanuka) in the ED is estimated to be 10% (17.8% including manuka and kanuka) (New Zealand Landcover Database (Version 4)).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has one nationally At Risk plant species, two that are uncommon within the ecological region or ecological district, one nationally At Risk fish species and six nationally Threatened or At Risk aquatic invertebrates, most of which are endemic to Banks Peninsula.

**Plants**

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Wildland Consultants unpubl. data 2012) are:

- Climbing groundsel (*Brachyglottis sciadophila*) (At Risk – Declining)

Plant species recorded from the site (Wildland Consultants unpubl. data 2012) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- Raukawa (*Raukawa edgerleyi*) (rare in the ecological region (Wilson 1992)) - known from only one other site on Banks Peninsula.
- Leathery shield fern (*Rumohra adiantiformis*) (rare in the ecological region (Wilson 1992))

**Fish**

One nationally At Risk fish species (Goodman et al. 2014) has been recorded from the mid and upper reaches of Grehan Stream<sup>1</sup> (EOS unpubl. data 2014):

- Longfin eel (*Anguilla dieffenbachii*)

**Freshwater invertebrates**

Nationally Threatened and At Risk aquatic invertebrates (Grainger et al. 2014), most of which are endemic to Banks Peninsula, that have been recorded from the middle and/or upper reaches of Grehan Stream (EOS unpubl. data 2014) are:

<sup>1</sup> Inanga (At Risk – Declining) are present in the lower reaches of Grehan Stream (EOS unpubl. data 2015)



- *Orchymontia banksiana* (beetle) (Threatened - Nationally Endangered, endemic to Banks Peninsula)
- *Nesameletus vulcanus* (mayfly) (Threatened - Nationally Vulnerable, endemic to Banks Peninsula)
- *Costachorema peninsulae* (caddisfly) (Threatened - Nationally Vulnerable, endemic to Banks Peninsula)
- *Hydrobiosis styx* (caddisfly) (Threatened - Nationally Vulnerable)
- *Zelandobius wardi* (Ward's stonefly) (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Neocurupira chiltoni* (net-winged midge) (endemic to Banks Peninsula)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There is one species at its southern national limit on Banks Peninsula and one species at its southern regional limit on Banks Peninsula (Wildland Consultants unpubl. data 2012):

- Pigeonwood (*Hedycarya arborea*) (southern regional limit)
- Kawakawa (*Piper excelsum*) (southern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is not significant under this criterion. It does not have indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

The site contains a continuously forested altitudinal sequence from approximately 140 to 540 m above sea level. Both lowland and montane plant species occur within the site reflecting this altitudinal range. The site also supports a relatively high diversity of indigenous hardwood tree species and ferns (Wilson 1992). Wilson (1992) and Wildland Consultants (unpubl. data 2012) recorded 72 and 75 vascular plant species respectively during brief botanical surveys of the site.

**Ecological Context**



**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The indigenous forest within the site extends into the head of Grehan Valley. It provides a very important ecological linkage between the indigenous vegetation and habitats within Grehan Valley and the west facing slopes of Akaroa Harbour with Hinewai Reserve which has extremely high ecological values.

The site also buffers the headwaters of Grehan Stream which has high aquatic ecology values including nationally Threatened, At Risk and endemic aquatic invertebrates and one nationally At Risk fish species.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site that meet this criterion.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess the site against this criterion.

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## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants: sycamore (<i>Acer pseudoplatanus</i>) (one tree at lower end of site), hawthorn (<i>Crataegus monogyna</i>), Himalayan honeysuckle (<i>Leycesteria formosa</i>) (both occasional) (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing sycamore urgently. This species is a high priority for control. Hawthorn and Himalayan honeysuckle are lower priorities for control.</li> <li>Consider ongoing surveillance for other biodiversity pest plants including old mans beard (<i>Clematis vitalba</i>), banana passionfruit (<i>Passiflora sp.</i>), Darwin's barberry (<i>Berberis darwinii</i>), Japanese honeysuckle (<i>Lonicera japonica</i>) and cotoneaster (<i>Cotoneaster sp.</i>) that are known to occur in the wider area.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about pest plant monitoring and control, with assistance where appropriate.</li> <li>Advice and guidance for landowner about monitoring of regeneration of indigenous forest.</li> </ul>
<ul style="list-style-type: none"> <li>Domestic stock. Sheep are grazed within the site and the understorey in the more accessible areas has been affected, with fewer palatable species present (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the site to keep stock out and promote recovery of the understorey.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the benefits of stock management for biodiversity.</li> <li>Collaboration with other agencies and groups for assistance as appropriate with fencing.</li> </ul>
<ul style="list-style-type: none"> <li>Herbicide use on forest margins. Kanuka gorse (<i>Ulex europaeus</i>) and Scotch broom (<i>Cytisus scoparius</i>) grow on the margins of the forest and herbicide applications have resulted</li> </ul>	<ul style="list-style-type: none"> <li>Consider leaving kanuka, gorse and broom on the forest margins as it provides a buffer to the forest and a nurse crop for the regeneration of indigenous forest.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about benefits of buffering the areas of forest.</li> </ul>

in some damage from spray drift (Wildland Consultants unpubl. data 2012).		
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**Assessment completed by:** Scott Hooson  
**Date:** 3 March 2015

**Statement completed by:** Scott Hooson  
**Date:** 3 March 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2012).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Aristotelia serrata</i>	wineberry, makomako
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum discolor</i>	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum penna-marina</i>	little hard fern
<i>Blechnum procerum</i>	small kiokio
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Clematis paniculata</i>	puawananga
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Cyathea dealbata</i>	silver tree fern, ponga
<i>Cyathea smithii</i>	Smith's tree fern, katote
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dicksonia squarrosa</i>	wheki, rough tree fern
<i>Epilobium species</i>	willow herb
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum lanceolatum</i>	niniao
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Hypolepis ambigua</i>	pig fern
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea ericoides</i>	kanuka
<i>Lagenifera strangulata</i>	parani
<i>Lophomyrtus obcordata</i>	NZ myrtle, rohutu
<i>Macropiper excelsum</i>	kawakawa
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha



<i>Metrosideros diffusa</i>	white climbing rata
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Pittosporum eugeniioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus cunninghamii</i>	thin-bark totara, Hall's totara
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax colensoi</i>	mountain five-finger
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pteridium esculentum</i>	bracken
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Raukawa edgerleyi</i>	raukawa
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rumohra adiantiformis</i>	leathery shield fern
<i>Schefflera digitata</i>	pate, seven-finger
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai, weeping kowhai
<i>Uncinia leptostachya</i>	hook grass, hook sedge
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species</b>	
<i>Acer pseudoplatanus</i>	sycamore
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Cirsium vulgare</i>	Scotch thistle
<i>Crataegus monogyna</i>	hawthorn
<i>Cytisus scoparius</i>	Scotch broom
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypericum androsaemum</i>	tutsan
<i>Leycesteria formosa</i>	himalayan honeysuckle
<i>Mycelis muralis</i>	wall lettuce
<i>Phytolacca octandra</i>	inkweed
<i>Ulex europaeus</i>	gorse
<i>Verbascum thapsus</i>	woolly mullein



## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Lighthouse Road Coastal Slopes

**Site number:** SES/A/22

**Physical address of site:** Lighthouse Road, Akaroa

#### **Summary of Significance:**

The site is significant because it contains a large example of representative coastal shrublands and scrub that supports at least six indigenous plant species that are nationally At Risk, of which four are also endemic to Banks Peninsula, at least four species that are also uncommon within the ecological district or region and at least two species that are at their national or regional distributional limits on Banks Peninsula. It has basic coastal cliffs and extensive basic cliffs and scarps which nationally are originally rare ecosystems. It is linked to, and buffers, the Dan Rogers Nature Reserve, and is also part of an ecological linkage along the coastal slopes on the eastern side of the Akaroa Heads.

#### **Site Map**



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 53.38

**Central point (NZTM):** E1597686, N5141542

## Site Description

This site is on the eastern side of the Akaroa Heads west of Light House Road and extends from Te Ruahine Point to the Dan Rogers Nature Reserve. It is on very steep coastal slopes and cliffs from sea level to approximately 340 m above sea level. The site is part of a much larger area that the Department of Conservation identified as a Recommended Area for Protection (Akaroa RAP 16 – Nikau) (Wilson 1992) because of its very high ecological values.

The site is a mosaic of small-leaved scrub and shrubland over exotic grassland with a high component of rockland. At the northern end bluffs and steep gullies drop from the broad plateau spur down to the sea. Very steep slopes with boulders and numerous rock outcrops and shallow gullies extend south along the face for approximately two kilometres. The steep slopes drop down to vertical sea cliffs (Jensen unpubl. data 2013).

The shrubs *Coprosma propinqua* and *Coprosma crassifolia* are the dominant species within the site but here are clusters of ngaio (*Myoporum laetum*) and mahoe (*Melicytus ramiflorus*) trees in the shallow gullies. At the northern end the slopes are steeper with more tree species in gullies. Below the bluffs the scrub and shrubland is denser than the drier more open shrubland on the southern half of the site. Towards the southern end of the site the slopes become less steep and the shrubland is more open with more dryland species such as matagouri (*Discaria toumatou*) and prostrate kowhai (*Sophora prostrata*). The scrub and shrubland supports several Banks Peninsula endemics including Banks Peninsula blue tussock (*Festuca actae*), Banks Peninsula hebe (*Hebe strictissima*), Banks Peninsula button daisy (*Leptinella minor*), and Akaroa harebell (*Wahlenbergia akaroa*). The site is grazed by sheep and there are some stock tracks in the more open shrubland in the southern half of the site. The indigenous vegetation communities are in good condition with few weeds and strong regeneration (Jensen unpubl. data 2013).

## Extent of Site of Ecological Significance

The site includes the sea cliffs and coastal scrub and shrublands on very steep coastal slopes on the western side of Lighthouse Road from Te Ruahine Point to the Dan Rogers Nature Reserve.

The Department of Conservation identified a large contiguous area north of this site (Hugh Wilson's sites 108, 110 and 112) as a Recommended Area for Protection (Akaroa RAP 16 – Nikau) (Wilson 1992). These areas are a logical extension to the site. Some of this land is legally protected (i.e. Dan Rogers Nature Reserve and Palm





Gully Scenic Reserve) while other areas are in private ownership. There is up-to-date information available on parts of these sites (particularly the areas that are already protected), but no up-to-date information on other areas. However, based on Wilson (1992) and his unpublished survey data for these sites they are clearly of exceptionally high ecological value. Assessment and identification of these areas (particularly those that are not legally protected) as Significant Ecological Sites is a very high priority.

## Assessment Summary

The Lighthouse Road Coastal Slopes Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Although the vegetation within the site is secondary, and grazed by sheep, it supports indigenous coastal scrub and shrubland that is relatively diverse, and regenerating strongly with few exotic weeds. It provides habitat for specialist coastal and rockland flora, including a number of species that are nationally At Risk and endemic to Banks Peninsula. It contains many of the indigenous plant species expected in serial coastal shrublands and scrub in the Akaroa Ecological District.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It is a large example of coastal scrub and shrublands on very steep droughty slopes.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***



There is insufficient information available to assess the site against this criterion.

The site is not significant at the level IV land environment scale. It is on an At Risk land environment (F3.2a) where 23.0% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

Although very few areas of intact coastal shrublands remain on Banks Peninsula (e.g. Head 2007 in: Lettink 2013) there is no quantitative information on which to assess the reduction in its extent.

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports at least six indigenous plant species that are nationally At Risk, of which four are also endemic to Banks Peninsula. There are at least four species that are also uncommon within the ecological district or region.

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Jensen unpubl. data 2013) are:

- *Coprosma virescens* (At Risk - Declining) - frequent throughout the site
- *Chenopodium allanii* (At Risk - Naturally Uncommon) - abundant under shrubs in places
- Banks Peninsula fescue (*Festuca actae*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula) - occasional near south facing rock
- Banks Peninsula hebe (*Hebe strictissima*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula) - occasional amongst bluffs at the northern end of the site
- Banks Peninsula button daisy (*Leptinella minor*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula) - occasional on clay banks near prostrate kowhai
- Akaroa harebell (*Wahlenbergia akaroa*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula) - occasional across the site

Additional nationally At Risk plant species (de Lange et al. 2013) that were recorded from the site by Wilson unpubl. data (n.d.) but not recorded by Jensen unpubl. data (2013) are:

- Grassland speargrass (*Aciphylla subflabellata*) (At Risk - Declining)
- shore pūhā (*Sonchus kirkii*) (At Risk - Declining)
- Akaroa daisy (*Celmisia mackaui*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- Yellow rock groundsel (*Senecio glaucophyllus subsp basinudus*) (At Risk - Naturally Uncommon)

Plant species recorded from the site (Jensen unpubl. data 2013) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- Common maidenhair (*Adiantum cunninghamii*)
- *Carex secta*



- Shining broadleaf (*Griselinia lucida*)
- Shield fern (*Polystichum neozelandicum subsp. zerophyllum*)

Additional plant species that are “uncommon to rare or very local” on Banks Peninsula that were recorded from the site by Wilson unpubl. data (n.d.) but not recorded by Jensen unpubl. data (2013) are:

- Shore spleenwort (*Asplenium obtusatum*)
- *Cardamine corymbosa*
- Shore stonecrop (*Crassula moschata*)
- Slender clubrush (*Isolepis cernua*)
- Shore lobelia (*Lobelia anceps*)
- Blue shore tussock (*Poa astonii*)
- Bristle grass (*Rytidosperma corinum*)
- Shore primrose (*Samolus repens*)
- Climbing shore spinach (*Tetragonia implexicoma*)
- Bog rush (*Schoenus pauciflorus?*)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are at least two species that are at their national or regional distributional limits on Banks Peninsula (Wilson 2013). These species are (Jensen unpubl. data 2013):

- Kawakawa (*Piper excelsum*) (southern national limit)
- Shining broadleaf (*Griselinia lucida*) (southern regional limit)

Two additional plant species at their national distributional limits on Banks Peninsula (Wilson 2013) recorded by Wilson unpubl. data (n.d.) but not recorded by Jensen unpubl. data (2013) are:

- Native passion vine (*Passiflora tetrandra*) (southern national limit)
- Blue shore tussock (*Poa astonii*) (northern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

There are basic igneous sea cliffs along the coastline, and extensive basic rock bluffs and scarps within the site that support specialised vegetation communities (Jensen unpubl. data 2013). At a national scale, basic coastal cliffs and basic cliffs, scarps and tors are originally rare ecosystems (Williams et al. 2007).

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has**



***changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

The site supports a mosaic of small-leaved scrub and shrubland over exotic grassland with minor areas of mixed hardwood scrub/forest as well as bluffs, scarps, rock outcrops and coastal cliffs. The vegetation pattern varies across the site in response to factors such as the substrate, topography (and related levels of exposure and moisture) and salt tolerance. The composition of the vegetation strongly reflects its proximity to the sea with salt and exposure tolerant species such as New Zealand celery (*Apium prostratum*), shore stonecrop, New Zealand iceplant (*Disphyma australe*), club rush (*Ficinia nodosa*), sea spurge (*Spergularia media*) and *Samolus repens* being more common, or only occurring nearest the sea (Wilson unpubl. data n.d.).

**Ecological Context**

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

It adjoins and buffers the Dan Rogers Nature Reserve, an area with very high ecology values. It is also part of an ecological linkage along the coastal slopes on the eastern side of the Akaroa Heads that includes the Dan Rogers Nature Reserve, Palm Gully Scenic Reserve and the Hamilton property (recently purchased by the Nature Heritage Fund).

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information available to assess the site against this criterion.

## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants. Scattered small gorse (<i>Ulex europaeus</i>) bushes occur across the slope but are controlled by the landowner. A small number of cotoneaster shrubs and occasional cape gooseberry (<i>Physalis peruviana</i>) plants are scattered through the shrubland. A small number of wilding pines probably originate from the shelter belts above (Jensen unpubl. data 2013). Taupata (<i>Coprosma repens</i>) has been planted at the Akaroa Head lighthouse and has the potential to establish within the site (D. Carter pers. comm. 2015).</li> </ul>	<ul style="list-style-type: none"> <li>Continue controlling gorse and any other biodiversity pest plants. Remove wilding pines as they establish and control cotoneaster. Consider ongoing surveillance for biodiversity pest plants and control as required.</li> </ul>	<ul style="list-style-type: none"> <li>Assistance to landowner with pest plant control as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Stock. The site is grazed by sheep (Jensen unpubl. data 2013). This is likely to be preventing or impeding natural vegetation regeneration, particularly by removal of more palatable species.</li> </ul>	<ul style="list-style-type: none"> <li>Consider implications of stock grazing in relation to management of indigenous vegetation communities. Removing stock from the site would allow more natural vegetation regeneration.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about possible impacts of stock grazing the site.</li> </ul>

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**Assessment completed by:** Scott Hooson  
**Date:** 28 January 2015

**Statement completed by:** Scott Hooson  
**Date:** 28 January 2015

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Plant Species List

Sourced from Jensen unpubl. data (2013).

N.B. exotic species were not recorded during this survey.

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Adiantum cunninghamii</i>	maidenhair
<i>Apium prostratum</i>	New Zealand celery
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Austroderia richardii</i>	toetoe
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum minus</i>	swamp kiokio
<i>Calystegia tuguriorum</i>	NZ bindweed, pōwhiwhi
<i>Carex breviculmis</i>	grassland sedge
<i>Carex secta</i>	niggerhead, pūkiō
<i>Carex solandri</i>	
<i>Carmichaelia australis</i>	native broom, common broom
<i>Chenopodium allanii</i>	
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Convolvulus waitaha</i>	grass convolvulus
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, tī kōuka
<i>Coriaria arborea</i>	tree tutu
<i>Corokia cotoneaster</i>	korokio
<i>Crassula sieberiana</i>	stonecrop
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	dichondra
<i>Discaria toumatou</i>	matagouri, wild irishman, tūmatakuru
<i>Echinopogon ovatus</i>	hedgehog grass
<i>Festuca actae</i>	Banks Peninsula blue tussock
<i>Ficinia nodosa</i>	club rush, wiwi
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Griselinia lucida</i>	shining broadleaf, puka
<i>Haloragis erecta</i>	toatoa
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum lanceolatum</i>	niniao
<i>Hypolepis ambigua</i>	pig fern
<i>Ileostylus micranthus</i>	green mistletoe
<i>Leptinella minor</i>	Banks Peninsula button daisy
<i>Lophomyrtus obcordata</i>	rōhutu, NZ myrtle
<i>Melicope simplex</i>	poataniwha
<i>Melicytus alpinus</i>	porcupine shrub



<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Muehlenbeckia complexa</i>	scrub pōhuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red māpou, red matipo
<i>Oxalis exilis</i>	yellow oxalis
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Phormium cookianum</i>	mountain flax, wharariki
<i>Phormium tenax</i>	flax, harakeke
<i>Piper excelsum</i>	kawakawa
<i>Pneumatopteris pennigera</i>	gully fern, pākau
<i>Poa cita</i>	silver tussock, wī
<i>Polystichum neozelandicum subsp. zerophyllum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, pūniu
<i>Rubus cissoides</i>	bush lawyer, tātarāmoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tātarāmoa
<i>Scandia geniculata</i>	climbing aniseed
<i>Sophora microphylla</i>	small-leaved kōwhai
<i>Sophora prostrata</i>	dwarf kōwhai, prostrate kōwhai
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Wahlenbergia akaroa</i>	Akaroa harebell

DRAFT



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Oashore

**Site number:** SES/A/23

**Physical address of site:** Bossu Road, Little River.

#### Summary of Significance:

The site is significant because it contains representative grassland, silver tussock grassland, rock-outcrop and forest communities. The secondary hardwood forest has been reduced to less than 20% of its former extent in the ecological district and parts of the site are on Acutely and Chronically threatened land environments. It supports a high diversity of indigenous taxa including nationally Threatened plant species, a number of other indigenous plant and invertebrate species that are either nationally At Risk, endemic to Banks Peninsula or uncommon within the ecological district or region and four species that are at their distributional limits on Banks Peninsula. The site also provides an important buffering function to Lake Forsyth/Waiwera and is part of an ecological network.

#### Site Map



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 96.38

**Central point (NZTM):** E1580846, N5148862

## Site Description

This site is on the south-eastern side of Lake Forsyth/Waiwera. It includes steep droughty north and north-west facing slopes, extensive rock bluffs and scarps with open shrubland and an area of forest in the gully east of Trig V. The altitudinal range of the site is from approximately sea level to 440 m above sea level. Fifty-three hectares of the western part of the site is protected by a Banks Peninsula Conservation Trust (BPCT) covenant. The Department of Conservation identified this site as a Recommended Area for Protection (Akaroa RAP 1 – Oruaka) (Wilson 1992).

The vegetation at the site is strongly influenced by its aspect (exposure to hot, dry winds) and proximity to the sea and lakeshore (Lake Forsyth/Wairewa). The main indigenous vegetation communities, as described by Jensen unpubl. data (2013), Wildland Consultants unpubl. data (2014a) and Wilson (1992) are:

- *Coprosma propinqua*-*C. crassifolia* shrubland on steep rocky bluffs and lowland hill slopes
- Mixed exotic and indigenous grassland on droughty lowland hill slopes
- Silver tussock grassland on droughty lowland hill slopes
- (Matai-lowland totara)/mixed secondary hardwood forest on lowland hill slopes

## Extent of Site of Ecological Significance

The site includes the mixed exotic and indigenous grassland on north-facing slopes within the BPCT covenant, the shrublands on steep rocky bluffs and lowland hill slopes below Trig V, the (matai-lowland totara)/mixed secondary hardwood forest on lowland hill slopes in the gully east of Trig V and the silver tussock grassland on the upper slopes at the head of this gully.

## Assessment Summary

The Oashore Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2),



rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

The vegetation communities within the site are representative of the natural diversity of the relevant ecological district.

The (matai-lowland totara)/mixed secondary hardwood forest is representative of the forest that would once have occurred across the site. This forest has some emergent lowland totara (*Podocarpus totara*) and matai (*Prumnopitys taxifolia*) and the canopy and understorey species are typical for this forest type. Regeneration is occurring, especially of *Coprosma* species despite stock access (Jensen unpubl. data 2013).

Grassland and shrubland communities at the site were induced by Maori burning centuries ago (Wilson 1992). With the exception of the exotic species that have established following European arrival, these communities are typical of those that are likely to have been present at a baseline of 1840.

The grassland on lowland droughty hill slopes consists of mixed native and exotic grasses with patchy native shrub cover. The most common native grass species are bristle grass (*Rytidosperma clavatum*), meadow rice grass (*Microlaena stipoides*), and silver tussock (*Poa cita*). This vegetation is a good example of these dry droughty grasslands in the context of the ecological district despite the presence of exotic grasses such as danthonia (*Rytidosperma racemosum*), ripgut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), and cocksfoot (*Dactylis glomerata*). Prostrate kowhai (*Sophora prostrata*) is the most common native shrub with this grassland, followed by *Coprosma crassifolia* and *C. propinqua*. The native vine scrub pōhuehue (*Muehlenbeckia complexa*) is abundant throughout the site, while leafless clematis (*Clematis afoliata*) is abundant in amongst shrubs (Wildland Consultants unpubl. data 2014a).

The *Coprosma propinqua*-*C. crassifolia* shrubland has a representative structure and composition. The main shrubland species is *Coprosma propinqua* but *C. crassifolia*, *C. virescens* and kanuka (*Kunzea robusta*) are common. The grassland within it has a high component of native grasses with scattered silver tussocks. The native *Rytidosperma clavatum* is common and meadow rice grass is common around rock outcrops and boulders. Although grazed by sheep, cattle and goats there is some regeneration of shrubby species with different age classes of kanuka and shrubs present (Jensen unpubl. data 2013).



Rock outcrops support typical dry rock species such as New Zealand linen flax (*Linum monogynum*), Banks Peninsula button daisy (*Leptinella minor*), stonecrop (*Crassula colligata* and *C. sieberiana*), New Zealand iceplant (*Disphyma australe*) and native ferns such as round-leaved fern (*Pellaea rotundifolia*), necklace fern (*Asplenium flabellifolium*), rock fern (*Cheilanthes sieberi*), woolly cloak fern (*C. distans*) and blanket fern (*Pleurosorus rutifolius*) (Jensen unpubl. data 2013, Wildland Consultants unpubl. data 2014a).

The area of secondary kanuka forest on the lower less steep slopes near Lake Forsyth/Wairewa is more modified and is not representative. The understorey is used as a stock camp and is bare with few species in the understorey (Jensen unpubl. data 2013).

The habitats within the BPCT covenant (grassland, shrubland and rock outcrops) that were surveyed also contain a representative assemblage of indigenous invertebrates. Of the 104 species recorded only four are exotic (Wildland Consultants unpubl. data 2014b).

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

It contains large examples of *Coprosma propinqua*-*C. crassifolia* shrubland on lowland hill slopes and mixed exotic and indigenous grassland on droughty lowland hill slopes.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

Parts of the site are significant under this criterion.

The higher altitude parts of the site (on the northern side of Bossu Road) are on Acutely and Chronically Threatened land environments (F3.1a (Acutely Threatened) and F3.1b and F3.3b (Chronically Threatened)). Parts of the lower slopes above Lake Forsyth/Wairewa are also on the Acutely Threatened land environment (F3.1a). There is <10% indigenous vegetation left on Acutely Threatened land environments nationally and <20% on Chronically Threatened land environments (Walker et al. 2007).

The (matai-lowland totara)/mixed secondary hardwood forest on the steep slopes in the gully east of Trig V is also significant under this criterion because it has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest in the ED (excluding manuka and kanuka) is estimated to be 10% (New Zealand Landcover Database (Version 4)).



**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports the only population of the nationally Threatened plant species shrubby tororaro (*Muehlenbeckia astonii*) in the Banks Ecological Region as well as a number of other indigenous plant and invertebrate species that are either nationally At Risk, endemic to Banks Peninsula or uncommon within the ecological district or region.

**Plants**

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Jensen unpubl. data 2013, Wildland Consultants unpubl. data 2014a) are:

- shrubby tororaro (*Muehlenbeckia astonii*) (Threatened - Nationally Endangered) approximately 15 plants towards the western end of the site
- *Coprosma virescens* (At Risk - Declining)
- *Chenopodium allanii* (At Risk - Naturally Uncommon)
- Banks Peninsula button daisy (*Leptinella minor*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- Blanket fern (*Pleurosorus rutifolius*) (At Risk - Naturally Uncommon)
- Fierce lancewood (*Pseudopanax ferox*) (At Risk - Naturally Uncommon)

Plant species recorded from the site (Jensen unpubl. data 2013, Wildland Consultants unpubl. data 2014a) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Carex secta*
- woolly cloak fern (*Cheilanthes distans*)
- climbing shore spinach (*Tetragonia implexicoma*)

**Invertebrates**

Invertebrates were surveyed within the Oashore BPCT covenant in March 2014 (Wildland Consultants unpubl. data 2014b).

Nationally At Risk invertebrate species recorded from the site during this survey (Wildland Consultants unpubl. data 2014b) are:

- praying mantis (*Orthodera novaezealandiae*) (At Risk - Declining)
- *Cosmiotes helonoma* (At Risk Relict)
- broom looper (*Samana acutata*) (At Risk Relict)
- *Bityla sericea* (Naturally Uncommon)

Invertebrates recorded from the site (Wildland Consultants unpubl. data 2014b) that are endemic to Banks Peninsula are:

- rock face moth (*Dichromodes cynica*)



Invertebrates recorded from the site (Wildland Consultants unpubl. data 2014b) that are uncommon in the Akaroa Ecological District are:

- rock cicada (*Amphipsalta strepitans*)
- *Nola parvitis*

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are four species that are at their southern national or regional distributional limits on Banks Peninsula (Wilson 2013). These species are (Jensen unpubl. data 2013, Wildland Consultants unpubl. data 2014a):

- Akeake (*Dodonaea viscosa*) (southern national limit)
- Pigeonwood (*Hedycarya arborea*) (southern regional limit)
- Kawakawa (*Piper excelsum*) (southern national limit)
- Woolly cloak fern (*Cheilanthes distans*) (southern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

There is indigenous vegetation (forest, shrubland and grassland communities) growing on basic igneous bluffs, scarps and rock outcrops throughout the site. At a national scale, basic cliffs, scarps and tors are an originally rare ecosystem (Williams et al. 2007).

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

The site contains a mosaic of vegetation communities, and a high diversity of indigenous plant taxa. One-hundred and three indigenous plant species have been recorded from the site during recent botanical surveys (Jensen unpubl. data 2013, Wildland Consultants unpubl. data 2014a). This diversity reflects the range of vegetation communities and micro-habitats and the altitudinal gradient from Lake Forsyth/Wairewa at sea level to approximately 440 m above sea level.

The habitats within the BPCT covenant (grassland, shrubland and rock outcrops) that were surveyed contain a high diversity of indigenous invertebrates. One hundred indigenous invertebrate taxa were recorded during the survey. This included 84 Lepidoptera. This high diversity reflects the sites sunny north-facing



aspect, high diversity of indigenous plant taxa and the large size of the site (Wildland Consultants unpubl. data 2014b).

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The site is directly linked to the Lake Forsyth/Wairewa (SES/H/6), a lake of very high ecological value, and particularly as a habitat for indigenous fauna. It is also in close proximity to the forested gullies below and north of Te Oka Peak (also on the south-eastern side of Lake Forsyth/Wairewa) (SES/A/11).

The indigenous vegetation within the site provides an important buffering function to Lake Forsyth/Waiwera. This lake is in a highly eutrophic state and reducing nutrient and sediment inputs is a high priority (Gray 2013). Maintaining vegetation cover on these slopes reduces these local inputs, but management within the wider catchment is also essential to address water quality issues.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site that meet this criterion.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

It provides an important habitat for a diverse number of indigenous invertebrate taxa including species that are nationally At Risk, endemic to Banks Peninsula or uncommon within the ecological district.

## Site Management

### Existing Protection Status

Fifty-three hectares of the western part of the site is protected by a Banks Peninsula Conservation Trust (BPCT) covenant.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Stock. Part of the site (north-east of the BPCT covenant) is grazed cattle and sheep (Jensen unpubl. data 2013).</li> </ul>	<ul style="list-style-type: none"> <li>Consider implications of stock grazing in relation to management of indigenous vegetation communities. Consider grazing sheep instead of cattle or removing grazing stock.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about options for stock management.</li> </ul>
<ul style="list-style-type: none"> <li>Goats are present within part of the site (north-east of the BPCT covenant) (Jensen unpubl. data 2013).</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing goats from the site. Goats are a serious threat to the ecological values of the site. They also have the potential to spread onto neighbouring properties and into other areas with high ecological values. Not removing goats poses a significant threat to the success of the multi-agency Banks Peninsula Feral Goat Eradication Programme.</li> </ul>	<ul style="list-style-type: none"> <li>Assistance with removal of goats</li> </ul>
<ul style="list-style-type: none"> <li>Several pigs ear (<i>Cotyledon orbiculata</i>) plants occur on rock outcrops within the BPCT covenant (Wildland Consultants unpubl. data 2014a). This species poses a threat to native rock outcrop plants.</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing pigs ear from the locations within the covenant where it is present and undertaking ongoing surveillance for it and other biodiversity pest plants such as spur valerian and boxthorn.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about monitoring and control of pest plants, with assistance as appropriate in collaboration with other agencies and groups with landowner agreement.</li> </ul>
<ul style="list-style-type: none"> <li>Hares and rabbits occur within the site. Rabbit sign indicates densities may be high (Wildland</li> </ul>	<ul style="list-style-type: none"> <li>Consider monitoring rabbit numbers and</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the benefits</li> </ul>



Consultants unpubl. data 2014a).	controlling them if required.	of, and options for rabbit control.
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**Assessment completed by:** Scott Hooson  
**Date:** 19 January 2015

**Statement completed by:** Scott Hooson  
**Date:** 19 January 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: List of Plant Species Recorded within the BPCT Covenant

Sourced from Wildland Consultants unpubl. data (2014a).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Asplenium flabellifolium</i>	necklace fern
<i>Alternanthera nahui</i>	nahui
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carmichaelia australis</i>	native broom, common broom
<i>Carex comans</i>	
<i>Chenopodium allanii</i>	
<i>Cheilanthes sieberi</i>	rock fern
<i>Chenopodium triandrum</i>	pigweed
<i>Clematis afoliata</i>	leafless clematis
<i>Convolvulus waitaha</i>	grass convolvulus
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Crassula colligata</i>	stonecrop
<i>Crassula sieberiana</i>	stonecrop
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	Mercury Bay weed, dichondra
<i>Disphyma australe</i>	NZ iceplant
<i>Discaria toumatou</i>	matagouri, wild irishman
<i>Festuca novae-zelandiae</i>	fescue tussock, hard tussock
<i>Ficinia nodosa</i>	club rush, wiwi
<i>Haloragis erecta</i>	toatoa
<i>Helichrysum lanceolatum</i>	niniaio
<i>Hierochloe redolens</i>	holy grass, karetu
<i>Leptinella dioica</i>	button daisy
<i>Leptinella minor</i>	Banks Peninsula button daisy
<i>Lilaeopsis novae-zelandiae</i>	
<i>Linum monogynum</i>	NZ linen flax
<i>Luzula banksiana var. orina</i>	woodrush
<i>Melicytus alpinus</i>	porcupine shrub
<i>Microlaena stipoides</i>	meadow rice grass, patiti
<i>Muehlenbeckia astonii</i>	shrubby tororaro, wiggywig
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Oxalis exilis</i>	native oxalis
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Phormium tenax</i>	flax, harakeke
<i>Plagianthus divaricatus</i>	saltmarsh ribbonwood
<i>Pleurosorus rutifolius</i>	blanket fern
<i>Poa cita</i>	silver tussock
<i>Polystichum oculatum</i>	shield fern
<i>Pteridium esculentum</i>	bracken



<i>Rytidosperma clavatum</i>	danthonia, bristle grass
<i>Selliera radicans</i>	selliera
<i>Senecio quadridentatus</i>	cotton fireweed, pekapeka
<i>Sophora prostrata</i>	dwarf kowhai, prostrate kowhai
<i>Tetragonia implexicoma</i>	climbing shore spinach
<i>Wahlenbergia gracilis</i>	NZ harebell
<b>Exotic species</b>	
<i>Acaena agnipila</i>	Australian sheeps bur
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Austrostipa nodosa</i>	needle grass
<i>Bromus diandrus</i>	ripgut brome
<i>Bromus hordeaceus</i>	soft brome
<i>Carduus tenuiflorus</i>	winged thistle
<i>Coronopus didymus</i>	twin cress
<i>Cotyledon orbiculata</i>	pig's ear, elephant's ear
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Echium vulgare</i>	vipers bugloss
<i>Festuca arundinacea</i>	tall fescue
<i>Galium aparine</i>	cleavers
<i>Geranium dissectum</i>	cut-leaved cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Lagurus ovatus</i>	hairstail
<i>Lepidium africanum</i>	peppercress
<i>Lolium perenne</i>	ryegrass
<i>Petroselinum crispum</i>	wild parsley
<i>Plantago coronopus</i>	bucks horn plantain
<i>Rumex acetosella</i>	sheeps sorrel
<i>Rytidosperma racemosum</i>	danthonia
<i>Silene gallica</i>	catchfly
<i>Silybum marianum</i>	variegated thistle
<i>Solanum nigrum</i>	black nightshade
<i>Sonchus oleraceus</i>	puha, smooth sow thistle
<i>Spergula arvensis</i>	spurrey
<i>Ulex europaeus</i>	gorse
<i>Verbascum thapsus</i>	woolly mullein
<i>Verbascum virgatum</i>	moth mullein
<i>Vicia sativa</i>	vetch
<i>Vittadinia gracilis</i>	purple fuzzweed



**Appendix 2: List of Plant Species Recorded North-east of the BPCT Covenant**

Sourced from Jensen unpubl. data (2013).

N.B. exotic species were not recorded during this survey.

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Anthosachne solandri</i>	native wheatgrass, blue wheatgrass
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Austroderia richardii</i>	toetoe
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum penna-marina</i>	little hard fern
<i>Calystegia tuguriorum</i>	NZ bindweed, pōwhiwhi
<i>Carex breviculmis</i>	grassland sedge
<i>Carex secta</i>	niggerhead, pūkio
<i>Carmichaelia australis</i>	native broom, common broom
<i>Carpodetus serratus</i>	marbleleaf, putaputāwētā
<i>Cheilanthes distans</i>	woolly cloak fern, woolly rock fern
<i>Cheilanthes sieberi</i>	rock fern
<i>Chenopodium allanii</i>	
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Convolvulus waitaha</i>	grass convolvulus
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, tī kōuka
<i>Corokia cotoneaster</i>	korokio
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	dichondra
<i>Discaria toumatou</i>	matagouri, wild irishman, tūmatakuru
<i>Dodonaea viscosa</i>	akeake
<i>Echinopogon ovatus</i>	hedgheg grass
<i>Einadia triandra</i>	pigweed
<i>Euchiton audax</i>	native cudweed
<i>Ficinia nodosa</i>	club rush, wiwi
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Geranium microphyllum</i>	
<i>Griselinia littoralis</i>	broadleaf, kāpuka
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri



<i>Helichrysum lanceolatum</i>	ninia
<i>Hierochloe redolens</i>	holy grass, kāretu
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea robusta</i>	kānuka
<i>Leptinella minor</i>	Banks Peninsula button daisy
<i>Linum monogynum</i>	NZ linen flax
<i>Lophomyrtus obcordata</i>	rōhutu, NZ myrtle
<i>Luzula banksiana var. orina</i>	woodrush
<i>Melicope simplex</i>	poataniwha
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Microlaena stipoides</i>	meadow rice grass, pātiti
<i>Muehlenbeckia australis</i>	large-leaved pōhuehue
<i>Muehlenbeckia complexa</i>	scrub pōhuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red māpou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping māpou
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	yellow oxalis
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Phormium tenax</i>	flax, harakeke
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum eugenioides</i>	lemonwood, tarātā
<i>Pittosporum tenuifolium</i>	kōhūhū, black matipo
<i>Plagianthus divaricatus</i>	saltmarsh ribbonwood
<i>Plagianthus regius</i>	lowland ribbonwood, mānatu
<i>Poa cita</i>	silver tussock, wī
<i>Podocarpus totara</i>	lowland tōtara
<i>Polystichum vestitum</i>	prickly shield fern, pūniu
<i>Prumnopitys taxifolia</i>	mataī, black pine
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Pteridium esculentum</i>	bracken, rārahu, rauaruhe
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tātarāmoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tātarāmoa
<i>Rytidosperma clavatum</i>	danthonia, bristle grass
<i>Scandia geniculata</i>	climbing aniseed
<i>Senecio quadridentatus</i>	cotton fireweed, pekapeka
<i>Sophora microphylla</i>	small-leaved kōwhai
<i>Sophora prostrata</i>	dwarf kōwhai, prostrate kōwhai
<i>Strelbus heterophyllus</i>	small-leaved milk tree, tūrepo
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Vittadinia australis</i>	white fuzzweed
<i>Wahlenbergia gracilis</i>	



### Appendix 3: Invertebrate Species List

Sourced from Wildland Consultants (2014)

<b>HEMIPTERA</b>	
<b>Tibicinidae</b>	cicada
<i>Amphipsalta zelandica</i>	clapping cicada
<i>Amphipsalta strepitans</i>	rock cicada
<b>ORTHOPTERA</b>	
<b>Tettigoniidae</b>	katydid
<i>Conocephalus bilineatus</i>	
<b>Gryllidae</b>	cricket
<i>Pteronemobius bigelowi</i>	
<b>Acrididae</b>	grasshoppers
<i>Phaulacridium marginale</i>	
<b>Anastostomatidae</b>	ground weta
<i>Hemiandrus new species</i>	
<b>COLEOPTERA</b>	
<b>Carabidae</b>	ground beetles
<i>Megadromus antarcticus</i>	
<i>Neocicindella latecincta</i>	tiger beetle
<b>Scarabaeidae</b>	chafers
<i>Costelytra zelandica</i>	
<i>Odontria striata</i>	striped chafer
<i>Odontria new species</i>	
<b>HYMENOPTERA</b>	
<b>Formicidae</b>	ant
<i>Monomorium antarcticum</i>	
<b>Ichneumonidae</b>	
<i>Netelia producta</i>	
<b>Pompilidae</b>	spider wasp
<i>Priocnemis carbonarius</i>	
<i>Epipompilus insularis</i>	
<b>LEPIDOPTERA</b>	
<b>Glyphipterigidae</b>	
<i>Glyphipterix cionophora</i>	
<b>Elachistidae</b>	
<i>Cosmiotes helonoma</i>	
<i>Cosmiotes ombrodoca</i>	
<b>Momphidae</b>	
<i>Zapyastra calliphana</i>	
<b>Lyonetiidae</b>	
<i>Bedellia psammitis</i>	
<b>Oecophoridae</b>	
<i>Gymnobathra sarcoxantha</i>	
<i>Hierodoris s-fractum</i>	
<i>Leptocroca species</i>	
<i>Stathmopoda horticola</i>	
<i>Tingena macarella</i>	
<i>Tingena melinella</i>	
<b>Pterophoridae</b>	plumemoth





<i>Pterophorus innotatalis</i>	
<b>Tortricidae</b>	leaf rollers
<i>Capua semiferana</i>	
* <i>Cydia succedana</i>	
<i>Harmologa amplexana</i>	
<i>Harmologa oblongana</i>	
<i>Harmologa new species</i>	
<i>Merophyas leucaniana</i>	
<b>Crambidae</b>	
* <i>Achyra affinitalis</i>	
<i>Eudonia leptalea</i>	
<i>Eudonia sabulosella</i>	
<i>Eudonia submarginalis</i>	
<i>Eudonia manganeseutis</i>	
<i>Gadira acerella</i>	
<i>Hygraula nitens</i>	
<i>Orocrambus flexuosellus</i>	
<i>Orocrambus ordishi</i>	
<i>Orocrambus ramosellus</i>	
<i>Orocrambus vittellus</i>	
<i>Orocrambus vulgaris</i>	
<i>Scoparia chalicodes</i>	
<i>Scoparia exilis</i>	
<i>Udea flavidalis</i>	
<i>Uresiphita maorialis</i>	Kowhai moth
<b>GEOMETRIDAE</b>	
<i>Asaphodes abrogata</i>	
<i>Austrocidaria gobiata</i>	
<i>Austrocidaria similata</i>	
* <i>Chloroclystis filata</i>	
<i>Chloroclystis inductata</i>	
<i>Chloroclystis sphragitis</i>	
<i>Declana junctilinea</i>	
<i>Dichromodes cynica</i>	
<i>Epicyme rubropunctata</i>	
<i>Epyaxa lucidata</i>	
<i>Epyaxa rosearia</i>	
<i>Epyaxa venipunctata</i>	
<i>Gellonia pannularia</i>	
<i>Homodotis megaspilata</i>	
<i>Helastia cinerearia</i>	
<i>Helastia corcularia</i>	
<i>Helastia triphragma</i>	
<i>Hydriomena deltoidata</i>	
<i>Hydriomena rixata</i>	
<i>Pasiphila muscosata</i>	
<i>Pasiphila sandycias</i>	
<i>Poecilasthena schistaria</i>	
<i>Pseudocoremia indistincta</i>	
<i>Samana acutata</i>	
<i>Scopula rubraria</i>	
<b>Noctuidae</b>	
<i>Aletia moderata</i>	



<i>Agrotis ipsilon</i>	
<i>Bityla defigurata</i>	
<i>Bityla sericea</i>	
<i>Cosmodes elegans</i>	
<i>Graphania insignis</i>	
<i>Graphania lignana</i>	
<i>Graphania morosa</i>	
<i>Graphania mutans</i>	
<i>Graphania omoplaca</i>	
<i>Graphania phricias</i>	
<i>Graphania plena</i>	
<i>Graphania rubescens</i>	
<i>Graphania ustistriga</i>	
<i>Meterana decorata</i>	
<i>Meterana ochthistis</i>	
<i>Persectania aversa</i>	
<i>Proteuxoa comma</i>	
<i>Tmetolophota atristriga</i>	
<i>Tmetolophota propria</i>	
<i>Tmetolophota unica</i>	
<b>Erebidae</b>	
<i>Celama parvitis</i>	
<i>Nyctemera annulata</i>	magpie moth
<b>Lycaenidae</b>	coppers/ blues
<i>Lycaena "comon copper" complex</i>	
<i>Lycaena feredayi</i>	
<i>Zizina oxleyi</i>	
<b>Nymphalidae</b>	admirals
<i>Vanessa gonerilla</i>	red admiral
<i>Vanessa itea</i>	yellow admiral
<b>Pieridae</b>	white butterfly
<i>*Pieris rapae</i>	
<b>MANTODEA</b>	praying mantis
<i>Orthodera novaezelandiae</i>	

## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Otepatotu

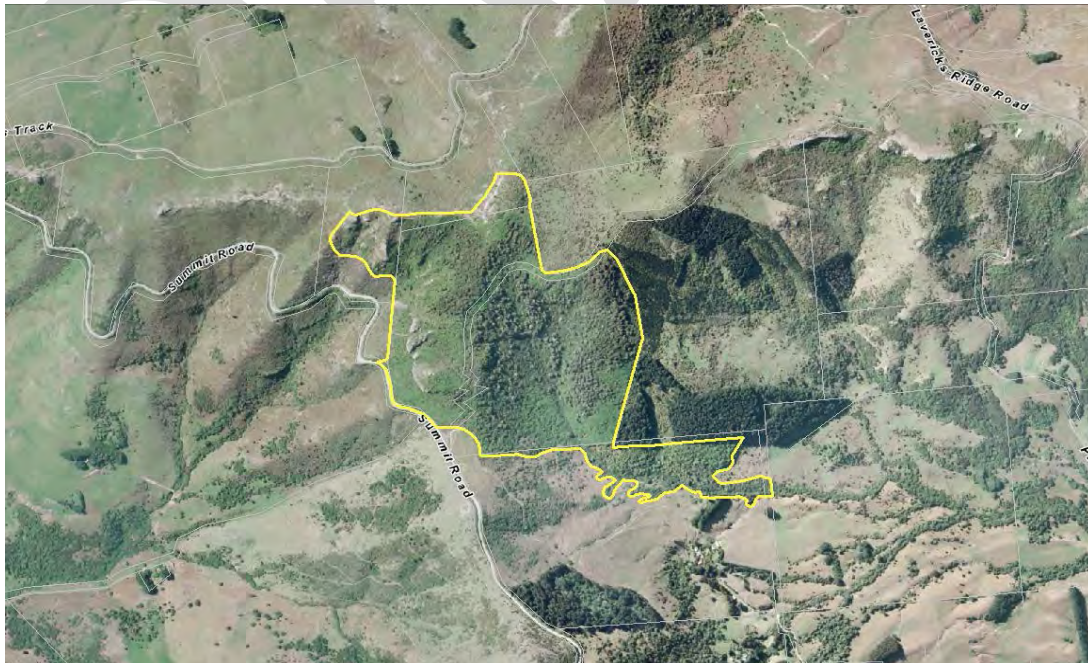
**Site number:** SES/A/24

**Physical address of site:** 1933 Summit Road, Akaroa

#### **Summary of Significance:**

This site is significant because it contains a large example of rare, diverse and highly representative old growth montane thin-barked totara forest. It supports two nationally At Risk plant species and a large number of plant species that are uncommon within the ecological region or ecological district, four terrestrial invertebrates that are nationally At Risk or endemic to Banks Peninsula, one bird species that is uncommon in the ecological district and two plant species at their regional distributional limits on Banks Peninsula. It contains large basic igneous bluffs, and rock outcrops are an originally rare ecosystem and is also distinctive for the large number of mountain cabbage tree plants present. The site is well buffered and contributes to an important ecological linkage of connected indigenous vegetation and habitats in the wider area.

#### **Site Map**



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 28.96

**Central point (NZTM):** E1601423, N5155923

## Site Description

The site is located in the Akaroa Ecological District on the northern side of the Summit Road between Camerons Track and Le Bons Bay. The aspect is generally south facing and the altitudinal range of the site is from approximately 500 above sea level to the summit of Lavericks Peak at 755 m above sea level. The majority of the site (39.9 ha) is protected as the Otepatoto Scenic Reserve (conservation unit no. N36088) administered by the Department of Conservation.

The scenic reserve contains extensive areas of old-growth montane thin-bark totara/hardwood forest (with conspicuous lichen (*Usnea* sp.) and goblin moss (*Weymouthia* sp.)), montane second-growth mixed hardwood forest with abundant mountain five-finger and tree fuchsia, holygrass grassland and shrubland, montane scrub and shrubland, *Chionochloa conspicua* tall tussockland, tall tussock shrubland, and scattered plants on montane bluffs. Totara and mountain five-finger regeneration is abundant. Species of particular note in the reserve are: *Cordyline indivisa*, filmy ferns (*Hymenophyllum multifidum*, *H. sanguinolentum*, *H. flabellatum*), *Leptolepia novae-zelandiae*, *Leptopteris hymenophylloides*, *Hebe strictissima*, *Pseudopanax anomalus*, *Brachyglottis lagopus*, *Rytidosperma corinum*, *Olearia ilicifolia*, *Cyathea colensoi*, *C. smithii*, *Clematis paniculata* and *Ourisia lacteal* (Wilson 1992).

South-east of the reserve is an area (matai-thin barked totara)/ montane second-growth mixed hardwood forest with abundant mountain five-finger broadleaf and mahoe. Other main canopy species include small-leaved hoheria, lemonwood, fuchsia, lancewood and kaikomako. There is abundant regeneration in this part of the site with numerous seedlings and saplings of all the above trees including totara and matai. *Coprosma rotundifolia*, pate, mountain five-finger and horopito form a dense understorey and ferns are also abundant (Jensen unpubl. data 2012).

## Extent of Site of Ecological Significance

The site includes the Otepatotu Scenic Reserve, the area of (matai-thin barked totara)/ montane second-growth mixed hardwood forest south east of the reserve and the rocky bluffs on the western side of the reserve above the Summit Road.

## Assessment Summary

The Otepatoto Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from



the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5, and 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 8).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

It contains highly representative old growth montane thin-barked totara forest. Stock have been excluded from the site (both the Otepatotu Scenic Reserve and the area of forest to the south-east of the reserve) for many years and the vegetation is very intact, both structurally and compositionally relative to other examples. The forest south-east of the reserve is also in excellent condition with high species diversity, abundant regeneration, few exotic pest plants and little evidence of animal pest damage (Jensen unpubl. data 2012).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It contains a large stand of thin-barked totara totara/ hardwood forest that is a relatively large example of its type within the Akaroa Ecological District.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

The site contains old-growth montane thin-bark totara/hardwood forest and second-growth mixed hardwood forest with emergent podocarp trees. This forest is significant under this criterion because forest has been reduced to less than 20% of its former extent in the ecological district (and ecological region). Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 10% of the ecological district (New Zealand Landcover Database (Version 4)).

Of particular significance is the presence of montane old growth thin-barked totara forest within the site. Old growth forest (of any type) has been reduced to



approximately 800 ha or <1% of its original extent on Banks Peninsula (Wilson 2009).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has two nationally At Risk plant species and a large number of plant species that are uncommon within the ecological region or ecological district. It also has four terrestrial invertebrates that are either nationally At Risk or endemic to Banks Peninsula and one bird species that is uncommon in the ecological district.

**Plants**

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site are:

- *Brachyglottis sciadophila* (At Risk – Declining) (Wilson 1992) – also south-east of the reserve (Jensen unpubl. data 2012)
- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to banks Peninsula) (Wilson 1992, Wiser unpubl. data)
- *Senecio glaucophyllus* subsp. *basinudus* (At Risk - Naturally Uncommon) (Wiser unpubl. data)

Plant species recorded from the site (Wilson unpubl. data n.d.), unless cited otherwise) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Anisotome aromatica* (also Wiser unpubl. data)
- *Asplenium richardii* (also Wiser unpubl. data)
- *Chionochloa conspicua*
- *Coprosma ciliata*
- *Cordyline indivisa* (rare in the ecological region (Wilson 1992))
- *Histiopteris incisa*
- *Hymenophyllum flabellatum*
- *Hymenophyllum multifidum*
- *Hymenophyllum sanguinolentum* 'Canterbury'
- *Leptolepia novae-zelandiae*
- *Lycopodium fastigiatum*
- *Lycopodium scariosum* – south-east of the reserve (Jensen unpubl. data 2012)
- *Microlaena avenacea*
- *Notogrammitis heterophylla* (also Wiser unpubl. data)
- *Olearia ilicifolia*
- *Ourisia macrophylla* subsp. *lactea*
- *Paesia scaberula*
- *Phlegmariurus varius* (also Wiser unpubl. data)
- *Poa colensoi*
- *Pyrrosia eleagnifolia* (also Wiser unpubl. data)
- *Raukaua anomalus*
- *Rytidosperma corinum* (also Wiser unpubl. data)
- *Schizeilema trifoliolatum*



- *Senecio wairauensis*
- *Uncinia clavata* (also Wisser unpubl. data)
- *Uncinia ferruginea*
- *Uncinia rupestris*

### Birds

One bird species that is uncommon in the ecological district has been recorded at the site (DOC 2002):

- South Island rifleman.

### Invertebrates

Nationally At Risk and endemic invertebrate species recorded from the site are:

- *Mecodema howitti* (carabid beetle) (At Risk - Declining, endemic to eastern Banks Peninsula) (Bowie et al. 2011)
- Banks Peninsula tree weta (*Hemideina ricta*) (At Risk – Naturally Uncommon, endemic to eastern Banks Peninsula) (Townsend et al. 1997).
- *Periegops suterii* (six-eyed spider) (At Risk - Relict) (Bowie et al. 2011)
- *Holcaspis* 'new species' (carabid beetle) - one of only 5 sites (Bowie et al. 2011), endemic to Banks Peninsula and uncommon in the Akaroa ED.

#### **5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There is one species at its southern regional limit on Banks Peninsula and one species at its northern regional limit on Banks Peninsula:

- Pigeonwood (*Hedycarya arborea*) (southern regional limit)
- *Rytidosperma corinum* (northern regional limit)

#### **6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

The western side of the site in particular contains large basic igneous bluffs, and rock outcrops that support indigenous vegetation. At a national scale, basic cliffs, scarps and tors are an originally rare ecosystem (Williams et al. 2007).

The site is also distinctive for the large number of mountain cabbage tree (*Cordyline indivisia*) plants present (DOC 2002). This species is rare in the Banks Ecological Region.



## Diversity and Pattern

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

It supports a relatively high diversity of indigenous vascular plant species (Jensen unpubl. data 2012, Wilson 1992) including a large number of species that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) (see criterion 4).

## Ecological Context

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is significant under this criterion.

The indigenous vegetation and habitats within the site, particularly the relatively intact old-growth forest, contribute to an important ecological linkage of connected indigenous vegetation and habitats on the northern side of Le Bons Bay and on the eastern side of Banks Peninsula.

Montane second-growth mixed hardwood forest and regenerating scrub and shrublands provide an important buffer to the core area of montane thin-barked totara forest within the Scenic Reserve.

- 9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. There are no wetlands within the site.

- 10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

The presence of relatively intact old-growth forest within the site means it provides important habitat for indigenous fauna. A number of indigenous forest birds use the site for feeding, breeding and resting, including brown creeper, South Island rifleman, South Island tomtit, bellbird and New Zealand pigeon (DOC 2002).



## Site Management

### Existing Protection Status

A large part of the site (39.9 ha) is protected as the Otepatoto Scenic Reserve (conservation unit no. N36088) which is administered by the Department of Conservation. The remainder is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants: Spanish heath (<i>Erica lusitanica</i>), <i>Pinus radiata</i> spreading from adjoining plantations and <i>Pinus ponderosa</i> (originating from a former plantation between the Summit Road and the Otepatotu Bluffs (Wilson 1992).</li> </ul>	<ul style="list-style-type: none"> <li>Consider ongoing control of wilding conifers (<i>Pinus radiata</i> and <i>P. ponderosa</i>).</li> <li>If it is still a threat, consider annual surveillance for Spanish heath near the slip between Summit Road and reserve boundary. Remove any plants to prevent re-establishment (Wilson unpubl. data n.d.).</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for private landowner about wilding pine control options and assistance where appropriate.</li> <li>Discuss with adjoining landowner/s the potential impact of pest plants upon the biodiversity of the site and options for control, with assistance as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Rock climbing damaging indigenous rock bluff communities.</li> </ul>	<ul style="list-style-type: none"> <li>Department of Conservation to liaise with rock climbing groups to raise awareness of the importance of rock bluff communities and ensure any damage is minimised.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>



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**Assessment completed by:** Scott Hooson  
**Date:** 3 March 2015

**Statement completed by:** Scott Hooson  
**Date:** 3 March 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List - South-east of Otepatotu Scenic Reserve

Sourced from Jensen unpubl. data (2012).

Note: exotic plant species were not recorded during this survey.

Scientific Name	
Indigenous species	Common Name(s)
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium bulbiferum</i>	hen & chicken's fern
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum procerum</i>	small kiokio
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Carpodetus serratus</i>	marbleleaf, putaputawētā
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Cordyline australis</i>	cabbage tree, tī kōuka
<i>Cyathea colensoi</i>	rough tree fern, mountain tree fern
<i>Cyathea smithii</i>	Smith's tree fern, kātote
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Griselinia littoralis</i>	broadleaf, kāpuka
<i>Hebe salicifolia</i>	koromiko
<i>Helichrysum lanceolatum</i>	niniaio
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle moschata</i>	pennywort
<i>Hypolepis ambigua</i>	pig fern
<i>Kunzea robusta</i>	kānuka
<i>Leptopteris hymenophylloides</i>	crepe fern, heruheru
<i>Lycopodium scariosum</i>	creeping clubmoss
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rātā
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Muehlenbeckia australis</i>	large-leaved pōhuehue
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Phormium cookianum</i>	mountain flax, wharariki
<i>Pittosporum eugeniioides</i>	lemonwood, tarātā
<i>Plagianthus regius</i>	lowland ribbonwood, mānatu
<i>Podocarpus cunninghamii</i>	mountain tōtara, thin-barked tōtara
<i>Polystichum vestitum</i>	prickly shield fern, pūniu



<i>Prumnopitys taxifolia</i>	mataī, black pine
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax colensoi</i>	mountain five-finger
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pteridium esculentum</i>	bracken, rārahu, rauaruhe
<i>Pterostylis graminea</i>	green-hooded orchid
<i>Rubus cissoides</i>	bush lawyer, tātarāmoa
<i>Schefflera digitata</i>	patē, seven-finger
<i>Sophora microphylla</i>	small-leaved kōwhai
<i>Urtica ferox</i>	ongaonga, tree nettle

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## Appendix 2: Plant Species List - Otepatotu Scenic Reserve

Sourced from Wilson unpubl. data (n.d).

Scientific Name
<b>Indigenous species</b>
<i>Anisotome aromatica</i>
<i>Aristolelia serrata</i>
<i>Asplenium appendiculatum</i>
<i>Asplenium bulbiferum</i>
<i>Asplenium flaccidum</i>
<i>Asplenium hookerianum</i>
<i>Astelia fragrans</i>
<i>Blechnum chambersii</i>
<i>Blechnum colensoi</i>
<i>Blechnum discolor</i>
<i>Blechnum fluviatile</i>
<i>Blechnum procerum</i>
<i>Brachyglottis lagopus</i>
<i>Brachyglottis sciadophila</i>
<i>Carpodetus serratus</i>
<i>Chionochloa conspicua</i>
<i>Clematis foetida</i>
<i>Clematis paniculata</i>
<i>Coprosma ciliata</i>
<i>Coprosma linariifolia</i>
<i>Coprosma rhamnoides</i>
<i>Coprosma rigida</i>
<i>Coprosma rotundifolia</i>
<i>Coprosma sp 't'</i>
<i>Coprosma spp</i>
<i>Cordyline australis</i>
<i>Cordyline indivisa</i>
<i>Ctenopteris heterophylla</i>
<i>Cyathea colensoi</i>
<i>Cyathea smithii</i>
<i>Dacrycarpus dacrydioides</i>
<i>Dichelachne crinata</i>
<i>Epilobium alsinoides subsp atriplicifolium</i>
<i>Euchiton audax</i>
<i>Fuchsia excorticata</i>
<i>Fuchsia excorticata x perscandens</i>
<i>Geranium sessiliflorum</i>
<i>Griselinia littoralis</i>
<i>Hebe salicifolia</i>
<i>Hebe strictissima</i>
<i>Hedycarya arborea</i>
<i>Helichrysum filicaule</i>
<i>Helichrysum lanceolata</i>



<i>Helychrysum bellidioides</i>
<i>Hierochloa redolens</i>
<i>Histiopteris incisa</i>
<i>Hoheria angustifolia</i>
<i>Hymenophyllum flabellatum</i>
<i>Hymenophyllum multifidum</i>
<i>Hymenophyllum sanguinolentum</i>
<i>Hypolepis millefolium</i>
<i>Hypolepis rufobarbata</i>
<i>Leptolepia novae-zelandiae</i>
<i>Leptopteris hymenophylloides</i>
<i>Libertia ixioides</i>
<i>Luzula banksiana var orina</i>
<i>Lycopodium fastigiatum</i>
<i>Meliccytus ramiflorus</i>
<i>Metrosideros diffusa</i>
<i>Microlaena avenacea</i>
<i>Microsorium pustulatum</i>
<i>Microtis unifolia</i>
<i>Muehlenbeckia australis</i>
<i>Myrsine australis</i>
<i>Myrsine divaricata</i>
<i>Olearia ilicifolia</i>
<i>Ourisia lactea</i>
<i>Paesia scaberula</i>
<i>Parsonsia heterophylla</i>
<i>Pennantia corymbosa</i>
<i>Phormium cookianum</i>
<i>Pittosporum eugenoides</i>
<i>Pittosporum tenuifolium</i>
<i>Poa colensoi</i>
<i>Poa mathewsii</i>
<i>Podocarpus hallii</i>
<i>Podocarpus totara</i>
<i>Polystichum vestitum</i>
<i>Polystichum xvestitum</i>
<i>Pseudopanax colensoi</i>
<i>Pseudopanax crassifolius</i>
<i>Pseudowintera colorata</i>
<i>Pteridium esculentum</i>
<i>Raoulia glabra</i>
<i>Raukawa anomalus</i>
<i>Rubus cissoides</i>
<i>Rytidosperma corinum</i>
<i>Rytidosperma gracile</i>
<i>Schefflera digitata</i>
<i>Schizeilema trifoliolatum</i>
<i>Senecio wairauensis</i>
<i>Stellaria decipiens</i>
<i>Uncinia cf. angustifolia (or silvestris)</i>
<i>Uncinia clavata</i>
<i>Uncinia ferruginea</i>
<i>Uncinia rupestris</i>



<i>Urtica ferox</i>
<i>Urtica incisa</i>
<b>Exotic species</b>
<i>Achillea millefolium</i>
<i>Erica lusitanica</i>
<i>Hieracium caespitosum</i>
<i>Hieracium pilosella</i>
<i>Hieracium praeltum</i>
<i>Hypochoeris radicata</i>
<i>Malus domestica</i>
<i>Mycelis</i>
<i>Ulex europaeus</i>
<b>Non-vascular species</b>
<i>Calomnion laetum</i>
<i>Dicranoloma menziesii</i>
<i>Echinodium hispidum</i>
<i>Neckera pennata</i>
<i>Weymouthia cochleaurifolia</i>
<i>Weymouthia mollis</i>

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Saddle Hill

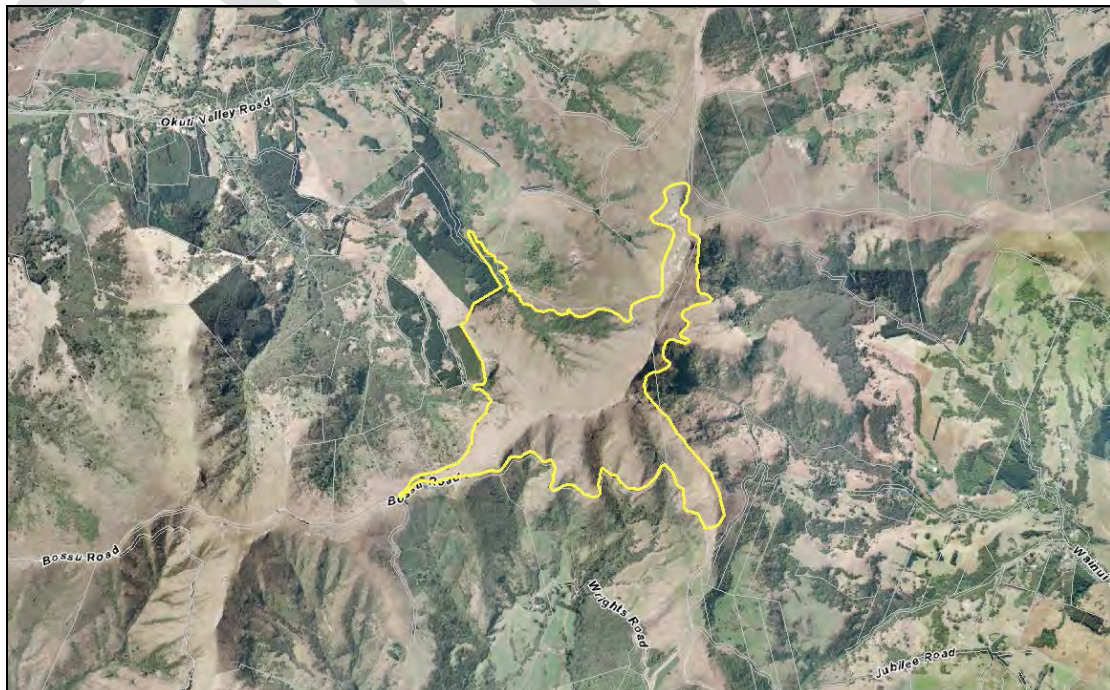
**Site number:** SES/A/26

**Physical address of site:** Bossu Road, Little River

#### Summary of Significance:

This site is significant because it contains rare and representative indigenous rock bluff, lowland and montane forest and snow tussock vegetation communities. The narrow leaved snow tussock community, which is of restricted occurrence on Banks Peninsula is probably the best remaining example in the ecological region. The site also has ecosystems that are originally rare on a national scale. These vegetation communities support a high diversity of plant taxa including six nationally At Risk plant species, a large number of species that are uncommon within the ecological region or ecological district, one at its southern national distributional limit on Banks Peninsula and one at its northern national limit. The site provides important habitat for a unique assemblage of indigenous moths including one that is nationally Threatened and only known to occur at the site, one that is nationally At Risk and another two that are endemic to Banks Peninsula. It directly adjoins areas of very high value and is an important ecological linkage.

#### Site Map



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 171.00

**Central point (NZTM):** E1588247, N5150193

## Site Description

At 841 m Saddle Hill is highest summit in the Akaroa Ecological District. It is situated on a high ridge between the Okuti and Wainui Valleys. The site includes the upper north-west and south-east facing slopes and main ridge of Saddle Hill. The altitudinal range of the site is from approximately 320 m to 840 m at the summit of Saddle Hill. Most of the site is part of the Saddle Hill Scenic Reserve administered by the Department of Conservation. It is also part of an area that was identified by the Department of Conservation as a Recommended Area for Protection (Akaroa RAP 10 – Saddle Hill) (Wilson 1992).

The main vegetation communities within the site (Wilson 1992, Head 2011, Wildland Consultants unpubl. data 2012a) are:

- Narrow-leaved snow tussock tussockland
- Silver tussock-fescue tussock/browntop grassland on montane hill slopes
- *Coprosma-Dracophyllum acerosum*/narrow-leaved snow tussock shrubland on montane hill slopes
- Mixed small-leaved shrubland on montane hill slopes
- Rocky bluff and rock outcrop communities
- (matai-kahikatea)/ second-growth hardwoods on lowland hill slopes
- Thin-bark totara/mixed hardwood forest on montane hill slopes
- Mixed broadleaved second-growth hardwood forest on lowland and montane hill slopes

The site is botanically rich and includes many species of particular note. The vegetation communities within the site are described in more detail by (Head 2011).

## Extent of Site of Ecological Significance

This site includes the rock outcrop and bluff communities and narrow-leaved snow tussock grasslands on the upper north-west and south-east facing slopes and main ridge of Saddle Hill and montane thin-barked totara forest and lowland (matai-kahikatea)/mixed second-growth hardwood forest in the gullies. Silver tussock-fescue tussock/browntop grassland linking these areas is also included within the site. The site is bounded by Bossu Road and Reynolds Roads on its southern and western sides respectively.

The Department of Conservation included the upper catchments of the Wainui and French Farm Valleys on the eastern side of Saddle Hill within the Saddle Hill Recommended Area for Protection (RAP 10) (Wilson 1992). There is no available up-to-date information on these sites, but based on Wilson (1992) (and his unpublished survey data for these sites), they are clearly of exceptionally high ecological value. They are contiguous with the Saddle Hill Site and could be included within this site. Assessment and identification of these areas as Significant Ecological Sites is a very high priority.

## Assessment Summary

The Saddle Hill Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below). Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

It contains a range of indigenous vegetation communities that are representative of those that would have occurred in the ecological district at a baseline of 1840. These include areas of old-growth podocarp forest (montane thin-barked totara forest (*Podocarpus cunninghamii*) and mature lowland matai (*Prumnopitys taxifolia*)- kahikatea (*Dacrycarpus dacrydioides*)/mixed second-growth hardwood forest), rock bluff communities and narrow-leaved snow tussock (*Chionochoa rigida*) grasslands on the upper slopes.

The narrow-leaved snow tussock community on the upper southern slopes of Saddle Hill is very natural, has relatively few exotic species and is highly representative of the sub-alpine vegetation that occupied exposed, higher altitude sites in the ecological district. It is probably the best remaining example in the Banks Ecological Region (Head 2011).

The large lava domes (including Coffin Rock) rock outcrops and the Saddle Hill massif support rock bluff plant communities. These communities act as refugia for a variety of predominantly indigenous ferns, shrubs and herbs. They are largely unmodified and include a full range of unique and specialised bluff plant communities, including subalpine species, and species endemic to the Peninsula, some of which are classified as nationally threatened (Head 2011).



Areas of old growth thin-bark totara/mixed hardwood forest are highly representative of the original forest cover on montane slopes in the ecological district. Secondary hardwood forest occurs in gullies on the lower north-west facing slopes. Although recovering from historical disturbance, mature matai and kahikatea are present and these forest areas are diverse, relatively natural and typical of (Head 2011) secondary hardwood forest in the Akaroa Ecological District.

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

It supports one of the largest areas of narrow-leaved snow tussock grassland in the Akaroa Ecological District and has extensive indigenous rock outcrop and bluff communities.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The vegetation on the southern side of Saddle Hill between Bossu Road and the Summit and on the upper slopes and ridge of Saddle Hill is significant at the Level 4 land environment scale. It is on a Chronically Threatened land environment (F3.3b) where 17.6% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

The old growth montane thin-barked totara forest and (matai - kahikatea/mixed hardwood forest and regenerating secondary forest ecosystems are significant under this criterion because they have been reduced to less than 20% of their former extent in the ecological district. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). Following human arrival the extent of forest in the ecological district (and region) was greatly reduced. The present extent of all indigenous forest in the ED is estimated to be 10% (17.8% including manuka and kanuka) (New Zealand Landcover Database (Version 4)). The present extent of old growth forest is estimated to be approximately 800 ha or <1% of its original extent (Wilson 2009).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has six nationally At Risk plant species, a large number of plant species that are uncommon within the ecological region or ecological district, one invertebrate that is nationally Threatened and only known to occur at the site, one that is nationally At Risk and another two that are endemic to Banks Peninsula.



## Plants

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site are:

- Grassland speargrass (*Aciphylla subflabellata*) (At Risk - Declining) (Wildland Consultants unpubl. data 2012a, Head 2011)
- Banks Peninsula blue tussock (*Festuca actae*) (At Risk – Naturally uncommon, endemic to Banks Peninsula) (Head 2011)
- Banks Peninsula hebe (*Hebe strictissima*) (At Risk – Naturally uncommon, endemic to Banks Peninsula) (Head 2011)
- Banks Peninsula sun hebe (*Heliohebe lavaudiana*) (At Risk - Declining, endemic to Banks Peninsula) (Wildland Consultants unpubl. data 2012a, Head 2011)
- Fan-leaved mat daisy (*Raoulia monroi*) (At Risk - Declining) (Wildland Consultants unpubl. data 2012a)
- Yellow rock groundsel (*Senecio glaucophyllus* subsp. *basinudus*) (At Risk – Naturally uncommon) (Wildland Consultants unpubl. data 2012a)

Plant species that have been recorded from within the site that are 'uncommon to rare or very local' on Banks Peninsula (Wilson 2013) are:

- Golden Spaniard (*Aciphylla aurea*) (Wildland Consultants unpubl. data 2012a, Head 2011)
- Aromatic aniseed (*Anisotome aromatica*) (Wildland Consultants unpubl. data 2012a)
- Richard's spleenwort (*Asplenium richardii*) (Wildland Consultants unpubl. data 2012a)
- slender mountain daisy (*Celmisia gracilentia*) (Head 2011)
- narrow-leaved snow tussock (*Chionochloa rigida*) (Wildland Consultants unpubl. data 2012a, Head 2011)
- Tutu (*Coriaria sarmentosa*) (Wildland Consultants unpubl. data 2012a)
- Willow herb (*Epilobium brunnescens*) (Wildland Consultants unpubl. data 2012a)
- Mountain aniseed (*Gingidia montana*) (Wildland Consultants unpubl. data 2012a)
- Water fern (*Histiopteris incisa*) (Wildland Consultants unpubl. data 2012a)
- Pennywort (*Hydrocotyle novae-zeelandiae*) (Wildland Consultants unpubl. data 2012a)
- Pennywort (*Hydrocotyle sulcata*) (Wildland Consultants unpubl. data 2012a)
- *Kelleria dieffenbachii* (Wildland Consultants unpubl. data 2012a, Head 2011)
- Prickly mingimingi (*Leptecophylla juniperina*) (Wildland Consultants unpubl. data 2012a)
- *Leptostigma setulosa* (Wildland Consultants unpubl. data 2012a)
- Alpine clubmoss (*Lycopodium fastigiatum*) (Wildland Consultants unpubl. data 2012a)
- Creeping pōhuehue (*Muehlenbeckia axillaris*) (Head 2011)
- Dwarf strap fern (*Notogrammitis crassior*) (Wildland Consultants unpubl. data 2012a)
- shrub daisy (*Olearia bullata*) (Wildland Consultants unpubl. data 2012a)
- New Zealand holly (*Olearia ilicifolia*) (Head 2011)



- Mountain foxglove (*Ourisia macrophylla* subsp. *lactea*) (Wildland Consultants unpubl. data 2012a, Head 2011)
- *Scleranthus brockiei* (Wildland Consultants unpubl. data 2012a)
- *Scleranthus uniflorus* (Wildland Consultants unpubl. data 2012a)
- Forest violet (*Viola filicaulis*) (Wildland Consultants unpubl. data 2012a, Head 2011)
- New Zealand harebell (*Wahlenbergia albomarginata*) (Wildland Consultants unpubl. data 2012a, Head 2011)

### Invertebrates

Nationally Threatened and At Risk invertebrate species recorded from the site (Wildland Consultants unpubl. data 2012b) are:

- *Cnephasia paterna* (a day-flying tortricid moth) (Threatened - Nationally Endangered, endemic to the Akaroa ED) – rediscovered in snow tussock tussockland on the south-eastern slopes below Saddle Hill
- *Dasyuris partheniata* (day flying moth) (At Risk – Recovering, uncommon in the Akaroa ED) – on speargrass (*Aciphylla subflabellata*)

Invertebrates recorded from the site (Wildland Consultants unpubl. data 2012b) that are endemic to Banks Peninsula are:

- *Dichromodes cynica*, (a day flying moth)
- *Asterivora nsp.* (a choreutid moth) – on *Brachyglottis lagopus* on steep rock faces and ledges below the summit of Saddle Hill.

#### **5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There is one plant species at its southern national distributional limit on Banks Peninsula and one at its northern national limit:

- Narrow-leaved snow tussock (*Chionochoa rigida*) (northern regional limit) (Wildland Consultants unpubl. data 2012a, Head 2011)
- Turpentine scrub (*Dracophyllum acerosum*) (southern national limit) (Wildland Consultants unpubl. data 2012a, Head 2011)

#### **6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

It contains vegetation communities that are distinctive, of restricted occurrence, and that occur within an originally rare ecosystem.

The upper slopes of the site support distinctive tall snow tussock tussockland. Snow tussockland is of very restricted occurrence on Banks Peninsula and only occurs on the tops of the highest peaks. This vegetation type is also at its northern national distributional limit on Banks Peninsula.



There are extensive igneous bluffs, scarps and rock outcrops along the Saddle Hill summit and on the spurs radiating out from the summit. This includes the imposing lave dome of Coffin Rock. At a national scale, basic cliffs, scarps and tors are an originally rare ecosystem (Williams et al. 2007). Where indigenous vegetation occurs on these features within the site they are significant under this criterion.

There are a small number of seepages and flush wetlands on the slopes of Saddle Hill. This ecosystem type is an originally rare ecosystem on a national scale (Williams et al. 2007).

### Diversity and Pattern

- 7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

It includes a discontinuous but relatively intact altitudinal sequence from approximately 320 m to 840 m at the summit of Saddle Hill that is largely within protected land. It comprises a diverse mosaic of vegetation communities including lowland to montane old growth and secondary forest and scrub, and rock bluff communities and sub-alpine vegetation at the highest altitudes. It also spans the summit ridge which encompasses contrasting northern and southern aspects (Head 2011).

The altitudinal and associated climatic gradient (encompassing lowland, montane and sub-alpine environments), topographic variation and range of distinctive ecosystems means the site supports a high diversity of plant taxa (Wilson 1992, Head 2011, Wildland Consultants unpubl. data 2012a) including a relatively high proportion of nationally Threatened and At Risk, endemic and locally uncommon species. A list of the plant taxa recorded from the southern faces and main ridge of Saddle Hill (Wildland Consultants unpubl. data 2012a) is provided in Appendix 1.

### Ecological Context

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

It directly adjoins areas of very high value Wilson (1992) in the upper catchments of the Wainui and French Farm Valleys on the eastern side of Saddle Hill. It provides an important ecological linkage between these areas and indigenous forest communities in the Okuti and Peraki Valleys. The site is also part of an important network of indigenous montane and sub-alpine communities along much of the Bossu Road corridor that includes Peraki Saddle Scenic Reserve



and Carews Peak to the south. This network is likely to be particularly important for indigenous invertebrates.

**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. Although they are of ecological importance, within the context of the wider landscape the small number of relatively small, seepages and flushes within the site are unlikely to play an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

It provides important habitat for a unique assemblage of indigenous moths including endemic and nationally Threatened and At Risk species (including one only known to occur within the site) (Wildland Consultants 2012b). It also provides habitat for lizards (Head 2011).

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## Site Management

### Existing Protection Status

The majority of the site is within the 290 ha Saddle Hill Scenic Reserve administered by the Department of Conservation. The remainder is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Biodiversity pest plants. There are very few biodiversity pest plants within the site. Those that are a risk to ecological values are:</li> <li>• Wilding pines are present within the site and nearby plantations will be an ongoing seed source (Wildland Consultants unpubl. data 2012a).</li> <li>• Gorse (<i>Ulex europaeus</i>) - occasionally present and is a threat to the bluff communities (Head 2011)</li> </ul>	<ul style="list-style-type: none"> <li>• Consider removing all of the wilding pines from the site to prevent further spread.</li> <li>• Consider ongoing surveillance for wilding pines to prevent their establishment, particularly within open tussock, grassland and rock bluff communities.</li> <li>• Consider controlling gorse on rock bluffs and rock outcrops.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with private landowners about benefits to biodiversity of control of wilding pines and gorse.</li> <li>• In collaboration with agencies (particularly DOC) assistance available where appropriate,</li> </ul>
<ul style="list-style-type: none"> <li>• Animal pests: possums (Head 2011) and hares (Wildland Consultants unpubl. data 2012a)</li> </ul>	<ul style="list-style-type: none"> <li>• Consider monitoring possum densities and undertake control as required.</li> <li>• Hares are unlikely to be a significant threat to the values at the site, however if densities are high, control could be considered.</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance to private landowners about monitoring and control of possum and hare populations.</li> <li>• In collaboration with ECan provide assistance where appropriate.</li> </ul>

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**Assessment completed by:** Scott Hooson  
**Date:** 11 March 2015

**Statement completed by:** Scott Hooson  
**Date:** 11 March 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List, Southern Faces and Ridge of Saddle Hill

Sourced from Wildland Consultants unpubl. data (2012a).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Aciphylla aurea</i>	golden spaniard
<i>Aciphylla subflabellata</i>	speargrass, spaniard, kurikuri
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Anisotome aromatica</i>	kopoti
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Asplenium richardii</i>	Richard's spleenwort
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum penna-marina</i>	little hard fern
<i>Blechnum procerum</i>	small kiokio
<i>Brachyglottis lagopus</i>	groundsel
<i>Carex breviculmis</i>	grassland sedge
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Celmisia gracilentia</i>	slender mountain daisy, pekapeka
<i>Chionochloa conspicua</i>	hunangamoho, broad-leaved bush tussock
<i>Chionochloa rigida</i>	narrow-leaved snow tussock
<i>Colobanthus strictus</i>	
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma propinqua X robusta</i>	
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Corokia cotoneaster</i>	korokio, corokia
<i>Cortaderia richardii</i>	toetoe
<i>Coriaria sarmentosa</i>	tutu
<i>Crassula colligata subsp. colligata</i>	stone crop
<i>Crassula sieberiana</i>	stone crop
<i>Cyathea colensoi</i>	rough tree fern, mountain tree fern
<i>Deyeuxia avenoides</i>	oat grass
<i>Dichelachne crinita</i>	plume grass
<i>Dracophyllum acerosum</i>	turpentine shrub
<i>Elymus solandri</i>	blue wheatgrass
<i>Epilobium atriplicifolium</i>	willow herb
<i>Epilobium brunnescens</i>	willow herb



<i>Epilobium pubens</i>	willow herb
<i>Euchiton species</i>	cudweed
<i>Festuca novae-zelandiae</i>	fescue tussock, hard tussock
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Gaultheria antipoda</i>	bush snowberry
<i>Gaultheria depressa var. novae-zelandiae</i>	snowberry
<i>Geranium sessiliflorum</i>	geranium
<i>Gingidia montana</i>	mountain aniseed
<i>Grammitis poeppigiana</i>	strap fern
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Gunnera monoica</i>	
<i>Hebe salicifolia</i>	koromiko
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Heliohebe lavaudiana</i>	Banks Peninsula sun hebe
<i>Hierochloe redolens</i>	holy grass, karetu
<i>Histiopteris incisa</i>	water fern
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle montana</i>	pennywort
<i>Hydrocotyle novae-zeelandiae</i>	pennywort
<i>Hydrocotyle sulcata</i>	pennywort
<i>Hypolepis millefolium</i>	thousand-leaved fern
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kelleria dieffenbachii</i>	
<i>Kunzea ericoides</i>	kanuka
<i>Leptecophylla juniperina</i>	prickly mingimingi, mikimiki
<i>Leptostigma setulosa</i>	
<i>Leucopogon fraseri</i>	dwarf heath, patotara
<i>Linum monogynum</i>	NZ linen flax
<i>Luzula rufa</i>	woodrush
<i>Lycopodium fastigiatum</i>	alpine clubmoss, mountain clubmoss
<i>Melicytus alpinus</i>	porcupine shrub
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Pseudopanax colensoi</i>	mountain five-finger
<i>Olearia bullata</i>	shrub daisy
<i>Ourisia macrophylla subsp. lactea</i>	mountain foxglove
<i>Phormium cookianum</i>	mountain flax, wharariki
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Podocarpus hallii</i>	thin-bark totara, Hall's totara
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prasophyllum colensoi</i>	leek orchid
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudognaphalium luteoalbum</i>	jersey cudweed
<i>Pteridium esculentum</i>	bracken
<i>Ranunculus foliosus</i>	buttercup
<i>Raoulia glabra</i>	mat daisy
<i>Raoulia monroi</i>	fan-leaved mat daisy
<i>Raoulia subsericea</i>	turf mat daisy, turf scabweed
<i>Rubus cissoides</i>	bush lawyer, tataramoa



<i>Rytidosperma unarede</i>	danthonia
<i>Scleranthus brockiei</i>	
<i>Scleranthus uniflorus</i>	
<i>Senecio glaucophyllus</i> subsp. <i>basinudus</i>	yellow rock groundsel
<i>Stellaria decipiens</i>	chickweed
<i>Thelymitra</i> species	sun orchid
<i>Uncinia rubra</i>	hook grass
<i>Viola cunninghamii</i>	white violet
<i>Viola filicaulis</i>	forest violet
<i>Wahlenbergia albomarginata</i>	NZ harebell
<b>Exotic species</b>	
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Cerastium glomeratum</i>	chickweed
<i>Clinopodium vulgare</i>	wild basil
<i>Cynosurus cristatus</i>	crested dogstail
<i>Hieracium lepidulum</i>	tussock hawkweed
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Lolium perenne</i>	ryegrass
<i>Mycelis muralis</i>	wall lettuce
<i>Pilosella officinarum</i>	mouse-ear hawkweed
<i>Pinus</i> species	pine
<i>Rytidosperma racemosum</i>	danthonia
<i>Rumex acetosella</i>	sheeps sorrel
<i>Linum catharticum</i>	purging flax
<i>Trifolium repens</i>	white clover
<i>Ulex europaeus</i>	gorse



## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Stony Beach

**Site number:** SES/A/27

**Physical address of site:** Stony Beach, Chorlton Road, Okains Bay

#### **Summary of Significance:**

This site is significant because it contains areas of rare and moderately representative vegetation. It supports an outstanding number of indigenous plant species that are nationally Threatened or At Risk and is part of an area that is considered to be the most important site for threatened tree daisies on Banks Peninsula. It supports three plant species that are uncommon within the ecological region or ecological district and another seven at their national distributional limit on Banks Peninsula. It also has eight invertebrate species that are nationally Threatened or At Risk, five that are endemic to Banks Peninsula, three that are uncommon in the ecological district and another three that are possibly new species. The site is part of an ecological network and is of particular importance in linking the high value forest patches in North-west Okains Bay and Donaldsons Bush.

#### **Site Map**





## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 18.95

**Central point: (NZTM):** E1603998, N5164398

## Site Description

This site is indigenous secondary forest, treeland and scrub on lowland hill slopes on the eastern and western slopes of Stony Beach Valley. The altitudinal range of the site extends from approximately sea level to 160 m above sea level. The aspect is north-west facing on the eastern side of Stony Beach and south and east-facing on the western side.

The main indigenous vegetation community at the site, as described by Wildland Consultants unpubl. data (2014a) is ngaio-lowland ribbonwood-kowhai/*Coprosma crassifolia*- *Coprosma virescens* treeland on lowland hill slopes.

The vegetation on the north-west facing slopes on the eastern side of Stony Beach comprises four patches of secondary growth hardwood treeland and forest. The majority of the vegetation consists of treeland over exotic pasture, however a narrow gully in the southern part of the site contains secondary growth forest with a denser canopy. Scattered fragrant tree daisy (*Olearia fragrantissima*) and *O. fimbriata* trees occur throughout the area and a single heart-leaved kōhūhū (*Pittosporum obcordatum*) grows here. The whole area is grazed by stock and the understorey contains relatively few native plant species and is generally quite sparse, apart from unpalatable species (Wildland Consultants unpubl. data 2014a).

The vegetation on the western side of Stony Beach consists of three patches of secondary growth treeland, forest and scrub. The land is relatively steep and contains scattered bands of small rock bluffs and outcrops. One large, emergent lowland totara (*Podocarpus totara*) grows in the northern-most patch near the beach. Five large, old fragrant tree daisy trees were found in the southern-most patch of forest-treeland. Rock outcrops provide refugia for a wide variety of native plants, including a suite of specialist species.

Indigenous birds recorded at the site during the botanical survey are bellbird (*Anthornis melanura melanura*), South Island fantail (*Rhipidura fuliginosa fuliginosa*), grey warbler (*Gerygone igata*), New Zealand kingfisher (*Halcyon sancta vagans*), paradise shelduck (*Tadorna variegata*) and silvereye (*Zosterops lateralis lateralis*) (Wildland Consultants unpubl. data 2014a).

## Extent of Site of Ecological Significance

The site includes the patches of indigenous forest, treeland and scrub on the eastern and western slopes of lower Stony Beach Valley east side of Chorlton Road.





## Assessment Summary

The Stony Beach Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

It supports distinctive plant communities that have an unusual suite of species including a high diversity of plants that are nationally Threatened or At Risk and at their distributional limits on Banks Peninsula (see criteria 4 and 5 below). It has the only population of *Olearia fimbriata* on Banks Peninsula (apart from two separate sites with single individuals) and is only the second known site for heart-leaved kōhūhū (Wildland Consultants unpubl. data 2014a). This vegetation community is likely to have been more widespread on Banks Peninsula in the past but is now probably the last remnant of this community type on Banks Peninsula. Because the whole area is grazed by stock the understorey contains relatively few native plant species and is generally quite sparse, apart from unpalatable species. Despite being degraded, this site is significant as the best (and only known) example of its type in the ecological district.

Rock outcrops on the western side of Stony Beach provide refugia for a representative variety of indigenous plants, including a suite of specialist species such as yellow rock groundsel (*Senecio glaucophyllus subsp. basinudus*), New Zealand linen flax (*Linum monogynum*), *Chenopodium allanii*, and Banks Peninsula hebe (*Hebe strictissima*).

The site supports an invertebrate assemblage that is representative of the distinctive vegetation assemblages at the site. There is a diverse range of both herbivores and detritivores at the site (Wildland Consultants unpubl. data 2015).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.



The patches of secondary growth hardwood forest, treeland and scrub within the site are significant under this criterion because they include part of the largest population of *O. fimbriata* on Banks Peninsula (Walls 2001) and are now probably the last remnant of this community type on Banks Peninsula.

### Rarity/Distinctiveness

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

At least parts of the site are significant under this criterion.

The forest, treeland and scrub within the site is likely to be significant under this criterion. The distinctive suite of species found at this site (see criterion 6) would probably have been more widespread on Banks Peninsula before major vegetation clearance by humans. This site is possibly the last remnant of this community type in the Ecological Region.

In addition, coastal and lowland forest has been reduced to a tiny area of its former extent at the Region and ecological district scales. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 10% and the extent of all indigenous woody vegetation within the ecological district, as mapped in the New Zealand Landcover Database (Version 4), is 17.8%.

Indigenous vegetation on the higher elevation (mid to upper) slopes and broad ridges within the site are on an Acutely Threatened land environment (F3.1a) where <10% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has nine indigenous plant species that are nationally Threatened or At Risk, and three that are uncommon within the ecological region or ecological district (Wildland Consultants unpubl. data 2014a), eight invertebrate species that are nationally Threatened or At Risk, five that are endemic to Banks Peninsula, three that are uncommon in the ecological district and another two that are possibly new species.

### Plants

Nationally Threatened and At Risk species (de Lange et al. 2013) recorded from the site (Wildland Consultants unpubl. data 2014a) are:



- Heart-leaved kōhūhū (*Pittosporum obcordatum*) (Threatened - Nationally Vulnerable) – single shrub. This species is only known from one other (nearby) location on Banks Peninsula.
- *Olearia fimbriata* (Threatened - Nationally Vulnerable) - 10 adult trees, no juveniles. This species is very rare on Banks Peninsula, and is only known from two other sites nearby (Walls 2001).
- Fragrant tree daisy (*Olearia fragrantissima*) (At Risk - Declining) – 8 adult trees, no juveniles
- *Coprosma virescens* (At Risk - Declining) – frequent throughout the site
- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- Banks Peninsula button daisy (*Leptinella minor*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula) – one patch
- Fierce lancewood (*Pseudopanax ferox*) (At Risk - Naturally Uncommon) - four trees, three adults and 1 juvenile.
- *Chenopodium allanii* (At Risk - Naturally Uncommon)
- yellow rock groundsel (*Senecio glaucophyllus* subsp. *basinudus*) (At Risk - Naturally Uncommon) – on rock outcrops

Plant species recorded from the site (Wildland Consultants unpubl. data 2014a) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- Shining broadleaf (*Griselinia lucida*) - two trees on rock outcrops where they are inaccessible to stock
- Leatherleaf fern (*Pyrrosia eleagnifolia*)
- Climbing shore spinach (*Tetragonia implexicoma*) – uncommon on rock outcrops

### Invertebrates

Nationally Threatened and At Risk invertebrate species recorded from the site (Wildland Consultants unpubl. data 2015) are:

- *Declana toreuta* (Threatened - Nationally Vulnerable)
- *Pseudocoremia cineracia* (Threatened - Nationally Vulnerable)
- *Stathmopoda endotherma* (At Risk - Naturally uncommon)
- *Zelleria sphenota* (At Risk – Declining)
- *Declana griseata* (At Risk – Declining)
- *Tatosoma agrionata* (At Risk – Declining)
- Banks Peninsula ground beetle (*Megadromus guerenii*) (At Risk – Declining, endemic)
- *Meterana exquisita* (At Risk –Relict)

Endemic invertebrate species recorded from the site (Wildland Consultants unpubl. data 2015) are:

- A flatworm (*New Zealandia sp. nr moseleyi*)
- *Kikihia 'new species'*
- Great giant scale (*Coelostomidia ?zealandica*)
- *Celatoblatta peninsularis* Banks Peninsula cockroach

Invertebrates recorded from the site (Wildland Consultants unpubl. data 2015) that are uncommon in the Akaroa Ecological District are:



- *Phycomorpha metachrysa*
- *Tingena nsp.* (first record for Banks Peninsula BP)
- *Stathmopoda nsp. "olearia"* (first record for Banks Peninsula BP)

Three invertebrate species recorded from the site (Wildland Consultants unpubl. data 2015) are possible new species:

- A chafer (*Odontria 'large'*)
- Stag beetle (*Ceratognathus sp.*)
- *Thelyphassa nr. brouni*

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

It has six species at their southern national or regional limits on Banks Peninsula and one at its northern national limit on Banks Peninsula (Wildland Consultants unpubl. data 2014a). These species are:

- Shining spleenwort (*Asplenium oblongifolium*) (southern national limit)
- Titoki (*Alectryon excelsus*) (southern national limit)
- Akeake (*Dodonaea viscosa*) (southern national limit)
- Shining broadleaf (*Griselinia lucida*) (southern regional limit)
- Fragrant tree daisy (*Olearia fragrantissima*) (northern national limit)
- Native passion vine (*Passiflora tetrandra*) (southern national limit)
- Kawakawa (*Piper excelsum*) (southern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

The plant communities within the site are very distinctive because of the unusual suite of species present and diversity of species at their southern distributional limit (perhaps influenced by a warm microclimate in combination with clay soils). This is the only population of *Olearia fimbriata* on Banks Peninsula (apart from two separate sites with single individuals), and only the second known site for heart-leaved kōhūhū. The presence of these species on north-facing slopes is also rather unusual. However, these species would probably have been more widespread on Banks Peninsula in the past (before major vegetation clearance by humans), and Stony Beach probably reflects the last remnants of this community type on Banks Peninsula.

The invertebrate assemblage at the site is also distinctive reflecting the distinctive plant communities present at the site. The moth, beetle and bug fauna associated with *Olearia fimbriata*, (which includes four moth species that are new records for Banks Peninsula, three of which are nationally Threatened) is the only assemblage of its type known from Banks Peninsula. Also the moth *Phycomorpha metachrysa*, for which small-leaved milk tree (*Streblus*



*heterophyllus*) is the plant host, is only one of two populations known on Banks Peninsula (Wildland Consultants unpubl. data 2015).

### Diversity and Pattern

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

Despite having a high number of nationally Threatened and At Risk plant species relative to other sites, and a number of species at their distributional limits on Banks Peninsula, the site does not support a high diversity of indigenous ecosystem or habitat types or plant taxa. However, it does support a high diversity of invertebrates, particularly moths, as indicated by high diversity in certain genera (*Declana* (5 species), *Tingena* (7 species), *Stathmopoda* (5 species) and *Meterana* (7 species)) (Wildland Consultants unpubl. data 2015).

### Ecological Context

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is significant under this criterion.

The indigenous vegetation within the site, in conjunction with other similar patches in the wider area, is part of a network that is important for the movement and dispersal of indigenous fauna and potentially in providing a corridor for the expansion of rare plant species such as heart-leaved kōhūhū and *Olearia fimbriata*. Of particular importance is its role in linking the forest patches in North-west Okains Bay and Donaldsons Bush that are of very high ecological value. The secondary growth hardwood forest-treeland-scrub on the western side of Stony Beach connects Donaldsons Bush and the coast.

- 9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. There are no wetlands within the site.

- 10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

It provides important habitat for populations of indigenous invertebrates, including a high proportion of nationally Threatened and At Risk and endemic species. It is



also important as a stronghold for specialist invertebrates associated with small-leaved milk tree and *Olearia fimbriata*.

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## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Stock. The site is grazed and there is very little regeneration of native plant species (Wildland Consultants unpubl. data 2014a).</li> </ul>	<ul style="list-style-type: none"> <li>If feasible, consider light sheep grazing to maintain ecological values and encourage recruitment of shrublands.</li> <li>Consider fencing the higher value areas of forest and treeland. High priority areas are those with more mature forest and areas that support heart-leaved kōhūhū, <i>Olearia fimbriata</i> and fragrant tree daisy (see recommendations below regarding management of <i>Olearia</i>).</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about advantages to biodiversity and options for stock management, and assistance where appropriate</li> <li>Collaboration with agencies and other groups about assistance with fencing if landowners opt for it.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants. Few of the exotic plant species within the site are ecological weeds. Pigs ear (<i>Cotyledon orbiculata</i>) has invaded some rock outcrops on the western side of the valley. This species is a threat to native plants which grow in the same habitats. Sweet briar (<i>Rosa rubiginosa</i>) is rare on the western side of the valley (Wildland Consultants unpubl. data 2014a).</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling pigs ear to protect rock out crop communities with the aim of containing it to the coastal cliffs.</li> <li>Consider controlling sweet briar.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about pest plant monitoring and control.</li> <li>Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Pest animals. Rabbits were recorded from the</li> </ul>	<ul style="list-style-type: none"> <li>Consider monitoring rabbit numbers and</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowners about</li> </ul>

site (Wildland Consultants unpubl. data 2014a).	controlling them if densities increase.	monitoring and control of pest animals.
<ul style="list-style-type: none"> <li>Lack of recruitment of <i>Olearia fimbriata</i> or fragrant tree daisy. No seedlings or juveniles of either <i>Olearia</i> species were found, and all the trees appear to be very old. It appears that the numbers of plants of both species have declined since Walls' (2001) survey (Wildland Consultants unpubl. data 2014a). Recruitment of this species is important for the survival of host-specific invertebrates.</li> </ul>	<ul style="list-style-type: none"> <li>Consider installing stock-proof (and ideally rabbit-proof) fencing around the forest/scrub in the southern gully and other areas with <i>Olearia fimbriata</i> (priority) or fragrant tree daisy.</li> <li>Monitor recruitment.</li> <li>Supplementary planting of progeny raised from seed collected from the site into appropriate and fenced habitats could be considered to maintain these populations.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about advantages to biodiversity and options for land management.</li> <li>Collaboration with agencies and other groups about assistance with fencing if landowner opts for it.</li> <li>Encourage collaboration with ecologists / universities for seed collection and possible planting.</li> </ul>

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**Assessment completed by:** Scott Hooson  
**Date:** 26 January 2015

**Statement completed by:** Scott Hooson  
**Date:** 26 January 2015

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2014a).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Alectryon excelsus</i>	titoki
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium oblongifolium</i>	shining spleenwort, huruhuruwhenua
<i>Calystegia tuguriorum</i>	NZ bindweed, pōwhiwhi
<i>Carmichaelia australis</i>	native broom, common broom
<i>Cardamine species</i>	bittercress
<i>Chenopodium allanii</i>	
<i>Clematis afoliata</i>	leafless clematis
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, tī kōuka
<i>Corokia cotoneaster</i>	korokio
<i>Crassula sieberiana</i>	stonecrop
<i>Dichondra repens</i>	Mercury Bay weed, dichondra
<i>Dodonaea viscosa</i>	akeake
<i>Fuchsia excorticata X perscandens</i>	shrubby fuchsia
<i>Geranium aff. microphyllum</i>	native geranium
<i>Griselinia lucida</i>	shining broadleaf, puka
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum lanceolatum</i>	ninia
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Korthalsella lindsayi</i>	dwarf mistletoe
<i>Kunzea robusta</i>	kānuka, mānuka, kopuka
<i>Leptinella minor</i>	Banks Peninsula button daisy
<i>Linum monogynum</i>	NZ linen flax
<i>Lophomyrtus obcordata</i>	rōhutu, NZ myrtle
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Muehlenbeckia australis</i>	large-leaved pōhuehue
<i>Muehlenbeckia complexa</i>	scrub pōhuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine divaricata</i>	weeping matipo, weeping māpou
<i>Olearia fimbriata</i>	
<i>Olearia fragrantissima</i>	fragrant tree daisy
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	yellow oxalis
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parietaria debilis</i>	NZ pellitory



<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum obcordatum</i>	heart-leaved kōhūhū
<i>Plagianthus regius</i>	lowland ribbonwood, mānatu
<i>Poa imbecilla</i>	weak poa
<i>Podocarpus totara</i>	lowland tōtara
<i>Polystichum oculatum</i>	shield fern
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Pyrosia eleagnifolia</i>	leatherleaf fern
<i>Rubus squarrosus</i>	leafless bush lawyer, tātarāmoa
<i>Scandia geniculata</i>	climbing aniseed
<i>Senecio glaucophyllus</i> subsp. <i>basinudus</i>	yellow rock groundsel
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	small-leaved kōwhai
<i>Streblus heterophyllus</i>	small-leaved milk tree, tūrepo
<i>Tetragonia implexicoma</i>	climbing shore spinach
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Wahlenbergia gracilis</i>	NZ harebell
<b>Exotic species</b>	
<i>Agrostis capillaris</i>	brown top
<i>Anthriscus caucalis</i>	beaked parsley
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Bellis perennis</i>	daisy
<i>Bromus diandrus</i>	rippgut brome
<i>Bromus hordeaceus</i>	soft brome
<i>Carduus tenuiflorus</i>	winged thistle
<i>Cerastium glomeratum</i>	chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Claytonia perfoliata</i>	miners lettuce
<i>Cotula australis</i>	common cotula, soldiers button
<i>Cotyledon orbiculata</i>	pig's ear, elephant's ear
<i>Cupressus macrocarpa</i>	macrocarpa, Monterey cypress
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Euphorbia peplus</i>	petty spurge, milkweed
<i>Fumaria muralis</i>	scrambling fumitory
<i>Galium aparine</i>	cleavers
<i>Geranium dissectum</i>	cut-leaved cranesbill
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Juncus bufonius</i>	toad rush
<i>Lolium perenne</i>	ryegrass
<i>Marrubium vulgare</i>	horehound
<i>Medicago arabica</i>	spotted bur medick
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Ranunculus parviflorus</i>	small-flowered buttercup
<i>Ribes uva-crispa</i>	gooseberry
<i>Rosa rubiginosa</i>	sweet briar, briar rose



<i>Sherardia arvensis</i>	field madder
<i>Sisymbrium officinale</i>	hedge mustard
<i>Solanum nigrum</i>	black nightshade
<i>Sonchus oleraceus</i>	puha, smooth sow thistle
<i>Stellaria media</i>	chickweed
<i>Trifolium dubium</i>	suckling clover
<i>Trifolium repens</i>	white clover
<i>Trifolium subterraneum</i>	subterranean clover
<i>Urtica urens</i>	nettle
<i>Veronica arvensis</i>	field speedwell
<i>Vicia sativa</i>	vetch
<i>Vittadinia gracilis</i>	purple fuzzweed

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## Appendix 2: Invertebrate Species List

Sourced from Wildland Consultants unpubl. data (2015)

Order	Family	Scientific Name	Common Name	Species Status
<b>Indigenous species</b>				
TUBELLARIA	Geoplanidae	<i>New Zealandia sp. near moseleyi</i>	flatworm	endemic
BLATTODEA	Blattidae	<i>Celatoblatta peninsularis</i>	BP cockroach	endemic to BP
PSEUDOSCORPIONES		<i>indet. species</i>	Pseudoscorpion	
MEGALOPTERA	Corydalidae	<i>Archichauliodes diversus</i>	dobsonfly	
NEUROPTERA	Hemerobiidae	<i>Drepanacra binocula</i>	lacewing	
		<i>Micromus tasmaniae</i>	lacewing	
HEMIPTERA	Tibicinidae	<i>Amphipsalta strepitans</i>	rock cicada	
		<i>Kikihia new species</i>		endemic
	Margarodidae	<i>Coelostomidia ?zealandica</i>	great giant scale	endemic
	Pentatomidae	<i>Oncacontias vittatus</i>	shieldbug	
	Miridae	<i>Bipuncticoris species</i>		
	Reduviidae	<i>?Empicoris sp.</i>	threadbug	??

ORTHOPTERA	Tettigoniidae	<i>Conocephalus bilineatus</i>	katydid	
	Rhaphidophoridae	<i>Pleioplectron simplex</i>	cave weta	common
	Gryllidae	<i>Pteronemobius bigelowi</i>	cricket	
Diptera			fruit fly	
	Acrididae	<i>Phaulacridium marginale</i>	grasshopper	
below to check				
COLEOPTERA	Carabidae	<i>Megadromus guerenii</i> <i>Demetridia dieffenbachii</i>	BP ground beetle	endemic; At Risk Declining
	Cerambycidae	<i>Prionoplus reticularis</i>	huhu	
	Cleridae	<i>Phymatopoca sp. 1 indet.</i> <i>Phymatopoca sp. 2 indet.</i>		
	Coccinellidae	<i>Coccinella leonina</i> <i>species indet.</i>	ladybird	
	Curculionidae	<i>Pentathrum sp.</i>		
	Scarabaeidae	<i>Costelytra zelandica</i> <i>Odontria striata</i> <i>Odontria 'pale'</i> <i>Odontria 'large'</i>	Common grassgrub striped chafer chafer chafer	possible new species possible new species
	Lucanidae	<i>Ceratognathus sp.</i>	stag beetle	possible new species
	Oedemeridae	<i>Thelyphassa nr. browni</i>		??
	Anobidae	<i>Ptinus tectus</i>	spider beetle	

		<i>Ptininae Indet. sp. 1</i>		??
		<i>Ptininae Indet. sp. 2</i>		??
	Lathridiidae	<i>Lithostygnus sp.</i>		
	Corylophidae	<i>Anisomeristes sp.</i>		
	Dermestidae	<i>Trogoderma ?antimale</i>		
	Scirtidae	<i>sp. indet.</i>		
	Zopheridae	<i>Colydiinae indet.</i> <i>Pycnomerus sp. indet.</i>		
HYMENOPTERA	Formicidae	<i>Monomorium antarcticum</i>		ant
	Ichneumonidae	<i>Netelia producta</i>		ichneumonid wasp
	Vespulidae	<i>Vespula vulgaris</i>		common wasp
LEPIDOPTERA	Hepialidae	<i>Wiseana copularis</i> <i>Wiseana cervinata</i> <i>Wiseana umbraculata</i>		porina moth porina moth striped porina moth
	Nepticulidae	<i>Stigmella ilsea</i>		
	Tineidae	<i>Erechthias fulguritella</i> <i>Sagephora phortigera</i>		
	Psychidae	<i>Liothula omnivora</i>		casemoth
	Elachistidae	<i>Cosmiotes ombrodoxa</i>		

	Yponomeutidae	<i>Zelleria sphenota</i>		At Risk, Declining
	Plutellidae	<i>Plutella antiphona</i>		
	Carposinidae	<i>Heterocrossa gonosemana</i>		
	Copromorphidae	<i>Phycomorpha metachrysa</i>		uncommon in ED
	Gelechiidae	<i>Anisoplaca achyrotia</i>		
		<i>Kiwaia monophragma</i>		
		<i>Kiwaia schematica</i>		
	Oecophoridae	<i>Phaeosaces apocrypta</i>		
		<i>Phaeosaces coarctatella</i>		
		<i>Gymnobathra omphalota</i>		
		<i>Gymnobathra parca</i>		
		<i>Hierodoris s-fractum</i>		
		<i>Izatha copiosella</i>		
		<i>Izatha katadiktya</i>		
		<i>Izatha convulsella</i>		
		<i>Leptocroca scholaea</i>		
		<i>Tingena chloradelpha</i>		
		<i>Tingena siderodeta</i>		
		<i>Tingena melanamma</i>		
		<i>Tingena melinella</i>		
		<i>Tingena plagiata</i>		
		<i>Tingena paula</i>		
		<i>Tingena nsp.</i>		uncommon in ED; first BP record
		<i>Trachypepla conspicuella</i>		
	Stathmopodidae	<i>Stathmopoda endotherma</i>		Naturally uncommon
		<i>Stathmopoda horticola</i>		
		<i>Stathmopoda nsp. "olearia"</i>		uncommon in ED; first



				BP record
		<i>Stathmopoda aposema</i>		
		<i>Stathmopoda holochra</i>		
	Pterophoridae	<i>Platyptilia repletalis</i>	hebe plumemoth	
	Tortricidae	<i>Apoctena orthropis</i>		
		<i>Capua intractana</i>		
		<i>Capua semifera</i>		
		<i>Cnephasia jactatana</i>		
		<i>Ctenopseustis obliquana</i>		
		<i>Catamacta gavisana</i>		
		<i>Dipterina imbriferana</i>		
		<i>Harmologa amplexana</i>		
		<i>Harmologa scoliastes</i>		
		<i>Harmologa nsp.</i>		
		<i>Merophyas leucaniana</i>		
		<i>Planotortrix excessana</i>		
		<i>Prothlymna antiquana</i>		
		<i>New genus and species</i>		
	Crambidae	<i>Deana hybreasalis</i>		
		<i>Eudonia aspidota</i>		
		<i>Eudonia manganeutis</i>		
		<i>Eudonia steropaea</i>		
		<i>Eudonia philerga</i>		
		<i>Eudonia leptalea</i>		
		<i>Eudonia sabulosella</i>		
		<i>Eudonia submarginalis</i>		
		<i>Gadira acerella</i>		
		<i>Glaucocharis chrysochyta</i>		
		<i>Glaucocharis elaina</i>		
		<i>Hygraula nitens</i>		
		<i>Orocrambus flexuosellus</i>		

		<i>Orocrambus ramosellus</i>		
		<i>Orocrambus vittellus</i>		
		<i>Orocrambus vulgaris</i>		
		<i>Scoparia chalicodes</i>		
		<i>Scoparia halopis</i>		
		<i>Scoparia ustimacula</i>		
		<i>Udea flavidalis</i>		
		<i>Udea marmarina</i>		
		<i>Uresiphita maoralis</i>	kowhai moth	
	GEOMETRIDAE	<i>Asaphodes aegrota</i>		
		<i>Asaphodes chlamydota</i>		
		<i>Austrocidaria callichlora</i>		
		<i>Austrocidaria gobiata</i>		
		<i>Austrocidaria similata</i>		
		<i>Chloroclystis inductata</i>		
		<i>Chloroclystis sphragitis</i>		
		<i>Cleora scriptaria</i>		
		<i>Declana griseata</i>		At Risk, Declining
		<i>Declana floccosa</i>		
		<i>Declana niveata</i>		
		<i>Declana junctilinea</i>		
		<i>Declana toreuta</i>		Nationally Vulnerable
		<i>Elvia glaucata</i>		
				Epiphyrne undosata
		<i>Epiphyrne verriculata</i>		
		<i>Epyaxa lucidata</i>		
		<i>Epyaxa rosearia</i>		
		<i>Epyaxa venipunctata</i>		
		<i>Gellonia dejectaria</i>		
		<i>Gellonia pannularia</i>		
		<i>Horisma suppressaria</i>		
		<i>Homodotis megaspilata</i>		
		<i>Helastia cinerearia</i>		

		<i>Helastia corcularia</i>	
		<i>Helastia triphragma</i>	
		<i>Pasiphila muscosata</i>	
		<i>Pasiphila sandycias</i>	
		<i>Pasiphila urticae</i>	
		<i>Poecilasthena schistaria</i>	
		<i>Pseudocoremia cineracia</i>	Nationally Vulnerable
		<i>Pseudocoremia indistincta</i>	
		<i>Pseudocoremia leucelaea</i>	
		<i>Pseudocoremia pergrata</i>	
		<i>Pseudocoremia suavis</i>	
		<i>Scopula rubraria</i>	
		<i>Tatosoma agrionata</i>	At Risk, Declining
		<i>Xanthorhoe semifissata</i>	
	Noctuidae	<i>Agrotis ipsilon</i>	
		<i>Bityla defigurata</i>	
		<i>Feredayia graminosa</i>	
		<i>Graphania beata</i>	
		<i>Graphania disjungens</i>	
		<i>Graphania infensa</i>	
		<i>Graphania insignis</i>	
		<i>Graphania lithias</i>	
		<i>Graphania mutans</i>	
		<i>Graphania plena</i>	
		<i>Graphania ustistriga</i>	
		<i>Meterana coelena</i>	
		<i>Meterana decorata</i>	
		<i>Meterana diatmeta</i>	
		<i>Meterana exquisita</i>	At Risk, Relict
		<i>Meterana levis</i>	
		<i>Meterana ochthistis</i>	
		<i>Meterana stipata</i>	
		<i>Persectania aversa</i>	

		<i>Proteuxoa comma</i>		
		<i>Tmetolophota unica</i>		
	Erebidae	<i>Nyctemera annulata</i>	magpie moth	
		<i>Rhapsa scotoscialis</i>		
	Lycaenidae	<i>Lycaena "common copper"</i>	common copper	
	Nymphalidae	<i>Vanessa gonerilla</i>	red admiral	
		<i>Vanessa itea</i>	yellow admiral	
PHASMIDA	Phasmidae	<i>Clitarchus hookeri</i>	stick insect	
<b>Exotic species</b>				
LEPIDOPTERA	Tineidae	<i>Monopis ethelella</i>		
	Geometridae	<i>Chloroclystis filata</i>		
	Pieridae	<i>Pieris rapae</i>	white butterfly	
ARANEAE	Lycosidae	<i>Anoteropsis hilaris</i>		
	Gnaphosidae	<i>Zelanda kaituna</i>		
	Araneidae	<i>Cryptaranea albolineata</i>		
	Idiopidae	<i>Cantuarina sp. (probably C. dendyi)</i>	Trapdoor spider	



## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Paua Bay Valley

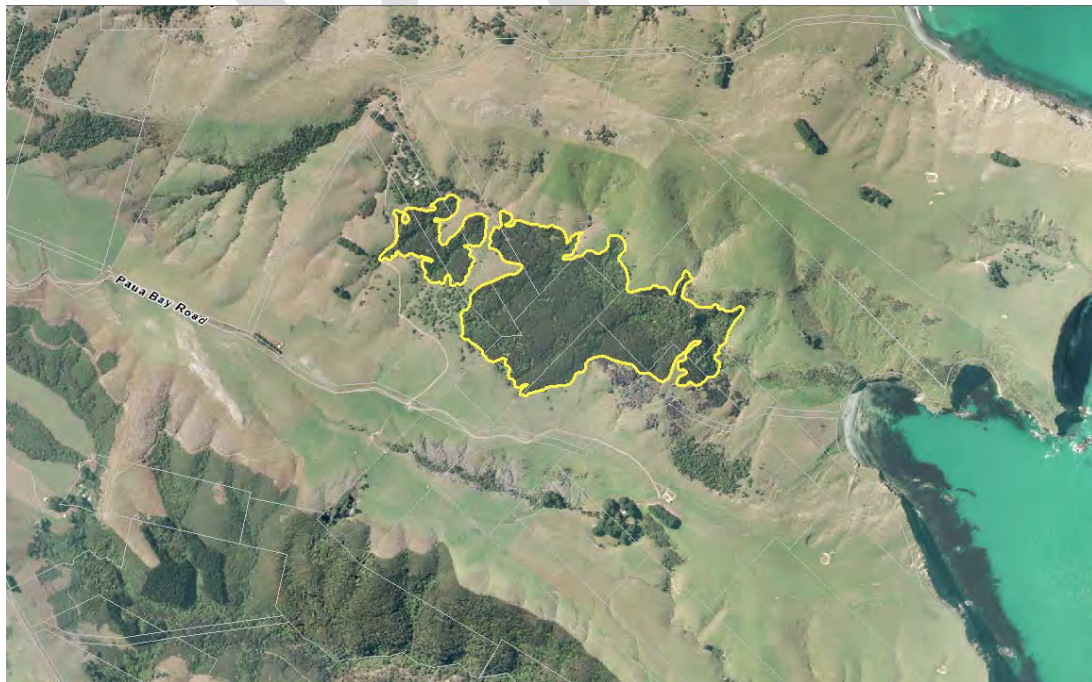
**Site number:** SES/A/28

**Physical address of site:** Paua Bay Road, Akaroa

#### **Summary of Significance:**

The site is significant because it contains a large example of representative and rare indigenous lowland forest with nationally At Risk, endemic and uncommon plant and invertebrate species. The abundance and diversity of plant species at their southern distributional limit is also a feature of this site. The site buffers Paua Bay Stream and two small tributaries and it is an important part of a network of other forest patches in the wider landscape.

#### **Site Map**



## Additional Site Information

**Ecological District:** Akaroa

**Area of SES (ha):** 73.72

**Central point (NZTM):** E1606744, N5148222

## Site Description

The site is an area of indigenous forest in the lower part of Paua Bay Valley. Paua Bay Stream flows through the middle of the site. The altitudinal range of the site is from approximately 20 to 160 m above sea level. It was identified by the Department of Conservation as a Recommended Area for Protection (Akaroa RAP 22 – Paua Bay) (Wilson 1992).

Wildland Consultants unpubl. data (2012) describe the vegetation communities of the site. They are:

- (Totara-matai-kahikatea)/mixed secondary hardwood forest with remnant podocarps occurring along Paua Bay stream and the south-facing slopes of the valley.
- Secondary kanuka-mahoe forest mostly occurring on the drier, north-facing side of the valley.

These communities are described in more detail below (from Wildland Consultants unpubl. data 2012).

The margins of Paua Bay Stream and adjacent south-facing slopes support mixed secondary hardwood forest with occasional remnant podocarps (lowland totara, (*Podocarpus totara*) kahikatea (*Dacrycarpus dacrydioides*) and matai (*Prumnopitys taxifolia*)) that are emergent above the main canopy. Juveniles of all three podocarp species are present. The main canopy species are mahoe (*Melicytus ramiflorus*), titoki (*Alectryon excelsus*), kaikomako (*Pennantia corymbosa*), and kanuka (*Kunzea robusta*). *Coproma rhamnoides*, kawakawa (*Piper excelsum*), rohutu (*Lophomyrtus obcordata*), ongaonga (*Urtica ferox*) and shield fern (*Polystichum neozelandicum*) are the most common understorey plants. A notable feature of this vegetation type is the presence of nikau (*Rhopalostylis sapida*). There is a rocky area with steep bluffs at the lower end of Paua Bay Stream with scattered shining broadleaf (*Griselinia lucida*) and Banks Peninsula hebe (*Hebe strictissima*) and a small area of shrubland (dominated by small-leaved *Coprosma* species) along the northern rim of the bluffs. The central part of this vegetation type has been protected by a conservation covenant (Banks Peninsula Conservation Trust) and stock have been excluded from the covenant by fencing and the steep terrain. There is excellent regeneration of palatable native species within the covenant, however outside the covenant the understorey is open and dominated by unpalatable species such as *Coproma rhamnoides* and ongaonga. The site is free of biodiversity pest plants, and there is no obvious possum damage.



The secondary kanuka-mahoe forest consists of secondary growth forest dominated by kanuka, with mahoe and other native hardwoods such as kaikomako and kowhai (*Sophora microphylla*) along the stream channels. Occasional young podocarps were seen (mostly matai). Native vines, particularly native jasmine (*Parsonsia heterophylla*), are common. The majority of the area is grazed by stock (sheep and/or cattle), however part of the forest has been protected by a Banks Peninsula Conservation Trust covenant and stock have been excluded from the covenant by fencing. Outside the covenant, the understorey contains relatively few palatable species, and is dominated by small-leaved *Coprosma* species (particularly *C. areolata* and *C. rhamnoides*) and ongaonga, however there is good regeneration of a variety of native species inside the covenant.

Indigenous birds recorded at the site are bellbird (*Anthornis melanura melanura*), South Island fantail (*Rhipidura fuliginosa fuliginosa*), grey warbler (*Gerygone igata*), shining cuckoo (*Chrysococcyx lucidus lucidus*), New Zealand pigeon (*Hemiphaga novaeseelandiae novaeseelandiae*) and silvereye (*Zosterops lateralis lateralis*) (Wildland Consultants unpubl. data 2012, Hutchison 2008a, Wilson 1992). The carabid beetle (*Mecodema howitti*) and the Banks Peninsula tree weta (*Hemideina ricta*), which are both endemic to Banks Peninsula, occur at the site (Townsend et al. 1997, Bowie et al. 2011, 2014).

### **Extent of Site of Ecological Significance**

The site includes the (totara-matai-kahikatea)/mixed secondary hardwood forest and secondary kanuka-mahoe forest. The area of sprayed kanuka on the north-facing side of the valley is not included in the Site of Ecological Significance.

### **Assessment Summary**

The Paua Bay Valley Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 5), diversity and pattern (criterion 7) and ecological context criteria (criterion 8).

### **Assessment against Significance Criteria**

#### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.



It has a representative composition of canopy species including large remnant matai, kahikatea and totara (as well as juveniles of all three podocarp species) (Wildland Consultants unpubl. data 2012). The secondary kanuka-mahoe forest also contains a representative diversity of indigenous hardwood tree species with occasional young podocarps. The site is almost entirely free of biodiversity pest plants (Wildland Consultants unpubl. data 2012). Inside the fenced covenant there is a well developed understorey. Overall the site is a good example of its type in the ecological district and is representative of forest on lowland hill slopes in the Akaroa Ecological District (ED).

**2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

The site is a relatively large example of lowland podocarp/hardwood forest in the Akaroa ED.

**Rarity/Distinctiveness**

**3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

Lowland forest has been reduced to a fragment of its former extent at the Region and ecological district scales. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and kanuka) in the ED is estimated to be 10% (17.8% including manuka and kanuka) (New Zealand Landcover Database (Version 4)).

This site also meets this criterion at the Level IV land environment scale. It is entirely on Acutely and Chronically Threatened land environments (F3.1a and F3.1b) where 9.9 and 12.2% indigenous vegetation is left on these land environments nationally (Walker et al. 2007).

**4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.***

The site is significant under this criterion.

It has several indigenous plant species that are either At Risk nationally, uncommon within the ecological region or ecological district, and two terrestrial invertebrate species that are At Risk nationally. One of these plants and both invertebrates are also endemic to Banks Peninsula.

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Wildland Consultants unpubl. data 2012) are:





- Climbing groundsel (*Brachyglottis sciadophila*) (At Risk - Declining)
- Banks Peninsula hebe (*Hebe strictissima*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- Yellow rock groundsel (*Senecio glaucophyllus subsp. basinudus*) (At Risk - Naturally Uncommon)

Plant species recorded from the site (Wildland Consultants unpubl. data 2012) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Carex secta*
- Shining broadleaf (*Griselinia lucida*)
- Smooth shield fern (*Lastreopsis glabella*)
- Nikau (*Rhopalostylis sapida*) (several adults and seedlings)
- Climbing fuchsia (*Fuchsia perscandens*)

The two nationally At Risk and endemic invertebrate species recorded from the site are:

- A carabid beetle (*Mecodema howitti*) (At Risk - Declining, endemic to Banks Peninsula) (Bowie et al. 2011)
- Banks Peninsula tree weta (*Hemideina ricta*) (At Risk - Naturally Uncommon, endemic to the eastern side of Banks Peninsula (Townsend et al. 1997, Bowie et al. 2014).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

The abundance and diversity of plant species at their southern distributional limit is a feature of this site. There are seven species that are at their southern national limit on Banks Peninsula (Wildland Consultants unpubl. data 2012). These species are:

- Titoki (*Alectryon excelsus*) (southern national limit)
- Shining spleenwort (*Asplenium oblongifolium*) (southern national limit)
- Pigeonwood (*Hedycarya arborea*) (southern regional limit),
- Shining broadleaf (*Griselinia lucida*) (uncommon and southern regional limit)
- Native passion vine (*Passiflora tetrandra*) (southern national limit),
- Kawakawa (*Piper excelsum*) (southern national limit),
- Nikau (*Rhopalostylis sapida*) (uncommon and southern regional limit).

Wilson (1992) also recorded the fern *Loxogramme dictyopteris*<sup>1</sup> at the site but it was not recorded during more recent surveys. This species is at its southern regional limit in the Akaroa ED.

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

<sup>1</sup> Referred to as *Arthropteris lanceolata* in Wilson (1992).



The site is not significant under this criterion. It does not have indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.

### **Diversity and Pattern**

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

The lowland hardwood/podocarp forest supports a diverse range of indigenous plant taxa relative to other examples of this forest type in the ED. Eighty-eight species were recorded at the site in a recent botanical survey (Wildland Consultants unpubl. data 2012).

### **Ecological Context**

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

It includes a large area of continuous riparian forest that buffers Paua Bay Stream and two of its small tributaries. It is in close proximity to other forest patches and its moderate to large size and relative intactness means it is likely to be important as part of a network of other forest patches in the wider landscape.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess the site against this criterion.

## Site Management

### Existing Protection Status

Partially protected. The site contains two Banks Peninsula Conservation Trust covenants (refer to Site Map, page 1).

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Stock browse (Wildland Consultants unpubl. data 2012)</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the remainder of the site to keep stock out and promote seedling recruitment and recovery of the understorey.</li> </ul>	<ul style="list-style-type: none"> <li>Discussions with landowners about the benefits to biodiversity and options for stock management.</li> <li>Assistance with fencing where appropriate and with landowner agreement.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants. There are few weeds of concern within the site but garden escapes from the dwelling at the western end of the site are a potential threat.</li> <li>Ongoing invasion via bird and wind dispersal.</li> </ul>	<ul style="list-style-type: none"> <li>Consider ongoing surveillance for, and control if detected, of biodiversity pest plants such as banana passionfruit (<i>Passiflora</i> sp.) and old mans beard (<i>Clematis vitalba</i>).</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowners about monitoring and control of pest plants.</li> </ul>
<ul style="list-style-type: none"> <li>Areas of kanuka forest on the north-facing slopes have previously been sprayed with herbicide.</li> </ul>	<ul style="list-style-type: none"> <li>Consider not spraying or clearing vegetation on the margins of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Discussions with landowners about the benefits to biodiversity of not spraying, and alternative options available.</li> </ul>
<ul style="list-style-type: none"> <li>Possums. Possums appear to be at low densities within the site and currently are not causing obvious damage.</li> </ul>	<ul style="list-style-type: none"> <li>Monitor possum densities within the site and possum damage to preferred species. Control as required.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowners about monitoring and control of possums.</li> </ul>

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**Assessment completed by:** Scott Hooson  
**Date:** 9 September 2014

**Statement completed by:** Scott Hooson  
**Date:** 9 September 2014

**Statement updated by:**  
**Date:**

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.

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## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2012).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Alectryon excelsus</i>	titoki
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Asplenium oblongifolium</i>	shining spleenwort, huruhuruwhenua
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum minus</i>	swamp kiokio
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carex secta</i>	niggerhead, pukio
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma propinqua x robusta</i>	
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Cyathea smithii</i>	Smith's tree fern, katote
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	Mercury Bay weed, dichondra
<i>Dicksonia squarrosa</i>	wheki, rough tree fern
<i>Echinopogon ovatus</i>	hedgehog grass
<i>Epilobium species</i>	willow herb
<i>Euchiton species</i>	cudweed
<i>Fuchsia excorticata x perscandens</i>	shrubby fuchsia
<i>Fuchsia perscandens</i>	climbing fuchsia
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Griselinia lucida</i>	shining broadleaf, puka
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum lanceolatum</i>	ninia
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort



<i>Hypolepis ambigua</i>	pig fern
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea robusta</i>	kanuka
<i>Lagenifera pumila</i>	papataniwhaniwha
<i>Lastreopsis glabella</i>	smooth shield fern
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Metrosideros diffusa</i>	white climbing rata
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Pneumatopteris pennigera</i>	gully fern, pakau
<i>Poa matthewsii</i>	
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum neozelandicum</i>	shield fern
<i>Prumnopitys taxifolia</i>	matai
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pterostylis species</i>	green-hooded orchid
<i>Pyrrosia eleagnifolia</i>	leatherleaf fern
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Rhopalostylis sapida</i>	nikau
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Rytidosperma species</i>	danthonia
<i>Scandia geniculata</i>	climbing aniseed
<i>Schefflera digitata</i>	pate, seven-finger
<i>Senecio glaucophyllus</i> subsp. <i>basinudus</i>	yellow rock groundsel
<i>Senecio glomeratus</i>	groundsel
<i>Senecio minimus</i>	native fireweed
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai, weeping kowhai
<i>Streblus heterophyllus</i>	small-leaved milk tree, turepo
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species</b>	
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Bromus hordeaceus</i>	soft brome
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle



<i>Cynosurus cristatus</i>	crested dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Linum bienne</i>	pale flax
<i>Marrubium vulgare</i>	horehound
<i>Mimulus guttatus</i>	monkey musk
<i>Mycelis muralis</i>	wall lettuce
<i>Nasturtium officinale</i>	watercress
<i>Orobancha minor</i>	broomrape
<i>Phytolacca octandra</i>	inkweed
<i>Prunella vulgaris</i>	selfheal
<i>Rosa rubiginosa</i>	sweet briar, briar rose
<i>Sambucus nigra</i>	elderberry
<i>Silene gallica</i>	catchfly
<i>Solanum nigrum</i>	black nightshade
<i>Sonchus oleraceus</i>	puha, smooth sow thistle
<i>Stellaria media</i>	chickweed
<i>Trifolium repens</i>	white clover
<i>Vulpia bromoides</i>	vulpia hair grass

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Cotter's Bush

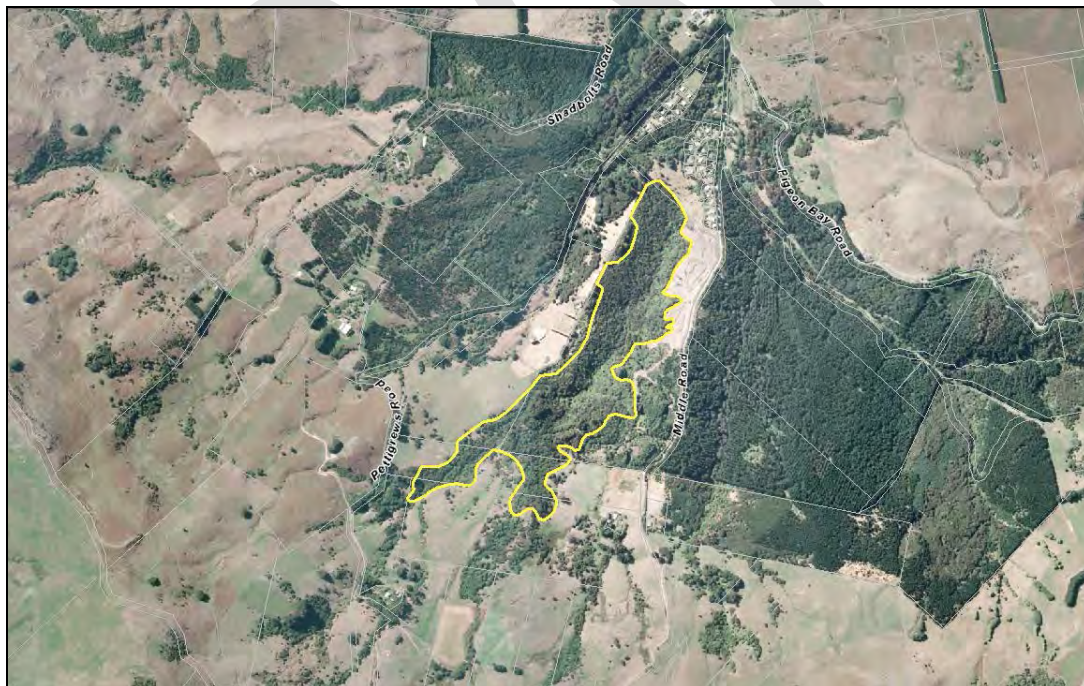
**Site number:** SES/H/1

**Physical address of site:** Middle Road, Pigeon Bay

#### Summary of Significance:

The site is significant because it is a large example of diverse secondary growth hardwood forest that is representative of the natural diversity of the ecological district. It supports one At Risk plant species, three species that are uncommon within the ecological region or ecological district and five species that are at their distributional limit.

#### Site Map



## **Additional Site Information**

**Ecological District:** Herbert

**Area of SES (ha):** 23.94

**Central point (NZTM):** E1591489, N5158446

## **Site Description**

This forested site occupies a gently-sloping gully in the head of Pigeon Bay Valley. It is situated between approximately 100 and 320 m above sea level and has a north-easterly aspect. An un-named southern tributary of Pigeon Bay Stream flows through the site.

The vegetation consists of secondary growth indigenous hardwood forest with pockets of planted trees (both native and exotic). The main canopy species are kanuka and mahoe, with lesser amounts of tree fuchsia, five-finger and kowhai. There is one large remnant totara and occasional seedlings and saplings of kahikatea and totara. The canopy is open in places, and many of these gaps are filled with dense patches of vines, native plants and invasive exotic weeds. The site is ungrazed and stock have been excluded from the site for approximately 20 years. The understorey appears to be very healthy, with good regeneration of a variety of native species, particularly ferns and palatables such as kawakawa and pate/seven-finger. A variety of exotic tree and shrub species have been planted around the margins of the forest, including a number of potentially invasive species and there are a number of pine and eucalypt trees on the eastern side of the site. A variety of native species have also been planted at the site, including many species not native to Banks Peninsula. The majority of these non-local plantings occur along the driveway and around the forest margins, however some non-local natives have also been planted along tracks through the forest (Wildland Consultants unpubl. data 2012).

Recent information on birds is limited to those species recorded during the botanical survey. They were bellbird, South Island fantail, grey warbler, kereru and silvereye (Wildland Consultants unpubl. data 2012).

## **Extent of Site of Ecological Significance**

The site includes all of the secondary hardwood forest within the gully but excludes the exotic tree and shrub species that have been planted around the margins of the forest. While the access way through the site has been included within the boundary of the site the landowner will continue to be able to use and maintain it.

## **Assessment Summary**



The Cotters Bush Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 5) and diversity and pattern criteria (criterion 7).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The vegetation within the site is secondary growth forest, but the canopy is dominated by indigenous tree species. The understorey is very healthy, with good regeneration of a diverse number of native species, particularly ferns and palatables such as kawakawa and pate/seven-finger. Although there are a wide range of introduced and non-local native species growing within the site, and most of the emergent podocarp species are absent, the structure and composition of the forest is otherwise representative of the natural diversity of the Herbert ED.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It is a large example of indigenous hardwood forest in the Herbert ED.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

The existing vegetation within the site is comprised of secondary growth forest dominated by kanuka and mahoe with at least one mature totara and other young regenerating podocarps (Wildland Consultants unpubl. data 2012). Podocarp/hardwood forest has been reduced to less than 20% of its former extent at the Region, ecological district and land environment scales. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013) (Harding (2009)) estimates that the original extent of podocarp/hardwood forest in the ED (as a %



of the ED) was 51 - 75%). The present extent of all indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

This site also meets this criterion at the Level IV land environment scale. It supports indigenous vegetation that is entirely on Acutely and Chronically Threatened land environments (F3.1a, F3.1b) where 9.9 and 12.2% indigenous vegetation is left on these land environments nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports one (At Risk Declining) plant species and three species that are uncommon within the ecological region or ecological district.

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Wildland Consultants unpubl. data 2012) are:

- *Brachyglottis sciadophila* (At Risk - Declining)

Plant species recorded from the site (Wildland Consultants unpubl. data 2012)<sup>1</sup> that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Microlaena polynoda* (uncommon in Banks the ecological region and Canterbury (Wilson 1992))
- *Histiopteris incisa*
- *Blechnum novae-zealandiae*<sup>2</sup>

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are five species that are at their southern national or regional distributional limits on Banks Peninsula (Wilson 2013). These species are (Wildland Consultants unpubl. data 2012):

- Titoki (southern national limit)
- Kawakawa (southern national limit)
- Native passion vine (southern national limit)
- Shining spleenwort (southern national limit)
- Pigeonwood (southern regional limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare**

<sup>1</sup> Indigenous species that have been planted within this site have not been included here as their providence is unknown.

<sup>2</sup> It is unclear whether kiokio (*Blechnum novae-zealandiae*) which is “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) occurs naturally at this site or has been planted (Wildland Consultants unpubl. data 2012).



*ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

The site is not significant under this criterion. It does not support indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.

### **Diversity and Pattern**

- 7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

Although the site does not contain a high diversity of indigenous ecosystems or habitat types or have changes in species composition reflecting the existence of diverse natural features or ecological gradients, the diversity of indigenous plant species is high (Wildland Consultants unpubl. data 2012).

### **Ecological Context**

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is not significant under this criterion. It is not a particularly important ecological link, although like many of Banks Peninsula's indigenous forest patches it is likely to play some role as a stepping stone for the dispersal of indigenous fauna within the wider landscape. It does not provide a buffer to other high value areas, but it does buffer a large proportion of the headwaters one of the tributaries of Pigeon Bay Stream. Overall, the extent to which this site contributes to local ecological processes is not important enough for it to meet the threshold for significance under this criterion.

- 9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within this site.

- 10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess the site against this criterion.

## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>The site is dissected by a road/driveway which runs from Middle Road to the landowner's house on the western side of the site and there is a well-developed, sign-posted track network throughout the site (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>The landowner will continue to be able to use and maintain the accessway and track network.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the landowner is aware that the tracks can be used and maintained.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants: banana passionfruit (frequent small and large vines), old man's beard, sweet cherry (occasional), hawthorn, rowan, sycamore, cotoneaster (rare) (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing control and surveillance for biodiversity pest plants.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about monitoring and control of pest plants.</li> <li>Provide information to neighbouring properties (e.g. 'Plant Me Instead') to raise awareness about the spread of pest plants.</li> </ul>
<ul style="list-style-type: none"> <li>Exotic and non-local native tree and shrub species have been planted around the margins of the forest and along tracks. These include a number of potentially invasive species (cherry laurel, cotoneaster, rowan) some of which are now spreading (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing those species that are potentially invasive and could threaten the ecological values of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowners about impacts of planting exotic and / or non-local native species.</li> </ul>



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**Assessment completed by:** Scott Hooson  
**Date:** 12 August 2014

**Statement completed by:** Scott Hooson  
**Date:** 12 August 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2012).

† denotes species that have been planted, or are likely to have been planted.

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Alectryon excelsus</i>	titoki
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Arthropodium candidum</i>	grass lily, rephinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Asplenium oblongifolium</i>	shining spleenwort, huruhuruwhenua
<i>Astelia fragrans</i> †	kakaha, bush lily
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum discolour</i> †	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum novae-zealandiae</i> †	kiokio
<i>Blechnum procerum</i>	small kiokio
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carex species</i>	cutty grass, rautahi
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma propinqua x robusta</i>	
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Cordyline australis</i> †	cabbage tree, ti kouka
<i>Corynocarpus laevigatus</i> †	karaka
<i>Cyathea dealbata</i> †	silver fern, ponga
<i>Cyathea medullaris</i>	mamaku, black tree fern
<i>Dacrydium cupressinum</i> †	rimu
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dichelachne crinita</i>	plume grass
<i>Dodonaea viscosa</i> †	akeake
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Haloragis erecta</i>	toatoa
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri





<i>Helichrysum lanceolatum</i>	niniaio
<i>Histiopteris incisa</i>	water fern
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Kunzea ericoides</i>	kanuka
<i>Lagenifera strangulata</i>	parani
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Macropiper excelsum</i>	kawakawa
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Metrosideros diffusa</i>	white climbing rata
<i>Microlaena polynoda</i>	bamboo rice grass
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Nothofagus fusca</i> †	red beech
<i>Nothofagus solandri var. solandri</i> †	black beech
<i>Olearia ilicifolia</i> †	NZ holly, hakeke
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Pneumatopteris pennigera</i>	gully fern, pakau
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum neozelandicum</i>	shield fern
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys ferruginea</i> †	miro
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pteridium esculentum</i>	bracken
<i>Pterostylis species</i>	green-hooded orchid
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Schefflera digitata</i>	pate, seven-finger
<i>Senecio minimus</i>	native fireweed
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai, weeping kowhai
<i>Stellaria decipiens</i>	chickweed
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species and planted species not native to Banks Peninsula</b>	



<i>Acer pseudoplatanus</i>	sycamore
<i>Agathis australis</i> †	kauri
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Arthropodium cirratum</i> †	renga lily, rengarenga
<i>Beilschmiedia tawa</i> †	tawa
<i>Brachyglottis repanda</i> †	rangiora, bushmans friend
<i>Brachyglottis species</i> †	groundsel
<i>Chamaecytisus palmensis</i>	tree lucerne
<i>Clematis vitalba</i>	old man's beard
<i>Clianthus puniceus</i> †	kakabeak
<i>Cotoneaster species</i>	cotoneaster
<i>Crataegus monogyna</i>	hawthorn
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Eucalyptus species</i> †	eucalypt, gum tree
<i>Euonymus europaeus</i>	European spindle tree
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Gleditsia triacanthos</i> †	honey locust
<i>Hebe species</i> †	hebe
<i>Hoheria populnea</i> †	North Island lacebark, houhere
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Mahonia aquifolium</i> †	mahonia, Oregon grape
<i>Metrosideros umbellata</i> †	southern rata
<i>Mycelis muralis</i>	wall lettuce
<i>Passiflora pinnatistipula</i>	yellow passionfruit
<i>Phyllocladus trichomanoides</i> †	tanekaha, celery pine
<i>Pittosporum crassifolium</i> †	karo
<i>Prunus avium</i>	sweet cherry
<i>Prunus laurocerasus</i>	cherry laurel
<i>Pseudopanax laetus</i> †	
<i>Robinia pseudoacacia</i> †	black locust, locust tree
<i>Rosa rubiginosa</i>	sweet briar, briar rose
<i>Rubus fruticosus</i>	blackberry
<i>Sambucus nigra</i>	elderberry
<i>Sorbus aucuparia</i>	rowan
<i>Stellaria media</i>	chickweed
<i>Ulex europaeus</i>	gorse

## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Decanter Bay Valley

**Site number:** SES/H/2

**Physical address of site:** Decanter Bay

#### **Summary of Significance:**

This site is significant because it contains a large example of forest, treeland, scrub and shrubland that is typical of indigenous vegetation on steep lowland slopes in the ecological district and indigenous vegetation on basic cliffs, scarps and tors which are an originally rare ecosystem. It supports a high diversity of indigenous plants, moths and cicadas including species that are nationally At Risk and/or endemic to Banks Peninsula, uncommon within the ecological district or region or at their distributional limits on Banks Peninsula. It also provides important habitat for indigenous fauna.

#### **Site Map**



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 142.09

**Central point (NZTM):** E1598083, N5165621

## Site Description

The site is situated on the north-west side of Decanter Bay Valley. It includes the steep coastal headland above the bay and south-east facing slopes that extend inland. The altitudinal range of the site is from sea level to approximately 380 m. A layer of bluffs cut a line across the steep slopes on the north-eastern half of the area. Several small tributaries of Duncan Stream, which is on the valley floor below the site, flow down the steep slopes within the site. 3.7 ha of the SES is protected by a Banks Peninsula Conservation Trust (BPCT) covenant.

The area is a mosaic of forest, treeland, scrub and shrubland over steep short tussock grassland and pasture. Scrub and regenerating forest occupy many of the gullies with treeland and shrubland over extensive grassland. Open grassy spurs descend between forest and shrubland from the main spur to the valley floor. Common tree species are kanuka, kowhai, mahoe, ngaio and *Hoheria angustifolia* and common shrubs include *Coprosma virescens*, *C. crassifolia*, *Hebe strictissima*, *Helichrysum lanceolata* and *Melicope simplex*.

The land rises from bluffs at sea level up to 400 m and this altitude range is reflected in a gradient of coastal vegetation merging into montane shrubland/forest at higher levels. There is a diverse flora and regeneration is vigorous with many seedlings and saplings establishing on the forest floor and into shrubland. Plants of note include *Olearia fragrantissima*, *Parietaria debilis* and a single young matai on the valley floor. The fenced BPCT covenant contains several *Olearia fragrantissima* and there are many more outside the fenced area. Together this population is the largest on Banks Peninsula (Walls 2001, 2010). With the exception of the fenced covenant the site is grazed by cattle and sheep and in places where stock have access, the forest floor is bare.

Common indigenous bird species recorded from the site are bellbird, grey warbler, swamp harrier, South Island fantail and silvereye (Walls 2010). South Island riflemen, a species that is uncommon within the Herbert Ecological District, has also been recorded at the site (Jensen 2014).

## Extent of Site of Ecological Significance

The site includes the indigenous forest, treeland, scrub and shrubland communities on the east to south-east facing slopes of Decanter Bay Valley. There are some large areas of silver tussock and pasture on steep slopes within the site that have been



included because excluding them would fragment the site and reduce its ecological integrity.

## Assessment Summary

The Decanter Bay Valley Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6) and diversity and pattern criteria (criterion 7).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The mosaic of forest, treeland, scrub and shrubland over steep short tussock grassland is typical of indigenous vegetation on steep lowland slopes on the drier northern side of the Herbert Ecological District. Although largely second-growth, the vegetation on the higher slopes also contains large old totara (*Podocarpus totara*, *P. hallii* and hybrids) and broadleaf which are remnants of the original forest cover (Jensen 2014, Walls 2010). Although the structure and composition of the vegetation has been modified by grazing, the flora is diverse and representative and regeneration is vigorous with many seedlings and saplings establishing on the forest floor and into shrubland (Jensen 2014).

The indigenous invertebrate assemblage is diverse and representative of the habitat types that occur within the site (Wildland Consultants 2014).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It is a large example of indigenous forest, treeland, scrub and shrubland on lowland hill slopes in the Herbert Ecological District.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***



The forest within the site is significant under this criterion.

At the ecological district (and ecological region) scale indigenous forest has been reduced to less than 20%. Banks Peninsula, including the Akaroa Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

There is no accurate information to assess the change in extent of indigenous scrub and shrublands within the ecological district, but the extent of all indigenous vegetation (as a percentage of the ecological district) as mapped by the New Zealand Landcover Database (Version 4) is only 14.5%.

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports a number of indigenous plant and invertebrate species that are nationally At Risk and/or endemic to Banks Peninsula and plant, invertebrate and bird species that are uncommon within the ecological district or region.

**Plants**

The site contains the largest population of *Olearia fragrantissima* on Banks Peninsula. This species has a conservation status of the nationally (At Risk – Declining). There are an estimated 150-200 *Olearia fragrantissima* trees on the north-western slopes above Duncan Stream and Decanter Bay within three adjacent sites with a combined area of about 40ha. A few more plants grow near the Menzies Bay Road (Walls 2001).

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Jensen 2014, Walls 2010, Walls 2001) are:

- *Aciphylla subflabellata* (At Risk - Declining)
- *Chenopodium allanii* (At Risk - Naturally Uncommon)
- *Coprosma virescens* (At Risk - Declining)
- *Olearia fragrantissima* (At Risk – Declining)
- *Raoulia monroi* (At Risk - Declining)
- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Leptinella minor* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Pseudopanax ferox* (At Risk - Naturally Uncommon)
- *Senecio glaucophyllus* subsp. *basinudus* (At Risk - Naturally Uncommon)

Four of these nationally At Risk plants occur within the BPCT covenant (Walls 2010):

- *Brachyglottis sciadophila* (At Risk - Declining)
- *Coprosma virescens* (At Risk - Declining)



- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Olearia fragrantissima* (At Risk - Declining)

Plant species recorded from the site (Jensen 2014) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Epilobium cinereum*
- *Histiopteris incisa*
- *Pyrrosia eleagnifolia*

### Invertebrates

Nationally At Risk invertebrate species recorded from the site (Wildland Consultants 2014) are:

- *Kikihia* new species (Banks Peninsula green cicada) (endemic to Banks Peninsula)
- *Zelleria sphenota* (mistletoe miner) (At Risk – Declining)
- *Gadira petraula* (At Risk – Naturally Uncommon)
- *Declana griseata* (mistletoe moth) (At Risk – Declining)
- *Tatosoma agrionata* (mistletoe carpet moth) (At Risk – Declining)
- *Bityla sericea* (At Risk – Naturally Uncommon)

Invertebrate species recorded from the site (Wildland Consultants 2014) that are uncommon within the ecological district are:

- *Rhodopsalta microdora*
- *Phycomorpha metachrysa* (milktree fruit moth)
- *Meterana octans* (milktree moth)
- *Asterivora chatuidea* (Helichrysum jet)
- *Nola parvitis*

### Birds

South Island rifleman, a species that is uncommon within the Herbert Ecological District, occurs within the site (Jensen 2014).

#### **5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are four species that are at their southern national or regional distributional limits on Banks Peninsula and one that is at its northern national limit (Wilson 2013). These species are (Jensen 2014):

- *Alectryon excelsus* (southern regional limit)
- *Asplenium oblongifolium* (southern national limit)
- *Passiflora tetrandra* (southern national limit)
- *Piper excelsum* (southern national limit)
- *Olearia fragrantissima* (northern national limit)



- 6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

There are igneous bluffs, scarps and rock outcrops throughout the site. At a national scale, basic cliffs, scarps and tors are an originally rare ecosystem (Williams et al. 2007). Where indigenous vegetation occurs on these features within the site they are significant under this criterion.

### Diversity and Pattern

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

It supports a very diverse range of indigenous plant taxa. Ninety-six species were recorded at the site in a recent botanical survey (Jensen 2014). Vegetation composition and canopy varies across the site in a complex pattern depending on slope, substrate, altitude, moisture availability, exposure, distance from the coast and historic human disturbance. Species such as native iceplant (*Disphyma australe*), *Passiflora tetrandra*, *Senecio glaucophyllus subsp. basinudus* and *Apium prostratum* are only found near the coast. The occurrence of titoki, ngaio, kawakawa and shining spleenwort also reflects the influence of the coastal environment (Jensen 2014).

A high diversity of indigenous moths and cicadas were also recorded at the site, including a number of nationally At Risk and uncommon species (Wildland Consultants 2014).

### Ecological Context

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is not significant under this criterion. The forest, treeland, scrub and shrublands that make up the site are surrounded by farmed grassland and are distant from other areas of indigenous forest, treeland, scrub and shrublands in the surrounding landscape.

Indigenous vegetation buffers the small steep tributary streams that drain into Duncan Stream and canopy cover is dense along the riparian margins. However, this buffering function is not important enough to meet the threshold for significance under this criterion at this site.





**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. There are no wetlands within the site that meet this criterion.

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

The size, diversity and relative intactness of the vegetation means that the site provides important habitat for common indigenous birds, three species of lizard (Walls 2010) and a diverse range of invertebrates including a number of nationally At Risk and uncommon species (Wildland Consultants 2014).

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## Site Management

### Existing Protection Status

3.7 ha (approximately 2%) of the site is protected by a BPCT covenant. The remainder of the site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>The BPCT covenant is fenced (although Walls (2010) noted that at the time the covenant was still accessible to sheep). The remainder of the site is grazed by stock.</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing other areas within the site. High priority areas are those with more mature forest and unfenced areas of <i>Olearia fragrantissima</i>.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the benefits to biodiversity of fencing and the options available for stock control.</li> <li>Assistance available as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants. There are few weeds of ecological concern and no serious woody weeds (Jensen 2014, Walls 2010). Pigs ear is present on coastal rocks.</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling pigs ear to protect rock out-crop and shrubland values.</li> <li>Consider ongoing surveillance for, and control if detected, of other biodiversity pest plants such as banana passionfruit and sycamore that are known to occur in the vicinity of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about monitoring and control of pest plants.</li> <li>Assistance available as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Pest animals. Possums and rabbits numbers are low as a result of wider control programmes on Banks Peninsula but Walls (2010) noted some damage to seedlings in BPCT covenant. An increase in rabbit and/or possums populations would threaten the establishment and survival of <i>Olearia fragrantissima</i> seedlings.</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling rabbit and possum numbers if populations increase. Any additional pest animal control (e.g. trapping or poisoning of hedgehogs, stoats, cats and rats) would benefit native fauna (birds, lizards and larger invertebrates).</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about monitoring and control of pest animals.</li> <li>Assistance available as appropriate.</li> </ul>



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**Assessment completed by:** Scott Hooson  
**Date:** 17 December 2014

**Statement completed by:** Scott Hooson  
**Date:** 17 December 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Plant Species List

Sourced from Jensen unpubl. data (2014).

N.B. exotic species were not recorded during this survey.

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Aciphylla subflabellata</i>	grassland speargrass
<i>Alectryon excelsus</i>	titoki
<i>Apium prostratum</i>	New Zealand celery
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Asplenium oblongifolium</i>	shining spleenwort, huruhuruwhenua
<i>Athnosachne solandri</i>	native wheatgrass, blue wheatgrass
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum penna-marina</i>	little hard fern
<i>Calystegia tuguriorum</i>	NZ bindweed, pōwhiwhi
<i>Carex resectans</i>	
<i>Carmichaelia australis</i>	native broom, common broom
<i>Carpodetus serratus</i>	marbleleaf, putaputawētā
<i>Chenopodium allanii</i>	
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Convolvulus waitaha</i>	grass convolvulus
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, tī kōuka
<i>Corokia cotoneaster</i>	korokio
<i>Corynocarpus laevigatus</i>	karaka
<i>Crassula colligata</i>	stonecrop
<i>Cyathea smithii</i>	Smith's tree fern, kātote
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	dichondra
<i>Disphyma australe</i>	NZ iceplant
<i>Einadia triandra</i>	pigweed
<i>Epilobium cinereum</i>	willow herb
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Fuchsia x colensoi</i>	
<i>Griselinia littoralis</i>	broadleaf, kāpuka
<i>Hebe strictissima</i>	Banks Peninsula hebe



<i>Helichrysum lanceolatum</i>	niniaio
<i>Histiopteris incisa</i>	water fern, mātātā
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle moschata</i>	pennywort
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea robusta</i>	kānuka
<i>Leptinella minor</i>	Banks Peninsula button daisy
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Lophomyrtus obcordata</i>	rōhutu, NZ myrtle
<i>Luzula banksiana var. orina</i>	woodrush
<i>Melicope simplex</i>	poataniwha
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rātā
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Muehlenbeckia australis</i>	large-leaved pōhuehue
<i>Muehlenbeckia complexa</i>	scrub pōhuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red māpou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping māpou
<i>Olearia fragrantissima</i>	fragrant tree daisy
<i>Oxalis exilis</i>	yellow oxalis
<i>Parietaria debilis</i>	NZ pellitory
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum eugeniioides</i>	lemonwood, tarātā
<i>Pittosporum tenuifolium</i>	kōhūhū, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, mānatu
<i>Poa cita</i>	silver tussock, wī
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus cunninghamii</i>	mountain tōtara, thin-barked tōtara
<i>Polystichum oculatum</i>	shield fern
<i>Prumnopitys taxifolia</i>	mataī, black pine
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudopanax ferrox</i>	fierce lancewood
<i>Pteridium esculentum</i>	bracken, rārahu, rauaruhe
<i>Pyrrhosia eleagnifolia</i>	leatherleaf fern
<i>Raoulia monroi</i>	fan-leaved mat daisy
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tātarāmoa
<i>Rubus schmidelioides</i>	bush lawyer, tātarāmoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tātarāmoa
<i>Scandia geniculata</i>	climbing aniseed
<i>Senecio glaucophyllus subsp. basinudus</i>	yellow rock groundsel
<i>Senecio quadridentatus</i>	cotton fireweed, pekapeka
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	small-leaved kōwhai
<i>Streblus heterophyllus</i>	small-leaved milk tree, tūrepo



<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Wahlenbergia gracilis</i>	

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## Appendix 2: Invertebrate Species List

Sourced from Wildland Consultants unpubl. data (2014)

<b>NEUROPTERA</b>	lacewings
<b>Hemerobiidae</b>	
<i>Drepanacra binocula</i>	
* <i>Micromus tasmaniae</i>	
<b>HEMIPTERA</b>	
<b>Tibicinidae</b>	cicada
<i>Amphipsalta zelandica</i>	clapping cicada
<i>Kikihia new species</i>	
<i>Rhodopsalta microdora</i>	
<b>Pentatomidae</b>	shieldbug
<i>Dictyotis caenosus</i>	
<b>Miridae</b>	
<i>Bipuncticoris species 1</i>	
<i>Bipuncticoris species 2</i>	
<b>ORTHOPTERA</b>	
<b>Tettigoniidae</b>	katydid
<i>Conocephalus bilineatus</i>	
<b>Gryllidae</b>	cricket
<i>Pteronemobius bigelowi</i>	
<b>Acrididae</b>	grasshoppers
<i>Phaulacridium marginale</i>	
<b>Rhaphidophoridae</b>	cave weta
<i>Isoplectron armatum</i>	
<b>COLEOPTERA</b>	
<b>Carabidae</b>	ground beetles
<i>Neocicindella latecincta</i>	tiger beetle
slender species	
<b>Coccinellidae</b>	
<i>Coccinella leonina</i>	ladybird
<b>Scarabaeidae</b>	chafers
<i>Costelytra zelandica</i>	
<i>Odontria striata</i>	striped chafer
<b>HYMENOPTERA</b>	
<b>Colletidae</b>	native bee
<i>Leioproctus huakiwi</i>	
<b>Formicidae</b>	ant
<i>Monomorium antarcticum</i>	
<b>Ichneumonidae</b>	
<i>Netelia producta</i>	
<b>Pompilidae</b>	spider wasp
<i>Epipompilus insularis</i>	
<b>LEPIDOPTERA</b>	
<b>Hepialidae</b>	porina moths
<i>Wiseana copularis</i>	
<b>Nepticulidae</b>	leaf miners
<i>Stigmella ilsea</i>	
<b>Tineidae</b>	



<i>Erechthias fulguritella</i>	
<b>Psychidae</b>	
<i>Liothula omnivora</i>	
<b>Glyphipterigidae</b>	
<i>Glyphipterix cionophora</i>	
<i>Glyphipterix triselena</i>	
<b>Elachistidae</b>	
<i>Cosmiotes ombrodoxa</i>	
<i>Cosmiotes ochroleuca</i>	
<b>Copromorphidae</b>	
<i>Phycomorpha metachrysa</i>	
<b>Momphidae</b>	
<i>Zapyastra calliphana</i>	
<b>Lyonetiidae</b>	
<i>Bedellia psammitis</i>	
<b>Yponomeutidae</b>	
<i>Zelleria sphenota</i>	
<b>Plutellidae</b>	
<i>Orthenches chlorocoma</i>	
<i>Plutella antiphona</i>	
<b>Gelechiidae</b>	
<i>Anisoplaca achyrota</i>	
<i>Kiwaia brontophora</i>	
<b>Oecophoridae</b>	
<i>Gymnobathra parca</i>	
<i>Hierodoris s-fractum</i>	
<i>Izatha huttoni</i>	
<i>Izatha katadiktya</i>	
<i>Izatha convulsella</i>	
<i>Leptocroca species</i>	
<i>Stathmopoda horticola</i>	
<i>Tingena melinella</i>	
<i>Trachypepla euryleucota</i>	
<b>Choreutidae</b>	jets
<i>Asterivora chatuidea</i>	
<b>Tortricidae</b>	leaf rollers
<i>Apoctena flavescens</i>	
<i>Capua semiferana</i>	
<i>Catamacta gavisana</i>	
<i>Ctenopseustis obliquana</i>	
<i>Harmologa amplexana</i>	
<i>Planotortrix notophaea</i>	
<i>Planotortrix excessana</i>	
<i>New genus and species</i>	
<i>Strepsicrates ejectana</i>	
<b>Thyrididae</b>	
<i>Morova subfasciata</i>	
<b>Pyralidae</b>	
<i>Patagoniodes farinaria</i>	
<i>*Stericta carbonalis</i>	
<b>Crambidae</b>	
<i>Deana hybreasalis</i>	
<i>Eudonia cymatias</i>	





<i>Eudonia manganeutis</i>	
<i>Eudonia philerga</i>	
<i>Eudonia leptalea</i>	
<i>Eudonia sabulosella</i>	
<i>Eudonia submarginalis</i>	
<i>Gadira acerella</i>	
<i>Gadira petraula</i>	
<i>Orocrambus enchophorus</i>	
<i>Orocrambus flexuosellus</i>	
<i>Orocrambus ramosellus</i>	
<i>Orocrambus vittellus</i>	
<i>Orocrambus vulgaris</i>	
<i>Udea flavidalis</i>	
<i>Udea marmarina</i>	
<i>Uresiphita maoralis</i>	kowhai moth
<b>GEOMETRIDAE</b>	
<i>Anachloris subochraria</i>	
<i>Asaphodes abrogata</i>	
<i>Asaphodes beata</i>	
<i>Austrocidaria gobiata</i>	
<i>Austrocidaria similata</i>	
* <i>Chloroclystis filata</i>	
<i>Chloroclystis inductata</i>	
<i>Cleora scriptaria</i>	
<i>Declana griseata</i>	
<i>Declana leptomera</i>	
<i>Declana junctilinea</i>	
<i>Epyaxa lucidata</i>	
<i>Epyaxa rosearia</i>	
<i>Epyaxa venipunctata</i>	
<i>Epiphyrne undosata</i>	
<i>Epiphyrne verriculata</i>	
<i>Gellonia pannularia</i>	
<i>Homodotis megaspilata</i>	
<i>Helastia cinerearia</i>	
<i>Helastia corcularia</i>	
<i>Helastia triphragma</i>	
<i>Hydriomena deltoidata</i>	
<i>Hydriomena rixata</i>	
<i>Ischalis fortinata</i>	
<i>Pasiphila testulatus</i>	
<i>Pasiphila urticae</i>	
<i>Poecilasthena schistaria</i>	
<i>Pseudocoremia indistincta</i>	
<i>Pseudocoremia pergrata</i>	
<i>Scopula rubraria</i>	
<i>Tatosoma agrionata</i>	
<i>Xyridacma ustaria</i>	
<i>Xyridacma veronicae</i>	
<i>Xanthorhoe semifissata</i>	
<b>Noctuidae</b>	
<i>Agrotis ipsilon</i>	
<i>Bityla defigurata</i>	



<i>Bityla sericea</i>	
<i>Cosmodes elegans</i>	
<i>Graphania insignis</i>	
<i>Graphania beata</i>	
<i>Graphania lignana</i>	
<i>Graphania morosa</i>	
<i>Graphania mutans</i>	
<i>Graphania plena</i>	
<i>Graphania ustistriga</i>	
<i>Meterana decorata</i>	
<i>Meterana octans</i>	
<i>Meterana ochthistis</i>	
<i>Mythimna separata</i>	
<i>Persectania aversa</i>	
<i>Tmetolophota atristriga</i>	
<i>Tmetolophota propria</i>	
<b>Erebidae</b>	
<i>Celama parvitis</i>	
<i>Nyctemera annulata</i>	magpie moth
<i>Rhapsa scotoscialis</i>	
<b>Lycaenidae</b>	coppers/ blues
<i>Lycaena "comon copper" complex</i>	
<i>Zizina oxleyi</i>	
<b>Nymphalidae</b>	admirals
<i>Vanessa gonerilla</i>	red admiral
<b>Pieridae</b>	white butterfly
<i>*Pieris rapae</i>	
<b>PHASMIDA</b>	stick insects
<i>Pachymorpha hystriculea</i>	lesser spiny

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Hay Reserve

**Site number:** SES/H/3

**Physical address of site:** 874 Pigeon Bay Road, Pigeon Bay

#### Summary of Significance:

This site is significant because it contains one of the best, if not the best example of lowland podocarp forest on an alluvial landform on Banks Peninsula. This forest type is very rare in the ecological district and region and occurs on Acutely and Chronically Threatened land environments at this site. It supports a high diversity of indigenous plant and freshwater fish taxa including species that are nationally At Risk. Several plant species are also uncommon within the ecological region or ecological district and five are at their southern national or regional distributional limits.

#### Site Map



## **Additional Site Information**

**Ecological District:** Herbert

**Central point (NZTM):**

**Area of SES (ha):** 7.21ha

## **Site Description**

This site is situated on the lowland alluvial valley floor of Pigeon Bay. It is approximately 25 metres above sea level and 1.5 km inland. Pigeon Bay Stream flows through the site. Most of the site is within the 6 ha Hay Scenic Reserve administered by the Department of Conservation.

Hugh Wilson (unpubl. data n.d.) described Hay Reserve as “a magnificent remnant of lowland forest”. The site is an outstanding example of a mature lowland valley-floor forest remnant on an alluvial surface. It has many large adult kahikatea, matai, lowland totara and one adult female miro. Other canopy species include titoki, pokaka, mahoe, lemonwood, kowhai, fuchsia, kanuka and red mapou. There is a good diversity of shrubs and forest floor species including podocarp seedlings (Willems 1999). There are many plant species of note within the reserve including titoki, pokaka, native passion vine, three species of tree fern, kawakawa, pigeonwood, *Metrosideros diffusa*, and *Raukaua anomalus* (Wilson 1992). There is an area of planted indigenous species in the south-western corner of the reserve and secondary kanuka-lowland totara forest adjoins the mature forest on private land on the eastern side of the reserve on the toe of the valley side (Wilson 1992, Willems 1999).

Indigenous birds recorded at the site are bellbird, South Island fantail, silvereye, grey warbler, brown creeper and kereru (Cochrane and Schmechel 2011, Cochrane 2012).

## **Extent of Site of Ecological Significance**

The site includes Hay Scenic Reserve and the connected planted and regenerating indigenous forest and scrub around its immediate boundaries. The secondary growth kanuka - lowland totara forest on the adjoining McKellar property is included within the site because it plays an important role in buffering the high value remnant lowland podocarp forest within Hay Scenic Reserve and supports a nationally At Risk – Declining species.

## **Assessment Summary**

Hay Reserve has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2),



rarity/distinctiveness (criteria 3, 4 and 5). The area of planted indigenous species in the south-western corner of Hay Reserve and the secondary growth kanuka-lowland totara forest on private land on the eastern side of the reserve meet the ecological context criteria (criterion 8).

## **Assessment against Significance Criteria**

### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

It is one of the best, if not the best example of lowland podocarp forest on Banks Peninsula (Wilson 1992). The canopy has many large emergent kahikatea, matai and lowland totara and one adult miro. It has a representative canopy of hardwood species and a relatively intact understorey including podocarp seedlings (Willems 1999).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

Hay Reserve is a large example of its type within the Herbert ED (and on Banks Peninsula). At 6 ha it is the second largest lowland podocarp forest remnant on alluvial surface on Banks Peninsula (only the 7 ha Prices Valley remnant is larger (Willems 1999)).

### **Rarity/Distinctiveness**

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

Lowland podocarp/hardwood forest on alluvial landforms has been reduced to a tiny area of its original extent within the ecological district and region. There are now only five very small remnant lowland podocarp/hardwood forest remnants left on valley floor alluvium on Banks Peninsula (Wilson 1992). Old-growth lowland podocarp forest is identified by (Wilson 1992) as being the highest priority for protection in the Herbert ED. The original extent of podocarp/hardwood forest in the ED (as a % of the ED) is estimated to have been between 51 - 75% (Harding 2009).



This site also meets this criterion at the Level IV land environment scale. It is entirely on Acutely and Chronically Threatened land environments (F3.1a and J2.1d) where <20% indigenous vegetation is left on these land environments nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports indigenous plant and fish species that are nationally At Risk, and several plant species that are uncommon within the ecological region or ecological district.

**Plants**

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (including the eastern edge on private land) (Wildland Consultants unpubl. data 2013) are:

- *Brachyglottis sciadophila* (At Risk – Declining)
- *Coprosma virescens* (At Risk – Declining)

Plant species recorded from the site that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Carex solandri* (Wilson unpubl. data n.d.)
- Miro (*Prumnopitys ferruginea*) (This species is very rare within the ED and on Banks Peninsula where it grows in only a few locations inland of Port Levy and Pigeon Bay (Wilson 2013)) (Wilson unpubl. data n.d.)
- Pokaka (*Elaeocarpus hookerianus*) (Wilson unpubl. data n.d., Rosenblad unpubl. data 2011)
- *Microlaena avenacea* (Wilson unpubl. data n.d., Rosenblad unpubl. data 2011)
- *Carex secta* (Wildland Consultants 2013)

**Fish**

Nationally At Risk fish species (Goodman et al. 2013) recorded during fish surveys within Hay Reserve (EOS unpubl. data 2014) are:

- Bluegill bully (At Risk – Declining)
- Longfin eel (At Risk – Declining)
- Redfin bully (At Risk – Declining)
- Torrentfish (At Risk – Declining)

**Aquatic invertebrates**

*Neocurupira chiltoni*, an aquatic invertebrate species that is endemic to Banks Peninsula, has been recorded as present within the site (in Pigeon Bay Stream) (Fraser 2006).



**5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.***

The site is significant under this criterion.

There are five species (Rosenblad unpubl. data 2011, Wilson unpubl. data n.d.) that are at their southern national or regional distributional limits on Banks Peninsula (Wilson 2013). They are:

- Titoki (southern national limit)
- Kawakawa (southern national limit)
- Shining spleenwort (southern national limit)
- Native passion vine (southern national limit)
- Pigeonwood (southern regional limit)

**6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

The site is not significant under this criterion. It does not support indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.

### **Diversity and Pattern**

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

The site contains a high diversity of indigenous plant taxa. Also, Pigeon Bay Stream, which flows through the site supports a very high diversity of indigenous freshwater fish species. Surveys at two sample sites in Pigeon Bay Stream (including one within Hay Reserve) recorded seven species (blue gilled, redbin, upland and common bullies, short and longfin eel and torrentfish).

### **Ecological Context**

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

Part of the site is significant under this criterion.

Due to its small size and geographic isolation the remnant mature podocarp forest is vulnerable to edge effects. The area of planted indigenous species in the south-western corner of Hay Reserve and the secondary growth kanuka-lowland totara forest on private land on the eastern side of the reserve provide an



important role in buffering the mature forest from these effects and are significant under this criterion.

**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. It does not include any wetland ecosystems.

***Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is not significant under this criterion. It provides habitat for a small number of common indigenous forest bird species (Cochrane and Schmechel 2011, Cochrane 2012) but does not support large numbers of any of these species.

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## Site Management

### Existing Protection Status

The majority of site is within Hay Scenic Reserve which is administered by the Department of Conservation. Secondary kanuka-lowland totara forest on the eastern side of the reserve is on private land and is unprotected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants. A large number of weed species are present including old mans beard, ash, hawthorn, sycamore, cherry plum, blackberry, male fern, crack willow, elder, wandering Jew and montbretia (DOC 2002, Wildlands unpubl. data, Wilson unpubl. data)</li> </ul>	<ul style="list-style-type: none"> <li>The Department of Conservation undertake weed control within Hay Reserve. Consider extending this work to the kanuka forest on private land and continuing ongoing control and monitoring of biodiversity pest plants.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Stock. The secondary kanuka-lowland forest on private land is unfenced and grazed by stock.</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the secondary kanuka-lowland forest and continue ongoing maintenance of the boundary fence around Hay Reserve.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the benefits to biodiversity of stock control and about options available.</li> <li>Assistance available as appropriate.</li> </ul>

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**Assessment completed by:** Scott Hooson  
**Date:** 25 July 2014

**Statement completed by:** Scott Hooson  
**Date:** 25 July 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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**Appendix 1: Plant Species List, Private Land Eastern Edge Hay Reserve**

Sourced from Wildland Consultants unpubl. data (2013).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Alectryon excelsus</i>	titoki
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Blechnum chambersii</i>	lance fern
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carex forsteri</i>	cutty grass
<i>Carex secta</i>	niggerhead, pukio
<i>Clematis foetida</i>	yellow clematis
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma lucida</i>	karamu
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hypolepis ambigua</i>	pig fern
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea ericoides</i>	kanuka
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Piper excelsum</i>	kawakawa
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Myrsine australis</i>	red mapou, red matipo
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Pneumatopteris pennigera</i>	gully fern, pakau
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum neozelandicum subsp. zerophyllum</i>	shield fern
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Urtica ferox</i>	ongaonga, tree nettle



<b>Exotic species</b>	
<i>Acer pseudoplatanus</i>	sycamore
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Clematis vitalba</i>	old man's beard
<i>Crataegus monogyna</i>	hawthorn
<i>Cynosurus cristatus</i>	crested dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Eucalyptus globulus</i>	eucalypt, blue gum
<i>Fraxinus excelsior</i>	ash
<i>Galium aparine</i>	cleavers
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Juncus effusus</i>	soft rush
<i>Phleum pratense</i>	timothy
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Plantago major</i>	broad-leaved plantain
<i>Prunus cerasifera</i>	cherry plum
<i>Prunella vulgaris</i>	selfheal
<i>Ranunculus repens</i>	creeping buttercup
<i>Rubus fruticosus</i>	blackberry
<i>Rumex acetosella</i>	sheeps sorrel
<i>Rumex obtusifolius</i>	broad-leaved dock
<i>Sambucus nigra</i>	elderberry
<i>Trifolium repens</i>	white clover



## Appendix 2: Plant Species List for Hay Reserve

Sourced from Rosenblad (2011).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Alectryon excelsus</i>	titoki
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Asplenium bulbiferum</i>	hen & chicken's fern
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium oblongifolium</i>	shining spleenwort, huruhuruwhenua
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Calystegia tuguriorum</i>	NZ bindweed, pōwhiwhi
<i>Carex forsteri</i>	cutty grass
<i>Carpodetus serratus</i>	marbleleaf, putaputāwētā
<i>Clematis foetida</i>	yellow clematis
<i>Clematis</i> sp.	
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma lucida</i>	karamū
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamū
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Cordyline australis</i>	cabbage tree, tī kōuka
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dicksonia squarrosa</i>	whekī, rough tree fern
<i>Elaeocarpus hookerianus</i>	pōkākā
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Hebe salicifolia</i>	koromiko
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Lophomyrtus obcordata</i>	rōhutu, NZ myrtle
<i>Melicope simplex</i>	poataniwha
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rātā
<i>Microlaena avenacea</i>	bush rice grass
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Muehlenbeckia australis</i>	large-leaved pōhuehue
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red māpou, red matipo
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Parsonsia</i> sp.	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine



<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum eugenioides</i>	lemonwood, tarātā
<i>Pittosporum tenuifolium</i>	kōhūhū, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, mānatu
<i>Pneumatopteris pennigera</i>	gully fern, pākau
<i>Podocarpus totara</i>	lowland tōtara
<i>Polystichum richardii</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, pūniu
<i>Prumnopitys taxifolia</i>	mataī, black pine
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tātarāmoa
<i>Rubus schmidelioides</i>	bush lawyer, tātarāmoa
<i>Schefflera digitata</i>	patē, seven-finger
<i>Senecio minimus</i>	native fireweed
<i>Solanum aviculare or laciniatum</i>	poroporo
<i>Sophora microphylla</i>	small-leaved kōwhai
<i>Stellaria parviflora</i>	New Zealand chickweed
<i>Streblus heterophyllus</i>	small-leaved milk tree, tūrepo
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species</b>	
<i>Acer pseudoplatanus</i>	sycamore
<i>Bellis perennis</i>	daisy
<i>Calystegia silvatica</i>	great bindweed
<i>Cedronella canariensis</i>	balm of gilead
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Clematis vitalba</i>	old man's beard
<i>Crataegus monogyna</i>	hawthorn
<i>Crocsmia x crocosmiiflora</i>	montbretia
<i>Dactylis glomerata</i>	cocksfoot
<i>Daphne laureola</i>	
<i>Digitalis purpurea</i>	foxglove
<i>Fraxinus excelsior</i>	ash
<i>Galium aparine</i>	cleavers
<i>Hoheria populnea</i>	lacebark
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochaeris radicata</i>	catsear
<i>Lunaria annua</i>	honesty
<i>Mycelis muralis</i>	wall lettuce
<i>Myosotis sylvatica</i>	garden forget-me-not
<i>Oxalis articulata</i>	sourgrass
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Plantago major</i>	broad-leaved plantain
<i>Populus nigra</i>	lombardy poplar
<i>Prunus avium</i>	sweet cherry



<i>Prunus cerasifera</i>	cherry plum
<i>Quercus robur</i>	English oak
<i>Ranunculus repens</i>	creeping buttercup
<i>Sambucus nigra</i>	elderberry
<i>Solanum dulcamara</i>	bittersweet
<i>Sonchus oleraceus</i>	pūhā, smooth sow thistle
<i>Taraxacum officinale</i>	dandelion
<i>Trifolium repens</i>	white clover
<i>Trifolium sp.</i>	
<i>Vicia sativa</i>	vetch

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Menzies Bay

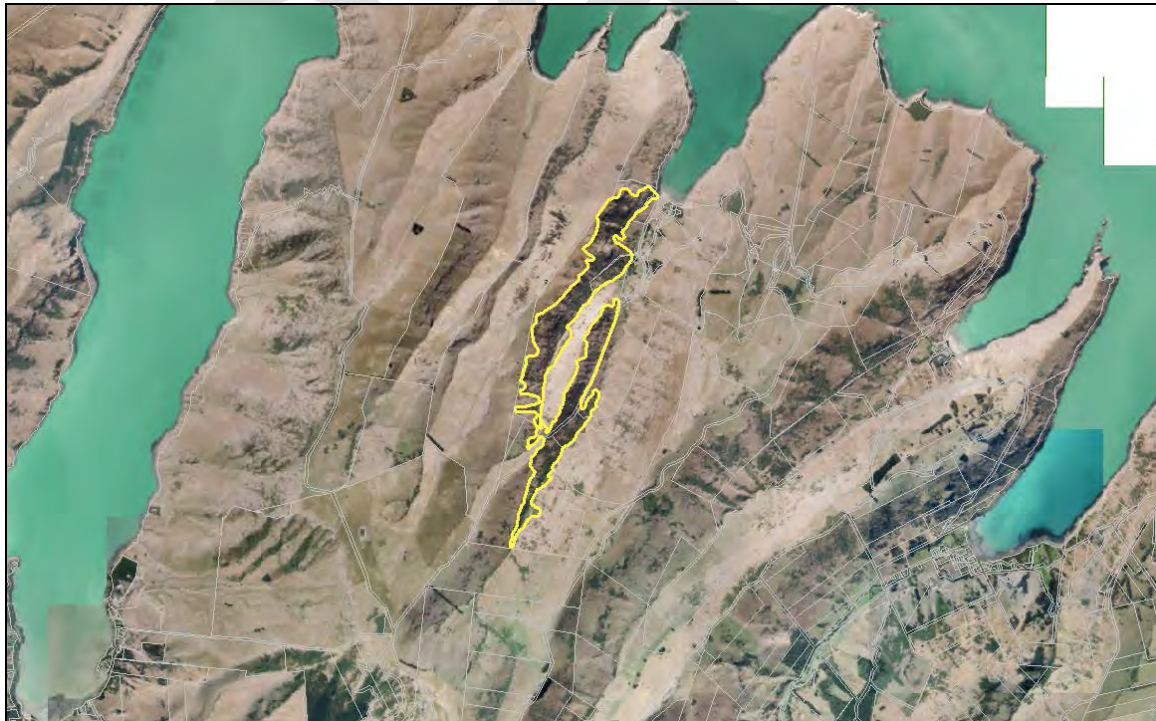
**Site number:** SES/H/4

**Physical address of site:** Menzies Bay

#### Summary of Significance:

The site is significant because it is a large example of secondary growth indigenous treeland, scrub and shrubland and is almost entirely on an Acutely Threatened land environment. It supports a diverse range of plant species including several that are nationally At Risk, endemic to Banks Peninsula and uncommon, and four plant species at their national distributional limits on Banks Peninsula. It also provides habitat for a bird species that is uncommon in the ecological district.

#### Site Map





## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 86.49

**Central point (NZTM):** E1595679, N5165782

## Site Description

This site is a mosaic of secondary growth hardwood treeland and scrub on east to southeast-facing slopes of two more or less parallel valleys separated by a prominent narrow spur. Streams in both valleys drain into Menzies Bay. The altitudinal range of the site extends from near sea level at Menzies Bay to approximately 260 m above sea level. The site was identified as a Recommended Area for Protection (RAP H22 - Menzies) (Wilson 1992).

Wildland Consultants unpubl. data (2012) describes the main vegetation communities at the site. They are:

- A mosaic of lowland ribbonwood-narrow leaved lacebark-kowhai-ngaio-kanuka-mahoe/*Coprosma virescens*-*C. propinqua* treeland and scrub, and;
- *Coprosma virescens*-*C. crassifolia*-common native broom shrubland.

These communities are described in more detail below (from Wildland Consultants unpubl. data 2012).

The majority of the site is covered in a mosaic of secondary growth hardwood treeland and scrub. The most common canopy species are lowland ribbonwood, narrow-leaved lacebark, kowhai, ngaio, mahoe, and kanuka, however canopy cover and species composition vary across the site in a complex pattern. Rock outcrops are scattered throughout the site and support a suite of specialist indigenous plants including large trees of *Olearia paniculata*. In both valleys, canopy cover was most dense near the streams, with treeland almost becoming forest.

The native shrubland is dominated by small-leaved coprosma/mikimiki (mainly *Coprosma virescens*, followed by *C. crassifolia*) and native broom (*Carmichaelia australis*).

Indigenous birds recorded at the site during the botanical survey were kingfisher, grey warbler, bellbird, rifleman, silvereeye and swamp harrier (Wildland Consultants unpubl. data 2012).

## Extent of Site of Ecological Significance

The site includes the indigenous dominated treeland, scrub and shrubland communities on the east to southeast-facing slopes of the two valleys draining into Menzies Bay. Two small areas with exotic willows and pine trees near the main



dwellings and on the western side of the head of Menzies Bay are excluded from the site

## Assessment Summary

The Menzies Bay Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 5), diversity and pattern (criterion 7) and ecological context (criterion 10) criteria.

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Although the vegetation communities at the site have been modified by grazing and exotic species, they are diverse, and dominated by indigenous vegetation, and are representative of dry coastal forest associations. The Menzies Bay vegetation is one of the better examples of its type remaining within the Herbert Ecological District.

There is insufficient information to assess the representativeness of the fauna assemblages that occur at the site.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It is a large example of secondary growth indigenous treeland, scrub and shrubland on lowland hill slopes in the Herbert ED.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion at the Level IV land environment scale.



It is almost entirely on an Acutely Threatened land environment (F3.1a) where 9.9% indigenous vegetation is left on these land environments nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

A number of plant species have been recorded from the site that are nationally At Risk, endemic, or uncommon either within the ecological district or region. The site also supports one bird species that is uncommon in the Herbert ED.

**Plants**

Six nationally At Risk plant species (de Lange et al. 2013) occur at the site (Walls 2001, Wildland Consultants unpubl. data 2012) and three of these are endemic to Banks Peninsula:

- *Coprosma virescens* (At Risk - Declining)
- *Olearia fragrantissima* (At Risk - Declining) (six adult trees were recorded by Walls 2001)
- *Festuca actae* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Leptinella minor* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Pseudopanax ferox* (At Risk - Naturally Uncommon) (one of the best populations on Banks Peninsula and containing some very old trees. (M. Hutchison pers. comm. 2014)).

A further three plant species occur at the site (Wildland Consultants unpubl. data 2012) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013):

- *Carex comans*
- *Earina autumnalis*
- *Hydrocotyle novae-zeelandiae*

**Birds**

One bird species that is uncommon in the Herbert ED occurs at the site:

- South Island rifleman.

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are four plant species at their national distributional limits on Banks Peninsula (Wildland Consultants unpubl. data 2012).



The plant species' at their southern national limits are:

- *Alectryon excelsus*
- *Asplenium oblongifolium*
- *Piper excelsum*

The species at its northern national limit is:

- *Olearia fragrantissima*

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion. There are igneous scarps and rock outcrops within the site. At a national scale, basic cliffs, scarps and tors are originally rare ecosystems (Williams et al. 2007). Where indigenous vegetation occurs on these features they are significant under this criterion.

### Diversity and Pattern

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

It supports a relatively diverse range of indigenous plant taxa. Seventy-eight species were recorded at the site in a recent botanical survey (Wildland Consultants unpubl. data 2012).

Vegetation composition and canopy varies across the site in a complex pattern depending on slope, substrate, altitude, moisture availability, exposure and distance from the coast. For example, weeping matipo (*Myrsine divaricata*) and *Coprosma areolata* were only found in the eastern branch of Menzies Stream, whereas titoki only occurs west of the main dwellings nearer the coast. Rock outcrops are scattered throughout the site and support a diverse suite of specialist plants.

### Ecological Context

**8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is not significant under this criterion. The two areas of treeland, scrub and shrublands that make up the site are surrounded by farmed grassland and



are distant from other areas of indigenous forest, treeland, scrub and shrublands in the surrounding landscape.

Indigenous vegetation buffers parts of both streams that drain into Menzies Bay and in places, canopy cover is dense along the riparian margins (Wildland Consultants unpubl. data 2012). However, much of this vegetation is open with exotic grassland below which reduces its buffering function. This riparian buffering function is not important enough to meet the threshold for significance under this criterion at this site.

**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. There are no wetlands within the site that meet this criterion.

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

There is insufficient information to assess the site against this criterion.

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## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Existing accessways. There are several farm tracks within the site.</li> </ul>	<ul style="list-style-type: none"> <li>The landowner will continue to be able to use and maintain these existing access ways.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the landowner is aware of the continued use of access ways and tracks.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants are rare. The few weeds of concern include cherry plum, pig's ear, elderberry and sweet briar.</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling existing biodiversity pest plants and carrying out ongoing surveillance for new weeds such as banana passionfruit, old mans beard and wilding pines.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about monitoring and control of pest plants.</li> <li>Assistance available as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Lack of recruitment of <i>Olearia fragrantissima</i></li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing a portion of the site where this species occurs with rabbit proof fencing to protect seedlings and other indigenous plants from stock, hares and rabbits.</li> <li>Consider cultivating and planting out progeny into suitable areas protected from stock, hares and rabbits (Walls 2001).</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the benefits to biodiversity of stock and pest animal control - and options available.</li> <li>Assistance available as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Stock grazing</li> </ul>	<ul style="list-style-type: none"> <li>Consider implications of stock grazing in relation to management of indigenous vegetation communities.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the benefits to biodiversity of stock and pest animal control - and options available.</li> <li>Assistance available as appropriate.</li> </ul>



## References

- de Lange, P. J., Rolfe, J. R., Champion, P. D., Courtney, S. P., Heenan, P. B., Barkla, J. W., Cameron, E.K., Norton, D.A., Hitchmough, R. A. (2013). *Conservation status of New Zealand indigenous vascular plants, 2012* (New Zealand Threat Classification Series No. 3). Department of Conservation, Wellington.
- Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.
- Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., Park, T., & Porteous, T. (2007). *Guide for users of the threatened environment classification (Ver 1.1.)*.
- Walls, G. (2001). *Olearia Survey and Site Assessment, Banks Peninsula and Tasman Valley - Overview Report*. Report prepared for the Department of Conservation, October 2001. Christchurch.
- Wildland Consultants (2012). *Botanical Survey Results – Menzies Bay community descriptions and abundance*. Unpublished data. (Trim: 13/288359).
- Wilson, H.D. (2013). *Plant Life on Banks Peninsula*. Manuka Press, Cromwell. 412 pp.

**Assessment completed by:** Scott Hooson  
**Date:** 10 October 2014

**Statement completed by:** Scott Hooson  
**Date:** 10 October 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.





## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2012).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Alectryon excelsus</i>	titoki
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium oblongifolium</i>	shining spleenwort, huruhuruwhenua
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carmichaelia australis</i>	native broom, common broom
<i>Carex comans</i>	
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Corokia cotoneaster</i>	korokio
<i>Crassula sieberiana</i>	stone crop
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	Mercury Bay weed, dichondra
<i>Earina autumnalis</i>	easter orchid, raupeka
<i>Echinopogon ovatus</i>	hedgehog grass
<i>Festuca actae</i>	Banks Peninsula blue grass
<i>Ficinia nodosa</i>	club rush, wiwi
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Haloragis erecta</i>	toatoa
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum lanceolatum</i>	niniaio
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle moschata</i>	pennywort
<i>Hydrocotyle novae-zeelandiae</i>	pennywort
<i>Hypolepis ambigua</i>	pig fern
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea ericoides</i>	kanuka
<i>Leptinella minor</i>	Banks Peninsula button daisy
<i>Linum monogynum</i>	NZ linen flax
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Luzula banksiana var. orina</i>	woodrush
<i>Macropiper excelsum</i>	kawakawa
<i>Meliccytus ramiflorus</i>	mahoe, whiteywood



<i>Melicope simplex</i>	poataniwha
<i>Microtis unifolia</i>	onion orchid, maikaika
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Olearia fragrantissima</i>	fragrant tree daisy
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	native oxalis
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parietaria debilis</i>	NZ pellitory
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Poa cita</i>	silver tussock
<i>Poa imbecilla</i>	weak poa
<i>Polystichum oculatum</i>	shield fern
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Pyrrosia eleagnifolia</i>	leatherleaf fern
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Rytidosperma species</i>	danthonia
<i>Scandia geniculata</i>	climbing aniseed
<i>Senecio minimus</i>	native fireweed
<i>Senecio quadridentatus</i>	cotton fireweed, pekapeka
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai, weeping kowhai
<i>Sophora prostrata</i>	dwarf kowhai, prostrate kowhai
<i>Streblus heterophyllus</i>	small-leaved milk tree, turepo
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Wahlenbergia violacea</i>	NZ harebell
<b>Exotic species</b>	
<i>Agrostis capillaris</i>	brown top
<i>Aira caryophyllea</i>	silvery hair grass
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Anthosachne scabra</i>	blue wheatgrass
<i>Bromus diandrus</i>	riggut brome
<i>Bromus hordeaceus</i>	soft brome
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Cotyledon orbiculata</i>	pig's ear, elephant's ear
<i>Critesion murinum</i>	barley grass
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Epilobium cinereum</i>	willow herb
<i>Euphorbia peplus</i>	petty spurge, milkweed



<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Juncus bufonius</i>	toad rush
<i>Lactuca virosa</i>	acid letuce
<i>Lolium perenne</i>	ryegrass
<i>Marrubium vulgare</i>	horehound
<i>Mimulus guttatus</i>	monkey musk
<i>Nasturtium officinale</i>	watercress
<i>Physalis peruviana</i>	cape gooseberry
<i>Polycarpon tetraphyllum</i>	allseed
<i>Prunus cerasifera</i>	cherry plum
<i>Ranunculus repens</i>	creeping buttercup
<i>Rosa rubiginosa</i>	sweet briar, briar rose
<i>Sagina procumbens</i>	procumbent pearlwort
<i>Sambucus nigra</i>	elderberry
<i>Sonchus oleraceus</i>	puha, smooth sow thistle
<i>Stellaria media</i>	chickweed
<i>Verbascum thapsus</i>	woolly mullein

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Pigeon Bay Road Bush

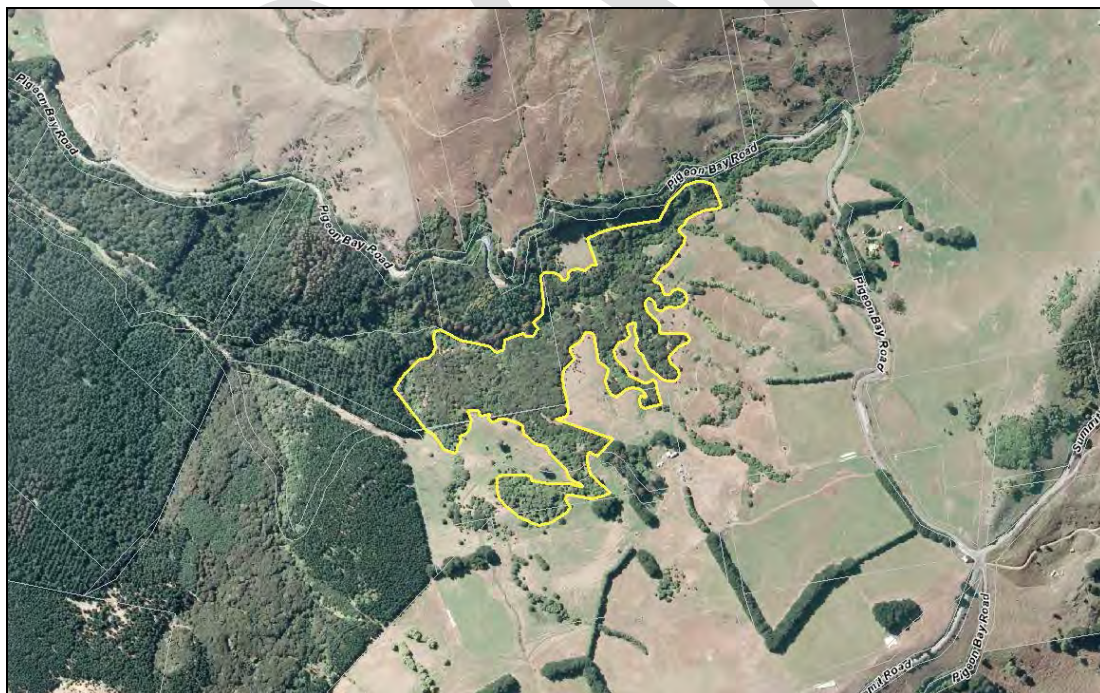
**Site number:** SES/H/5

**Physical address of site:** Pigeon Bay Road, Pigeon Bay

#### Summary of Significance:

The site is significant because it has indigenous forest that has been reduced to less than 20% of its former extent at the Region and ecological district scales. It supports an indigenous plant species that is nationally At Risk and two others that are uncommon within the ecological region or ecological district. It also provides habitat for a bird species that is uncommon in the ecological district.

#### Site Map



## **Additional Site Information**

**Ecological District:** Herbert

**Area of SES (ha):** 11.88

**Central point (NZTM):** E1593042, N5158374

## **Site Description**

The site is situated on a moderately steep, north to north-west facing hill slope in the headwaters of Pigeon Bay Stream on the southern side of Pigeon Bay Road. The elevation of the site is between approximately 180 – 300 m above sea level. Pigeon Bay Stream and several small tributaries flow through the site.

The dominant vegetation type within the site is indigenous secondary growth kanuka-mahoe forest with a small number of emergent old-growth podocarp trees. The canopy is dominated by kanuka and mahoe, with lesser amounts of tree fuchsia, kowhai, kaikomako and five-finger. Podocarps (kahikatea, totara and matai), although rare, are a conspicuous feature of the site and there are occasional juveniles of totara and matai. Native vines, particularly native jasmine and large-leaved pohuehue are abundant throughout the site, and form dense patches in the narrow tongues of forest which occur along the tributary streams on the north-facing slopes. The site has exotic plantation forest (pines and eucalypts) on its northern and western boundaries. Stock have been excluded from the western side of the site, while the remainder is grazed by cattle and sheep. In the ungrazed part, there is vigorous regeneration of palatable species such as mahoe, lemonwood and karamu, however the understorey in the grazed areas is much more open, and mainly consists of ferns and less palatable species (Wildland Consultants unpubl. data 2012). Plant species recorded from within the site are listed in Appendix 1.

Information on birds is limited to those species recorded during the botanical survey: bellbird, grey warbler, kereru, South Island rifleman and silvereye (Wildland Consultants unpubl. data 2012).

## **Extent of Site of Ecological Significance**

The site includes secondary growth kanuka-mahoe forest. Two large remnant kahikatea grow in pasture outside the site boundaries, these trees are ecologically important and they are worthy of protection via alternative methods.

This site is connected to another area of kanuka dominant forest further to the west that has not been surveyed. There is insufficient information available to assess its significance.



## Assessment Summary

The Pigeon Bay Road Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the rarity/distinctiveness criteria (criteria 3, 4 and 5).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.*

The site is not significant under this criterion. Although there are a small number of large remnant podocarp trees on the upper (south-eastern) margins of the site most of the site is young secondary growth kanuka-mahoe forest. While there is vigorous regeneration occurring in the unfenced half of the site, the north-eastern half is grazed and the understorey is much more modified and comprised largely of less palatable plant species (Wildland Consultants unpubl. data 2012). Overall, this site is not typical of the vegetation and habitats that would have been present in the ED at a baseline of 1840 and does not meet this criterion.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

The site is not significant under this criterion. It is not a relatively large example of its type within the Herbert Ecological District.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

The site is significant under this criterion.

The existing vegetation within the site is comprised of secondary growth forest dominated by kanuka and mahoe, with a small number of emergent old-growth podocarp trees (Wildland Consultants unpubl. data 2012). Lowland podocarp-hardwood forest has been reduced to a fragment of its former extent at the Region and ecological district scales. Harding (2009) estimates that the original extent of podocarp/hardwood forest in the ED (as a % of the ED) was 51 - 75%. The present extent of all indigenous forest (including manuka and/or kanuka) in the ED is estimated to be 10.9% (New Zealand Landcover Database (Version 4)).



This site also meets this criterion at the Level IV land environment scale. It supports indigenous vegetation that is on a Chronically Threatened land environment (F3.1b) where 12.2% indigenous vegetation is left on these land environments nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has an indigenous plant species that is nationally At Risk, and two others that are uncommon within the ecological region or ecological district. It also provides habitat for a bird species that is uncommon in the ecological district.

**Plants**

Nationally Threatened and At Risk plant species (de Lange et al. 2013) recorded from the site (Wildland Consultants unpubl. data 2012) are:

- *Brachyglottis sciadophila* (At Risk – Declining) (there are occasional patches in the northeastern part of site).

Plant species recorded from the site (Wildland Consultants unpubl. data 2012) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Microlaena polynoda* (uncommon in the ecological region and in Canterbury (Wilson 1992)). This species grows in a seepage next to the stream in the north-western part of the site.
- Kiokio (*Blechnum novae-zealandiae*)

**Birds**

The bird species recorded from the site (Wildland Consultants unpubl. data 2012) that is uncommon in the ecological district (Crossland unpubl. data 2014) is:

- South Island rifleman

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There is one species (Wildland Consultants unpubl. data 2012) that is at its southern regional distributional limits on Banks Peninsula (Wilson 2013):

- Pigeonwood (*Hedycarya arborea*)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is not significant under this criterion. It does not support indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.

### **Diversity and Pattern**

- 7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is not significant under this criterion. It only contains one vegetation community. It does not contain a high diversity of indigenous ecosystems or habitat types or have changes in species composition reflecting the existence of diverse natural features or ecological gradients. The diversity of indigenous plant species is not particularly high for this vegetation type.

### **Ecological Context**

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is not significant under this criterion. It is not a particularly important ecological link, although like many of Banks Peninsula's indigenous forest patches it is likely to play some role as a stepping stone for indigenous fauna within the wider landscape. It does not provide a buffer to other high value areas, but it does buffer a small section of Pigeon Bay Stream. The site itself is currently buffered to some extent by exotic plantation forest (pines and eucalypts) on its northern and western boundaries. Overall, the extent to which this site contributes to local ecological processes is not important enough for it to meet the threshold for significance under this criterion.

- 9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site that meet the threshold for significance under this criterion.

- 10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess the site against this criterion.



## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants: old man's beard, hawthorn, sweet cherry and crack willow (Wildlands unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling high priority biodiversity pest plants such as old man's beard.</li> <li>Consider ongoing surveillance for, and control if detected, of other biodiversity pest plants such as banana passionfruit and sycamore that are known to occur in the vicinity of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowners about monitoring and control of pest plants.</li> </ul>
<ul style="list-style-type: none"> <li>Stock</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the north-eastern half of the site that is currently unfenced.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the benefits to biodiversity of stock management and about the options available.</li> <li>Assistance available as appropriate and with landowner agreement.</li> </ul>



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**Assessment completed by:** Scott Hooson  
**Date:** 6 August 2014

**Statement completed by:** Scott Hooson  
**Date:** 6 August 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2012).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum minus</i>	swamp kiokio
<i>Blechnum novae-zealandiae</i>	kiokio
<i>Blechnum penna-marina</i>	little hard fern
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carex forsteri</i>	cutty grass
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Clematis paniculata</i>	puawananga
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma propinqua x robusta</i>	
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coriaria arborea</i>	tree tutu
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Cyathea smithii</i>	Smith's tree fern, katote
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dicksonia squarrosa</i>	wheki, rough tree fern
<i>Euchiton species</i>	cudweed
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Hebe salicifolia</i>	koromiko
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum lanceolatum</i>	niniao
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Hypolepis ambigua</i>	pig fern
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea ericoides</i>	kanuka
<i>Lagenifera strangulata</i>	parani



<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Meliccytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Metrosideros diffusa</i>	white climbing rata
<i>Microlaena polynoda</i>	bamboo rice grass
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Myrsine australis</i>	red mapou, red matipo
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Pneumatopteris pennigera</i>	gully fern, pakau
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum neozelandicum</i>	shield fern
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pteridium esculentum</i>	bracken
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Schefflera digitata</i>	pate, seven-finger
<i>Senecio minimus</i>	native fireweed
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai, weeping kowhai
<i>Uncinia leptostachya</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species</b>	
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Callitriche stagnalis</i>	starwort
<i>Cirsium vulgare</i>	Scotch thistle
<i>Clematis vitalba</i>	old man's beard
<i>Crataegus monogyna</i>	hawthorn
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Eucalyptus globulus</i>	eucalypt, blue gum
<i>Holcus lanatus</i>	Yorkshire fog
<i>Lotus pedunculatus</i>	lotus
<i>Mimulus guttatus</i>	monkey musk
<i>Mycelis muralis</i>	wall lettuce
<i>Nasturtium officinale</i>	watercress
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Prunus avium</i>	sweet cherry
<i>Prunella vulgaris</i>	selfheal



<i>Ranunculus repens</i>	creeping buttercup
<i>Rubus fruticosus</i>	blackberry
<i>Salix fragilis</i>	crack willow
<i>Sambucus nigra</i>	elderberry
<i>Stellaria media</i>	chickweed
<i>Trifolium pratense</i>	red clover
<i>Ulex europaeus</i>	gorse
<i>Verbena officinalis</i>	vervain

DRAFT

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

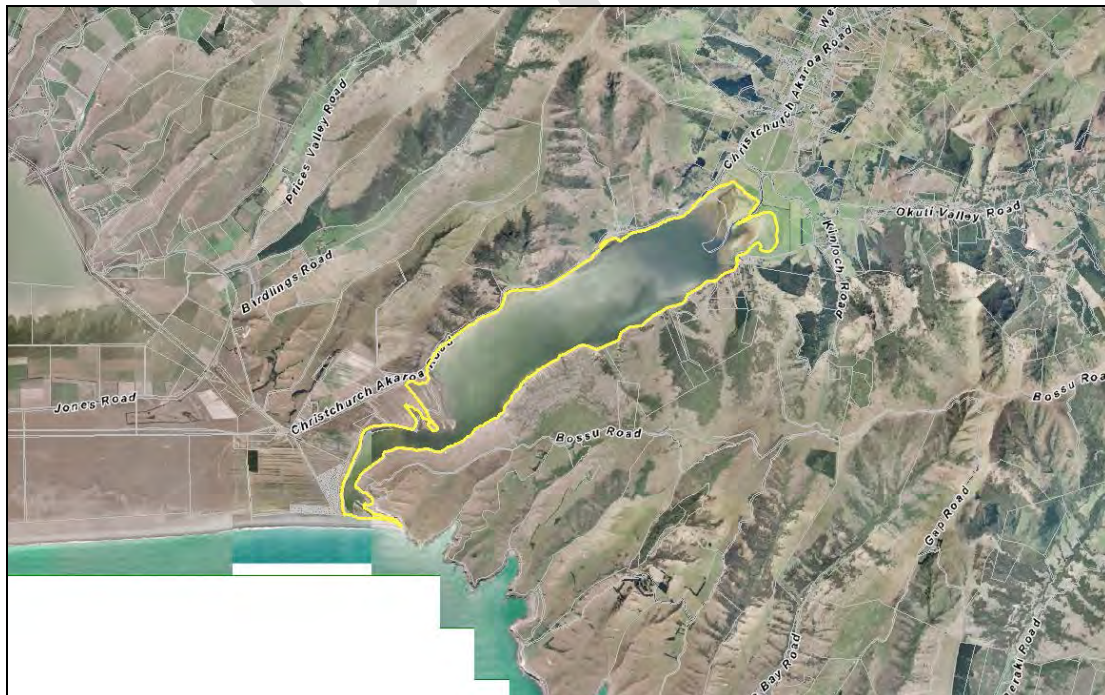
**Site name:** Lake Forsyth/Wairewa

**Site number:** SES/H/6

#### Summary of Significance:

Lake Forsyth/Wairewa is significant as a large example of a coastal lake with extensive and representative saltmarsh and freshwater wetlands. The lake margins are an originally rare ecosystem that supports distinctive vegetation communities. The lake and its margins support a large number of indigenous plant, bird and fish species that are nationally Threatened and At Risk and uncommon within the ecological districts or region. The site also provides habitat for a very diverse, representative assemblage of birds and is a nationally and regionally significant habitat for a large number of species. It is an important ecological corridor for fauna, including several migratory freshwater fish and is ecologically linked to other surrounding areas of high ecological value.

#### Site Map



## Additional Site Information

**Ecological District:** Herbert and Akaroa<sup>1</sup>

**Area of SES (ha):** 715.42

**Central point (NZTM):** E1578845, N5149699

## Site Description

Lake Forsyth/Wairewa is a narrow lake (approximately 7.6 km long by 1 km wide) (Cromarty and Scott 1995) at the eastern end of Kaitorete Spit and within the steep sides of Little River Valley. The Christchurch - Akaroa Road passes along the lake's northwestern edge. The boundary between the Herbert and Akaroa Ecological Districts runs through the centre of the lake.

Curved beach ridges at the base of Kaitorete Spit impound the lake. A short man-made channel leads to the sea, but surface discharge is usually blocked by a gravel beach ridge. This barrier is mechanically opened when lake levels are high. The lake is near sea level, approximately 2 m deep, slightly brackish and highly eutrophic (Cromarty and Scott 1995).

There are extensive wetlands located around the perimeter of the lake. Those nearer the coast are non-tidal estuarine habitats that are comprised mostly of native sea rush rushland and marsh ribbonwood shrubland with smaller areas of native reedland and mixed saltmarsh herbfield. Remaining perimeter wetlands, including extensive wetland areas at the head of the lake, are freshwater lacustrine marsh, and palustrine marsh and swamp habitats. The vegetation of the palustrine wetlands is mainly wet pasture with *Juncus edgariae* rushland and smaller areas of raupo reedland and willow treeland and forest. The lacustrine habitats are mainly indigenous lakeshore turf/herbfields with a high diversity of species. Stands of raupo also occur at intervals in shallow water around the lake margin (Grove and Parker 2013). A comprehensive plant species list (Jensen 2009) is provided in Appendix 1.

The lake was identified by the Department of Conservation as a Recommended Area for Protection (Herbert RAP 17 – Wairewa) Wilson (1992).

## Extent of Site of Ecological Significance

The site includes the lake and margins, including its wetlands and the wet pasture at the head of the lake which provide important habitat for birds (Crossland 2008).

<sup>1</sup> The boundary between the Herbert and Akaroa Ecological Districts following Wilson (1992) runs approximately through the centre of Lake Forsyth/Wairewa.



## Assessment Summary

The Lake Forsyth/Wairewa Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8, 9 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Although the lake has a very high nutrient status and some of the vegetation on the margins has been modified by dryland plant invasion (ECan 2010) it supports moderately representative examples of both freshwater palustrine and lacustrine wetland vegetation and diverse and representative indigenous lakeshore turfland and herbfield communities. The site still retains the key wetland functions of a coastal lake/lagoon habitat.

The lake has an international significance ranking for bird habitat (Cromarty and Scott 2005, O'Donnell 2000) and supports a diverse and representative assemblage of water birds. A very high proportion of the species in the "Banks Peninsula estuaries/coastal wetlands bird species assemblage" (Crossland unpubl. data 2014) occur at the site (Appendix 2). A full list of the species recorded by Council staff at the site (Crossland unpubl. data 2014) is provided in Appendix 3.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

Lake Forsyth/Wairewa is the largest lake in both the Herbert and Akaroa Ecological Districts. It supports the most extensive non-tidal saltmarshes and freshwater marshes in the Banks Ecological Region.





### Rarity/Distinctiveness

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The wetlands within the site are significant under this criterion.

Wetland ecosystems have been reduced to less than 20% of their former extent at the ecological district, regional and freshwater biogeographic unit scales. Ausseil et al. (2008) estimate that wetlands have been reduced to 10.6% of their original extent in the Canterbury Region and 7.0% in the Canterbury freshwater biogeographic unit.

The site is also significant at the Level 4 land environment scale. Much of the indigenous freshwater wetland vegetation on the margins of the lake is on Acutely and Chronically Threatened land environments (predominantly J2.2b, F3.1a and J2.1d,) where 4.5, 9.9 and 10.6% indigenous vegetation, respectively, is left on these land environments nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

Lake Forsyth/Wairewa supports a large number of indigenous plant, bird and fish species that are nationally Threatened and At Risk and plant and bird species that are uncommon within the ecological district or region.

### Plants

Nationally Threatened and At Risk plant species (de Lange et al. 2013) that occur in the lake or on the margins of the lake (Jensen 2009, Wilson 1992) include:

- *Muehlenbeckia astonii* (Threatened - Nationally Endangered) (Jensen 2009)
- *Isolepis basillaris* (Threatened - Nationally Vulnerable) (Jensen 2009, Wilson 1992) – this is probably the best site for this species in Canterbury (Jensen 2009)
- *Lepilaena bilocularis* (Threatened – Nationally Vulnerable) (Wilson 1992)
- *Eryngium vesiculosum* (At Risk – Declining) (Jensen 2009, Wilson 1992)
- *Coprosma virescens* (At Risk – Declining) (Jensen 2009)
- *Chenopodium allanii* (At Risk – Naturally Uncommon) (Jensen 2009)
- *Hebe strictissima* (At Risk – Naturally Uncommon) (Jensen 2009)
- *Mimulus repens* (At Risk – Naturally Uncommon) (Jensen 2009, Wilson 1992)
- *Stuckenia pectinata* (At Risk – Naturally Uncommon) (Wilson 1992)

Plant species (Jensen 2009) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Alternanthera nahui*
- *Bolboschoenus caldwellii*



- *Carex buechananii*
- *Chenopodium glaucum*
- *Crassula sinclairii*
- *Isolepis cernua*
- *Juncus krausii*
- *Limosella lineata*
- *Myriophyllum triphyllum*
- *Potamogeton cheesemanii*
- *Pratia perpusilla*
- *Ranunculus limosella*
- *Ruppia polycarpa*
- *Selliera radicans*
- *Typha orientalis*
- *Zannichellia palustris*

### Birds

Nationally Threatened bird species (Robertson et al. 2012) that use the lake and its margins (Crossland unpubl. data 2014) are:

- White heron (Threatened - Nationally Critical)
- Black-billed gull (Threatened - Nationally Critical)
- Black-fronted tern (Threatened - Nationally Endangered)
- Australasian crested grebe (Threatened - Nationally Vulnerable)
- Banded dotterel (Threatened - Nationally Vulnerable)
- Caspian tern (Threatened - Nationally Vulnerable)
- Pied cormorant (Threatened - Nationally Vulnerable)
- Red-billed gull (Threatened - Nationally Vulnerable)

The site is also known to provide habitat for Australasian bittern (Threatened - Nationally Endangered, and threatened and uncommon in the ecological district), marsh crake (At Risk – Relict, and threatened and uncommon in the ecological district) but due to the cryptic nature of these species they are not recorded during formal Council surveys (Andrew Crossland *pers.comm* 2015).

Nationally At Risk (Robertson et al. 2012) bird species<sup>2</sup> that use the lake its margins are:

- Eastern bar-tailed godwit (At Risk - Declining)
- Pied stilt (At Risk - Declining)
- South Island pied oystercatcher (At Risk - Declining)
- White-fronted tern (At Risk - Declining)
- Black cormorant (At Risk - Naturally Uncommon)
- Little black cormorant (At Risk - Naturally Uncommon)
- Royal spoonbill (At Risk - Naturally Uncommon)
- Variable oystercatcher (At Risk- Recovering)

<sup>2</sup> Although for mobile fauna such as birds, species classified as nationally At Risk do not meet the threshold for significance (Wildland Consultants 2013).



## Fish

A number of nationally Threatened and At Risk (Goodman et al. 2014) fish species are found in, or migrate through the site between the marine environment and the rivers and streams above the lake (Gray 2013):

- Lamprey (Threatened – Nationally Vulnerable)
- Longfin eel (At Risk - Declining)
- Torrentfish (At Risk - Declining)
- Bluegill bully (At Risk - Declining)
- Koaro (At Risk - Declining)
- Inanga (At Risk - Declining)
- Redfin bully (At Risk - Declining)

**5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.***

The site is not significant under this criterion. There are no indigenous vegetation communities or indigenous species at their distributional limit within Canterbury Region or nationally.

**6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

The site is significant under this criterion.

Lake margins are originally rare ecosystems Williams et al. (2007). The lake and its margins also support a distinctive assemblage of salt marsh turf species and a distinctive assemblage of indigenous birds.

## Diversity and Pattern

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

The lake supports a diverse range of indigenous wetland plant communities. The composition of the wetland communities change in response to differences in salinity between the mouth and the head of the lake. Wetlands at the head of the lake are freshwater palustrine and lacustrine wetlands while those nearer the coast are comprised mostly of species more tolerant to higher salinity including native sea rush rushland and marsh ribbonwood shrubland with areas of native reedland and saltmarsh herbfield (Grove and Parker 2013).

Indigenous lakeshore vegetation communities support turfland and herbfield vegetation communities that are notable for their diversity (Wilson 1992, Jensen 2009, Grove and Parker 2013).



The lake also provides habitat for a very diverse assemblage of birds. With 93 bird species recorded since 1840 (including 51 resident species, 14 seasonal visitors, 17 vagrants and 11 locally extinct species) the lake and its environs has a comparable or higher species diversity than most other New Zealand coastal wetland and estuarine systems and the seventh highest ranking in Canterbury behind Lake Ellesmere, the Avon-Heathcote Estuary/Bromley Oxidation Ponds, Lake Ki-Wainono, Ashley-Saltwater Creek Estuary, Brooklands Lagoon and Washdyke Lagoon. Fifty-three species are wetland and coastal birds (Crossland 2008).

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

Lake Forsyth/Wairewa is ecologically linked to other areas of high ecological value including the indigenous shrublands of Birdlings Flat, diverse shrublands and forest on the north-western side of the lake, dryland vegetation communities on the south eastern side of the lake, the shingle beach and dune ecosystems of Kaitorete Spit, and the Takiritawai River and its upstream tributaries.

The lake provides an important ecological corridor for a number of migratory fish species including large numbers of long- and shortfin eel. The ecological linkage between the coast and the rivers and the streams via the lake is essential for these fish.

The lake and its margins are also part of an ecological network of coastal habitats along the South Island's east coast that provide habitat for water and wetland birds. It provides important additional habitat in close proximity to Lake Ellesmere/Te Waihora. When habitat conditions in Lake Ellesmere are unsuitable for the feeding requirements of a range of wetland bird species (e.g. pied stilt, banded dotterel, grey teal, New Zealand shoveler and black swan) there is a substantial movement of birds from Lake Ellesmere/Te Waihora to Lake Forsyth/Wairewa (Crossland *pers. comm.* 2015).

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is significant under this criterion.

Its large size and high species richness mean the site plays an important role in maintaining the genetic and ecological diversity of the region. The wetlands on the lakes margin are also significant under this criterion. They retain their key hydrological functions and are hydrologically connected to the lake.



**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

Lake Forsyth/Wairewa has an international significance ranking for bird habitat (Cromarty and Scott 1995, O'Donnell 2000). It supports large numbers and a high diversity of wetland and coastal birds including large numbers of nationally Threatened and At Risk species (Robertson et al. 2012) (refer to Criterion 4, above).

Fifty-three bird wetland and coastal bird species have been recorded on the lake and numbers of birds peak at 10,000+ in late summer/autumn (Crossland 2008). Twenty-one of these species use the lake and its margins in numbers of national, regional or local significance (Appendix 2). The key bird species of conservation importance at Lake Forsyth are Australasian crested grebe (year round); white heron (autumn-winter); paradise shelduck (summer-autumn); New Zealand shoveler (summer-autumn); Grey teal (summer-winter); New Zealand scaup (autumn-winter) and Pied stilt (spring-summer) (Crossland 2008).

The lake is of special value as a wintering site for up to 70% (up to 269 birds) of the entire New Zealand population of Australasian crested grebe (Crossland 2008, unpubl. data 2014).

Important habitats for birds at the site are:

- Lower Okana River and delta
- Lowland wet grassland at the head of the lake
- Mudflats at the head of the lake
- Mudflats at the southern end of the lake
- Freshwater wetlands adjacent to the western shoreline
- East and west lake margins
- Short grassland, saltmeadow and saltmarsh habitats at the southern end of the lake
- The lake outlet channel
- The lake mouth at Birdlings Flat

These habitats and the bird guilds that use them are described in more detail in Crossland (2008).

## Site Management

### Existing Protection Status

The majority of the site is within the Wairewa Conservation Area (conservation unit no. N36135 and M37017, M37018, M37019 and M37020). This areas are administered by the Department of Conservation. Areas at the head (north-eastern end) of the lake are in private ownership and are not legally protected. The site is a Maori Fishing Reserve under Fisheries Regulations (1986). Ngai Tahu and local runanga are responsible for the management of The Wairewa Maori Fisheries Reserve (Cromarty and Scott 1995).

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Water quality issues: high nutrient levels sedimentation. The lake is in a highly eutrophic state and experiences frequent algal blooms.</li> </ul>	<ul style="list-style-type: none"> <li>The Banks Peninsula Zone Committee has prepared an action plan to address freshwater quality (and flooding issues) in the catchment. The plan will be incorporated into a sub-regional section (section 10) of the proposed Land &amp; Water Regional Plan.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Stock, particularly cattle at the head of the lake (Jensen 2009).</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the alluvial flats at the head of the lake and working with landowner(s) to remove grazing from areas of high botanical and/or habitat value.</li> <li>Consider fencing the wetland margin around the Christchurch City Council's Birdlings Flat Regional Park (Reserve 3185) to keep sheep out of the wetland communities.</li> <li>Consider fencing other un-fenced parts of the lake.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about the benefits to biodiversity of stock control and of the options available.</li> <li>Collaboration with other agencies and groups to assist landowners as appropriate.</li> </ul>

<ul style="list-style-type: none"> <li>• Passage for eels and other indigenous diadromous fish species through the mouth of the lake.</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to open the lake at key upstream and downstream migration periods to allow the passage of indigenous migratory fish.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Prolonged heightened lake levels affecting saltmarsh and turfland vegetation, bird breeding, feeding, roosting habitat and the condition of buffering vegetation on the lake margins.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider the ecological requirements of indigenous fauna and saltmarsh and turfland vegetation in decisions regarding the management of lake levels, particularly in relation to extended periods of extremely low or high lake levels.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Vehicle damage to turfland in front of the powerboat clubhouse house (Jensen 2009).</li> </ul>	<ul style="list-style-type: none"> <li>• Consider signage and fencing or bollards to limit vehicle access at this location. Consider the feasibility of constructing a boat ramp to discourage people driving over the turfland to launch boats.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Power boats disturbing wildlife on the lake.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider options for controlling or prohibiting the use of power boats on the lake.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Model planes disturbing wildlife on the lake</li> </ul>	<ul style="list-style-type: none"> <li>• Consider options for restricting the use of model planes in the air space over areas with high wildlife values.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>
<ul style="list-style-type: none"> <li>• Gamebird hunting disturbing non-target waterfowl, particularly species such as Australasian crested grebe.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider identifying sensitive locations where hunting is best prohibited and identifying appropriate locations for gamebird hunting. This is considered to be particularly important now that Canada geese can be hunted year round. The hunting window now extends through the breeding season, the moulting season and the period of peak occupancy of indigenous bird species (including threatened and at risk species).</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>

<ul style="list-style-type: none"> <li>Biodiversity pest plants. Many exotic plants are present on the lake margins (e.g. grey and crack willows and horned poppy near Birdlings Flat).</li> </ul>	<ul style="list-style-type: none"> <li>Consider implementing a programme (in partnership with DOC?) to control grey willows (as a priority) and crack willows (where they are not providing important roosting/nesting habitat for birds).</li> <li>Consider controlling other biodiversity pest plants within site.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
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**Assessment completed by:** Scott Hooson  
**Date:** 18 November 2014

**Statement completed by:** Scott Hooson  
**Date:** 18 November 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



## Appendix 1: Plant Species List

Sourced from Jensen (2009).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena novae-zelandiae</i>	piripiri, bidibid
<i>Aira caryophyllea</i>	
<i>Alectryon excelsus</i>	titoki
<i>Alternanthera nahui</i>	
<i>Bolboschoenus caldwellii</i>	
<i>Calystegia soldanella</i>	shore convolvulus
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carex buechananii</i>	
<i>Carex secta</i>	pukio
<i>Carex virgata</i>	pukio
<i>Chenopodium allanii</i>	
<i>Chenopodium glaucum</i>	glaucous goosefoot
<i>Clematis afoliata</i>	leafless clematis
<i>Coprosma areolata</i>	
<i>Coprosma crassifolia</i>	mikimiki
<i>Coprosma propinqua</i>	mikimiki
<i>Coprosma repens</i>	taupata
<i>Coprosma robusta</i>	karamu
<i>Coprosma virescens</i>	
<i>Cordyline australis</i>	ti kouka, cabbage tree
<i>Corokia cotoneaster</i>	korokio
<i>Cotula coronopifolia</i>	batchelors button
<i>Crassula sinclairii</i>	
<i>Cristesion marimum</i>	salt barley grass
<i>Dichondra brevifolia</i>	
<i>Disphyma australe</i>	horokaha, NZ ice plant
<i>Eleocharis acuta</i>	sharp spike sedge
<i>Eryngium vesiculosum</i>	
<i>Ficinia nodosa</i>	
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Hebe strictissima</i>	
<i>Helichrysum lanceolatum</i>	
<i>Hoheria angustifolia</i>	houhere, narrow-leaved lacebark
<i>Hydrocotyle sulcata</i>	
<i>Ileostylus micranthus</i>	
<i>Isolepis basilaris</i>	
<i>Isolepis cernua</i>	slender clubrush
<i>Juncus edgariae</i>	wiwi
<i>Juncus kraussii</i> var.	sea rush
<i>Kunzea ericoides</i>	kanuka
<i>Leptinella dioica</i>	
<i>Lilaeopsis novae-zelandiae</i>	
<i>Limosella lineata</i>	mudwort
<i>Meliccytus ramiflorus</i>	mahoe



<i>Mimulus repens</i>	native musk
<i>Muehlenbeckia astonii</i>	pohuehue
<i>Muehlenbeckia australis</i>	pohuehue
<i>Muehlenbeckia axillaris</i>	pohuehue
<i>Muehlenbeckia complexa</i>	pohuehue
<i>Muehlenbeckia ephedroides</i>	pohuehue
<i>Myoporum laetum</i>	ngaio
<i>Myriophyllum triphyllum</i>	water milfoil
<i>Myrsine australis</i>	mapau, red matipo
<i>Olearia paniculata</i>	akiraho, hedge olearia
<i>Oxalis exilis</i>	creeping oxalis
<i>Phormium tenax</i>	harakeke, NZ flax
<i>Pittosporum tenuifolium</i>	kohuhu
<i>Plagianthus divaricatus</i>	marsh ribbonwood
<i>Poa cita</i>	silver tussock, wii
<i>Polystichum richardii</i>	
<i>Pratia perpusilla</i>	
<i>Pseudopanax arboreus</i>	five-finger
<i>Pteridium esculentum</i>	bracken
<i>Ranunculus limosella</i>	
<i>Rubus cissoides</i>	tataramoa, bush lawyer
<i>Schoenoplectus pungens</i>	three-square
<i>Selliera radicans</i>	remuremu, selliera
<i>Sophora microphylla</i>	kowhai
<i>Sophora prostrata</i>	prostrate kowhai
<i>Tetragonia implexicoma</i>	NZ spinach
<i>Triglochin striatum</i>	arrow grass
<i>Typha orientalis</i>	raupo
<b>Exotic species</b>	
<i>Acaena agnipila</i>	Australian sheeps bur
<i>Acer pseudoplatanus</i>	sycamore
<i>Achillea millefolium</i>	yarrow
<i>Agrostis stolonifera</i>	creeping bent
<i>Anagallis arvensis</i>	scarlet pimpernel
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Atriplex prostrata</i>	orache
<i>Bromus diandrus</i>	riggut brome
<i>Calystegia silvatica</i>	bindweed
<i>Carpobrotus edulis</i>	ice plant
<i>Centranthus ruber</i>	spur valerian
<i>Chenopodium album</i>	fathen
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Echium candicans</i>	
<i>Echium vulgare</i>	
<i>Elytrigia repens</i>	couch
<i>Erodium cicutarium</i>	common storksbill
<i>Foeniculum vulgare</i>	fennel
<i>Glaucium flavum</i>	
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear



<i>Lolium perenne ryegrass</i>	
<i>Lotus pedunculatus</i>	lotus major
<i>Malus domesticus</i>	Malus sp.
<i>Pittosporum ralphii</i>	
<i>Plantago coronopus</i>	bucks horn plantain
<i>Plantago lanceolata</i>	narrow plantain
<i>Plantago major</i>	broad plantain
<i>Polygonum salicifolium</i>	swamp willow weed
<i>Quercus sp.</i>	oak
<i>Rosa rubiginosa</i>	sweet briar
<i>Rubus fruticosus agg.</i>	blackberry
<i>Rumex acetosella</i>	sheep sorrel
<i>Rumex crispus</i>	curled dock
<i>Rumex obtusifolius</i>	broad dock
<i>Salix cinerea</i>	grey willow
<i>Salix fragilis</i>	crack willow
<i>Sambucus nigra</i>	elder
<i>Schedonorus phoenix</i>	tall fescue
<i>Sedum acre</i>	stonecrop
<i>Solanum nigrum</i>	black nightshade
<i>Spergularia marina</i>	
<i>Trifolium fragiferum</i>	strawberry clover
<i>Trifolium pratense</i>	red clover
<i>Trifolium repens</i>	white clover
<i>Ulex europaeus</i>	gorse
<i>Verbascum thapsus</i>	woolly mullein
<i>Vicia sativa</i>	vetch



## Appendix 2: Indigenous Banks Peninsula Estuaries/Coastal Wetlands Bird Species Assemblage

Comparison of bird species recorded at Lake Forsyth/Wairewa (Crossland unpubl. data 2014) (and incidental observations by Council staff) with the “Banks Peninsula Estuaries/Coastal Wetlands Bird Species Assemblage” (Crossland 2014).

Species recorded at the study site are marked with a tick ✓.

	Common name	Scientific Name
	Arctic Skua	<i>Stercorarius parasiticus</i>
	Australasian Gannet	<i>Morus serrator</i>
✓	Australasian Harrier	<i>Circus approximans</i>
✓	Black Cormorant	<i>Phalacrocorax carbo novaehollandiae</i>
✓	Black Swan	<i>Cygnus atratus</i>
✓	Black-backed Gull	<i>Larus dominicanus dominicanus</i>
✓	Black-billed Gull	<i>Larus bulleri</i>
✓	Black-fronted Tern	<i>Sterna albobriata</i>
✓	Caspian Tern	<i>Sterna caspia</i>
✓	Eastern Bar-tailed Godwit	<i>Limosa lapponica baueri</i>
✓ *	Grey Duck	<i>Anas superciliosa superciliosa</i>
✓	Grey Teal	<i>Anas gracilis</i>
✓	Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>
✓	Little Cormorant	<i>Phalacrocorax melanoleucos brevirostris</i>
✓	Marsh Crake	<i>Porzana pusilla affinis</i>
✓	New Zealand Kingfisher	<i>Halcyon sancta vagans</i>
✓	New Zealand Shoveler	<i>Anas rhynchotis</i>
✓	Paradise Shelduck	<i>Tadorna variegata</i>
✓	Pied Cormorant	<i>Phalacrocorax varius varius</i>
✓	Pied Stilt	<i>Himantopus himantopus leucocephalus</i>
	Pomarine Skua	<i>Stercorarius pomarinus</i>
✓	Pukeko	<i>Porphyrio porphyrio melanotus</i>
✓	Red-billed Gull	<i>Larus novaehollandiae scopulinus</i>
	Reef Heron	<i>Egretta sacra sacra</i>
✓	South Island Pied Oystercatcher	<i>Haematopus ostralegus finschi</i>
✓	Spotted Shag	<i>Stictocarbo punctatus</i>
✓	Spur-winged Plover	<i>Vanellus miles</i>
✓	Variable Oystercatcher	<i>Haematopus unicolor</i>
✓	Welcome Swallow	<i>Hirundo tahitica neoxena</i>
✓	White-faced Heron	<i>Ardea novaehollandiae novaehollandiae</i>
✓	White-fronted Tern	<i>Sterna striata</i>
	New Zealand Pipit	<i>Anthus novaeseelandiae novaeseelandiae</i>

\* Mallard/grey duck hybrids have been recorded at the site (Crossland unpubl. data 2014).



### Appendix 3: Bird Species List

Waterbirds recorded from Lake Forsyth/Wairewa during Council monitoring, July 1989 to July 2014. Sourced from Crossland unpubl. data (2014).

\* denotes introduced species

Species
Australasian crested grebe
Australasian harrier
Australian coot
Banded dotterel
Black cormorant
*Black swan
Black-backed gull
Black-billed gull
Black-fronted tern
*Canada goose
Caspian tern
Eastern bar-tailed godwit
*Feral goose
Grey teal
Gull-billed tern
Little black cormorant
Little cormorant
Little egret
Little tern
Mallard/grey duck
*Mute swan
New Zealand shoveler
New Zealand scaup
Paradise shelduck
Pied cormorant
Pied stilt
Pukeko
Red-billed gull
Royal spoonbill
South Island pied oystercatcher
Spotted shag
Spur-winged plover
Variable oystercatcher
Welcome swallow
White heron
White-faced heron
White-fronted tern



#### Appendix 4: Significance for Bird Species

Bird species that use Lake Forsyth/Wairewa and environs in numbers of national (N), regional (R) or local (L) significance (defined as >5% of local or regional or >1% of national populations; based on lagoon bird monitoring data and best estimates for local/regional/national populations). Peak populations on Lake Forsyth are provided in brackets (from Crossland 2008).

Species	Max count	Significance
Australasian Crested Grebe	(250+)	N
White Heron	(3)	N
Paradise Shelduck	(3400+)	N
New Zealand Shoveler	(3000+)	N
Grey Teal	(3000+)	N
New Zealand Scaup	(4100+)	N
Pied Stilt	(700+)	N
Bar-tailed Godwit	(160)	R
Red-billed Gull	(2450)	R
Pied Cormorant	(20)	L
White-faced Heron	(20)	L
Australasian Bittern	(?)	L
Royal Spoonbill	(10)	L
Variable Oystercatcher	(6)	L
Spur-winged Plover	(210)	L
Banded Dotterel	(80)	L
Black-billed Gull	(320)	L
White-fronted Tern	(300)	L
Black-fronted Tern	(10)	L
Caspian Tern	(10)	L
New Zealand Kingfisher	(?)	L



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Pigeon Bay Turnoff

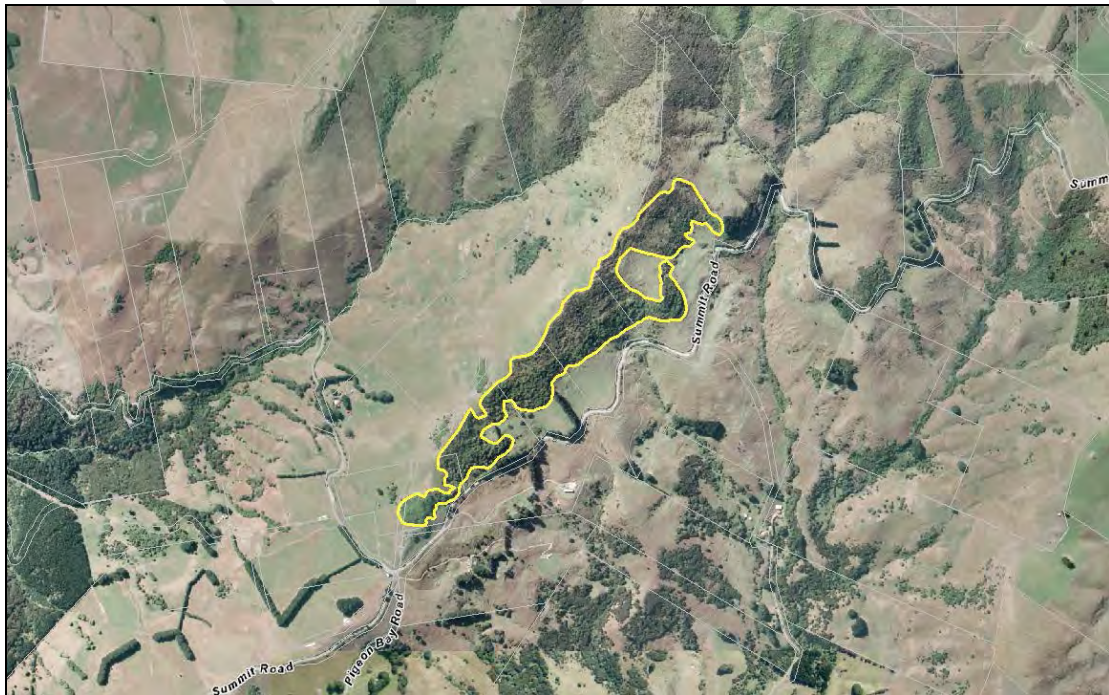
**Site number:** SES/H/7

**Physical address of site:** Pigeon Bay Road / Summit Road

#### Summary of Significance:

This site is significant because it contains indigenous forest that has been reduced to less than 20% of its former extent at the ecological district, ecological region and Level IV land environment scale. It supports three At Risk Declining plant species, including one of the best populations of climbing groundsel (*Brachyglottis sciadophila*) on Banks Peninsula and three species at their southern national distribution limit on Banks Peninsula. It is also part of an ecological network in the upper Pigeon Bay catchment and is an important link to the extensive areas of ecologically important indigenous vegetation and habitat on Mt Pearce.

#### Site Map



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 20.38

**Central point (NZTM):** E1594462, N5158729

## Site Description

This site occupies part of the top of a rocky ridge and a moderately steep south-east facing hill slope on the northern (uphill) side of the Summit Road north of the intersection of the Summit Road and Pigeon Bay Road. It is situated between approximately 380 and 540 m above sea level.

The vegetation consists of mixed canopy montane secondary hardwood forest, mixed canopy cool temperate secondary hardwood forest and mixed shrubland with scattered emergent hardwoods (Wildland Consultants unpubl. data 2012). These vegetation communities are described in more detail below and list of the plant species recorded at the site is provided in Appendix 1.

Mixed canopy secondary hardwood forest occupies the exposed southern end of a ridge just above the Summit Road. The canopy consists of a mixture of secondary growth hardwoods, with five-finger, mahoe, tree fuchsia and pigeonwood being the main species. There are also some old-growth broadleaf trees. Several saplings of matai were seen, and a number of totara seedlings. On the south-facing slopes and along the top of the ridge there is a dense ground cover of ferns (mostly hounds tongue and bracken), however the site is grazed, and there are few understorey plants on the more accessible north-facing slopes. The ground is covered in rocks and small boulders.

The south-facing slopes below the ridge are covered in cool temperate secondary hardwood forest. Five-finger, tree fuchsia and narrow-leaved lacebark are the most common canopy species, and there are occasional old-growth broadleaf trees. Horopito/peppertree and mikimiki (mainly *Coprosma rotundifolia* and *C. crassifolia*) are abundant in the subcanopy and understorey. A wide variety of native vines are present - native jasmine, large-leaved pohuehue and leafless bush lawyer are particularly abundant. *Brachyglottis sciadophila* is very common throughout the site, with dense patches around the edges and covering the ground in some places. This vegetation community is also grazed by stock.

The south-facing slopes near the top of the ridge support mixed shrubland dominated by small-leaved *Coprosma*/mikimiki species (mainly *Coprosma rigida*, *C. dumosa* and *C. crassifolia*) and horopito/peppertree. Scattered hardwood trees including five-finger, tree fuchsia, narrow-leaved lacebark and broadleaf also occur throughout this vegetation type and there is a small patch of kanuka in the middle of the shrubland (not present elsewhere at the site). Mature bloodwood (*Coprosma wallii*) trees were recorded within this vegetation community (towards the northern end of the ridge). The area is grazed by stock, and there are animal trails through the shrubland. Open areas between shrubs are dominated by exotic pasture grasses, with clumps of prickly shield fern underneath the shrubs.



Information on birds is limited to those species recorded during the botanical survey. They were bellbird, grey warbler and kereru (Wildland Consultants unpubl. data 2012).

## Extent of Site of Ecological Significance

The site includes the secondary forest, the mixed shrublands that buffer the forest and the shrublands on the southern side of the ridge that link the site to the extensive areas of indigenous vegetation on Mt Pearce.

## Assessment Summary

The Pigeon Bay Turnoff Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1), rarity/distinctiveness (criteria 3, 4 and 5) and ecological context criteria (criterion 8).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

With the exception of old growth broadleaf trees, the montane and cool temperate hardwood forest within the site is secondary growth forest. The canopy consists of a mixture of secondary growth hardwoods that is typical of these forest types in the Herbert ED. However the understorey is not considered to be representative because the site is grazed and the structure and composition of the understorey has been modified. The mixed indigenous shrublands on the south-facing slopes near the top of the ridge support a relatively diverse range of indigenous shrub and vine species. Although they are grazed by stock, with open areas between shrubs dominated by exotic pasture grasses, they are typical of indigenous shrublands on montane hill slopes within the ecological district.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is not significant under this criterion. It does not contain indigenous vegetation communities or habitats for indigenous fauna that are relatively large examples of their type within the Herbert Ecological District.



### Rarity/Distinctiveness

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The extent of any forest type other than kanuka scrub/forest, including podocarp/hardwood forest has been substantially reduced in the ecological district and ecological region. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of indigenous forest in the ecological district is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

This site also meets this criterion at the Level IV land environment scale because the indigenous vegetation within the site, including the mixed shrublands, is entirely on Chronically Threatened land environments where 10 - 20% indigenous vegetation remains on these land environments nationally (Walker *et al.* 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion. It supports three (At Risk Declining) plant species (de Lange *et al.* 2013) (including one of the best populations of climbing groundsel on Banks Peninsula (M. Hutchison pers. com 2014)) and one species that is “uncommon to rare or very local” on Banks Peninsula. These species are:

Nationally At Risk plant species (de Lange *et al.* 2013) recorded from the site (Wildland Consultants unpubl. data 2012) are:

- *Brachyglottis sciadophila* (At Risk Declining)
- *Coprosma virescens* (At Risk Declining)
- *Coprosma wallii* (At Risk Declining)

The plant species (Wildland Consultants unpubl. data 2012) that is “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) is:

- *Brachyscome radicata*

Climbing groundsel (*Brachyglottis sciadophila*) and *Coprosma virescens* (At Risk Declining) are both frequent within the mixed canopy cool temperate secondary hardwood forest and mixed shrubland and occasional within the mixed canopy secondary hardwood forest occupying the top and sides of the rocky ridge. *Coprosma wallii* occurs in the mixed shrubland near the top of the ridge. *Brachyscome radicata* occurs in the mixed canopy secondary hardwood forest on the south-facing slope below the rocky ridge.

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**



The site is significant under this criterion.

It contains three species (Wildland Consultants unpubl. data 2012) that are at their southern national or regional distributional limits on Banks Peninsula (Wilson 2013):

- Kawakawa (southern national limit)
- Native passion vine (southern national limit)
- Pigeonwood (southern regional limit)

**6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

The site is not significant under this criterion. It does not support indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.

### Diversity and Pattern

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is not significant under this criterion. It does not contain a high diversity of indigenous ecosystems or habitat types or have changes in species composition reflecting the existence of diverse natural features or ecological gradients. The site contains three habitat types: mixed canopy montane secondary hardwood forest, mixed canopy cool temperate secondary hardwood forest and mixed shrubland (Wildland Consultants unpubl. data 2012). There is moderate diversity of indigenous plant species within the site, but stock have removed many of the palatable ground-tier and understorey species.

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

It is part of an important network of patches of indigenous forest patches in the head of Pigeon and Pawsons Valleys. It is also in close proximity a large area of indigenous vegetation of high ecological value on Mt Pearce. Within the site itself, the mixed shrubland is significant as a buffer to the mixed hardwood forest that grows down slope of it.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***



The site is not significant under this criterion. There are no wetlands within this site.

***10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess this criterion for this site.

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## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants: sycamore, gooseberry, hawthorn, holly and elderberry (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>Consider ongoing control and surveillance for biodiversity pest plants, particularly sycamore, hawthorn and holly which are high priorities for control.</li> <li>Consider ongoing surveillance for, and control if detected, of other biodiversity pest plants such as banana passionfruit, darwins barberry and Chilean flame creeper that are known to occur in the vicinity of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowners about pest plant monitoring and control.</li> <li>Assistance available as appropriate</li> </ul>
<ul style="list-style-type: none"> <li>Stock</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the forested areas to promote seedling recruitment and understorey development.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about benefits to biodiversity of stock management options.</li> <li>Assistance available as appropriate.</li> </ul>



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**Assessment completed by:** Scott Hooson  
**Date:** 12 August 2014

**Statement completed by:** Scott Hooson  
**Date:** 12 August 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.





## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2012).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Brachyscome radicata</i>	
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Coprosma wallii</i>	bloodwood
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Cyathea smithii</i>	Smith's tree fern, katote
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Fuchsia excorticata</i> X <i>perscandens</i>	shrubby fuchsia
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Hebe salicifolia</i>	koromiko
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum lanceolatum</i>	niniao
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Ileostylus micranthus</i>	green mistletoe
<i>Kunzea ericoides</i>	kanuka
<i>Macropiper excelsum</i>	kawakawa
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Metrosideros diffusa</i>	white climbing rata
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Microtis unifolia</i>	onion orchid, maikaika
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue



<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pteridium esculentum</i>	bracken
<i>Pterostylis species</i>	greenhood orchid
<i>Pyrrosia eleagnifolia</i>	leatherleaf fern
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Schefflera digitata</i>	pate, seven-finger
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Streblus heterophyllus</i>	small-leaved milk tree, turepo
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species</b>	
<i>Acer pseudoplatanus</i>	sycamore
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Alopecurus pratensis</i>	meadow foxtail
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Bellis perennis</i>	daisy
<i>Bromus hordeaceus</i>	soft brome
<i>Cerastium glomeratum</i>	chickweed
<i>Cirsium vulgare</i>	Scotch thistle
<i>Crataegus monogyna</i>	hawthorn
<i>Cynosurus cristatus</i>	crested dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Ilex aquifolium</i>	holly
<i>Mycelis muralis</i>	wall lettuce
<i>Orobanche minor</i>	broomrape
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Ribes uva-crispa</i>	gooseberry



<i>Rubus fruticosus</i>	blackberry
<i>Rumex obtusifolius</i>	broad-leaved dock
<i>Sambucus nigra</i>	elderberry
<i>Sonchus oleraceus</i>	puha, smooth sow thistle
<i>Trifolium pratense</i>	red clover
<i>Trifolium repens</i>	white clover
<i>Vicia sativa</i>	vetch

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

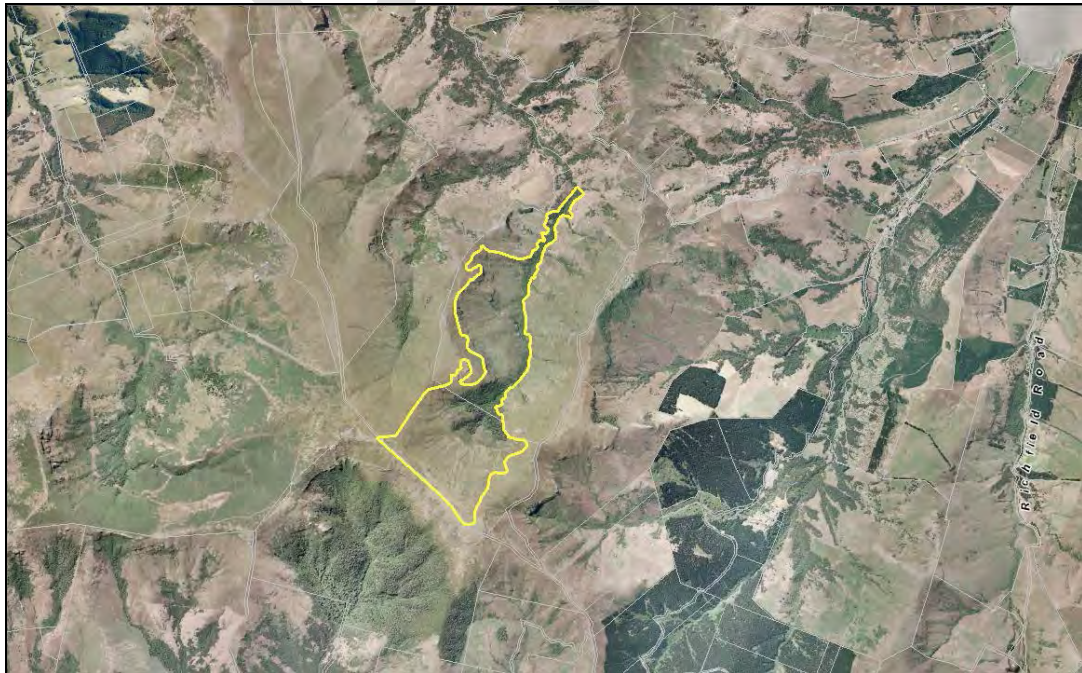
**Site name:** Purau Valley Head

**Site number:** SES/H/8

#### **Summary of Significance:**

The site is significant because it contains a diverse range of rare, representative and typical indigenous vegetation communities including a large example of remnant montane podocarp-hardwood forest. It has vegetation communities that are of restricted occurrence on Banks Peninsula and seepages and flush wetlands that are an 'originally rare' ecosystem. These communities provide habitat for a very high diversity of plant taxa including species that are nationally At Risk, endemic to Banks Peninsula and at distributional limits as well as an outstanding number of plant species that are uncommon within the ecological region or ecological district. The site is part of an important ecological corridor of connected indigenous forest in the upper Purau Valley catchment.

#### **Site Map**



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 212.1

**Central point (NZTM):** E1580511, N5163209

## Site Description

This site encompasses the head of the Purau Valley and a thin strip of continuous riparian second growth (podocarp)/mixed hardwood forest in the valley floor. The valley head faces north-north-east. The altitudinal range of the site is from approximately 340 and 880 metres above sea level.

There are a diverse range of vegetation types within the site (Wildland Consultants unpubl. data 2013) including:

- montane thin-barked totara / broadleaf – lancewood - mountain five-finger podocarp - hardwood forest in the basin at the head of the valley;
- secondary growth (matai) / mahoe - narrow leaved lacebark – broadleaf - tree fuchsia - kaikomako podocarp - hardwood forest in the lower valley;
- broadleaf - mountain five-finger / *Coprosma dumosa* – *C. propinqua* – lowland flax – toetoe shrubland along the rim of the rocky bluffs above the basin at the head of the valley;
- regenerating bracken – gorse / silver tussock grassland in the basin at the head of the valley;
- mountain five-finger, *Dracophyllum acerosum*, porcupine shrub shrubland with mountain flax and toetoe on isolated rocky bluffs on both sides of the valley;
- a mosaic of bog rush – wiwi – silver tussock – fescue tussock sedgeland-grassland in seepage wetlands and tussock grassland on the slopes above the basin at the head of the valley, and;
- regenerating (kanuka) / *Coprosma dumosa* – *C. propinqua* – *C. C. rhamnoides* shrubland on the western side of the valley.

The indigenous fauna recorded at the site during the botanical survey were bellbird, grey warbler, kereru, eastern New Zealand falcon, tomtit and silvereye. Common copper and red admiral butterflies were also recorded from the site during the botanical survey (Wildland Consultants unpubl. data 2013).

The site has several nationally At Risk plant species, one nationally At Risk bird species and an outstanding number of uncommon plant species.

## Extent of Site of Ecological Significance

This site includes the old-growth montane thin-barked totara/mixed hardwood forest in the basin at the head of the valley, the second-growth podocarp-hardwood forest in the lower valley including the narrow strip of riparian vegetation along the upper



reaches of Purau Stream, the distinctive shrubland communities on rocky bluffs around the rim of the basin, the distinctive seepage and flush wetlands and tussock grasslands on the upper slopes at the head of the valley. The regenerating shrubland on the western side of the valley has frequent *Hebe strictissima*, a species that has conservation status of At Risk – Naturally Uncommon and is endemic to Banks Peninsula, and is included within the site. Although more modified, regenerating bracken and gorse amongst tussock grassland in the basin at the head of the valley and some areas of silver and fescue tussock grassland with mixed exotic grasses on the western side of the valley are also included. These communities support species that are either nationally At Risk or uncommon to rare or very local on Banks Peninsula and help connect the other significant vegetation communities to form a more cohesive site with a higher degree of ecological integrity.

The boundaries of this site logically extend well beyond the mapped site boundaries to include extensive mixed second-growth hardwood forest further downstream in the main lower valley and its tributaries. These areas are likely to be ecologically significant. However, these areas were not surveyed and there is no up-to-date information to assess their significance. An ecological survey and assessment of these areas is recommended.

### Assessment Summary

The Purau Valley Head Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 8).

### Assessment against Significance Criteria

#### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Although modified to some degree by stock and the presence of introduced plant species, many of the vegetation communities and habitats within the site are representative of those that that would have been present at a baseline of 1840.

The canopy of the montane podocarp-hardwood forest and secondary growth podocarp-hardwood forest is highly representative. Montane forest areas that are inaccessible to stock due to the steep terrain and away from the margins have a good understorey cover of ferns and ground cover herbs. The understorey of the



secondary growth podocarp-hardwood forest is dominated by species such as ongaonga and various small-leaved coprosma species, less palatable to stock.

The rock outcrops and bluffs, which are mainly in the upper part of the valley are highly representative and typical of the original vegetation communities that would have occurred in these situations.

The grasslands on both sides of the valley are grazed and have a number of introduced grass species including browntop, sweet vernal, Yorkshire fog and cocksfoot. However, they also have native grasses such as silver tussock, fescue, blue wheatgrass and danthonia species (*Rytidosperma gracile* and *R. unarede*) and there is also a rich matrix of native inter-tussock herbs in damper parts of the grassland as well as indigenous herbs and sub-shrubs in drier areas.

The seepages support large areas of indigenous dominated bog rush (*Schoenus pauciflorus*) and wiwi (*Juncus edgariae*), along with dense herbfields with a diverse range of indigenous species.

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

The basin at the head of Purau Stream contains a sizeable area of remnant montane podocarp-hardwood forest that is continuous with secondary growth podocarp-hardwood forest along the lower section of Purau Stream and its tributaries. Above the forest are extensive areas of indigenous shrublands, silver and fescue tussock grassland and seepages.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The indigenous forest within the site is significant under this criterion because it has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all other indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

Of particular significance is the presence of montane old growth thin-barked totara forest within the site. Old growth forest (of any type) has been reduced to approximately 800 ha or <1% of its original extent on Banks Peninsula (Wilson 2009).

A small part of the site above the bluffs also meets this criterion at the Level IV land environment scale. It is on a Chronically Threatened land environment



where 10-20% indigenous vegetation is left on this land environment nationally (Walker *et al.* 2007).

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**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports nationally At Risk and endemic plant species and a large number of plant species that are uncommon within the ecological region or ecological district.

**Plants**

Nationally Threatened and At Risk plant species (de Lange et al. 2013) recorded from the site (Wildland Consultants unpubl. data 2013) are:

- *Aciphylla subflabellata* (At Risk – Declining)
- *Heliohebe lavaudiana* (At Risk – Declining and endemic to Banks Peninsula)
- *Hebe strictissima* (At Risk – Naturally Uncommon and endemic to Banks Peninsula)

Plant species recorded from the site (Wildland Consultants unpubl. data 2013) that are “uncommon to rare or very local” on Banks Peninsula are:

- *Acaena dumicola*
- *Anisotome aromatica*
- *Blechnum colensoi*
- *Blechnum montanum*
- *Blechnum novae-zealandiae*
- *Carex flagellifera*
- *Carex virgata*
- *Celmisia gracilentia*
- *Chionochoa conspicua*
- *Colobanthus strictus*
- *Cordyline indivisa* (also rare in Canterbury (Wilson 1992, 2001))
- *Coriaria sarmentosa*
- *Epilobium pedunculare*
- *Histiopteris incisa*
- *Hydrocotyle novae-zeelandiae*
- *Juncus novae-zelandiae*
- *Leptospermum scoparium*
- *Leptostigma setulosum*
- *Libocedrus bidwillii* (rare on Banks Peninsula (Wilson 1992, 2001) – only one adult and 150 saplings are known to remain on Banks Peninsula (Wilson 2013))
- *Lycopodium fastigiatum*
- *Lycopodium volubile*
- *Machaerina rubiginosa* (this is the only site on Banks Peninsula from which this species is currently known and it is rare in Canterbury (Wilson 1992, 2001))
- *Microlaena avenacea*
- *Nertera depressa*
- *Olearia bullata* (rare on Banks Peninsula (Wilson 1992))
- *Olearia ilicifolia*



- *Ourisia macrophylla* subsp. *lactea*
- *Schoenus pauciflorus*
- *Scleranthus uniflorus*
- *Wahlenbergia albomarginata*

Several other locally uncommon species were recorded by Hugh Wilson (unpubl. data) that were not recorded during the 2012/2013 botanical survey:

- *Tmesipteris tannensis*
- *Olearia arborescens*
- *Eleocharis gracilis*
- *Hymenophyllum peltatum*
- *Korthalsella salicornioides*
- *Neomyrtus pedunculata*
- *Sticherus cunninghamii*
- *Leptolepia novae-zelandiae*

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There is one species (Wildland Consultants unpubl. data 2013) at its southern national distributional limit on Banks Peninsula (Wilson 2013):

- *Dracophyllum acerosum*

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

Seepages and flush wetlands on the slopes above the basin at the head of the valley are an 'originally rare' ecosystem on a national scale (Williams et al. 2007). They support a distinctive and unusual indigenous wetland vegetation assemblage that contain a number of species that uncommon to rare or very local on Banks Peninsula such as the sedge baumea (*Macherina rubiginosa*) (the only known location for this species on Banks Peninsula), *Aciphylla subflabellata*, *Carex flagellifera*, *Olearia bullata* and bog rush (*Schoenus pauciflorus*) (Wildland Consultants unpubl. data 2013).

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.



It contains a very high diversity of indigenous ecosystems and habitat types representing both original and successional vegetation communities. The high diversity of ecosystems supports an outstanding diversity of indigenous plant species (143 indigenous species were recorded by Wildland Consultants (unpubl. data 2013).

### **Ecological Context**

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

It is part of an ecological corridor of connected indigenous forest in the upper Purau Valley catchment that is important for the movement and dispersal of indigenous fauna. The indigenous vegetation within the site provides continuous riparian cover which shades and buffers the upper reaches of Purau Stream. In conjunction with almost continuous indigenous vegetation cover further downstream this is likely to be important for maintaining the ecological functioning of this stream. In addition, this large site is in close proximity to several other ecologically important forest patches and is connected to Mt Herbert Scenic Reserve, an area recognised for its very high ecological values (Wilson 1992).

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. Although the wetlands above the bluffs at the head of the valley probably play a role in moderating flood flows from the head of the basin, their high position in the valley and their relatively small extent means they are unlikely to provide important benefits to the areas and ecosystems beyond their immediate boundaries.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess the site against this criterion.

## Site Management

### Existing Protection Status

The site is not legally protected

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Domestic stock. Impact on seepages, flushes, tussock grassland and forest communities (Wildlands unpubl. data 2013).</li> </ul>	<ul style="list-style-type: none"> <li>Consider implications of stock grazing in relation to management of indigenous vegetation communities, and in particular tussock grasslands and wetlands above the bluffs at the head of the valley.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with the landowner about the benefits to biodiversity of stock management options and assistance where possible.</li> <li>Collaboration with agencies and other groups for assistance as appropriate with landowner's preferred option.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants include radiata pine, elderberry, Himalayan honeysuckle, gorse, broom, (Wildlands unpubl. data 2013)</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing the small numbers of wilding pines to prevent further spread and consider controlling other high priority pest plants.</li> <li>There is a large infestation of Himalayan honeysuckle on the eastern side of the forest in the head of the basin. It is likely that this will succeed to forest over time and is not a priority for control.</li> <li>Gorse and broom are also low priorities for control.</li> <li>Consider ongoing surveillance for other biodiversity pest plants to prevent their establishment including sycamore, banana</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about monitoring and control of pest plants.</li> <li>Assistance available where possible.</li> </ul>

	passionfruit old mans beard, Darwin's barberry and spur valerian (on rock outcrops) that are known to occur in the area.	
<ul style="list-style-type: none"> <li>• Possums. (Wildlands unpubl. data 2013)</li> </ul>	<ul style="list-style-type: none"> <li>• Consider monitoring possum densities within the site and possum damage to preferred species. Thin-barked totara and New Zealand cedar (kaikawaka) are both vulnerable to possum browse. Undertake possum control as required.</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowner about possum monitoring and control.</li> <li>• Assistance available where possible.</li> </ul>

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**Assessment completed by:** Scott Hooson  
**Date:** 3 July 2014

**Statement completed by:** Scott Hooson  
**Date:** 3 July 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List

Sourced from Wildland Consultants (2013).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Acaena dumicola</i>	bidibidi, piripiri
<i>Aciphylla subflabellata</i>	speargrass, spaniard, kurikuri
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Anisotome aromatica</i>	kopoti
<i>Anthosachne solandri</i>	blue wheatgrass
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Austroderia richardii</i>	toetoe
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum colensoi</i>	Colenso's hard fern, peretao
<i>Blechnum discolor</i>	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum montanum</i>	mountain kiokio
<i>Blechnum novae-zelandiae</i>	kiokio
<i>Blechnum penna-marina</i>	little hard fern
<i>Blechnum procerum</i>	small kiokio
<i>Brachyglottis lagopus</i>	groundsel
<i>Carex breviculmis</i>	grassland sedge
<i>Carex flagellifera</i>	
<i>Carex forsteri</i>	cutty grass
<i>Carex virgata</i>	swamp sedge
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Celmisia gracilentia</i>	slender mountain daisy, pekapeka
<i>Centella uniflora</i>	centella
<i>Chionochoa conspicua</i>	hunangamoho, broad-leaved bush tussock
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Colobanthus strictus</i>	
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma propinqua X robusta</i>	mikimiki hybrid
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamu
<i>Corokia cotoneaster</i>	korokio
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Cordyline indivisa</i>	mountain cabbage tree





<i>Coriaria arborea</i>	tree tutu
<i>Coriaria sarmentosa</i>	tutu
<i>Cyathea colensoi</i>	rough tree fern, mountain tree fern
<i>Cyathea smithii</i>	Smith's tree fern, katote
<i>Deyeuxia avenoides</i>	oat grass
<i>Dichelachne crinita</i>	plume grass
<i>Dicksonia squarrosa</i>	wheki, rough tree fern
<i>Discaria toumatou</i>	matagouri, wild irishman
<i>Dracophyllum acerosum</i>	turpentine scrub
<i>Epilobium pedunculare</i>	willow herb
<i>Epilobium pubens</i>	willow herb
<i>Euchiton limosus</i>	native cudweed
<i>Festuca novae-zelandiae</i>	fescue tussock, hard tussock
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Gaultheria antipoda</i>	bush snowberry
<i>Gaultheria depressa</i> var. <i>novae-zelandiae</i>	snowberry
<i>Geranium</i> aff. <i>microphyllum</i>	native geranium
<i>Geranium brevicaule</i>	short-flowered cranesbill
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Gunnera monoica</i>	native gunnera
<i>Hebe salicifolia</i>	koromiko
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Helichrysum lanceolatum</i>	ninia
<i>Heliohebe laudiana</i>	Banks Peninsula sun hebe
<i>Hierochloa redolens</i>	holy grass, karetu
<i>Histiopteris incisa</i>	water fern
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle moschata</i>	pennywort
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle novae-zeelandiae</i>	pennywort
<i>Hypolepis ambigua</i>	pig fern
<i>Hypolepis millefolium</i>	thousand-leaved fern
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Juncus novae-zelandiae</i>	dwarf rush
<i>Kunzea ericoides</i>	kanuka
<i>Lagenifera strangulata</i>	parani
<i>Leptinella dioica</i>	button daisy
<i>Leptopteris hymenophylloides</i>	crepe fern, heruheru
<i>Leptospermum scoparium</i>	manuka, tea tree
<i>Leptostigma setulosa</i>	
<i>Leucopogon fraseri</i>	dwarf heath, patotara
<i>Libocedrus bidwillii</i>	pahautea
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Lobelia angulata</i>	pratia
<i>Luzula species</i>	woodrush
<i>Lycopodium fastigiatum</i>	alpine clubmoss, mountain clubmoss
<i>Lycopodium volubile</i>	climbing clubmoss, waewaekoukou
<i>Machaerina rubiginosa</i>	baumea
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe, whiteywood



<i>Melicope simplex</i>	poataniwha
<i>Metrosideros diffusa</i>	white climbing rata
<i>Microlaena avenacea</i>	bush rice grass
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Microtis unifolia</i>	onion orchid, maikaika
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myrsine australis</i>	red mapou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Nertera depressa</i>	nertera
<i>Olearia bullata</i>	shrub daisy
<i>Olearia ilicifolia</i>	NZ holly, hakeke
<i>Ourisia macrophylla subsp. lactea</i>	mountain foxglove
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Phormium cookianum</i>	mountain flax, wharariki
<i>Phormium tenax</i>	flax, harakeke
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Poa cita</i>	silver tussock
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus cunninghamii</i>	mountain totara, thin-barked totara
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pseudopanax colensoi</i>	mountain five-finger
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pteridium esculentum</i>	bracken
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Raoulia glabra</i>	mat daisy
<i>Raoulia subsericea</i>	turf mat daisy, turf scabweed
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rytidosperma gracile</i>	danthonia
<i>Rytidosperma unarede</i>	danthonia
<i>Schefflera digitata</i>	pate, seven-finger
<i>Schoenus pauciflorus</i>	bog rush
<i>Scleranthus uniflorus</i>	
<i>Senecio minimus</i>	native fireweed
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Stellaria decipiens</i>	chickweed
<i>Uncinia rubra</i>	hook grass
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Viola cunninghamii</i>	white violet
<i>Wahlenbergia albomarginata</i>	NZ harebell
<b>Exotic species</b>	
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Centaureum erythraea</i>	centaury
<i>Cerastium fontanum</i>	mouse-ear chickweed



<i>Cynosurus cristatus</i>	crested dogstail
<i>Cytisus scoparius</i>	scotch broom
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Holcus lanatus</i>	Yorkshire fog
<i>Juncus articulatus</i>	jointed rush
<i>Juncus effusus</i>	soft rush
<i>Leycesteria formosa</i>	himalayan honeysuckle
<i>Mimulus moschatus</i>	musk
<i>Mycelis muralis</i>	wall lettuce
<i>Nasturtium officinale</i>	watercress
<i>Pilosella officinarum</i>	mouse-ear hawkweed
<i>Pinus radiata</i>	radiata pine, Monterey pine
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Prunella vulgaris</i>	selfheal
<i>Ranunculus repens</i>	creeping buttercup
<i>Sambucus nigra</i>	elderberry
<i>Trifolium pratense</i>	red clover
<i>Trifolium repens</i>	white clover
<i>Ulex europaeus</i>	gorse

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Upper Port Levy Miro

**Site number:** SES/H/9

**Physical address of site:** Off Western Valley Road, Upper Port Levy

#### **Summary of Significance:**

This site is significant because it contains the only mature miro stand in the ecological district (and in the ecological region). The forest is highly representative of lowland podocarp forest, but is also distinctive and very rare. It contains a high diversity of indigenous plant species including two species that are At Risk nationally, several that are uncommon within the ecological region or ecological district and two that are at their distributional limits. It is also part of a network of connected indigenous forest in the upper part of the Port Levy catchment that is an important ecological corridor for the movement and dispersal of indigenous fauna.

#### **Site Map:**



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 7.21ha

**Central point (NZTM):** E1582152, N5161936

## Site Description

The site is an area of indigenous forest in a narrow generally east-facing gully above (and west) of Western Valley Road in the upper Port Levy Catchment. The altitudinal range of the site is from approximately 280 to 360 metres above sea level. The aspect is largely south facing, with a smaller area of north facing slope on the southern side of the gully. An un-named tributary of Te Kawa Stream flows through the gully.

This site was described by Wilson (unpubl. data) as an “outstanding bush remnant” and the best locality on Banks Peninsula for miro (*Prunopitys ferruginea*). More recent surveys confirm this (Partridge 2008). A few scattered individuals of this species occur elsewhere on the Peninsula, but this is the only site where miro remains in any abundance.

The vegetation at the site is mid-altitude old-growth podocarp/hardwood forest. It has four species of remnant emergent podocarp trees (matai, lowland totara, kahikatea and miro) and some regenerating miro were recorded by Wilson (1992). The mixed hardwood canopy is comprised of species such as mahoe, kowhai, tree fuchsia, lemonwood, marbleleaf and pigeonwood. The site was fenced in the mid 1980s and there has been good regeneration of the understorey since. The subcanopy and understorey has a variety of mostly small-leaved shrubs of which *Coprosma* species are the most common. Tree ferns are common along the stream with four species recorded at the site. The understorey also supports a diverse assemblage of indigenous ferns, especially along the road banks and stream margins (Wilson 1992) and the small greenhood orchid *Pterostylis graminea* was found under mature miro trees. Climbers are relatively common (Partridge 2008).

The vegetation changes around the forest margins, especially at the interface with the pine forest. There are small areas of open grassland and bracken being colonised by successional species such as kanuka. Forest margin species include wineberry, turpentine scrub (*Dracophyllum acerosum*), *Hebe salicifolia*, *Coprosma wallii* (At Risk – Declining) and bush lawyer (*Rubus cissoides*) (Partridge 2008).



## Extent of Site of Ecological Significance

The site is a narrow forested gully bounded by Western Valley Road on its lower (eastern boundary), exotic pine plantations on its northern and southern boundaries and the cadastral property boundary on its western side.

## Assessment Summary

The Upper Port Levy Miro Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 8).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

It is a highly representative example of podocarp/hardwood forest in the Herbert ED. Partridge (2008) surveyed the eastern side of the gully and commented that the forest canopy and understory layers are in remarkably good condition and that there are very few exotic species. Those present are mostly scattered along the roadside and around the forest edge with the pine trees, where the exotic plants are mostly pasture grasses in open areas.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It contains the only (and therefore largest) mature miro stand in the ecological district (and in the ecological region) (Wilson 1992, Partridge 2008).

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***



The site is significant under this criterion.

Old growth lowland forest has been reduced to a fragment of its former extent at the Region and ecological district scales. Harding (2009) estimates that the original extent of podocarp/hardwood forest in the ED (as a % of the ED) was 51 - 75%. The present extent of all old growth forest on Banks Peninsula is estimated to be approximately 800 ha or <1% of its original extent (Wilson 2009). The extent of all indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) of the ecological district (New Zealand Landcover Database (Version 4)).

This site also meets this criterion at the Level IV land environment scale. It supports indigenous vegetation on a Chronically Threatened land environment where 10-20% indigenous vegetation is left on these land environments nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has two indigenous plant species that are At Risk nationally and several that are uncommon within the ecological region or ecological district.

The nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Wilson unpubl. data) are:

- *Coprosma wallii* (At Risk – Declining) (on forest margins) (Partridge 2008)

Hugh Wilson (unpubl. data n.d.) recorded *Brachyglottis sciadophila* (At Risk - Declining) from the site.

Plant species recorded from the site (Partridge 2008) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Blechnum colensoi*
- *Dracophyllum acerosum*
- *Histiopteris incisa*
- *Prumnopitys ferruginea*

Several other locally uncommon species were recorded in an earlier survey by Wilson (unpubl. data) that were not recorded by Partridge (2008) during his brief survey of part of the site:

- *Blechnum vulcanicum*
- *Botrychium biforme*
- *Dicksonia fibrosa*
- *Elaeocarpus hookerianus*
- *Lycopodium volubile*
- *Microlaena avenacea*
- *Neomyrtus pedunculata*



- *Rumohra adiantiformis*

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There is one species at its southern national limit on Banks Peninsula and one species at its southern regional limit on Banks Peninsula. The species at its southern national limit is:

- *Dracophyllum acerosum* (Partridge 2008)

The species at its southern regional limit is:

- *Hedycarya arborea* (Wilson unpubl. data, Partridge 2008)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

Miro forest is of very restricted occurrence in the ecological region and in Canterbury. This site is the only known locality on Banks Peninsula with mature miro forest (scattered individual trees grow in only a few other locations inland of Port Levy and Pigeon Bay (Wilson 2013)). It is also the only known locality where miro is regenerating on Banks Peninsula (Wilson unpubl. data n.d.).

### Diversity and Pattern

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

It supports a diverse range of indigenous plant species (Wilson unpubl. data, Partridge 2008), particularly tree fern and fern species.

### Ecological Context

**8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is significant under this criterion.





It is part of a network of connected indigenous forest in the upper part of the Port Levy catchment that is an important ecological corridor for the movement and dispersal of indigenous fauna. The site links the Upper Port Levy Site of Ecological Significance (SES/H/10) (downstream) with indigenous riparian forest, bluff vegetation and festuca and silver tussock grassland in the large basin further upstream on the eastern side of Mt Herbert.

Te Kawa Stream flows through the site and the indigenous riparian vegetation within the site plays a role in shading and buffering the stream. In conjunction with other riparian vegetation in the upper catchment this buffering function is likely to be important.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess the site against this criterion.

**11. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess the site against this criterion.

## Site Management

### Existing Protection Status

Partially protected. Western Valley Conservation Area (DOC) (conservation unit N36014) protects a very small, narrow area along the stream in the bottom of the gully.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants: Chilean flame creeper (<i>Tropaeolum speciosum</i>) (Wilson unpubl. data, Partridge 2008, 2010).</li> </ul>	<ul style="list-style-type: none"> <li>Consider ongoing surveillance for and control of Chilean flame creeper.</li> <li>Consider ongoing surveillance for and control of other biodiversity pest plants such as old mans beard, tutsan, hawthorn, ash, Darwin's barberry and banana passionfruit.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about monitoring and control of pest plants.</li> <li>Assistance available as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Western Valley Road is on the eastern boundary of the site. Edge effects and weed invasion are a threat from the roadside.</li> </ul>	<ul style="list-style-type: none"> <li>Regular surveillance for biodiversity pest plants along the roadside adjacent to the site.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Pine plantations on the site boundaries.                             <ul style="list-style-type: none"> <li>Spread of wilding pines into the site.</li> <li>Damage to the indigenous forest within the site during harvesting operations.</li> <li>Land-use change or re-planting of more invasive conifer species on adjoining land.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Ongoing surveillance for and control of wilding pines</li> <li>Consider not re-planting more invasive conifer species such as Douglas fir on adjoining land following harvesting of the existing plantation.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to adjoining landowner/s about impacts of wilding pines on biodiversity prior to planting and harvesting of plantation forestry</li> </ul>
<ul style="list-style-type: none"> <li>Stock. Boundary fences need repairing</li> </ul>	<ul style="list-style-type: none"> <li>Consider repairing fences that are no longer stock-proof and undertaking regular fence</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about the benefits</li> </ul>

(Partridge 2008).	checks and maintenance as required.	to biodiversity of stock fencing. <ul style="list-style-type: none"><li>• Assistance where possible - in collaboration with agencies and other groups.</li></ul>
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**Assessment completed by:** Scott Hooson  
**Date:** 15 September 2014

**Statement completed by:** Scott Hooson  
**Date:** 15 September 2014

**Statement updated by:** XXX  
**Date:** XXX

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## Appendix 1: Plant Species List

Sourced from (Wilson unpublished data).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium bulbiferum</i>	hen and chicken fern
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum colensoi</i>	Colenso's hard fern, peretao
<i>Blechnum discolor</i>	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum penna-marina</i>	little hard fern
<i>Blechnum procerum</i>	small kiokio
<i>Blechnum sp 'black spot'</i>	
<i>Blechnum vulcanicum</i>	triangular hard fern
<i>Botrychium bifforme</i>	fine-leaved parsley fern
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Calystegia tuguriorum</i>	NZ bindweed, pōwhiwhi
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carex forsteri</i>	cutty grass
<i>Carpodetus serratus</i>	marbleleaf, putaputāwētā
<i>Clematis foetida</i>	yellow clematis
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamū
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Cordyline australis</i>	cabbage tree, tī kōuka
<i>Coriaria arborea</i>	tree tutu
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Cyathea smithii</i>	Smith's tree fern, kātote
<i>Cyathophorum bulbosum</i>	
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dicksonia fibrosa</i>	whekī-ponga, golden tree fern
<i>Dicksonia squarrosa</i>	whekī, rough tree fern
<i>Elaeocarpus hookerianus</i>	pōkākā
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Gaultheria antipoda</i>	bush snowberry
<i>Griselinia littoralis</i>	broadleaf, kāpuka
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hypolepis rufobarbata</i>	sticky pig fern
<i>Hypopterygium sp.</i>	
<i>Kunzea robusta</i>	kānuka
<i>Leptopteris hymenophylloides</i>	crepe fern, heruheru



<i>Lycopodium volubile</i>	climbing clubmoss, waewaekoukou
<i>Melicope simplex</i>	poataniwha
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rātā
<i>Microlaena avenacea</i>	bush rice grass
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Muehlenbeckia australis</i>	large-leaved pōhuehue
<i>Myrsine australis</i>	red māpou, red matipo
<i>Neomyrtus pedunculata</i>	rōhutu, myrtle
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Pittosporum eugenioides</i>	lemonwood, tarātā
<i>Plagianthus regius</i>	lowland ribbonwood, mānatu
<i>Pneumatopteris pennigera</i>	gully fern, pākau
<i>Podocarpus sp.</i>	
<i>Podocarpus totara</i>	lowland tōtara
<i>Polystichum richardii</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, pūniu
<i>Prumnopitys ferruginea</i>	miro
<i>Prumnopitys taxifolia</i>	mataī, black pine
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pyrrosia eleagnifolia</i>	leatherleaf fern
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus schmidelioides</i>	bush lawyer, tātarāmoa
<i>Rumohra adiantiformis</i>	leathery shield fern
<i>Schefflera digitata</i>	patē, seven-finger
<i>Senecio minimus</i>	native fireweed
<i>Sophora microphylla</i>	small-leaved kōwhai
<i>Trichomanes venosum</i>	veined filmy fern
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic Species</b>	
<i>Mycelis muralis</i>	wall lettuce
<i>Prunus avium</i>	sweet cherry
<i>Tropaeolum speciosum</i>	Chilean flame creeper



## Appendix 2: Indigenous Plant Species List - Richardson Property

Sourced from (Partridge 2008).

Note: this brief survey covered only part of the northern side of the gully.

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Aristolelia serrata</i>	wineberry
<i>Astelia fragrans</i>	kakaha
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flaccidum</i>	hanging spleenwort
<i>Asplenium gracillimum</i>	
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum colensoi</i>	Colenso's hard fern, peretao
<i>Blechnum discolor</i>	crown fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum minus</i>	swamp kiokio
<i>Cardamine debilis</i> agg.	bittercress
<i>Carpodetus serratus</i>	pouaputaweta
<i>Coprosma areolata</i>	mikimiki
<i>Coprosma robusta</i>	karamu
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mikimiki
<i>Coprosma rhamnoides</i>	mikimiki
<i>Coprosma rotundifolia</i>	round-leaved mikimiki
<i>Coprosma tayloriae</i>	mikimiki
<i>Coprosma wallii</i>	mikimiki
<i>Coriaria arborea</i>	tree tutu
<i>Cyathea dealbata</i>	silver tree fern
<i>Cyathea smithii</i>	soft tree fern
<i>Dacrycarpus dacrydioides</i>	kahikatea
<i>Dracophyllum acaesum</i>	turpentine scrub
<i>Dicksonia squarrosa</i>	wheki
<i>Fuchsia excorticata</i>	tree fuchsia
<i>Griselinia littoralis</i>	broadleaf
<i>Hebe salicifolia</i>	koromiko
<i>Hedycarya arborea</i>	pigeonwood
<i>Helichrysum lanceolatum</i>	niniao
<i>Histiopteris incisa</i>	water fern
<i>Hoheria angustifolia</i>	lacebark
<i>Kunzea ericoides</i>	kanuka
<i>Meliccytus ramiflorus</i>	mahoe
<i>Metrosideros diffusa</i>	climbing rata
<i>Microsorium pustulatum</i>	hound's tongue
<i>Muehlenbeckia australis</i>	pohuehue
<i>Myrsine australis</i>	mapou
<i>Parsonsia heterophylla</i>	NZ jasmine



<i>Pellaea rotundifolia</i>	tarawera
<i>Pennantia corymbosa</i>	kaikomako
<i>Plagianthus regius</i>	ribbonwood
<i>Polystichum vestitum</i>	prickly shield fern
<i>Pittosporum eugenioides</i>	lemonwood
<i>Podocarpus hallii</i>	Hall's totara
<i>Podocarpus totara</i>	totara
<i>Prumnopitys ferruginea</i>	miro
<i>Prumnopitys taxifolia</i>	matai
<i>Pseudopanax arboreus</i>	five-finger
<i>Pseudopanax crassifolius</i>	lancewood
<i>Pseudowintera colorata</i>	pepper tree
<i>Pteridium esculentum</i>	bracken
<i>Pterostylis graminea</i>	greenhood orchid
<i>Raukaua anomalus</i>	
<i>Rhipogonum scandens</i>	supplejack
<i>Rubus cissoides</i>	bush lawyer
<i>Schefflera digitata</i>	pate
<i>Senecio glomeratus</i>	fireweed
<i>Urtica ferox</i>	ongaonga
<i>Uncinia uncinata</i>	hook grass

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Upper Port Levy

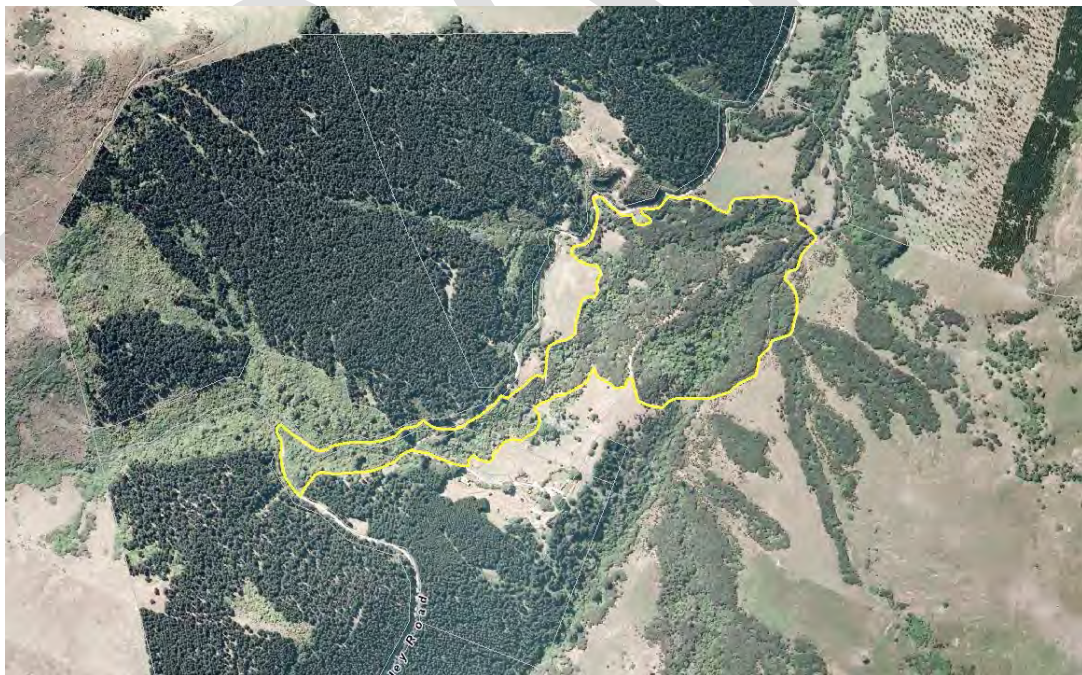
**Site number:** SES/H/10

**Physical address of site:**

#### Summary of Significance:

The site is significant because it contains representative and rare (podocarp)/lowland hardwood forest on a Chronically Threatened land environment. It has large remnant podocarp trees including miro, a species that is very rare on Banks Peninsula, and a diverse range of indigenous plant taxa including species that are “uncommon to rare or very local” and at their distributional limits on Banks Peninsula. It also forms part of a network of connected indigenous forest in the upper part of the catchment.

#### Site Map



## **Additional Site Information**

**Ecological District:** Herbert

**Area of SES (ha):** 20.05

**Central point NZTM:** E1582933, N5162075

## **Site Description**

This site is comprised of secondary hardwood forest with emergent podocarps along two stream gullies which flow into Te Kawa Stream and secondary kanuka forest on drier slopes and ridges (Wildland Consultants unpubl. data 2012). It is situated between approximately 140 and 310 m above sea level and has a predominantly northerly aspect.

The secondary growth hardwood forest has remnant emergent podocarps (kahikatea, matai, totara, and miro) and seedlings and saplings of kahikatea, matai, and totara are also present. The canopy is mainly mahoe and kanuka, with lesser amounts of other hardwood species. Native vines are abundant and small-leaved coprosma/mikimiki species and ongaonga are the most common understorey species. The understorey also contains a wide variety of ferns, including three species of tree fern and one epiphytic filmy fern (*Trichomanes venosum*). The eastern stream gully is larger and deeper than the western gully, and the vegetation is more diverse and less disturbed by stock. Most of the remnant podocarps are in this eastern gully (Wildland Consultants unpubl. data 2012).

The secondary growth kanuka forest is of various ages and occurs on the central ridge separating the two stream gullies and the drier slopes on either side of the two gullies. Young mahoe seedlings were frequently seen under the kanuka, however the understorey is dominated by small-leaved coprosma/mikimiki species and ongaonga. Native vines are very common in the canopy. Kanuka treeland occurs along the central ridge where young kanuka is colonising exotic grassland.

A full list of the plant species recorded within the site is provided in Appendix 1.

The indigenous fauna recorded at the site during the botanical survey were bellbird, grey warbler, shining cuckoo, silvereve and copper and red admiral butterflies (Wildland Consultants unpubl. data 2012).

## **Extent of Site of Ecological Significance**

The site includes the secondary growth hardwood forest with remnant emergent podocarps and secondary growth kanuka forest on the eastern side of Western Valley Road. Small areas of pasture have been included because excluding them would fragment the site and reduce its ecological integrity.



There are gullies of kanuka and secondary hardwood forest (to the north, east and south) that are connected to this site that are also likely to be significant, however there is currently insufficient information available to assess their significance.

## Assessment Summary

The Upper Port Levy Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 8).

### Assessment against Significance Criteria

#### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Although a large proportion of the site is in secondary kanuka forest there are remnant trees of four podocarp species: kahikatea, matai, totara, and miro. Seedlings and saplings of kahikatea, matai, and totara are also present. The canopy contains a diverse number of hardwood species and is also representative (Wildland Consultants unpubl. data 2012). Because there are very few examples of lowland podocarp/hardwood forest remaining in the ED, even degraded examples meet this criterion.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It is a relatively large example of lowland podocarp/secondary hardwood forest within the Herbert ED.

#### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

The site contains old-growth podocarp trees (kahikatea, matai, totara, and miro) which have been substantially reduced in extent in the ecological district and



region. The present extent of old growth forest is estimated to be approximately 800 ha or <1% of its original extent (Wilson 2009).

Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013) (Harding (2009)) estimates that the original extent of podocarp/hardwood forest in the ED (as a % of the ED) was 51 - 75%). The present extent of all indigenous forest (including manuka and/or kanuka) in the ED is estimated to be 10.9% (New Zealand Landcover Database (Version 4)).

This site also meets this criterion at the Level IV land environment scale. Almost all of the indigenous vegetation within the site is on a Chronically Threatened land environment (F3.1b) where 10-20% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has several indigenous plant species that are uncommon within the ecological region or ecological district.

There is a large remnant miro tree within the site (Wildland Consultants unpubl. data 2012). This species is very rare within the ED and on Banks Peninsula where it grows in only a few valleys inland of Port Levy and Pigeon Bay (Wilson 2013).

Other plant species recorded from the site (Wildland Consultants unpubl. data 2012) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Brachyscome radicata*
- *Epilobium rotundifolium*
- *Lastreopsis glabella*
- *Microlaena avenacea*
- *Pterostylis banksii*

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are two species (Wildland Consultants unpubl. data 2012) that are at their southern national or regional distributional limits on Banks Peninsula (Wilson 2013). These species are:

- Kawakawa (southern national limit)
- Pigeonwood (southern regional limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare**



***ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

The site is significant under this criterion.

The forest supports remnant trees of four podocarp species: kahikatea, matai, totara, and miro. Lowland podocarp forests with all four podocarp species are of very restricted extent in the Banks Ecological Region.

Miro is of very restricted occurrence in the ecological region and in Canterbury. This site is one of only a few known localities with this species on Banks Peninsula. Scattered individual trees grow in only a few other locations inland of Port Levy and Pigeon Bay (Wilson 2013).

### **Diversity and Pattern**

- 7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

It is only comprised of two broad vegetation communities: secondary hardwood forest with emergent podocarps and secondary kanuka forest, and does not contain a high diversity of indigenous ecosystems or habitat types. However, it meets this criterion because it supports a relatively high diversity of indigenous plant species, and is notable for the diversity of indigenous ferns (a total of 21 species), which includes three species of tree ferns (*Cyathea dealbata*, *C. smithii* and *Dicksonia squarrosa*) (Wildland Consultants unpubl. data 2012).

### **Ecological Context**

- 8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

It forms part of a network of connected indigenous forest in the upper part of the catchment which is likely to be an important ecological corridor for the movement and dispersal of indigenous fauna.

Te Kawa Stream flows through the site and the indigenous riparian vegetation within the site plays a role in shading and buffering the stream. In conjunction with other riparian vegetation in the upper catchment this buffering function is important for the ecological functioning of the stream.

- 9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. It does not have any wetland ecosystems.



*10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.*

There is insufficient information to assess the site against this criterion.

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## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Existing access ways. A driveway and several farm tracks pass through the site.</li> </ul>	<ul style="list-style-type: none"> <li>The landowner will continue to be able to use and maintain existing access ways.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the landowner is aware of this.</li> </ul>
<ul style="list-style-type: none"> <li>Domestic stock.</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the site, or at least the high value areas of forest to keep stock out and promote recovery of the understorey.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about benefits to biodiversity of stock management and options available.</li> <li>Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants. Chilean flame creeper, old man's beard (occasional vines and seedlings throughout the site), ash and crack willow, tutsan, and hawthorn (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling biodiversity pest plants. Chilean flame creeper, old man's beard are the highest priorities for control.</li> <li>Consider ongoing surveillance for and control of other biodiversity pest plants such as Darwin's barberry, sycamore and banana passionfruit.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance to landowner about monitoring and control of pest plants.</li> <li>Assistance where appropriate.</li> </ul>



## References

- Environment Canterbury. (2013). *Canterbury Regional Policy Statement 2013*. Environment Canterbury.
- Harding, M. A. (2009). *Canterbury Land Protection Strategy: A Report to the Nature Heritage Fund Committee*. Wellington: Nature Heritage Fund. 125 pp.
- Walker, S., Cieraad, E., Grove, P., Lloyd, K., Myers, S., Park, T., & Porteous, T. (2007). *Guide for Users of the Threatened Environment Classification* (Version 1.1).
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- Wilson, H.D. (2009). *Natural History of Banks Peninsula*. Canterbury University Press, Canterbury. 144 pp.
- Wilson, H.D. (2013). *Plant Life on Banks Peninsula*. Manuka Press, Cromwell. 412 pp.

**Assessment completed by:** Scott Hooson  
**Date:** 27 November 2014

**Statement completed by:** Scott Hooson  
**Date:** 27 November 2014

**Statement updated by:** XXX  
**Date:** XXX

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## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2012)

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Acaena novae-zelandiae</i>	red bidibidi
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum discolor</i>	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum penna-marina</i>	little hard fern
<i>Blechnum procerum</i>	small kiokio
<i>Brachyscome radicata</i>	
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carex species</i>	cutty grass
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma propinqua X robusta</i>	mikimiki-karamu hybrid
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coriaria arborea</i>	tree tutu
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Cyathea smithii</i>	Smith's tree fern, katote
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dicksonia squarrosa</i>	wheki, rough tree fern
<i>Epilobium rotundifolium</i>	willow herb
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Fuchsia excorticata X perscandens</i>	shrubby fuchsia
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Hebe salicifolia</i>	koromiko
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum lanceolatum</i>	niniaio
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus species</i>	
<i>Kunzea ericoides</i>	kanuka
<i>Lagenifera strangulata</i>	parani
<i>Lastreopsis glabella</i>	smooth shield fern



<i>Leptopteris hymenophylloides</i>	crepe fern, heruheru
<i>Macropiper excelsum</i>	kawakawa
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rata
<i>Microlaena avenacea</i>	bush rice grass
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Myrsine australis</i>	red mapou, red matipo
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Pneumatopteris pennigera</i>	gully fern, pakau
<i>Poa imbecilla</i>	weak poa
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum neozelandicum subsp. zerophyllum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys ferruginea</i>	miro
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pterostylis banksii</i>	green-hooded orchid
<i>Pteridium esculentum</i>	bracken
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Schefflera digitata</i>	pate, seven-finger
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Stellaria decipiens</i>	chickweed
<i>Trichomanes venosum</i>	filmy fern
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Introduced Species</b>	
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Anthriscus caucalis</i>	beaked parsley
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Callitriche stagnalis</i>	starwort
<i>Cerastium glomeratum</i>	chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Clematis vitalba</i>	old man's beard
<i>Crataegus monogyna</i>	hawthorn
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cytisus scoparius</i>	scotch broom
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Fraxinus excelsior</i>	ash



<i>Galium aparine</i>	cleavers
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypericum androsaemum</i>	tutsan
<i>Mimulus moschatus</i>	musk
<i>Mycelis muralis</i>	wall lettuce
<i>Pilosella officinarum</i>	mouse-ear hawkweed
<i>Pinus radiata</i>	radiata pine
<i>Plantago major</i>	broad-leaved plantain
<i>Prunella vulgaris</i>	selfheal
<i>Ranunculus repens</i>	creeping buttercup
<i>Rubus fruticosus</i>	blackberry
<i>Rumex obtusifolius</i>	broad-leaved dock
<i>Salix fragilis</i>	crack willow
<i>Sambucus nigra</i>	elderberry
<i>Stellaria media</i>	chickweed
<i>Trifolium pratense</i>	red clover
<i>Trifolium repens</i>	white clover
<i>Tropaeolum speciosum</i>	Chilean flame creeper
<i>Ulex europaeus</i>	gorse
<i>Vicia sativa</i>	vetch

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Goodwin Reserve and Bluffs

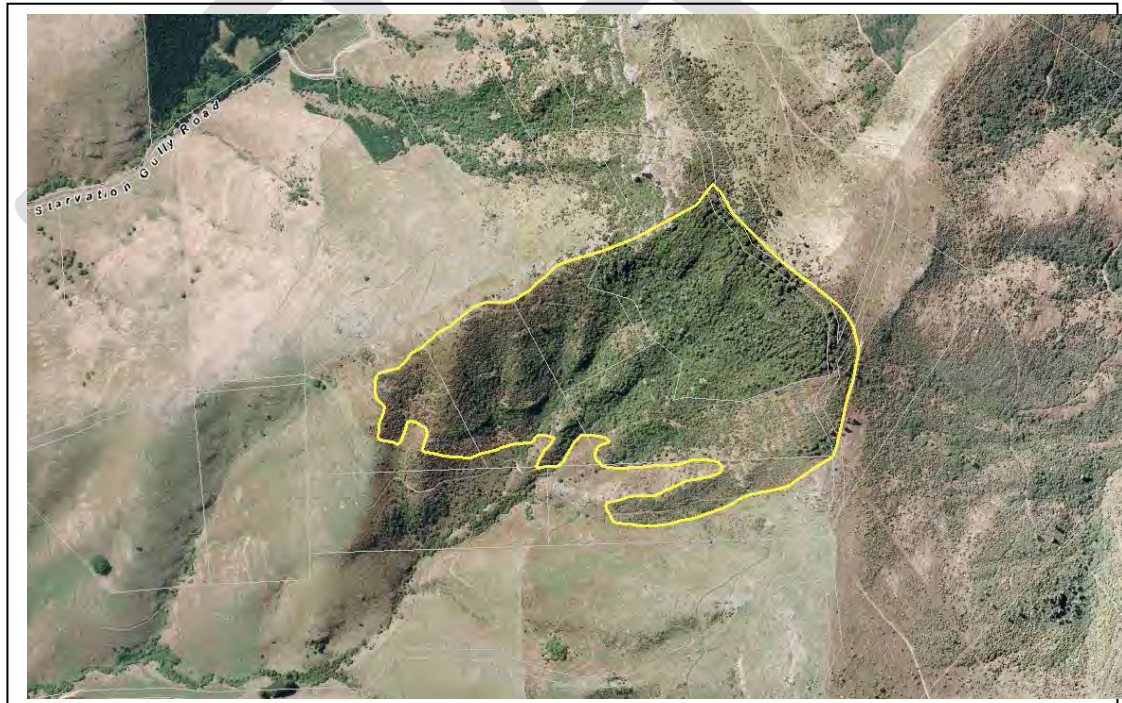
**Site number:** SES/H/11

**Physical address of site:** Starvation Gully Road, Pigeon Bay

#### **Summary of Significance:**

The site is significant because it contains an excellent example of rare montane mountain totara/hardwood forest and representative secondary podocarp/hardwood forest and scrub communities. It has basic cliffs, scarps and tors which, at a national level are an originally rare ecosystem. The site supports two nationally At Risk plant species and two plant species that are uncommon within the ecological region or ecological district. It also contributes to an important ecological linkage.

#### **Site Map**



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 85.10

**Central point (NZTM):** E1594714, N5162032

## Site Description

The site is located south of Starvation Gully Road on the eastern side of Pigeon Bay between approximately 480 and 713 m above sea level and includes the western part of Goodwin Bluffs and Goodwin Reserve (administered by the Department of Conservation). The aspect is generally south-east and the topography is steep to very steep and includes areas of rock bluffs and outcrops.

The vegetation of Goodwin Reserve is mountain totara/hardwood forest, second growth mixed hardwood forest and rock bluff vegetation (Wilson 1992). Wilson commented that the totara canopy is notable because of its density, and because it straddles the crest over a major dividing ridge.

The indigenous vegetation outside the reserve is contiguous with the vegetation within it and provides a buffer along the lower boundary of the reserve. The southwest-facing slopes and gullies below Goodwin Reserve are covered in a mosaic of secondary growth podocarp-hardwood forest and regenerating scrub and shrublands. The canopy contains a diverse range of species, and species composition varies widely across the site. The most common tree species are broadleaf, fuchsia, mountain-five-finger, lancewood, and lowland ribbonwood. There are some emergent mountain totara outside the reserve. In general, canopy cover is highest in the gullies, and sparser on the more exposed ridges, which have some dense patches of bracken. The most common shrubs are small-leaved coprosma/mikimiki species. Both adults and juveniles of *Coprosma wallii* (At Risk-Declining) were observed in the shrubland, and this site appears to be one of the strongholds for this species on the Peninsula. Several species of native climbers also occur at the site. There are also several exposed rock outcrops (Wildland Consultants unpubl. data 2013).

Birds recorded from the site during the botanical survey were South Island fantail, yellow breasted tomtit, swamp harrier, bellbird and New Zealand pigeon (Wildland Consultants unpubl. data 2013).

## Extent of Site of Ecological Significance

This site includes the Goodwin Scenic Reserve, the old-growth thin-barked totara on the north-east margin of the reserve and the secondary growth podocarp-hardwood forest and regenerating scrub and shrublands down-slope (south-west) of the reserve.



The boundaries of this site logically extend north beyond the mapped site boundaries to include the large connected areas of steep rock bluffs and scarps and indigenous forest in the head of Starvation Gully. These areas are highly likely to be ecologically significant. However, this area was not surveyed and there is no up-to-date information to assess its significance. An ecological survey and assessment of this area is a priority.

## Assessment Summary

The Goodwin Reserve and Bluffs Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 8).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Goodwin Reserve contains dense montane mountain totara/hardwood forest and is an excellent example of this vegetation community within the ecological district. Outside the reserve the secondary podocarp/hardwood forest is diverse and also supports some large emergent mountain totara and juvenile trees. The forest canopy and species composition varies widely across the site. The proportion of exotic species recorded within the site is relatively low and few weed species were recorded (Wildland Consultants unpubl. data 2013).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It contains a moderately large stand of relatively dense thin-barked totara totara/mixed hardwood forest on montane hill slopes.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***



The site is significant under this criterion.

The old growth and regenerating secondary forest ecosystems are significant under this criterion. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). Following human arrival the extent of forest in the ecological district (and region) was greatly reduced. The present extent of all indigenous forest (excluding manuka and/or kanuka) in the Herbert Ecological District is estimated to be 7% of the ecological district (New Zealand Landcover Database (Version 4)) and the extent of old growth forest is estimated to be approximately 800 ha or <1% of its original extent (Wilson 2009).

The majority of the indigenous vegetation within Goodwin Reserve, and the regenerating scrub and shrublands on the southwest-facing slopes and gullies in the lower part of the site also meet this criterion at the Level IV land environment scale. They occur on Chronically Threatened land environments where 10 - 20% indigenous vegetation remains on these land environments nationally (Walker *et al.* 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has two nationally At Risk plant species and four that are uncommon within the ecological region or ecological district.

Nationally At Risk plant species (de Lange *et al.* 2013) recorded from the site (Wildland Consultants unpubl. data 2013) are:

- *Brachyglottis sciadophila* (At Risk – Declining)
- *Coprosma wallii* (At Risk – Declining)

Plant species recorded from the site (Wildland Consultants unpubl. data 2013) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Brachyscome radicata*
- *Uncinia banksii*

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is not significant under this criterion. It does have any indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.



There are igneous bluffs, scarps and rock outcrops within the site formed by the Akaroa Volcano. This igneous rock formation is comprised of mildly alkaline (basic) basalt to trachyte (Sewell et al. 1992). At a national scale, basic cliffs, scarps and tors are an originally rare ecosystem (Williams et al. 2007). Where indigenous vegetation occurs on these features within the site they are significant under this criterion.

### Diversity and Pattern

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

The species composition of the forest canopy varies widely across the site, and supports a rich assemblage of indigenous plant taxa (Wildland Consultants unpubl. data 2013). The indigenous scrub communities also support a diverse range of indigenous plant taxa.

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The indigenous vegetation and habitats within the site contribute to an important ecological linkage of continuous indigenous forest and scrub from the northern side of Starvation Gully into the head of Duncan and Little Akaloa Streams through to the extensive protected areas on Mt Pearce (QEII covenants and Mt Pearce Scenic Reserve).

The secondary growth podocarp-hardwood forest and regenerating scrub and shrublands surrounding Goodwin Reserve provide an important buffer to high value montane thin barked totara/hardwood forest within the Scenic Reserve.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess this site against this criterion.



## Site Management

### Existing Protection Status

Goodwin Scenic Reserve (Department of Conservation) protects 11.6 ha of the site. The remainder is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>There are two existing farm tracks, one at mid slope on the western side of the site and another nearer the bottom of the site.</li> </ul>	<ul style="list-style-type: none"> <li>The landowner will continue to be able to use and maintain these access ways.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the landowner is aware of this.</li> </ul>
<ul style="list-style-type: none"> <li>Stock graze at least part of the site (M Hutchison pers. com 2014). There are some internal fences but there is no information available on the condition of existing fences.</li> </ul>	<ul style="list-style-type: none"> <li>Consider maintaining existing fences to a stock-proof condition to keep stock out and promote seedling recruitment and recovery of the understorey.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the benefits to biodiversity of stock exclusion and about options available.</li> <li>Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants. Hawthorn is present at the site (Wildland Consultants unpubl. data 2013). Crack willow and elder are found nearby (Wilson 1992) and sycamore has been controlled in the vicinity.</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing existing hawthorn trees within the site.</li> <li>Consider ongoing surveillance for, and control of sycamore and other biodiversity pest plants such as banana passionfruit, Darwin's barberry, Japanese honeysuckle and radiata pine.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about monitoring and control of pest plants.</li> <li>Assistance where appropriate, in collaboration with DOC.</li> </ul>



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- Wilson, H.D. (2013). *Plant Life on Banks Peninsula*. Manuka Press, Cromwell. 412 pp.

**Assessment completed by:** Scott Hooson  
**Date:** 3 September 2014

**Statement completed by:** Scott Hooson  
**Date:** 3 September 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2013).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum procerum</i>	small kiokio
<i>Brachyscome radicata</i>	
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma wallii</i>	bloodwood
<i>Euchiton species</i>	cudweed
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Geranium aff. microphyllum</i>	native geranium
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Hebe salicifolia</i>	koromiko
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Helichrysum lanceolatum</i>	ninia
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle moschata</i>	pennywort
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea ericoides</i>	kanuka
<i>Leptopteris hymenophylloides</i>	crepe fern, heruheru
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Myrsine australis</i>	red mapou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Olearia paniculata</i>	akiraho



<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Pittosporum eugenoides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus cunninghamii</i>	mountain totara, thin-barked totara
<i>Polystichum neozelandicum subsp. zerophyllum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Pseudopanax colensoi</i>	mountain five-finger
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pteridium esculentum</i>	bracken
<i>Pterostylis species</i>	green-hooded orchid
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Rytidosperma gracile</i>	danthonia
<i>Rytidosperma unarede</i>	danthonia
<i>Schefflera digitata</i>	pate, seven-finger
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Uncinia banksii</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Viola cunninghamii</i>	white violet
<b>Exotic species</b>	
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Arrhenatherum elatius</i>	tall oat grass
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Crataegus monogyna</i>	hawthorn
<i>Crepis capillaris</i>	hawksbeard
<i>Cynosurus cristatus</i>	crested dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Mycelis muralis</i>	wall lettuce
<i>Phleum pratense</i>	timothy
<i>Trifolium repens</i>	white clover
<i>Ulex europaeus</i>	gorse



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Head of the Harbour

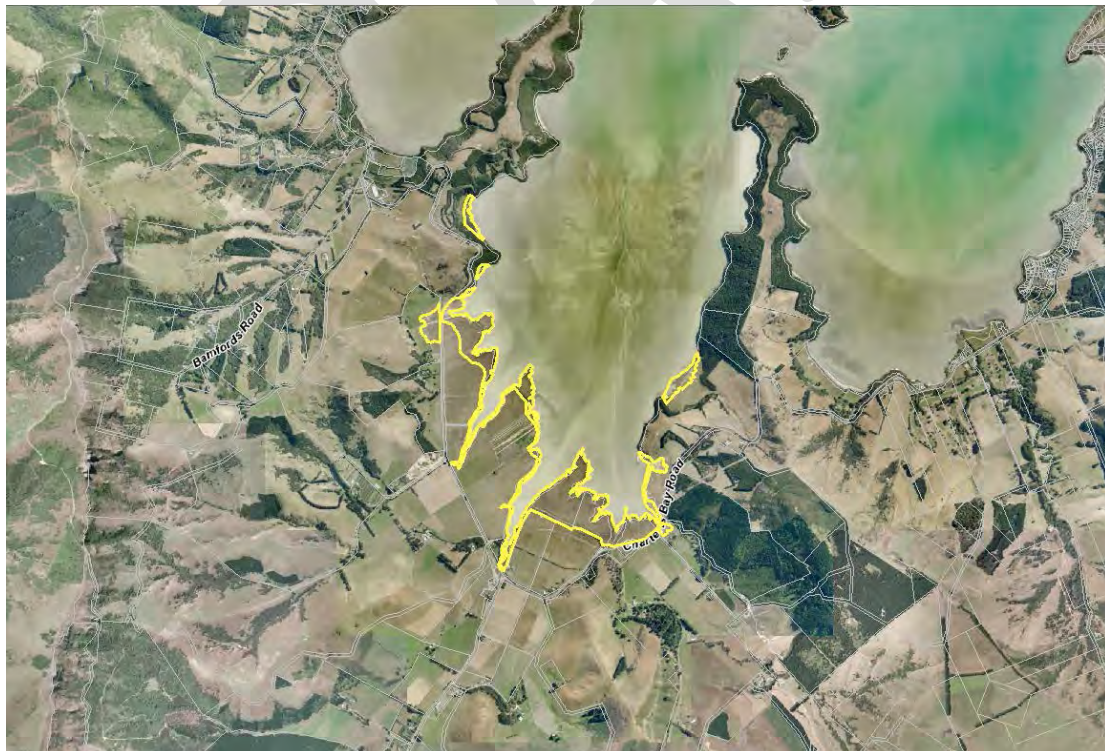
**Site number:** SES/H/12

**Physical address of site:** Governors Bay Teddington Road, Teddington

#### Summary of Significance:

The site is significant because it has distinctive and diverse saltmarsh vegetation communities that are the best and most extensive in the ecological district and ecological region. The site supports a number of indigenous plant and bird species that are nationally Threatened or At Risk and uncommon within the ecological district and region. It is a nationally significant bird habitat and is the second most important estuarine system for waders in Canterbury. It is also part of an important network of coastal and estuarine habitats for a large number of waders and water birds.

#### Site Map



## **Additional Site Information**

**Ecological District:** Herbert

**Area of SES (ha):** 48.55

**Central point (NZTM):** E1572914, N5165966

## **Site Description**

This site encompasses an extensive area of saltmarsh at the head of Lyttelton Harbour. Wilson (1992) considered the site to be the best and most extensive saltmarsh vegetation in the Herbert Ecological District and Banks Ecological Region. The Department of Conservation identified the site as a Recommended Area for Protection (RAP H1 – Head of the Bay) (Wilson 1992).

The main vegetation communities within the site, as described by ECan (2010) are:

- Glasswort herbfield with remuremu, salt grass and buck's horn plantain;
- Native salt grass grassland with glasswort and salt barley grass;
- Marsh ribbonwood shrubland with sea rush, tall fescue, glasswort, sea blight and salt grass;
- Tall fescue grassland with dock and plantain;
- Sea rush rushland with oioi, remuremu, sea primrose, salt grass and buck's horn plantain.

The site provides excellent feeding and roosting habitat for a large number and diverse range of coastal and wetland bird species and is recognised as being nationally significant bird habitat (O'Donnell, 2000).

## **Extent of Site of Ecological Significance**

The site includes all of the remaining saltmarsh and salt meadow vegetation communities and important bird habitat in the Head of the Harbour. An area of salt meadow herbfield on the western side of Governors Bay Teddington Road is included in the site. The Christchurch City Council's seaward boundary extends only as far as mean high water springs, but the salt marsh communities and unvegetated tidal mudflats below this are also of high ecological significance, and should be managed as part of the site given the high level of connectivity between the two.

## **Assessment Summary**

The Head of the Harbour Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) referring also to the Wildland Consultants (2013) Guidelines and advice from



the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4 and 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 8, 9 and 10).

## **Assessment against Significance Criteria**

### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Much of the saltmarsh area has been moderately to severely degraded by vegetation clearance and the construction and installation of stopbanks, drains, culverts and road construction (Parker unpubl. data 2010). However, the site still retains its key vegetation characteristics and hydrological functions (ECan 2010) and is the best and most extensive saltmarsh vegetation in the Ecological District and Banks Ecological Region (Wilson 1992). It includes a well-defined series of tidal inlets with saltmarsh vegetation separating salt meadow-dominated peninsulas, and includes an adjacent coastal plain of remnant open salt meadows. It is the only coastal/estuarine habitat complex remaining on Banks Peninsula that retains all the distinctive coastal wetland habitat types (mudflats, saltmarsh, saltmeadow and tidal creeks) (Crossland 2012).

In terms of its bird assemblages the site is considered to support the most intact estuarine/coastal wetland bird assemblage in the Herbert ED (and in the Banks Ecological Region) (Crossland 2012). A high proportion of the bird species in the "Banks Peninsula estuaries/coastal wetlands bird species assemblage" (Crossland unpubl. data 2014b) occur at the site (Appendix 2). A full list of the bird species recorded during formal Council surveys at the site (Crossland unpubl. data 2014) is provided in Appendix 3.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It is the largest area of saltmarsh vegetation in the Herbert ED and the Banks ER (Wilson 1992). The inter-tidal mudflats in the Head of the Bay (which are outside the Christchurch City Council boundary, but ecologically are an important part of the site) comprise approximately two-thirds of those found in Upper Lyttelton Harbour. These mudflats are substantially larger than any other inter-tidal mudflats in the Banks ER and are the largest expanse of inter-tidal mudflats in Canterbury. The site also supports the second largest area of saltmeadow vegetation after Lake Ellesmere (Crossland 2012).



### Rarity/Distinctiveness

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion at the Level 4 land environment level.

The areas within the site that are on land (i.e. terrestrial environments) are on Acutely and Chronically Threatened land environments (B6.1a, I3.3a) where <20% indigenous vegetation is left on these land environments nationally (Walker et al. 2007).

The site does not meet this threshold at the level of the Canterbury Region. Based on a comparison of recent detailed coastal wetland mapping with the area of soil types that would have developed in a saltmarsh environment (saline gley soils) (Grove et al. 2012) have estimated there has been more than 50% net reduction in the extent of saltmarsh habitat in the Canterbury Region post European settlement.

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has two indigenous plant species that are nationally Threatened or At Risk and several others that are uncommon within the ecological region or ecological district. It also provides habitat for a number of bird species that are nationally Threatened.

### Plants

The nationally Threatened and At Risk plant species (de Lange et al. 2013) recorded from the site (Partridge unpubl. data 2014) are:

- *Lachnagrostis tenuis* (Threatened – Nationally Vulnerable) (this species is rare in the (sea rush) / remuremu-glasswort- shore primrose herbfield)
- *Mimulus repens* (At Risk - Naturally Uncommon)

Plant species recorded from the site (Partridge unpubl. data 2014) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Apodasmia similis*
- *Isolepis cernua*
- *Juncus kraussii* var. *australiensis*
- *Lilaeopsis novae-zelandiae*
- *Samolus repens*
- *Selliera radicans*
- *Suaeda novae-zelandiae*





## Birds

The grassland, saltmarsh, salt meadow, tidal creek and mudflat habitats<sup>1</sup> are important habitat for a large number of bird species that are either nationally Threatened or At Risk (Robertson et al. 2012) (and at risk or uncommon within the Herbert Ecological District) (Crossland 2012, Crossland unpubl. data 2014a).

Nationally Threatened bird species (Robertson et al. 2012) that use the site (Crossland unpubl. data 2014a) are:

- Black billed gull (Threatened - Nationally Critical, and uncommon in the ED)
- Black-fronted tern (Threatened - Nationally Endangered, and uncommon in the ED)
- Caspian tern (Threatened - Nationally Vulnerable, and uncommon in the ED)
- Pied cormorant (Threatened - Nationally Vulnerable)
- Red-billed gull (Threatened - Nationally Vulnerable, and at risk in the ED)

It also supports a number of nationally At Risk (Robertson et al. 2012) bird species (Crossland unpubl. data 2014a)<sup>2</sup>:

- Eastern bar-tailed godwit (At Risk – Declining)
- New Zealand pipit (At Risk – Declining)
- Pied stilt (At Risk – Declining)
- South Island pied oystercatcher (At Risk – Declining)
- White-fronted tern (At Risk – Declining, and at risk in the ED)
- Variable oystercatcher (At Risk – Recovering, and uncommon in the ED)
- Black cormorant (At Risk – Naturally Uncommon, and uncommon in the ED)
- Little black cormorant (At Risk – Naturally Uncommon, and uncommon in the ED)
- Royal spoonbill (At Risk – Naturally Uncommon, and uncommon in the ED)

**5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.***

The site is not significant under this criterion. It does not contain indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.

**6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

The site is significant under this criterion.

The saltmarsh vegetation communities growing within the site are distinctive vegetation communities. They have developed as a result of an unusual combination of environmental factors (hydrological and salinity gradients). They

<sup>1</sup> The mudflats are outside the Christchurch City Council boundary, but ecologically are an important part of the site.

<sup>2</sup> Although for mobile fauna such as birds, species classified as nationally At Risk do not meet the threshold for significance (Wildland Consultants 2013).



are also of restricted occurrence in the Herbert ED and are the only examples of this ecosystem type in the ecological district.

### Diversity and Pattern

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

It has a relatively high diversity of saltmarsh vegetation communities reflecting hydrological and saline gradients. These communities include: glasswort herbfield, native salt grass grassland, marsh ribbonwood shrubland, tall fescue grassland, sea rush rushland, and tidal streams (ECan 2010).

The site provides high value habitats for a diverse range of indigenous bird species. It supports the second highest diversity of estuarine and coastal bird species in the ecological region after Lake Forsyth (Crossland 2012). Thirty three coastal and wetland bird species have been recorded in upper Lyttelton Harbour (Crossland 2012), of these 24 indigenous species have been recorded during formal Council monitoring between November 2002 and December 2014 (Crossland unpubl. data 2014a) (and an additional four have been regularly recorded during incidental observation but are not included in formal counts).

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The Head of the Harbour is a very important part of an ecological network of estuaries, river mouths, and coastal lagoons along the Canterbury coast and East Coast of the South Island that provide an important network of habitats for a number of indigenous bird species including international and internal migrants, waterfowl and wetland species (Crossland 2012).

Crossland (2012) notes that migratory bird species flying north or south tend to avoid flying around the outer perimeter of Banks Peninsula and instead either pass along “flyways” over Christchurch or down the length of Lyttelton Harbour and cross over Gebbies Pass. The site occupies a strategic position at the head of the harbour and below the elevation of Gebbies Pass and for this reason is an important staging point for international and domestic migratory birds. In total, a minimum 10,000 waterbirds of over 30 species are estimated to use the site per annum (Crossland 2012).

The saltmarsh vegetation communities within the site are directly connected to the inter-tidal mudflats which at approximately 450 ha are the by far the largest and most important on Banks Peninsula. The mudflats and channels are an



important feeding ground for many species of birds including cormorants, shags, herons, waterfowl, waders, gulls and terns. Many of these species then use the areas of saltmarsh and salt meadow communities as high tide roosting areas. The saltmarsh communities are also connected to the marine ecosystem of the upper Lyttelton Harbour and the site is also likely to play a role in buffering the inter-tidal mudflats and upper Lyttelton Harbour from run-off and sedimentation.

**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is significant under this criterion.

Because of its position at the head of Lyttelton Harbour the saltmarsh vegetation communities within this coastal wetland are likely to play an important role in buffering the inter-tidal mudflats and upper Lyttelton Harbour from run-off (including contaminants and nutrients) and sedimentation.

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

Head of the Harbour is a nationally significant bird habitat (O'Donnell 2000) and is the second most important estuarine system for waders in Canterbury after the Avon-Heathcote Estuary (Crossland 2012). It is a key migration staging point, post-breeding flocking area, wintering site, feeding, roosting, and moulting site for a diverse number of wetland, water and wader species and supports large numbers of birds both seasonally and permanently. Annual peak numbers include >1,000 waders, >500 gulls and >400 waterfowl with an estimated annual turnover of 10,000 coastal and estuarine birds (Crossland 2012). Crossland (2012) ranks the Head of the Harbour as the most important coastal/estuarine site in the ecological region for bar-tailed godwit, South Island pied oystercatcher, pied stilt and white-faced heron.

Important bird habitats within the site include tall salt marsh (comprising mainly sea rush and marsh ribbonwood), salt meadow (comprising *Sarcocornia*, *Selleria*, *Cotula*, salt grass, etc), mixed salt meadow/exotic pasture (where salty soils and/or periodic tidal inundation mean that salt-tolerant plants persist amongst pasture grasses), and lowland wet grassland (comprising exotic grassland with moist soils) (Crossland 2012).

## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Stock</li> </ul>	<ul style="list-style-type: none"> <li>Consider not grazing tall saltmarsh vegetation. However, light – moderate grazing of salt meadow vegetation can be beneficial for maintaining the optimum sward height for roosting and feeding waders and waterfowl.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about benefits to biodiversity of different stocking levels and options.</li> </ul>
<ul style="list-style-type: none"> <li>Agricultural activities which may damage saltmarsh communities.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain a steady state in terms of drainage, reclamation, cultivation and oversowing for agricultural purposes, of areas supporting indigenous saltmarsh and salt meadow vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about the benefits to biodiversity of at least maintaining the status quo with regards to agricultural use of the site and the impacts on biodiversity.</li> <li>Advice and guidance for landowners about enhancement of saltmarsh and salt meadow vegetation.</li> <li>Assistance where possible in collaboration with agencies and other groups.</li> </ul>
<ul style="list-style-type: none"> <li>Stop-banks disrupting the hydrological link between the sea and the salt marsh and salt meadow habitats landward of the stopbanks.</li> </ul>	<ul style="list-style-type: none"> <li>Investigate the feasibility / practicability of restoring a more natural hydrological link between the sea and the salt marsh/salt meadow habitats landward of the stopbanks in some areas.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners, in the first instance, about the desirability of restoring a more natural hydrological link between the sea and the salt marsh/salt meadow habitats in some areas.</li> </ul>
<ul style="list-style-type: none"> <li>Sedimentation and nutrient enrichment</li> </ul>	<ul style="list-style-type: none"> <li>Consider catchment wide solutions to reduce</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

	erosion and methods of reducing nutrient inputs (potential sources: fertiliser, stock access to waterways etc.) such as revegetation and appropriate planting of riparian buffers.	
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**Assessment completed by:** Scott Hooson  
**Date:** 7 August 2014

**Statement completed by:** Scott Hooson  
**Date:** 7 August 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List

Sourced from Partridge unpubl. data (2014).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Apium prostratum</i>	NZ celery
<i>Apodasmia similis</i>	oioi
<i>Cotula coronopifolia</i>	bachelor's button
<i>Disphyma australe</i>	NZ ice plant
<i>Ficinia nodosa</i>	knobby clubrush
<i>Isolepis cernua</i>	salt bristle sedge
<i>Juncus kraussii</i>	sea rush
<i>Lachnagrostis tenuis</i>	NZ wind grass
<i>Leptinella dioica</i>	cotula
<i>Lilaeopsis novae-zelandiae</i>	lilaeopsis
<i>Mimulus repens</i>	creeping musk
<i>Phormium tenax</i>	harakeke, flax
<i>Plagianthus divaricatus</i>	coastal ribbonwood
<i>Poa cita</i>	silver tussock
<i>Pseudognaphalium luteoalbum</i>	cudweed
<i>Puccinellia stricta</i>	salt grass
<i>Samolus repens</i>	shore primrose
<i>Sarcocornia quinqueflora</i>	glasswort
<i>Schoenoplectus pungens</i>	three-square
<i>Selliera radicans</i>	remuremu
<i>Senecio glomeratus</i>	NZ groundsel
<i>Spergularia media</i>	sea spurge
<i>Suaeda novae-zelandiae</i>	suaeda
<i>Triglochin striata</i>	arrow grass
<b>Exotic Species</b>	
<i>Agrostis stolonifera</i>	creeping bent
<i>Atriplex prostrata</i>	orache
<i>Beta vulgaris</i>	beet
<i>Carpobrotus edulis</i>	ice plant
<i>Cerastium glomeratum</i>	annual mouse-ear chickweed
<i>Crepis capillaris</i>	hawksbeard
<i>Critesion maritimum</i>	salt barley grass
<i>Hypochaeris radicata</i>	catsear
<i>Lepidium africanum</i>	peppergrass
<i>Lolium perenne</i>	perennial ryegrass
<i>Parapholis incurva</i>	sickle grass
<i>Parentucellia viscosa</i>	tarweed
<i>Plantago coronopus</i>	buck's horn plantain
<i>Polypogon monspeliensis</i>	annual beard grass
<i>Schedonorus arundinaceus</i>	tall fescue
<i>Sonchus oleraceus</i>	sow thistle
<i>Spartina anglica</i>	cord grass





<i>Trifolium fragiferum</i>	strawberry clover
<i>Tripleurospermum inodorum</i>	scentless mayweed

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## Appendix 2: Indigenous Banks Peninsula Estuaries/Coastal Wetlands Bird Species Assemblage

Comparison of bird species recorded from upper Lyttleton Harbour during Council monitoring (Crossland unpubl. data 2014a) (and incidental observations by Council staff) with the “Banks Peninsula Estuaries/Coastal Wetlands Bird Species Assemblage” (Crossland 2014b).

Species recorded at the study site are marked with a tick ✓.

	Common name	Scientific Name
	Arctic Skua	<i>Stercorarius parasiticus</i>
	Australasian Gannet	<i>Morus serrator</i>
✓	Australasian Harrier	<i>Circus approximans</i>
✓	Black Cormorant	<i>Phalacrocorax carbo novaehollandiae</i>
✓	Black Swan	<i>Cygnus atratus</i>
✓	Black-backed Gull	<i>Larus dominicanus dominicanus</i>
✓	Black-billed Gull	<i>Larus bulleri</i>
✓	Black-fronted Tern	<i>Sterna albobriata</i>
✓	Caspian Tern	<i>Sterna caspia</i>
✓	Eastern Bar-tailed Godwit	<i>Limosa lapponica baueri</i>
✓ *	Grey Duck	<i>Anas superciliosa superciliosa</i>
✓	Grey Teal	<i>Anas gracilis</i>
✓	Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>
✓	Little Cormorant	<i>Phalacrocorax melanoleucos brevirostris</i>
	Marsh Crake	<i>Porzana pusilla affinis</i>
✓	New Zealand Kingfisher	<i>Halcyon sancta vagans</i>
✓	New Zealand Pipit	<i>Anthus novaeseelandiae novaeseelandiae</i>
✓	New Zealand Shoveler	<i>Anas rhynchotis</i>
✓	Paradise Shelduck	<i>Tadorna variegata</i>
✓	Pied Cormorant	<i>Phalacrocorax varius varius</i>
✓	Pied Stilt	<i>Himantopus himantopus leucocephalus</i>
	Pomarine Skua	<i>Stercorarius pomarinus</i>
✓	Pukeko	<i>Porphyrio porphyrio melanotus</i>
✓	Red-billed Gull	<i>Larus novaehollandiae scopulinus</i>
	Reef Heron	<i>Egretta sacra sacra</i>
✓	South Island Pied Oystercatcher	<i>Haematopus ostralegus finschi</i>
✓	Spotted Shag	<i>Stictocorbo punctatus</i>
✓	Spur-winged Plover	<i>Vanellus miles</i>
✓	Variable Oystercatcher	<i>Haematopus unicolor</i>
✓	Welcome Swallow	<i>Hirundo tahitica neoxena</i>
✓	White-faced Heron	<i>Ardea novaehollandiae novaehollandiae</i>
✓	White-fronted Tern	<i>Sterna striata</i>

\* Mallard, grey duck or mallard/grey duck hybrids have been recorded (Crossland unpubl. data 2014a).

### Appendix 3: Bird Species List

Birds recorded from upper Lyttleton Harbour during Council monitoring, November 2002 to December 2014. Sourced from Crossland unpubl. data (2014a).

\* denotes introduced species

Species
Asiatic whimbrel
Australasian harrier
Black cormorant
*Black swan
Black-backed gull
Black-billed gull
Black-fronted tern
*Canada goose
Caspian tern
Eastern bar-tailed godwit
*Feral goose
Grey teal
Little black cormorant
Little cormorant
*Mallard/grey duck
New Zealand pied oystercatcher
Paradise shelduck
Pied cormorant
Pied stilt
Pukeko
Red-billed gull
Royal spoonbill
Spotted shag
Spur-winged plover
Variable oystercatcher
White-faced heron
White-fronted tern
Wrybill



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Howdens

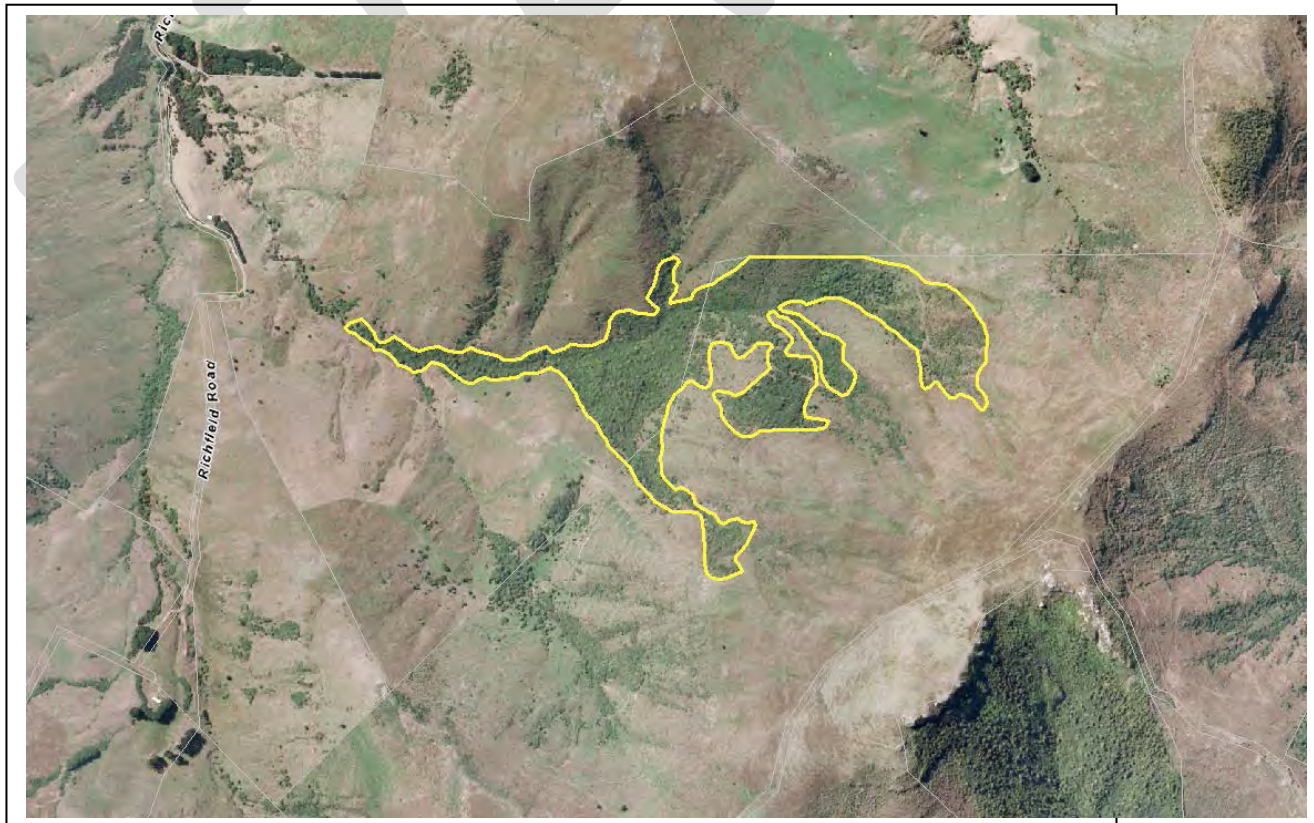
**Site number:** SES/H/13

**Physical address of site:** Richfield Road, Port Levy

#### Summary of Significance:

This site is significant because it contains rare and representative podocarp hardwood forest that supports one indigenous plant species that is At Risk nationally and three species that are uncommon within the ecological region or ecological district. It is in close proximity to Mt Fitzgerald Scenic Reserve and other areas of indigenous forest and scrub and is important as part of a network of other forest patches in the wider landscape.

#### Site Map:



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 33.03

**Central point (NZTM):** E1586333, N5161303

## Site Description

The site is located on the northern slopes of Mt. Fitzgerald in the headwaters of Owheoro Stream. The altitudinal range of the site is from approximately 380 to 700 metres above sea level. The Department of Conservation identified this site a Recommended Area for Protection (Herbert RAP 24 – Howden) (Wilson 1992).

The vegetation is a mosaic of secondary hardwood forest and small-leaved scrub. The forest is lowland (totara-matai-kahikatea)/narrow-leaved lacebark-ribbonwood. In the lower reaches a small number of kahikatea and matai are emergent through the canopy. Lowland totara of all ages (seedlings, juveniles and big old trees) are common and emergent trees are more common on the upper slopes. A patch of lowland ribbonwood forest on a higher broad north-west facing spur has several remnant totara and large old broadleaf trees but little understorey due to stock camping in the forest. In the upper main gully is narrow-leaved lacebark/tree fuchsia forest with dense *Polystichum vestitum* fern near the stream. The patches of forest are connected by fingers of forest and scrub lining the streams. Although stock have access to all areas there is considerable regeneration in the forested gullies. On the warm, dry upper slopes the forest is used for shelter by cattle and sheep and the understorey is open with no regeneration. All the forested areas are weed free apart from an occasional elder and foxglove (Jensen unpubl. data 2013).

Indigenous birds recorded at the site during the botanical survey were New Zealand pigeon, swamp harrier, bellbird and fantail (Jensen unpubl. data 2013).

## Extent of Site of Ecological Significance

The site includes the core areas of podocarp/hardwood forest, fingers of forest and scrub lining the streams and the small leaved scrub and shrubland communities which buffer and connect the core forest areas. Small areas of exotic grassland and shrubland and treeland interspersed with exotic grassland have been included in the site to make the boundaries less convoluted and the site more compact. These areas will succeed to indigenous vegetation in time.

## Assessment Summary

The Howdens Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from



the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3 and 4) and ecological context criteria (criterion 8).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Although largely secondary the forest contains scattered emergent remnant totara, matai and kahikatea and a typical diversity of indigenous hardwood and broadleaved tree species and shrubs. With the exception of forest on the warm, dry upper slopes, the understorey is in good condition. There is considerable regeneration occurring in the forested gullies (Jensen unpubl. data 2013) and very few weeds within the forest. There are “magnificent stands of lowland ribbonwood” (Wilson 1992) that also have several remnant totara and large old broadleaf trees (Jensen unpubl. data 2013).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It is a large example of secondary hardwood forest and small-leaved scrub on hill slopes in the Herbert ED.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

In the context of the Herbert Ecological District the forest within the site is significant under this criterion because indigenous forest it has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

This site also meets this criterion at the Level IV land environment scale. It supports indigenous vegetation that is entirely on Chronically Threatened land



environments (F3.1b and F3.3b) where 12.2 and 17.6% indigenous vegetation is left on these land environments nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It has one indigenous plant species that is At Risk nationally and three species that are uncommon within the ecological region or ecological district.

The Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Jensen unpubl. data 2013) is:

- *Coprosma virescens* (At Risk – Declining)

Plant species recorded from the site that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Blechnum colensoi* (Jensen unpubl. data 2013)
- *Hydrocotyle elongata* (Wilson 1992)
- *Uncinia ferruginea* (Wilson 1992)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is not significant under this criterion. It does not contain indigenous vegetation or indigenous species' at their distributional limits within Canterbury Region or nationally.

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is not significant under this criterion. It does not have indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is not significant under this criterion. It does not contain a high diversity of indigenous ecosystem or habitat types or a particularly high diversity of indigenous plant taxa.



## Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

It is in close proximity to Mt Fitzgerald Scenic Reserve and other areas of indigenous forest and scrub on the southern side of Mt Fitzgerald. It is likely to play a moderately important role as part of a network of other forest patches in the wider landscape, particularly because it has mature podocarp trees and other indigenous tree species (e.g. tree fuchsia and kowhai) that are important seasonal food sources for birds. Riparian forest within the site also buffers the headwaters of two tributaries of Owheoro Stream, although this represents only a tiny proportion of the Owheoro Stream's length.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess the site against this criterion.

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## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Stock grazing of the understorey, particularly on north-facing slopes (Jensen unpubl. data 2013).</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing forested areas.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the benefits to biodiversity of stock control and the options available.</li> <li>Assistance available as appropriate and with landowner agreement.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants are not currently a threat to the ecological values of the site. Elder and foxglove are the only species recorded within the site (Jensen unpubl. data 2013).</li> </ul>	<ul style="list-style-type: none"> <li>Consider ongoing weed surveillance for biodiversity pest plants such as Darwin's barberry, banana passionfruit and old mans beard which may appear in future.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about monitoring and control of pest plants.</li> <li>Assistance as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Existing access ways. A farm track passes through the lower part of the site and another traverse the upper slopes.</li> </ul>	<ul style="list-style-type: none"> <li>The landowner will continue to be able to use and maintain existing access ways.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the landowner is aware that existing access ways can continue to be used and maintained.</li> </ul>

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**Assessment completed by:** Scott Hooson  
**Date:** 18 September 2014

**Statement completed by:** Scott Hooson  
**Date:** 18 September 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Plant Species List

Sourced from Jensen unpubl. data (2013).

N.B. exotic species were not recorded during this survey.

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Aristotelia serrata</i>	wineberry, makomako
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum colensoi</i>	Colenso's hard fern, peretao
<i>Blechnum discolor</i>	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum penna-marina</i>	little hard fern
<i>Calystegia tuguriorum</i>	NZ bindweed, pōwhiwhi
<i>Carex forsteri</i>	cutty grass
<i>Carpodetus serratus</i>	marbleleaf, putaputāwētā
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma robusta</i>	karamū
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cyathea smithii</i>	Smith's tree fern, kātote
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Griselinia littoralis</i>	broadleaf, kāpuka
<i>Hebe salicifolia</i>	koromiko
<i>Helichrysum lanceolatum</i>	niniao
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hoheria populnea x H angustifolia</i>	
<i>Hydrocotyle moschata</i>	pennywort
<i>Kunzea robusta</i>	kānuka
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Melicope simplex</i>	poataniwha
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rātā
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Muehlenbeckia australis</i>	large-leaved pōhuehue
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red māpou, red matipo



<i>Oxalis exilis</i>	yellow oxalis
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Pittosporum eugenioides</i>	lemonwood, tarātā
<i>Plagianthus regius</i>	lowland ribbonwood, mānatu
<i>Pneumatopteris pennigera</i>	gully fern, pākau
<i>Poa cita</i>	silver tussock, wī
<i>Podocarpus totara</i>	lowland tōtara
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, pūniu
<i>Prumnopitys taxifolia</i>	mataī, black pine
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pteridium esculentum</i>	bracken, rārahu, rauaruhe
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tātarāmoa
<i>Rubus schmidelioides</i>	bush lawyer, tātarāmoa
<i>Schefflera digitata</i>	patē, seven-finger
<i>Sophora microphylla</i>	small-leaved kōwhai
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species<sup>1</sup></b>	
<i>Digitalis purpurea</i>	foxglove
<i>Sambucus nigra</i>	elderberry

<sup>1</sup> Exotic plant species were not recorded during this survey.

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Birdlings Flat Shrublands

**Site number:** SES/H/14

**Physical address of site:** Poranui Beach Road, Birdlings Flat

#### Summary of Significance:

This site is significant because it supports one of the best examples of distinctive, nationally rare indigenous stony beach ridge vegetation in New Zealand. It is the only example in the Canterbury region and one of only two examples in the South Island. Stony beach ridges are an originally rare ecosystem and the majority of the site is also on an Acutely Threatened land environment. The shrubland and grassland habitats within the site support a number of plant, invertebrate and lizard species that are either nationally Threatened, At Risk and/or endemic to Kaitorete Spit and Canterbury and one plant species at its northern national limit. The site provides important habitat for a distinctive assemblage of indigenous lizard species.

#### Site Map



## Additional Site Information

**Ecological District:** Herbert/Ellesmere

**Area of SES (ha):** 163.71

**Central point (NZTM):** E1575682, N5147976

## Site Description

This site is located behind Birdlings Flat at the eastern end of Kaitorete Spit and the western end of Lake Forsyth/Waiwera. It extends across both sides of Poranui Beach Road and is bounded by the Christchurch Akaroa Road, Lake Forsyth/Wairewa, the Birdlings Flat settlement and the Kaitorete Spit Scientific Reserve.

The site is approximately 10 m above sea level and is relatively flat with stony, semi-arid near coastal alluvial ground (Wilson 1992). It has a series of parallel stony beach ridges that are continuous with those in the adjoining Kaitorete Spit Scientific Reserve to the west. Stony beach ridges are former beach crests (and associated depressions) no longer influenced by wave action and comprised of wave-deposited water-smoothed gravel and cobbles. They become progressively older further inland. Stony beach ridge ecosystems are an originally rare ecosystem at a national scale (Williams et al. 2007).

The majority of the site east of Poranui Beach Road is a Christchurch City Council Reserve (Birdlings Flat Regional Park) and there is a small (0.7 ha) reserve (Omahanui Conservation Area, conservation number M36174) administered by the Department of Conservation near the intersection of the Christchurch Akaroa Road and Poranui Beach Road. A triangle of land on the eastern side of Poranui Beach Road is privately owned. On the western side of Poranui Beach Road a Banks Peninsula Conservation Trust (BPCT) covenant protects an area of private property near the coast and behind Birdlings Flat. Kaitorete Spit Scientific Reserve (conservation number M37014), administered by the Department of Conservation, has a similar landform and borders the western side of the site.

The main vegetation communities at the site (adapted from Partridge 2008) are:

- *Coprosma* shrubland (in beach ridge depressions) with danthonia grassland (on the beach ridges)
- (*Muehlenbeckia complexa*)/danthonia shrubland and grassland
- Danthonia grassland

The shrubland in the beach ridge depressions is dominated by *Coprosma propinqua* and *C. crassifolia*. Other shrubs include matagouri (*Discaria toumatou*), *Coprosma virescens*, *Helichrysum lanceolatum* and low-growing subshrubs of porcupine shrub (*Melicactus alpinus*), native broom (*Carmichaelia australis*) and kowhai (*Sophora microphylla*). Climbers include leafless clematis (*Clematis afoliata*), *Scandia geniculata*, native bindweed (*Calystegia tuguriorum*) and native jasmine (*Parsonsia heterophylla*). In the shelter of the shrubs are the necklace fern (*Asplenium flabellifolium*) and other small native herbs.



The grassland on the beach ridges between the depressions is dominated by dryland danthonia grasses comprising a mixture of native and Australian *Rytidosperma* species along with other exotic grasses such as *Austrostipa nodosa*, *Elymus scaber*, browntop (*Agrostis capillaris*), and sweet vernal (*Anthoxanthum odoratum*). The native silver tussock (*Poa cita*) is present, but uncommon. Creeping pohuehue (*Muehlenbeckia complexa*) grows amongst the grassland.

The (*Muehlenbeckia complexa*)/danthonia shrubland and grassland vegetation is similar to the shrubland and grassland mosaic described above but without the shrubs. Apart from the occasional *Coprosma propinqua* shrub, the depressions have no shrub or associated climbers at all. Common exotic grasses and herbs include browntop, sheeps sorrel (*Rumex acetosella*) and catchfly (*Silene gallica*). Within this vegetation community the beach ridges have a similar structure and composition to the depressions.

The danthonia grassland comprises grassland dominated by danthonia species, *Austrostipa nodosa*, and other exotic grasses. Barley grass (*Critesion murinum*) is also common, while closer to the lake margin it is replaced by the smaller salt barley grass (*C. marinum*), which can be dominant in hollows where salt water ponds.

Wilson (2013) recorded 36 indigenous vascular species from within the Hauroko BPCT covenant near the coast and behind Birdlings Flat. Species he identified as being of particular interest include the Kaitorete prostrate broom (*Carmichaelia appressa*), *Muehlenbeckia ephedroides*, and the tiny herbaceous *Galium* "kaitorete" (referred to as *Galium* "lake"). Wilson also recorded the drought-tolerant fern *Pyrrhosia eleagnifolia*, abundant drought-tolerant mosses *Triquetrella papillata* and *Hypnum cupressiforme* and several species of lichen. He noted that the diversity of the drought-tolerant, wind-sculptured native shrubs is of great botanical interest.

### **Extent of Site of Ecological Significance**

The site is bounded by the Little River Rail Trail to the north, cultivated land within the Christchurch City Council Reserve, Lake Forsyth/Wairewa to the east, the Birdlings Flat settlement and the coastal margin to the south and Kaitorete Spit Scientific Reserve to the west. A residential dwelling and its surrounding gardens on the eastern side of Poranui Beach Road, near its intersection with the Christchurch Akaroa Road, and a dwelling and fenced section north of Birdlings Flat settlement are excluded from the site. The Lake Forsyth/Wairewa lake margin vegetation is within the Lake Forsyth/Wairewa Site and the coastal dunes south of the site are included in the Kaitorete Spit Site.

### **Assessment Summary**

The Birdlings Flat Stony Beach Ridges Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).



## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

The stony beach ridges at the eastern end of Kaitorete Spit are the only known example of this ecosystem type in Canterbury (the only other known example in the South Island is at Rarangi in Marlborough) (Landcare Research website). Although the beach ridges within the site have been degraded by historic, and more recent, vegetation clearance, grazing and the presence of introduced plant species, the indigenous vegetation communities within the site are one the best examples of stony beach ridge vegetation in New Zealand and are highly representative. The vegetation within the site has retained a diverse range of indigenous plant species including shrubs, climbers and trailers, sedges, grasses herbs, mosses and lichens. Refer to Appendices 1 – 3 for plant species lists from the Birdlings Flat Regional Park, east of Poranui Beach Road, the Hauroko BPCT covenant and the land on the western side of Poranui Beach Road<sup>1</sup>).

The site also supports a representative indigenous lizard assemblage. Four of the five lizard species present on Banks Peninsula occur within the site (Lettink 2005, Lettink et al. 2008).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

It is the largest coastal shrubland in Canterbury (Lettink 2013) (and is the only known example of stony beach ridges in the ecological district and the Canterbury region).

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

<sup>1</sup> Jensen's 2015 survey of the land west of Poranui Beach Road was undertaken in January 2015 during a particularly hot dry summer. Because Kaitorete Spit is a dry environment several small herbs appear in winter or early spring and will have dried up by summer. It is likely that several more species, in particular, *Daucus glochidiatus*, *Galium sp.*, *Leptinella serrulata* would have been recorded on the Manson property if it was surveyed in the spring.





Coastal shrublands are likely to have been reduced to less than 20% of their former extent in the Region and the ecological district. There are very few intact coastal shrublands remaining on Banks Peninsula (Lettink 2013).

The site also meets this criterion at the Level IV land environment scale. The majority of the site is on an Acutely Threatened land environment (J2.1b) where <10% indigenous vegetation is left on this land environment nationally. The remainder is on a Chronically Threatened land environment (J2.1d) where 10 - 20% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports a number of plant, lizard and invertebrate species that are either nationally Threatened, At Risk and/or endemic to Kaitorete Spit and Canterbury.

**Plants**

Botanical surveys of the reserve land east of Poranui Beach Road (Partridge 2008) and the BPCT covenant (Wilson 2013) recorded several nationally Threatened and At Risk species and species that are uncommon within the Banks Ecological Region.

Nationally Threatened and At Risk plant species (de Lange et al 2013) are:

- *Geranium retrorsum* Threatened - Nationally Vulnerable (east of Poranui Beach Road)
- *Daucus glochidiatus* (Nationally Vulnerable) (BPCT covenant)
- *Muehlenbeckia ephedroides* (At Risk - Declining) (BPCT covenant)
- *Coprosma virescens* (At Risk – Declining) (east of Poranui Beach Road)
- *Carmichaelia appressa* (At Risk - Naturally Uncommon, and rare in Canterbury) (eastern and western sides of Poranui Beach Road, BPCT covenant)
- *Chenopodium allanii* (At Risk - Naturally Uncommon) (western side of Poranui Beach Road, BPCT covenant)
- *Pseudopanax ferox* (At Risk - Naturally Uncommon) - Council Reserve (Richardson unpubl. data 2015)
- *Galium* “kaitorete” (endemic to Kaitorete Spit) (BPCT covenant).

The site also supports several species that are either “uncommon to rare or very local” on Banks Peninsula (Wilson 2013a) or uncommon within the Ellesmere Ecological District.

**Lizards**

The site provides excellent habitat for at least two species of indigenous lizard (Lettink 2005, Lettink et al. 2008) that are nationally At Risk (Hitchmough et al. 2012). One of these species is also endemic to Canterbury. These species are:

- Canterbury gecko (At Risk – Declining, endemic to Canterbury)



- Common skink clade 5 (At Risk – Declining)

Central Canterbury spotted skinks *Oligosoma aff. lineocellatum* "central Canterbury" (Threatened – Nationally Vulnerable) may also be present. This species persists in low densities in shrubland west of the site (Lettink 2004).

### Invertebrates

Two nationally At Risk invertebrate species were recorded from the site during a recent survey (Wildland Consultants and Boffa Miskell unpubl. data 2015):

- *Mimopeus granulatus* (Brême) (darkling beetle) (At Risk - Naturally uncommon, endemic to eastern Banks Peninsula)
- *Samana acutata* (At Risk - Relict)

In addition, *Scythris* 'new species' (Threatened - Nationally Critical) may be present at the site. A single male of this species was discovered within the Hauroko BPCT covenant in 1989. It has not been re-collected since at its original location or elsewhere, but members of the genus are difficult to find in the field and don't come to light traps (Patrick 2014).

### 5. **The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are three plant species (Partridge 2008, Wilson 2013, Jensen unpubl. data 2015) at its northern national limit (Wilson 2013a):

- *Carmichaelia appressa* (eastern and western sides Poranui Beach Road and BPCT covenant)
- *Dodonea viscosa* (southern national limit) - Council Reserve (Richardson unpubl. data 2015)
- *Piper excelsum* (southern national limit) - Council Reserve (Richardson unpubl. data 2015)

### 6. **Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

It supports indigenous vegetation on stony beach ridges. Stony beach ridges are an originally rare ecosystem (Williams et al. 2007). The distribution of stony beach ridges is poorly known and most are likely to have been destroyed by land use changes. Nationally, extant stony beach ridges are of very restricted occurrence. They are known from Miranda and Whakatiwai, Pukerua Bay in Wellington, and on the South Island at Rarangi (Marlborough) and Kaitorete Spit in Canterbury (Landcare Research website).

The site provides habitat for a distinctive assemblage of indigenous lizard species. Three of the five lizard species known to occur on Banks Peninsula have been recorded from the site and the Central Canterbury spotted skinks



*Oligosoma aff. lineocellatum* "central Canterbury" persists in low densities in shrubland west of the site (Lettink 2004) and may also be present. The area is the only site on Banks Peninsula and in the Canterbury Region with this particular assemblage of lizard species (Lettink 2005, Lettink et al. 2008).

## Diversity and Pattern

### **7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

The vegetation includes a distinctive and contrasting vegetation pattern of indigenous shrubland in beach ridge depressions and danthonia grassland on the beach ridges. On the western side of Poranui Beach Road the stony beach ridge sequence has been modified by vegetation clearance on the higher ridges between depressions.

On the eastern side of Poranui Beach Road there is a sequence of indigenous vegetation communities from the narrow zones of the lake margin vegetation along Wairewa to the shrublands and grasslands on the stony beach ridges. On the western side there is a sequence of indigenous vegetation communities from the coast that includes a shingle beach, dune and back dune systems and older stony beach ridges.

Across the wider site the vegetation pattern within the site reflects the range and age of coastal landforms, increasing soil development inland and varying degrees of tolerance to exposure, salinity and moisture availability.

The indigenous plant taxa within the surveyed areas is relatively diverse (Partridge 2008, Wilson 2013, Jensen unpubl. data 2015) (refer to Appendices 1 – 3 for species lists from the Birdlings Flat Regional Park, east of Poranui Beach Road, the Hauroko BPCT covenant and the land on the western side of Poranui Beach Road).

## Ecological Context

### **8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is significant under this criterion.

The beach dune ridges and their associated indigenous vegetation are continuous with those in the adjoining Kaitorete Spit Scientific Reserve to the west. The site provides an important ecological corridor for indigenous lizards and invertebrates in the wider area and a linkage from Kaitorete Spit to Wairewa.



**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. There are no wetlands within the site (the Wairewa lake margin is included as part of the Lake Forsyth/Wairewa Site).

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

It is very important habitat for lizards (Lettink 2004). Shrublands provide excellent cover, refuge from predators, and an important seasonal food source for lizards (Lettink 2004, Lettink et al. 2008). It supports at least three and possibly four of the five lizard species known to occur on Banks Peninsula and has the highest known densities of Canterbury gecko (>1000 geckos per ha) on Banks Peninsula and on the Canterbury mainland (Lettink 2004). It is one of the three most significant sites for this species in Canterbury.

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## Site Management

### Existing Protection Status

The site is partially protected by:

- Birdlings Flat Regional Park - Reserve 3185 administered by the Christchurch City Council
- Omahanui Conservation Area, (conservation number M36174) administered by the DOC (0.7 ha)
- The Hauroko Banks Peninsula Conservation Trust Covenant immediately behind Kaitorete Spit Beach and Birdlings Flat settlement (18.7 ha)

The remainder of the site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Vegetation clearance. Historically there has been clearance of shubland in parts of the site by scraping off or mowing the shrubs, accentuating the banded appearance of the shrubland (Partridge 2008).</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain or increase the indigenous shrubland on the site, due to the very high ecological value of this vegetation community which is on a nationally important stony beach ridge ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with landowners about the benefits to biodiversity of the shrubland on the site and options available to manage such habitats.</li> <li>• Assistance available as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>• Stock damage to shrublands and grasslands, particularly during hot dry conditions when animals seek shade under the shrub canopy (Jensen unpubl. data 2015).</li> </ul>	<ul style="list-style-type: none"> <li>• Consider either removing grazing from the site and monitoring the growth of exotic grasses as was recommended by (Wilson 2013) for the Hauroko BPCT covenant. Or consider controlled, light sheep (but not cattle) grazing during the growing season to reduce rank exotic grass growth and the spread of some weeds, as was recommended by Lettink (2005) for the Council Reserve.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with landowners about the benefits to biodiversity of managed stock grazing on the site.</li> <li>• Assistance available as appropriate.</li> </ul>

	<ul style="list-style-type: none"> <li>Continue to monitor vegetation communities within the Council Reserve to inform the ongoing management of the site, and particularly to determine whether low-level sheep grazing is beneficial to indigenous vegetation within the site.</li> </ul>	
<ul style="list-style-type: none"> <li>The perception that the site is of low value (Wilson 1992, Lettink 2005). Wilson (1992) stated these semi-arid shrublands “are under considerable threat mainly because there is a common attitude that they are wastelands, and tend to be treated as such”.</li> </ul>	<ul style="list-style-type: none"> <li>Consider raising the profile of the area by educating the local community and landowners about the outstanding ecological value of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Discussions with landowners and development of interpretive material for local community about the biodiversity and ecosystems on the site.</li> </ul>
<ul style="list-style-type: none"> <li>Off-road vehicles (Partridge 2008, Lettink 2005)</li> </ul>	<ul style="list-style-type: none"> <li>Consider restricting the use of off-road vehicles to existing tracks and preventing vehicle access into the Council Reserve (with the exception of land owners and the leasee of the Council reserve for management purposes).</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about the benefits to biodiversity of managing off-road vehicle access to the site.</li> <li>Assistance available where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Karo (<i>Pittosporum crassifolium</i>), a non-local tree native to the North Island (Partridge 2008, Wilson 2013, Jensen unpubl. data 2015)</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling karo throughout the site.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowners about monitoring and controlling karo.</li> <li>Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>There are a large number of biodiversity pest plants that have been recorded from within the site, including garden escapes from Birdlings Flat settlement: karo, boneseed, yellow lupin, sweet brier, gorse, pig’s ear purple groundsel, broom, gorse, sweet briar, tree lucerne, karo, flowering cherry, oak, elderberry, spindleberry, tagasaste, old mans, plum, apple, spur valerian, asparagus, Euphorbia sp., prickly</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling the biodiversity pest plants already present at the site and undertaking regular surveillance for new weed incursions.</li> <li>Weeds are only present in small numbers on the western side of Poranui Beach Road and could be controlled relatively easily.</li> <li>Consider controlling biodiversity pest plants</li> </ul>	<ul style="list-style-type: none"> <li>In collaboration with BPCT, advice and guidance for landowners about monitoring and control of pest plants.</li> <li>Assistance available where possible.</li> </ul>

pear cactus, fennel, <i>Polypodium vulgare</i> .	inside the quarry to prevent them spreading to the surrounding land.	
<ul style="list-style-type: none"> <li>The current classification of the Council Reserve (Reserve 3185) is not appropriate and does not reflect the high ecological values present (Lettink 2005).</li> </ul>	<ul style="list-style-type: none"> <li>Consider changing the reserve's status to more appropriately reflect its high ecological values. Prepare and implement a management plan for the reserve (Lettink 2005).</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Quarry expansion</li> </ul>	<ul style="list-style-type: none"> <li>The existing quarry should not be expanded to encroach on the surrounding native shrubland communities.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Fire</li> </ul>	<ul style="list-style-type: none"> <li>Consider restricting the use of vehicles and managing visitor use.</li> <li>Council to consider preparing a fire response plan for the site.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

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**Assessment completed by:** Scott Hooson  
**Date:** 5 November 2014

**Statement completed by:** Scott Hooson  
**Date:** 5 November 2014

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



**Appendix 1: Plant Species List for the Birdlings Flat Regional Park, East of Poranui Beach Road**

From Partridge (2008).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Asplenium flabellifolium</i>	necklace fern
<i>Calystegia soldanella</i>	shore bindweed
<i>Calystegia tuguriorum</i>	bindweed
<i>Carex breviculmis</i>	dryland sedge
<i>Carmichaelia appressa</i>	prostrate broom
<i>Carmichaelia australis</i>	common broom
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	clematis
<i>Convolvulus waitaha</i>	convolvulus
<i>Coprosma crassifolia</i>	thick-leaved coprosma
<i>Coprosma propinqua</i>	coprosma
<i>Coprosma virescens</i>	coprosma
<i>Dichelachne crinita</i>	hair grass
<i>Discaria toumatou</i>	matagouri
<i>Geranium retrorsum</i>	Geranium
<i>Helichrysum lanceolatum</i>	
<i>Juncus edgariae</i>	wiwi
<i>Juncus krausii</i> var <i>australiensis</i>	sea rush
<i>Leucopogon fraseri</i>	patotara
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe
<i>Microtis unifolia</i>	onion orchid
<i>Muehlenbeckia axillaris</i>	mat pohuehue
<i>Muehlenbeckia complexa</i>	creeping pohuehue
<i>Oxalis exilis</i>	oxalis
<i>Parsonsia capsularis</i>	native jasmine
<i>Parsonsia heterophylla</i>	native jasmine
<i>Phormium tenax</i>	flax, harekeke
<i>Plagianthus divaricatus</i>	coastal ribbonwood
<i>Poa cita</i>	silver tussock
<i>Rubus schmidelioides</i>	leafless lawyer
<i>Rubus squarrosus</i>	lawyer
<i>Rubus squarrosus</i> x <i>schmidelioides</i>	
<i>Scandia geniculata</i>	
<i>Sophora microphylla</i>	kowhai
<b>Exotic Species</b>	
<i>Acaena agnipila</i>	Australian bidibid
<i>Achillea millefolium</i>	yarrow
<i>Agrostis stolonifera</i>	creeping bent
<i>Aira caryophyllea</i>	silvery hair grass
<i>Anthoxanthum odoratum</i>	sweet vernal



<i>Austrostipa nodosa</i>	
<i>Bromus diandrus</i>	ripgut brome
<i>Bromus hordeaceus</i>	soft brome
<i>Bromus tectorum</i>	downy brome
<i>Carduus tenuiflorus</i>	winged thistle
<i>Cerastium holosteoides</i>	mouse-ear chickweed
<i>Chamaecytisus palmensis</i>	tree lucerne
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Conyza bonariensis</i>	wavy-leaved fleabane
<i>Crepis capillaris</i>	hawksbeard
<i>Critesion marinum</i>	salt barley grass
<i>Critesion murinum</i>	barley grass
<i>Cytisus scoparius</i>	broom
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Echium vulgare</i>	viper's bugloss
<i>Elymus scaber</i>	
<i>Elytrigia repens</i>	couch
<i>Erodium cicutarium</i>	storksbill
<i>Eucalyptus globulus</i>	Tasmanian gum
<i>Galium aparine</i>	cleavers
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochaeris radicata</i>	catsear
<i>Linaria purpurea</i>	purple linaria
<i>Linum bienne</i>	pale flax
<i>Lolium perenne</i>	perennial ryegrass
<i>Malva neglecta</i>	dwarf mallow
<i>Marrubium vulgare</i>	horehound
<i>Oxalis corniculata</i>	horned oxalis
<i>Petroselinum crispum</i>	wild parsley
<i>Picris echioides</i>	oxtongue
<i>Pittosporum crassifolium</i>	karo
<i>Plantago lanceolata</i>	narrow-leaf plantain
<i>Poa pratensis</i>	Kentucky bluegrass
<i>Prunus avium</i>	wild cherry
<i>Pseudopanax crassifolius x arboreus</i>	hybrid lancewood
<i>Quercus robur</i>	oak
<i>Rosa rubiginosa</i>	sweet brier
<i>Rumex acetosella</i>	sheep sorrel
<i>Rytidosperma spp.</i>	danthonia grass
<i>Salix fragilis</i>	crack willow
<i>Schedonorus arundinaceus</i>	tall fescue
<i>Sedum acre</i>	stonecrop
<i>Silene gallica</i>	catchfly
<i>Silene latifolia</i>	white campion
<i>Sisymbrium officinale</i>	wall rocket
<i>Solanum nigrum</i>	black nightshade
<i>Sonchus oleraceus</i>	sow thistle
<i>Trifolium dubium</i>	suckling clover
<i>Trifolium fragiferum</i>	strawberry clover
<i>Trifolium glomeratum</i>	clustered clover
<i>Ulex europaeus</i>	gorse



<i>Verbascum thapsus</i>	wolly mullein
<i>Vicia sativa</i>	vetch
<i>Vicia tetrasperma</i>	smooth tare

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## Appendix 2: Plant Species List for the Hauroko Banks Peninsula Conservation Trust Covenant

From (Wilson 2013).

Species are listed alphabetically in the following categories, with native species listed first, and naturalised exotic species (including plants native to other parts of New Zealand) listed second.

- (a) Trees, shrubs and prostrate shrubs
- (b) Climbers and related trailers
- (c) Dicot herbs
- (d) Monocot herbs (grasses and sedges)
- (e) Ferns
- (f) Prominent mosses, lichens and fungi

\* = not native to Birdlings Flat area

Abundance symbols:

A = abundant to very common

B = quite common

C = uncommon to rare

<b>(a) Trees, shrubs and prostrate shrubs</b>		
<i>Carmichaelia appressa</i>	C	Kaitorete prostrate broom
<i>Coprosma crassifolia</i>	A	mikimiki
<i>Coprosma propinqua</i>	A	mikimiki
<i>Corokia cotoneaster</i>	C	korokio
<i>Discaria toumatou</i>	B	matagouri tūmatakuru
<i>Lophomyrtus obcordata</i>	C	rōhutu, NZ myrtle
<i>Melicytus alpinus</i>	A	porcupine shrub
<i>Olearia paniculata</i>	C	akiraho
* <i>Chrysanthemoides monolifera</i>	C	boneseed
* <i>Lupinus arboreus</i>	C	yellow lupin
* <i>Pittosporum crassifolium</i>	C	karo
* <i>Rosa rubiginosa</i>	B	sweet brier
* <i>Ulex europaeus</i>	C	gorse
<b>(b) Climbers and related trailers</b>		
<i>Calystegia solanella</i>	B	sand bindweed
<i>Calystegia tuguriorum</i>	B	NZ bindweed, pōwhiwhi
<i>Einadia allanii</i>	C	
<i>Einadia triandra</i>	C	
<i>Muehlenbeckia axillaries</i>	B	
<i>Muehlenbeckia complexa</i>	A	scrub pōhuehue
<i>Muehlenbeckia ephedroides</i>	A	
<i>Parsonsia heterophylla</i>	C	NZ jasmine, akakaikiora
<i>Rubus schmidelioides</i>		lawyer, tātarāmoa



<i>Rubus squarrosus</i>	A	leafless lawyer
<i>Scandia geniculata</i>	B	climbing aniseed
<b>(c) Dicot herbs</b>		
<i>Acaena novae-zelandiae</i>	C	bidibid, piri-piri
<i>Cotula australis</i> (possibly not native)		
<i>Crassula sieberiana</i>		
<i>Daucus glochidiatus</i>		NZ carrot
<i>Dichondra repens</i>		
<i>Galium species</i> "lake"	B	
<i>Halragis erecta</i>	B	toatoa
<i>Leptinella pusilla</i>		
<i>Oxalis exilis</i>	A	yellow oxalis
<i>Raoulia australis</i>	B	mat daisy, scrubweed
<i>scleranthus uniflorus</i>	B	
<i>senecio quadridentatus</i>	C	pekapeka
* <i>Acaena agnipila</i>	B	Australian burr
* <i>Anagallis arvensis</i>	C	scarlet pimpernel
* <i>Carduus pycnocephalus</i>	C	winged thistle
* <i>Cerastium glomeratum</i>		mouse-ear chickweed
* <i>Cerastium semidecandrum</i>		lesser mouse-ear chickweed
* <i>Cirsium vulgare</i>	C	scotch thistle
* <i>Cotyledon orbicularis</i>	C	elephant's ear
* <i>Echium vulgare</i>	C	viper's bugloss
* <i>Erodium cicutarium</i>		storksbill
* <i>Erodium moschatum</i>	C	musky storksbill
* <i>Geranium molle</i>		dove's foot cranesbill
* <i>Hypochoeris glabra</i>		smooth catsear
* <i>Hypochoeris radicata</i>	A	catsear
* <i>Lobularia maritime</i>	C	alyssum
* <i>Malva neglecta</i>		dwarf mallow
* <i>Marrubium vulgare</i>		horehound
* <i>Petroselinum crispum</i>	B	wild parsley
* <i>Rumex acetosella</i>	A	sheep's sorrel
* <i>Sedum acre</i>	C	yellow stonecrop
* <i>Senecio elegans</i>	C	purple groundsel
* <i>Silene gallica</i>	A	catchfly
* <i>Sisymbrium officinale</i>	C	hedge mustard
* <i>Stellaria media</i>	B	chickweed
* <i>Trifolium arvense</i>	C	hare's foot trefoil
* <i>Trifolium dubium</i>	B	suckling clover
* <i>Trifolium tomentosum</i>		woolly clover
* <i>Verbascum thapsus</i>	C	woolly mullein
* <i>Vicia sativa</i>	A	vetch



<b>(d) Monocot herbs (grasses and sedges)</b>		
<i>Carex pumila</i>	C	sand sedge
<i>Dichelachne crinita</i>	B	plume grass
<i>Elymus solandri</i>	C	blue wheatgrass
<i>Poa cita</i>	A	silver tussock, wī
* <i>Aira caryophylla</i>		silvery hair grass
* <i>Anthoxanthum odoratum</i>	C	sweet vernal
* <i>Bromus diandrus</i>	B	rippgut brome
* <i>Dactylis glomerata</i>	B	cocksfoot
* <i>Elymus rectisetus</i>	B	Australian wheatgrass
* <i>Lagurus ovatus</i>	A	hare's tail grass
* <i>Lolium perenne</i>	A	perennial ryegrass
* <i>Poa pratensis</i>	B	meadow grass
* <i>Rytidosperma racemosum</i>	A	danthonia
* <i>Stipa nodosa</i>	B	needle grass
* <i>Vulpia bromoides</i>	A	squirrel tail fescue
<b>(e) Ferns</b>		
<i>Pyrrhosia eleagnifolia</i>	C	leather leaf fern
<b>(f) Mosses, lichens, fungi</b>		
<i>Agaricus arvensis</i>	C	horse mushroom
<i>Hypnum cupressiforme</i>	A	
<i>Neofuscelia species</i>	A	
<i>Pseudocyphellaria crocata</i>	C	gold dust lichen
<i>Triquetrum papillata</i>	A	
<i>Usnea species</i>	C	
<i>Xanthoparmelia species</i>	A	



### Appendix 3: Plant Species List for Land West of Poranui Beach Road

Sourced from Jensen unpubl. data (2015).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Asplenium flabellifolium</i>	necklace fern
<i>Calystegia tuguriorum</i>	
<i>Carmichaelia appressa</i>	Kaitorete prostrate broom
<i>Chenopodium allanii</i>	
<i>Clematis afoliata</i>	
<i>Clematis foetida</i>	
<i>Coprosma crassifolia</i>	
<i>Coprosma propinqua</i>	
<i>Cordyline australis</i>	cabbage tree
<i>Corokia cotoneaster</i>	
<i>Dichelachne crinita</i>	plume grass
<i>Discaria toumatou</i>	matagouri
<i>Helichrysum lanceolatum</i>	
<i>Melicytus alpinus</i>	
<i>Muehlenbeckia complexa</i>	
<i>Oxalis exilis</i>	
<i>Parsonsia capsularis</i>	
<i>Pittosporum tenuifolium</i>	kohuhu
<i>Poa cita</i>	silver tussock
<i>Rubus squarrosus</i>	leafless lawyer
<i>Scandia geniculata</i>	
<i>Solanum laciniatum</i>	poroporo
<b>Indigenous non-vascular species</b>	
<i>Hypnum cupressiforme</i>	
<i>Polytrichum juniperinum</i>	
<i>Racomitrium species</i>	
<i>Triquetrella papillata</i>	
<b>Exotic and non-native species</b>	
<i>Aira caryophyllea</i>	silvery hair grass
<i>Anthosachne scabra</i>	Australian wheatgrass
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Asparagus officinalis</i>	asparagus
<i>Austrostipa nodosa</i>	needlegrass
<i>Bromus diandrus</i>	rippgut brome
<i>Cirsium vulgare</i>	scotch thistle
<i>Dactylis glomerata</i>	cocksfoot
<i>Echium vulgare</i>	viper's bugloss
<i>Euonymus europaeus</i>	spindleberry
<i>Euphorbia sp.</i>	





<i>Hypochoeris radicata</i>	catsear
<i>Lagurus ovatus</i>	hairs tail grass
<i>Linaria purpurea</i>	purple linaria
<i>Lolium perenne</i>	ryegrass
<i>Marrubium vulgare</i>	horehound
<i>Opuntia monacantha</i>	prickly pear cactus
<i>Petroselinum crispum</i>	wild parsley
<i>Poa pratensis</i>	meadow grass
<i>Pittosporum crassifolium</i> <sup>†</sup>	karo
<i>Rosa rubiginosa</i>	sweet brier
<i>Rumex acetosella</i>	sheep's sorrel
<i>Rytidosperma racemosum</i>	danthonia
<i>Senecio elegans</i>	purple groundsel
<i>Solanum dulcamara</i>	bittersweet
<i>Ulex europaeus</i>	gorse
<i>Verbascum thapsus</i>	woolly mullein
<i>Verbascum virgatum</i>	moth mullein
<i>Vupia bromoides</i>	

<sup>†</sup> A non-local North Island species that occurs naturally in the North Island.

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**Appendix 4: Invertebrate Species List for the Mansons Property (West of Poranui Beach Road)**

Sourced from Wildland Consultants and Boffa Miskell unpubl. data (2015)

Order	Family	Scientific Name	Common Name	Species Status
<b>Indigenous species</b>				
Orthoptera	Gryllidae	<i>Bobilla sp.</i>	a small field cricket	
		<i>Gryllidae, sp. indet. small pale</i>	a cricket	
Blattodea	Blattidae	<i>Celatoblatta peninsularis Johns</i>	a cockroach	
Neuroptera	Hemerobiidae	<i>Micromus tasmaniae (Walker)</i>	Tasmanian lacewing	
Coleoptera	Anthribidae	<i>Dysnocryptus maculifer Broun</i>	a fungus weevil	
	Cerambycidae	<i>Spilotrogia nr pulchella (Bates)</i>	a longhorn beetle	
	Coccinellidae	<i>Veronicobius acceptus (Broun)</i>	a lady bird beetle	
		<i>Veronicobius sp. dark, pale pronotum</i>	a lady bird beetle	
	Curculionidae	<i>Irenimus sp.</i>	a weevil	
		<i>Praolepra infusca Broun</i>	a flower weevil	
	Elateridae	<i>Conoderus exsul (Sharp)</i>	pasture wire worm	
		<i>Elateridae indet.</i>	a click beetle	
	Latridiidae	<i>Bicava sp.</i>	a mould beetle	

	Scarabaeidae	<i>Odontria smithii</i> Broun	Smith's chafer	
	Staphylinidae	<i>Staphylininae indet.</i>	a rove beetle	
	Tenebrionidae	<i>Mimopeus granulatus</i> (Brême)	a darkling beetle	Naturally uncommon, range restricted
Lepidoptera	Hepialidae	<i>Wiseana copularis</i>	porina moth	
	Plutellidae	<i>Plutella antiphona</i>		
	Gelechiidae	<i>Anisoplaca achyrotia</i> <i>Isochasta paradesma</i>		
	Tortricidae	<i>Bactra noteraula</i> <i>Capua semiferana</i> <i>Harmologa amplexana</i> <i>Harmologa oblongana</i> <i>Harmologa scoliastes</i> <i>Merophyas leucaniana</i>		
	Pyralidae	<i>Crocydopora cinigerella</i>		
	Crambidae	<i>Eudonia leptalea</i> <i>Eudonia sabulosella</i> <i>Eudonia submarginalis</i> <i>Deana hybreasalis</i> <i>Gadira acerella</i> <i>Hygraula nitens</i> <i>Orocrambus flexuosellus</i> <i>Orocrambus vittellus</i> <i>Orocrambus ramosellus</i>	pond moth	

		<i>Scoparia halopis</i>		
		<i>Udea flavidalis</i>		
	Geometridae	<i>Austrocidaria gobiata</i>		
		<i>Chloroclystis inductata</i>		
		<i>Declana junctilinea</i>		
		<i>Epyaxa rosearia</i>		
		<i>Epyaxa venipunctata</i>		
		<i>Gellonia pannularia</i>		
		<i>Homodotis megaspilata</i>		
		<i>Helastia corcularia</i>		
		<i>Samana acutata</i>		At Risk Relict
	Noctuidae	<i>Aletia moderata</i>		
		<i>Bityla defigurata</i>		
		<i>Euxoa admirationis</i>		
		<i>Graphania phricias</i>		
		<i>Graphania lithias</i>		
		<i>Graphania mutans</i>		
		<i>Persectania aversa</i>		
		<i>Proteuxoa comma</i>		
		<i>Tmetolophota atristriga</i>		
		<i>Tmetolophota propria</i>		
		<i>Tmetolophota unica</i>		
	Erebidae	<i>Schrankia costaestrigalis</i>		
	Lycaenidae	<i>Lycaena new species</i>	boulder copper butterfly	
<b>Exotic species</b>				
Coleoptera	Anobiidae	<i>Ptinus tectus Boieldieu</i>	Australian spider beetle	
	Anthicidae	<i>Anthicus hesperi King</i>	an ant-like beetle	
	Archeocrypticidae	<i>Archeocrypticus topali Kaszab</i>		

	Coccinellidae	<i>Coccinella undecimpunctata Linnaeus</i>	11-spotted ladybird	
	Curculionidae	<i>Otiorhynchus ovatus (Linnaeus)</i>	strawberry root weevil	
	Scarabaeidae	<i>Acrossidius tasmaniae (Hope)</i>	Tasmanian grass grub	
Lepidoptera	Tineidae	<i>Monopis ethelella</i>		
	Tortricidae	<i>Cydia succedana</i>		
		<i>Epiphyas postvittana</i>		
	Geometridae	<i>Chloroclystis filata</i>		
	Crambidae	<i>Achyra affinalis</i>		
	Crambidae	<i>Stericta carbonalis</i>		
	Coccinellidae	<i>Coccinella undecimpunctata Linnaeus</i>	11-spotted ladybird	
	Curculionidae	<i>Otiorhynchus ovatus (Linnaeus)</i>	strawberry root weevil	
	Scarabaeidae	<i>Acrossidius tasmaniae (Hope)</i>	Tasmanian grass grub	
Lepidoptera	Tineidae	<i>Monopis ethelella</i>		
	Tortricidae	<i>Cydia succedana</i>		
		<i>Epiphyas postvittana</i>		
	Geometridae	<i>Chloroclystis filata</i>		
	Crambidae	<i>Achyra affinalis</i>		
	Crambidae	<i>Stericta carbonalis</i>		



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Prices Valley QEII Covenant and Environs

**Site number:** SES/H/15

**Physical address of site:** Prices Valley, Little River

#### Summary of Significance:

This site is significant because it contains the largest and one of the two best examples of lowland podocarp forest on an alluvial landform on Banks Peninsula. This forest type is very rare in the ecological district and region. It supports a high diversity of indigenous plant taxa for its size including a rare fungi and plant species that are nationally At Risk. Several plant species are also uncommon within the ecological region or ecological district and five are at their southern national or regional distributional limits. It is part of a network of forested areas of high ecological value in the wider area. Secondary forest surrounding the QEII covenant is highly important as a buffer to the old-growth forest within the covenant.

#### Site Map



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 14.58

**Central point (NZTM):** E1576931, N5153835

## Site Description

This small site is situated on the lowland alluvial valley floor and lower east facing hill slopes of Prices Valley. It is contiguous with another larger Significant Ecological Site on the western slopes of Prices Valley. The altitudinal range of the site is approximately 40 to 100 m above sea level. The Department of Conservation identified the site as a Recommended Area for Protection (Herbert RAP 12 – Lower Prices) and Hugh Wilson described the site as “an outstanding remnant of valley floor old-growth forest” that is “one of the two best, if not the best, surviving remnants in the District and Region” (Wilson 1992). Approximately half of the site, which includes the best podocarp/hardwood forest is protected under a QEII covenant.

The main vegetation communities identified at the site by Wilson (1992) and Walls unpubl. data (2015) are:

- Matai-kahikatea-lowland totara/mixed hardwood forest on lowland alluvium
- (Matai-kahikatea-lowland totara)/mixed broadleaved second-growth hardwood forest and treeland on lowland alluvium and hill slopes
- Mixed broadleaved second-growth hardwood forest and treeland on lowland alluvium and hill slopes
- Second-growth kanuka forest and treeland with broadleaved trees on lowland hill slopes

The site is an outstanding example of a mature lowland valley-floor podocarp/hardwood forest remnant on an alluvial landform. It was placed under an Open Space Covenant by the Queen Elizabeth II National Trust in 1988, although stock had been excluded from part of site from as early as the 1950s.

The QEII covenant contains the core area of podocarp/hardwood forest which is dominated by matai with some kahikatea and lowland totara emergent above a subcanopy of mixed broad-leaved hardwood trees such as titoki, ngaio and mahoe canopy. It was fenced in the early 1950's and the forest structure is intact and supports many podocarp saplings (Willems 1999) and many notable plant species including *Teucrium parvifolium*, also *Melicactus micranthus*, small-leaved milk tree, pokaka, pigeonwood, *Lophomyrtus obcordata*, fierce lancewood, native passion vine, the rare forest floor grass *Microlaena polynoda*, *Pseudopanax anomalus*, leafless lawyer, *Scandia geniculata*, the mistletoes *Korthalsella lindsayi* and *Ileostylus micranthus*, and basket fungus (Wilson 1992). Plant species lists for the QEII covenant and the forest surrounding the covenant are provided in Appendices 1 and 2 respectively.



## Extent of Site of Ecological Significance

The site includes the podocarp/hardwood forest within the QEII covenant and the connected forest and treeland surrounding it.

## Assessment Summary

The Prices Valley QEII Covenant and Environs Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

It contains an outstanding remnant of valley floor old-growth forest that is considered to be one of the two best, if not the best, surviving remnants in the ecological district and ecological region (Wilson 1992). The canopy has many large emergent kahikatea, matai and lowland totara. It has a representative canopy of hardwood species and a relatively intact understorey with recruitment of all three podocarp species (Willems 1999).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

The site contains the largest example (7 ha) of old-growth lowland podocarp forest on an alluvial landform on Banks Peninsula (Willems 1999).

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***





The site is significant under this criterion.

Lowland podocarp/hardwood forest on alluvial landforms has been reduced to a tiny fragment of its original extent within the ecological district and region. The original extent of podocarp/hardwood forest in the ED (as a % of the ED) is estimated to have been between 51 - 75% (Harding 2009). There are now only five very small remnant lowland podocarp/hardwood forest remnants left on valley floor alluvium on Banks Peninsula (Wilson 1992). Old-growth lowland podocarp forest is identified by (Wilson 1992) as the highest priority for protection in the Herbert ED.

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports indigenous plant species that are nationally At Risk, and several plant species that are uncommon within the ecological region or ecological district.

**Plants**

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site are:

- *Coprosma virescens* (At Risk - Declining) - abundant both within and outside the covenant (QEII Trust unpubl. data 2004, Walls unpubl. data 2015)
- *Pseudopanax ferox* (At Risk - Naturally Uncommon) - occasional both within and outside the covenant (QEII Trust unpubl. data 2004, Walls unpubl. data 2015)
- *Teucrium parvifolium* (At Risk - Declining) - rare within and outside the covenant (QEII Trust unpubl. data 2004, Walls unpubl. data 2015)

Plant species recorded from the site (QEII Trust unpubl. data 2004, unless otherwise indicated) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Australina pusilla*
- *Blechnum novae-zelandiae*
- *Carex secta*
- *Carex solandri*
- *Carex virgata*
- *Elaeocarpus hookerianus*
- *Epilobium nerteroides*
- *Lastreopsis glabella*
- *Lastreopsis microsora*
- *Melicytus micranthus* - both within and outside the covenant (QEII Trust unpubl. data 2004, Walls unpubl. data 2015)
- *Microlaena avenacea*
- *Microlaena polynoda* (uncommon in the ecological region and in Canterbury (Wilson 1992)) - both within and outside the covenant (QEII Trust unpubl. data 2004, Walls unpubl. data 2015).
- *Pyrrosia eleagnifolia* - both within and outside the covenant (QEII Trust unpubl. data 2004, Walls unpubl. data 2015)



- *Raukaua anomalus* - both within and outside the covenant (QEII Trust unpubl. data 2004, Walls unpubl. data 2015)

### Fungi

A rare fungus *Macrocyttidia reducta* has been recorded within the covenant. It conforms to the mycological interpretation of the 2008 Threat Classification Category of Nationally Vulnerable and is thought to be endemic to Banks Peninsula (Cooper 2012).

#### **5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are five species that are at their southern national or regional distributional limits on Banks Peninsula (Wilson 2013). They are:

- Titoki (southern national limit) - locally dominant canopy species (QEII Trust unpubl. data 2004, Walls unpubl. data 2015)
- Kawakawa (southern national limit) - very high densities inside the covenant and frequent outside it (QEII Trust unpubl. data 2004, Walls unpubl. data 2015, Willems 1999)
- Native passion vine (southern national limit) - both within and outside the covenant (QEII Trust unpubl. data 2004, Walls unpubl. data 2015)
- Pigeonwood (southern regional limit) - both within and outside the covenant (QEII Trust unpubl. data 2004, Walls unpubl. data 2015)
- *Euchiton gynocephalus* (southern national limit)

#### **6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

It has an unusual complement of threatened and uncommon species, including fierce lancewood, *Melicytus micranthus*, *Teucrium parvifolium* and bamboo grass (Walls unpubl. data 2015).

### Diversity and Pattern

#### **7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

It contains a high diversity of indigenous plant taxa for its size. One hundred and six indigenous plant species have been recorded from within the QEII covenant (QEII Trust unpubl. data 2004)



## Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is important in linking the valley floor forest and treeland with the large areas of forest on the western hill slopes of Pricess Valley. In the wider area the site is part of a network of forested areas of high ecological value including the Kaituna Valley Scenic Reserve, Okana Valley, Waikoko Stream and Lathams that are important 'stepping stones' for the movement and dispersal of indigenous fauna such as New Zealand pigeon.

The secondary forest surrounding the QEII covenant is highly important as a buffer to the old-growth forest within the covenant.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. It does not have any wetlands that meet the threshold for significance under this criterion.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The old growth forest within the site provides important habitat for indigenous forest birds. The presence of large remnant podocarp trees means the site is particularly important seasonal feeding habitat for New Zealand pigeon. Other indigenous bird species recorded from the site include bellbird, South Island fantail, grey warbler, Australasian harrier, welcome swallow, New Zealand pipit, silvereye and New Zealand kingfisher (Walls unpubl. data 2015).

## Site Management

### Existing Protection Status

Approximately half of the site (3.5 ha), which includes the best podocarp/hardwood forest, is protected under a QEII covenant (covenant no. 5/11/059).

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants: Periwinkle, elderberry, crack willow, Scotch broom and old mans beard are present but rare in the covenanted area (QEII Trust unpubl. data 2004). There are very few weeds in the area surrounding the covenant. Elderberry is present but rare (Walls unpubl. data 2015).</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling biodiversity pest plants within the QEII covenant. High priority species for control are old mans beard and periwinkle, followed by crack willow.</li> <li>Consider ongoing surveillance for biodiversity pest plants to prevent the establishment of new infestations and new pest plant species such Darwin’s barberry.</li> </ul>	<ul style="list-style-type: none"> <li>In collaboration with QEII Trust, advice and guidance for landowners about monitoring and control of pest plants.</li> <li>Assistance available where possible.</li> </ul>
<ul style="list-style-type: none"> <li>Stock. The QEII covenant is fenced and the fences are well maintained. The forest outside of the QEII is unfenced and sheep are grazed at low intensity. This is preventing or impeding natural vegetation regeneration, especially in the more accessible parts site (Walls unpubl. data 2015).</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the remaining forest outside the QEII forest to enhance the integrity of the site and promote understorey development. This would assist in reducing the vulnerability of the core area of old-growth podocarp forest to edge effects.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about the benefits to biodiversity of stock management in areas beyond the QEII covenant, and options available.</li> <li>Assistance available as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Changes to drainage as a result of sub-division and road maintenance. The site receives run-off from the surrounding hills which is important for retaining the</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that installation of new drains, or modification of existing drains does not affect the hydrology of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners prior to modifications to drainage are proposed, to review options to benefit biodiversity.</li> </ul>

composition of the existing vegetation.		
<ul style="list-style-type: none"> <li>• Sulphur-crested cockatoos. This species have the potential to alter the ecology of the site, for example by competing for fruits and seeds with native bird species, and as seed predators (Willems 1999).</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor cockatoo numbers.</li> <li>• Consider undertaking research (e.g. in collaboration with local universities) to determine the potential effects of cockatoos on the ecology of the site.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with landowners about encouraging research into cockatoos.</li> </ul>
<ul style="list-style-type: none"> <li>• Management of the roadside damaging high ecological values on the roadside (e.g. matai, lowland totara, <i>Teucrium parvifolium</i>, bamboo grass and the mistletoe <i>Korthalsella lindsayi</i>) (Shanks 2012).</li> </ul>	<ul style="list-style-type: none"> <li>• Council roadside management, including weed control should compliment management of this high value site. i.e.</li> <li>• Council to ensure roading materials used adjacent to the site due not introduce new biodiversity pest plants.</li> <li>• Ensure there is no creep of the road surface area from gravelling and grading, and expansion of the two passing bays.</li> <li>• Ensure there is no mechanical damage from vehicles to the bases of roadside matai and totara trees.</li> <li>• Ensure that tree trimming does not allow more light to reach the roadside trees and promote the growth of grasses and weeds</li> <li>• Ensure there are controls over herbicide use along the roadside.</li> <li>• Council to ensure contractors are aware of the high ecological values of the roadside vegetation (Shanks 2012).</li> </ul>	<ul style="list-style-type: none"> <li>• N/A</li> </ul>



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**Assessment completed by:** Scott Hooson  
**Date:** March 2015

**Statement completed by:** Scott Hooson  
**Date:** March 2015

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Plant Species List

Plant species recorded within the QEII covenant (sourced from QEII Trust unpubl. data (2004)).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Alectryon excelsus</i>	titoki
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Australina pusilla</i>	
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum minus</i>	swamp kiokio
<i>Blechnum novae-zelandiae</i>	kiokio
<i>Blechnum penna-marina</i>	little hard fern
<i>Calystegia tuguriorum</i>	NZ bindweed, pōwhiwhi
<i>Cardamine debilis</i> agg.	NZ bitter cress
<i>Carex coriacea</i>	cutty grass, rautahi
<i>Carex secta</i>	niggerhead, pūkio
<i>Carex solandri</i>	
<i>Carex virgata</i>	swamp sedge
<i>Carmichaelia australis</i>	native broom, common broom
<i>Carpodetus serratus</i>	marbleleaf, putaputāwētā
<i>Clematis foetida</i>	yellow clematis
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamū
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Coprosma x cunninghamii</i>	
<i>Cordyline australis</i>	cabbage tree, tī kōuka
<i>Corokia cotoneaster</i>	korokio
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dichondra repens</i>	dichondra
<i>Elaeocarpus hookerianus</i>	pōkākā
<i>Epilobium nerteroides</i>	willow herb
<i>Euchiton gymnocephalus</i>	native cudweed
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Griselinia littoralis</i>	broadleaf, kāpuka
<i>Haloragis erecta</i>	toatoa



<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum lanceolatum</i>	niñiao
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus edgariae</i>	leafless rush, wi
<i>Korthalsella lindsayi</i>	dwarf mistletoe
<i>Kunzea robusta</i>	kānuka
<i>Lastreopsis glabella</i>	smooth shield fern
<i>Lastreopsis microsora</i>	
<i>Leptinella dioica</i>	
<i>Lophomyrtus obcordata</i>	rōhutu, NZ myrtle
<i>Piper excelsum</i>	kawakawa
<i>Melicope simplex</i>	poataniwha
<i>Melicytus micranthus</i>	small-leaved māhoe, swamp māhoe
<i>Melicytus micranthus x ramiflorus</i>	
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rātā
<i>Microlaena avenacea</i>	bush rice grass
<i>Microlaena polynoda</i>	bamboo rice grass
<i>Microlaena stipoides</i>	meadow rice grass, pātiti
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Muehlenbeckia australis</i>	large-leaved pōhuehue
<i>Muehlenbeckia complexa</i>	scrub pōhuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red māpou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping māpou
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	yellow oxalis
<i>Parietaria debilis</i>	NZ pellitory
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Pittosporum eugenoides</i>	lemonwood, tarātā
<i>Pittosporum tenuifolium</i>	kōhūhū, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, mānatu
<i>Pneumatopteris pennigera</i>	gully fern, pākau
<i>Podocarpus totara</i>	lowland tōtara
<i>Polystichum richardii</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, pūniu
<i>Prumnopitys taxifolia</i>	mataī, black pine
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pteridium esculentum</i>	bracken, rārahu, rauaruhe
<i>Pterostylis sp.</i>	green-hooded orchid
<i>Pyrrosia eleagnifolia</i>	leatherleaf fern
<i>Raukaua anomalus</i>	
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus schmidelioides</i>	bush lawyer, tātarāmoa





<i>Rubus squarrosus</i>	leafless bush lawyer, tātarāmoa
<i>Scandia geniculata</i>	climbing aniseed
<i>Schefflera digitata</i>	patē, seven-finger
<i>Sophora microphylla</i>	small-leaved kōwhai
<i>Stellaria parviflora</i>	New Zealand chickweed
<i>Streblus heterophyllus</i>	small-leaved milk tree, tūrepo
<i>Teucrium parvifolium</i>	New Zealand verbena, teucrium
<i>Uncinia leptostachya</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic Species</b>	
<i>Achillea millefolium</i>	yarrow
<i>Arctium sp</i>	burdock
<i>Bellis perennis</i>	daisy
<i>Callitriche stagnalis</i>	starwort
<i>Cerastium sp.</i>	chickweed sp.
<i>Cirsium vulgare</i>	Scotch thistle
<i>Clematis vitalba</i>	old man's beard
<i>Conium maculatum</i>	hemlock
<i>Crepis capillaris</i>	hawksbeard
<i>Cytisus scoparius</i>	scotch broom
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Euphorbia peplus</i>	petty spurge, milkweed
<i>Galium aparine</i>	cleavers
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochaeris radicata</i>	catsear
<i>Juncus effusus</i>	soft rush
<i>Linum catharticum</i>	purging flax
<i>Malus sp.</i>	apple
<i>Erythranthe guttata</i>	monkey musk
<i>Mycelis muralis</i>	wall lettuce
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Plantago major</i>	broad-leaved plantain
<i>Polygonum sp</i>	
<i>Prunella vulgaris</i>	selfheal
<i>Prunus sp.</i>	
<i>Ranunculus repens</i>	creeping buttercup
<i>Rosa rubiginosa</i>	sweet briar, briar rose
<i>Rubus fruticosus agg.</i>	blackberry
<i>Rumex obtusifolius</i>	broad-leaved dock
<i>Salix fragilis</i>	crack willow
<i>Sambucus nigra</i>	elderberry
<i>Silybum marianum</i>	variegated thistle
<i>Sisymbrium officinale</i>	hedge mustard
<i>Stellaria media</i>	chickweed
<i>Taxus baccata</i>	yew
<i>Trifolium repens</i>	white clover
<i>Verbascum thapsus</i>	woolly mullein
<i>Vicia sp.</i>	vetch
<i>Vinca major</i>	periwinkle



**Appendix 2: Plant Species List for Forested Areas Outside the QEII Covenant**

Sourced from Walls unpubl. data (2015).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Alectryon excelsus</i>	titoki
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carmichaelia australis</i>	native broom, common broom
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carex forsteri</i>	forest sedge
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Coprosma areolata</i>	mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	scrub coprosma
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma rotundifolia</i>	round-leaved coprosma
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Corokia cotoneaster</i>	korokio
<i>Dacrycarpus dacrydioides</i>	kahikatea
<i>Fuchsia excorticata</i>	tree fuchsia
<i>Griselinia littoralis</i>	broadleaf
<i>Haloragis erecta</i>	toatoa
<i>Hedycarya arborea</i>	pigeonwood
<i>Helichrysum lanceolatum</i>	ninia
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus distegus</i>	wiwi
<i>Korthalsella lindsayi</i>	dwarf mistletoe
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea robusta</i>	kanuka
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Melicytus micranthus</i>	shrub mahoe
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha



<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Microlaena polynoda</i>	bamboo grass
<i>Microlaena stipoides</i>	meadow rice grass, patiti
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	mapou
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Oxalis exilis</i>	native oxalis
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parietaria debilis</i>	
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine, kohia
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum eugenioides</i>	tarata, lemonwood
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Pneumatopteris pennigera</i>	gully fern
<i>Poa cita</i>	silver tussock
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum oculatum</i>	shield fern
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax arboreus</i>	five-finger
<i>Pseudopanax crassifolius</i>	lancewood
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Pteridium esculentum</i>	bracken
<i>Pyrrosia eleagnifolia</i>	leather leaf fern
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Raukaua anomalus</i>	
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless lawyer, tataramoa
<i>Scandia geniculata</i>	climbing aniseed
<i>Schefflera digitata</i>	pate
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Streblus heterophyllus</i>	turepo, small-leaved milk tree
<i>Teucrium parvifolium</i>	
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species</b>	
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Bellis perennis</i>	daisy
<i>Bromus diandrus</i>	ripgut brome
<i>Cerastium glomeratum</i>	chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Critesion murinum</i>	barley grass
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot



<i>Digitalis purpurea</i>	foxglove
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Lolium perenne</i>	ryegrass
<i>Mycelis muralis</i>	wall lettuce
<i>Rosa rubiginosa</i>	sweet brier/briar
<i>Rumex acetosella</i>	sheeps sorrel
<i>Sambucus nigra</i>	elder, elderberry
<i>Sisymbrium officinale</i>	hedge mustard
<i>Stellaria media</i>	chickweed
<i>Trifolium dubium</i>	suckling clover
<i>Trifolium repens</i>	white clover

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Lower Kaituna River

**Site number:** SES/H/16

**Physical address of site:** Kaituna Valley, Little River

#### Summary of Significance:

This site is significant because it provides important habitat for indigenous birds and freshwater fish. It contains a diverse and representative assemblage of indigenous freshwater fish including four species that are nationally At Risk. The ecological linkage that the lower river provides between Lake Ellesmere and the catchment is essential for these fish. The river also supports two bird species that are nationally Threatened, and one that is nationally At Risk. It is distinctive as one of only two lowland rivers in New Zealand where Australasian crested grebe are known to breed.

#### Site Map





## **Additional Site Information**

**Ecological District:** Herbert and Ellesmere

**Area of SES (ha):** 6.41

**Central point (NZTM):** E1572298, N5153595

## **Site Description**

Kaituna River is located on the south-western side of Banks Peninsula and flows into Lake Ellesmere/ Te Waihora. The lower Kaituna River has a long and varied riparian margin that comprises lowland river edge and riparian wetland habitat. It provides habitat for a high diversity of indigenous bird and fish species. Australasian crested grebe (Threatened - Nationally Vulnerable) breed in the lower reaches of the river (DOC 2013).

## **Extent of Site of Ecological Significance**

This site includes the lower reaches of the Kaituna River and its riparian banks. It extends from the northern boundary of the salt marsh and wetland communities within the "Lake Ellesmere/Te Waihora and margins" site of ecological significance (SES) and follows the river channel approximately 1.8 km upstream of the Christchurch to Akaroa Road.

## **Assessment Summary**

The Lower Kaituna River Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1) rarity/distinctiveness (criteria 4, 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## **Assessment against Significance Criteria**

### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***



The site is significant under this criterion.

The Lower Kaituna River supports a representative assemblage of indigenous freshwater fish. Six species have been recorded from the Kaituna River (DOC 2013, EOS Ecology Ltd unpubl. data 2014). A list of those species recorded in the river is provided in Appendix 1.

**2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is not significant under this criterion. It is not a large example of its type.

**Rarity/Distinctiveness**

**3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

There is insufficient information available to assess this criterion for rivers and streams.

**4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.***

The site is significant under this criterion.

It supports two bird species (Crossland unpubl. data 2014a) that are nationally Threatened and one bird species and four indigenous freshwater fish that are nationally At Risk.

**Birds**

The site is known to support two bird species (Crossland unpubl. data 2014a) that are nationally Threatened (Robertson et al. 2012):

- Australasian crested grebe (Threatened - Nationally Vulnerable, At Risk and uncommon in the ED) – between 3 and 6 pairs nest in the lower river (DOC 2013)
- Pied cormorant (Threatened - Nationally Vulnerable)

It also supports a breeding colony of a nationally At Risk (Robertson et al. 2012) bird species (Crossland unpubl. data 2014)<sup>1</sup>:

- Black cormorant (At Risk - Naturally Uncommon, uncommon in the ED)

**Freshwater fish**

<sup>1</sup> Although for mobile fauna such as birds, species classified as nationally At Risk do not trigger significance (Wildland Consultants 2013).



Kaituna River supports four fish species (EOS Ecology Ltd unpubl. data 2014) that are nationally Threatened or At Risk (Goodman et al. 2014):

- Lamprey (Threatened - Nationally Vulnerable) (EOS Ecology Ltd 2014)
- Longfin eel (At Risk – Declining) (EOS Ecology Ltd 2014)
- Bluegill bully (At Risk – Declining) (EOS Ecology Ltd 2014)
- Inanga (At Risk – Declining) (Taylor and Marshall 2014)

**5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.***

The site is significant under this criterion.

The site, together with adjacent Lake Ellesmere, Lake Forsyth, and Okana Rivers is the eastern national distributional limit for Australasian crested grebe. The site is one of a small number of locations where this species breeds on the lowlands of the eastern South Island (other locations are The Groynes and Clearwater Resort north-west of Christchurch, and on Lake Ellesmere, Lake Forsyth, and the Okana River (Crossland 2014b).

**6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

The site is significant under this criterion.

It is one of only two lowland rivers in New Zealand where Australasian crested grebe (Threatened - Nationally Vulnerable) are known to breed (Crossland 2010).

### Diversity and Pattern

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

The Kaituna River has a high diversity of indigenous freshwater fish species. At least six species occur in the Kaituna River and are either resident in, or pass through the site (EOS Ecology Ltd unpubl. data 2014).

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.





The Kaituna River supports at least five species of migratory freshwater fish (longfin eel, shortfin eel, lamprey, bluegill bully, and common bully) (EOS Ecology Ltd unpubl. data 2014). The ecological linkage between Lake Ellesmere and the catchment is essential for these fish.

**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. Other than riparian wetland vegetation on the river banks, there are no wetlands within the site. Wetlands at the mouth of the Kaituna River are significant under this criterion and have been identified as part of the Te Waihora/Lake Ellesmere (and margins) Site.

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

The site provides important breeding habitat for Australasian crested grebe (Threatened - Nationally Vulnerable) (Robertson et al. 2012). This species typically breeds on inland lakes in the South Island and this site is one of only two lowland rivers in New Zealand – the other being the Okana River, Little River) where this species breeds (Crossland 2010).

A line of shelter belts growing on the immediate true right river bank near the river mouth (below the Christchurch to Akaroa Road) supports a large nesting colony of pied cormorants (Threatened Nationally Vulnerable) and little cormorants. It is also an important night roost for royal spoonbill.

The lower Kaituna River also provides important habitat for at least six freshwater fish species, including nationally Threatened and At Risk species (EOS Ecology Ltd unpubl. data 2014) and is an important corridor for at least five species of migratory freshwater fish.

The site also provides spawning habitat for inanga (At Risk – Declining) (Taylor and Marshall 2014). Taylor and Marshall (2014) regard the lower river as having a high suitability for inanga rearing.

## Site Management

### Existing Protection Status

Part of the site is within the Kaituna River Esplanade (administered by the Christchurch City Council) and the remainder is on private land and is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Barriers to fish passage. Based on a boat survey upstream from Lake Ellesmere, it appears that there are currently no barriers to fish migration (Taylor and Marshall 2014).</li> </ul>	<ul style="list-style-type: none"> <li>Ensure no instream barriers to fish migration are constructed in the waterway.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Human disturbance to pied and little shag breeding colonies and royal spoonbill roost site</li> </ul>	<ul style="list-style-type: none"> <li>Restrict access to the vicinity of the nesting colony (specifically to anglers and Council staff undertaking maintenance of restoration plantings) during the breeding season. Dates of preferred access to this area should be discussed with Council Ranger staff.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with Fish and Game about restricting anglers' access at breeding season.</li> </ul>
<ul style="list-style-type: none"> <li>Removal of, or damage to, Australasian crested grebe nesting habitat</li> </ul>	<ul style="list-style-type: none"> <li>Australasian crested grebes typically nest in or near willows. Maintaining this habitat is therefore important. Consider undertaking maintenance work in the river or on its banks outside of the breeding season.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowners about benefits to biodiversity of maintenance of willow habitat in the river and permissions for Council staff to assist with this work.</li> </ul>
<ul style="list-style-type: none"> <li>Progressive loss of riparian habitat for birds</li> </ul>	<ul style="list-style-type: none"> <li>Consider excluding stock from the fenced riparian margins.</li> <li>Consider planting locally sourced indigenous</li> </ul>	<ul style="list-style-type: none"> <li>In collaboration with ECan discuss with landowners the benefits to biodiversity of stock control along riparian areas.</li> </ul>

	emergent wetland riparian vegetation (in conjunction with riparian restoration planting already underway) to enhance habitat for indigenous birds.	
<ul style="list-style-type: none"> <li>Stock. Stock have the potential to increase bank erosion and reduce water quality. Upstream of the Christchurch to Akaroa Road, both banks of the river are well fenced (Taylor and Marshall 2014) and the true left bank has been fenced by DOC (DOC 2013).</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing all un-fenced riparian margins to keep stock out. Priority areas for fencing are the lower true left fence (approx. 1km) and the upper true right above the section of fencing erected on CCC land) (DOC 2013).</li> <li>Ensure existing fences are maintained in stock proof condition.</li> </ul>	<ul style="list-style-type: none"> <li>In collaboration with ECan discuss with landowners the benefits to biodiversity of stock control along riparian areas.</li> </ul>
<ul style="list-style-type: none"> <li>Pest animals. DOC trap predators along the river margins during the breeding season to protect nesting crested grebes and other birdlife from a suite of introduced predators (DOC 2013).</li> </ul>	<ul style="list-style-type: none"> <li>Continue predator control work.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

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**Assessment completed by:** Scott Hooson  
**Date:** 22 January 2015

**Statement completed by:** Scott Hooson  
**Date:** 22 January 2015

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



**Appendix 1: Indigenous Freshwater Fish Species List**

Indigenous freshwater fish species recorded in the Kaituna River (Source: DOC 2013, EOS Ecology Ltd unpubl. data 2014).

<b>Species</b>
Common bully
Upland bully
Bluegill bully
Longfin eel
Shortfin eel
Inanga
Lamprey

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## Appendix 2: Indigenous Bird Species List

Indigenous bird species recorded from the lower Kaituna River during Council monitoring, August 2013 to January 2014. Sourced from Crossland unpubl. data (2014) (note that these counts exclude the saltmarsh wetland habitats at the mouth of the Kaituna River – this area is included within the Lake Ellesmere/Te Waihora and margins SES).

Species	6/08/2013	26/01/2014
Australasian crested grebe	n.c.	6
Black cormorant	0	6
Pied cormorant	20	1
Little cormorant	60	6
Black swan	n.c.	2
Mallard/grey hybrid	n.c.	8
NZ scaup	n.c.	2
Pukeko	n.c.	12

n.c. = not counted

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Kaituna Spur

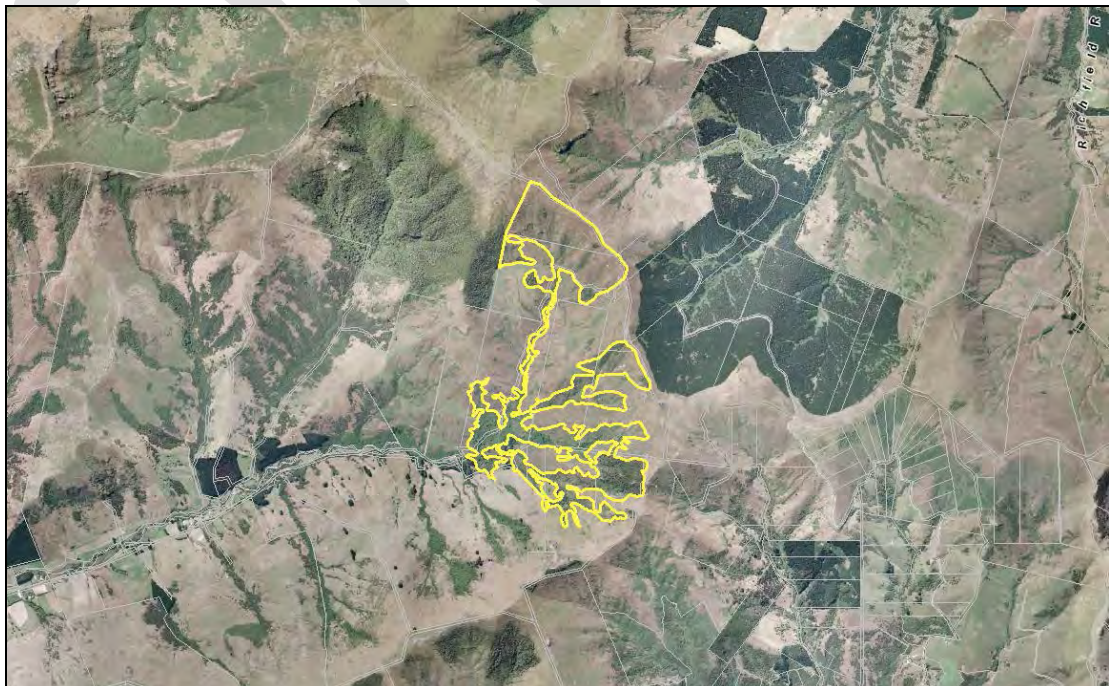
**Site number:** SES/H/17

**Physical address of site:** Head of Kaituna Valley, Little River

#### **Summary of Significance:**

This site is significant because it contains rare, distinctive and representative vegetation communities including old-growth forest and montane and sup-alpine vegetation. It has a representative assemblage of indigenous forest birds. The site has a large altitudinal sequence and a very high diversity of plant taxa. It supports four plant species that are nationally At Risk (two are also endemic to Banks Peninsula) an outstanding number of plant species that are uncommon within the ecological district or region and four that reach their distributional limits on Banks Peninsula. Two bird species that are uncommon within the ecological district also use the site. The site is an important ecological linkage between Mt Herbert Scenic Reserve and Kaituna Spur Scenic Reserve and within the site forest and scrub in gullies links the lowland podocarp/hardwood forest with the vegetation on the upper slopes.

#### **Site Map**



## **Additional Site Information**

**Ecological District:** Herbert

**Area of SES (ha):** 141.79

**Central point NZTM:** E1581193, N5160259

## **Site Description**

The site is situated in the basin-like valley head of Kaituna Valley on the south-eastern side of Mt Herbert Reserve. The landscape is comprised generally of west and south facing moderately steep to steep slopes and gullies. The altitudinal range of the site is from approximately 280 to 870 m above sea level. It includes the Kaituna Spur Scenic Reserve. The Department of Conservation identified the upper catchment south-east of Trig ZZ as part of a Recommended Area for Protection (Herbert RAP 4 – Mt Herbert) (Wilson 1992).

The main vegetation communities within the site (Wildland Consultants unpubl. data 2014, Wilson 2011) are:

- (Matai-kahikatea-lowland totara)/secondary growth mahoe-broadleaf-five finger forest on lowland hill slopes
- (Matai-kahikatea-thin-barked totara)/secondary growth mahoe-tree fuchsia-five finger forest and scrub on lowland and montane hill slopes
- Old-growth thin barked totara/mixed hardwood forest on montane hill slopes
- Montane and sub-alpine scrub and shrubland
- Short tussockland on montane hill slopes

One of the outstanding features of the site is the very large remnant trees of four species of podocarp (kahikatea, matai, lowland totara and thin-barked totara).

## **Extent of Site of Ecological Significance**

The site includes the lowland (podocarp)/secondary growth hardwood forest in the bottom of the valley and a smaller side gully to the east and the (podocarp)/secondary growth mixed hardwood forest and scrub that extend up the gullies to provide important linkages to the old growth thin-barked totara forest in Kaituna Scenic Reserve and the other small patches on upper slopes. Which are part of the site. The site also includes the representative and distinctive montane and sub-alpine vegetation in the upper catchment south-east of Trig ZZ.

## **Assessment Summary**

The Kaituna Spur Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and





advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## **Assessment against Significance Criteria**

### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The bottom of the valley and a smaller side gully to the east contain secondary growth lowland hardwood forest with many very large impressive kahikatea and matai trees. These trees provide support for numerous epiphytes and vines, and seedlings of all three podocarp species are common. This forest is representative of the lowland podocarp forest that was once much more common in the ecological district.

Montane old-growth thin-barked totara forest has survived in the Kaituna Spur Scenic Reserve and in several small patches at the head of the valley. The canopy is dense and these remnants are representative of this old-growth forest community.

Although regenerating following historic burning and grazing, the upper cool temperate and sub-alpine vegetation communities in the upper catchment south-east of Trig ZZ contain a diverse range of indigenous plant taxa including many of the locally restricted species characteristic of the Mt Herbert area (Wilson 2011).

The site supports a representative assemblage of Banks Peninsula forest bird species (Wildland Consultants unpubl. data 2014, Wilson 2011). A high proportion of the species in the "Banks Peninsula native bush bird species assemblage" (Crossland unpubl. data 2014) have been recorded at the site (Appendix 1) even though no formal bird monitoring has been undertaken.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is not significant under this criterion. It is comprised of a number of indigenous vegetation communities but none are significant as being a large example of its type within the ecological district.

### **Rarity/Distinctiveness**

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***



The site is significant under this criterion.

In the context of the Herbert Ecological District the indigenous forest within the site is significant under this criterion because it has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all other indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

Montane thin-barked totara forest has survived in the Kaituna Spur Scenic Reserve and as several small patches at the head of the valley. The bottom of the valley and a smaller side gully to the east contain secondary growth lowland hardwood forest with large emergent remnant podocarps (kahikatea, matai, and lowland totara). These examples of old growth forest are extremely rare on Banks Peninsula. Old growth forest has been reduced to approximately 800 ha or <1% of its original extent on Banks Peninsula (Wilson 2009).

The indigenous vegetation in the lower part of the site (below approximately 400 m) is on a Chronically Threatened land environment (F3.1b) where 12.2% indigenous vegetation is left on this land environment nationally (Walker et al. 2007). This land environment includes the majority of the lowland forest that contains the large remnant podocarp trees.

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

The site supports four plant species that are nationally At Risk (two are also endemic to Banks Peninsula) and an outstanding number of plant species that are also uncommon within the ecological district or region. Two bird species are present that are also uncommon within the Herbert Ecological District.

**Plants**

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site are:

- *Aciphylla subflabellata* (At Risk – Declining) (Wilson 2011)
- *Coprosma virescens* (At Risk – Declining) (Wildland Consultants unpubl. data 2014)
- *Heliohebe lavaudiana* (At Risk – Declining, endemic to Banks Peninsula)
- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to Banks Peninsula) (Wilson 2011)

An outstanding number of indigenous plant species have been recorded from the site that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Acaena caesiiglauca* (Wilson 2011)



- *Acaena dumicola* (Wilson 2011)
- *Aciphylla aurea* (Wilson 2011)
- *Adiantum cunninghamii* (Wilson 2011)
- *Anisotome aromatica* (Wilson 2011)
- *Aristotelia fruticosa* (Wilson 2011)
- *Blechnum montanum* (Wilson 2011)
- *Blechnum novae-zelandiae* (Wildland Consultants unpubl. data 2014, Wilson 2011)
- *Blechnum vulcanicum* (Wildland Consultants unpubl. data 2014)
- *Celmisia gracilentia* (Wilson 2011)
- *Chaerophyllum ramosum* (Wilson 2011)
- *Chionochloa conspicua* (Wilson 2011)
- *Coprosma ciliata* (Wilson 2011)
- *Epilobium brunnescens* (Wilson 2011)
- *Epilobium insulare* (Wilson 2011)
- *Epilobium rotundifolium* (Wilson 2011)
- *Epilobium tenuipes* (Wilson 2011)
- *Hymenophyllum multifidum* (Wilson 2011)
- *Isolepis habra* (Wilson 2011)
- *Juncus novae-zelandiae* (Wilson 2011)
- *Juncus planifolius* (Wilson 2011)
- *Juncus sarophorus* (Wilson 2011)
- *Kelleria dieffenbachia* (Wilson 2011)
- *Lachnagrostis pilosa* (Wilson 2011)
- *Lastreopsis glabella* (Wildland Consultants unpubl. data 2014)
- *Leptospermum scoparium* (Wilson 2011)
- *Leptostigma setulosum* (Wilson 2011)
- *Lobelia angulata* (Wilson 2011)
- *Luzula picta* (Wilson 2011)
- *Lycopodium fastigiatum* (Wilson 2011)
- *Lycopodium scariosum* (Wildland Consultants unpubl. data 2014)
- *Lycopodium volubile* (Wilson 2011)
- *Microlaena avenacea* (Wilson 2011)
- *Nertera depressa* (Wilson 2011)
- *Notogrammitis crassior* (Wilson 2011)
- *Olearia arborescens* (Wilson 2011) – restricted to the Herbert Ecological District within the Banks Ecological Region (Wilson 1992)
- *Olearia ilicifolia* (Wilson 2011)
- *Ourisia macrophylla subsp. lacteal* (Wilson 2011)
- *Paesia scaberula* (Wildland Consultants unpubl. data 2014, Wilson 2011)
- *Phlegmariurus varius* (Wilson 2011)
- *Plantago raoulii* (Wilson 2011)
- *Pyrrosia eleagnifolia* (Wildland Consultants unpubl. data 2014, Wilson 2011)
- *Rytidosperma corinum* (Wilson 2011)
- *Scleranthus biflorus* (Wilson 2011)
- *Uncinia clavata* (Wilson 2011)
- *Viola filicaulis* (Wilson 2011)



## Birds

Two bird species that are uncommon in the Herbert ecological district have been recorded from the site (Wilson 2011):

- New Zealand falcon (At Risk – Recovering (Robertson et al. 2012), uncommon in the ecological district)
- Tui (uncommon in the ecological district)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are three plant species that are at their southern regional or national distributional limits on Banks Peninsula and one at its northern distributional limit (Wilson 2013). These species are:

- *Dracophyllum acerosum* (southern national limit) (Wildland Consultants unpubl. data 2014, Wilson 2011)
- *Hedycarya arborea* (southern regional limit) (Wildland Consultants unpubl. data 2014)
- *Piper excelsum* (southern national limit) (Wildland Consultants unpubl. data 2014)
- *Rytidosperma corinum* (northern regional limit) (Wilson 2011)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

The site is distinctive in that it supports very large remnant trees of four species of podocarp (kahikatea, matai, lowland totara and thin-barked totara). All four species are regenerating (Wilson 2011).

It also supports upper cool temperate montane and sub-alpine vegetation that contain a high diversity of plant taxa (Wilson 2011). Sup-alpine vegetation is of restricted occurrence on Banks Peninsula where it occurs only as small (often isolated) relics in the highest, coolest and most exposed sites.

There are scattered rock bluffs and outcrops on the upper slopes of the site including within the Kaituna Spur Scenic Reserve. At a national scale, basic cliffs, scarps and tors are an originally rare ecosystem (Williams et al. 2007).

## Diversity and Pattern

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**



The site is significant under this criterion.

The site has an altitudinal sequence from 280 to 870 m above sea level that includes lowland, montane and sub-alpine zones. This large altitudinal gradient is reflected in the composition of the vegetation communities. Lowland podocarp/hardwood forest, montane thin-barked totara/hardwood forest, montane scrub and shrublands and sub-alpine shrublands and tussockland all occur within the site. As a result the site contains a very high diversity of plant taxa (Wildland Consultants unpubl. data 2014, Wilson 2011). Wilson (2011) recorded 188 indigenous vascular plant species during a preliminary botanical assessment of the property and comments that further survey work will reveal many more. His preliminary list included 23 native trees, (50 native trees and shrubs) and 37 ferns and fern allies.

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The vegetation within the site provides an important ecological linkage between Mt Herbert Scenic Reserve and Kaituna Spur Scenic Reserve. Both reserves are of outstanding ecological value. The montane and sub-alpine scrub and shrublands south-east of Trig ZZ adjoin and buffer the Mt Herbert Scenic Reserve.

Narrow fingers of secondary forest and scrub in the gullies provide important ecological linkages within the site between the lowland podocarp/hardwood forest and the upper catchment, including the Kaituna Spur Scenic Reserve and the montane and sub-alpine vegetation south-east of Trig ZZ.

The old-growth forest within the site is also part of a network of ecologically important forest patches in the wider area including Mt Herbert, Kaituna Spur and Waipuna Saddle Scenic Reserves and forested areas in the head of Prices Valley. These areas are important 'stepping stones' for the movement and dispersal of mobile indigenous fauna such as New Zealand pigeon.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.



The forest, and particularly the old-growth podocarp forest, provides important permanent habitat for a high diversity of indigenous forest birds and important seasonal feeding habitat for New Zealand pigeon (Wildland Consultants unpubl. data 2014, Wilson 2011).

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## Site Management

### Existing Protection Status

The part of the site that is in private ownership (the majority) has recently been legally protected under as a Banks Peninsula Conservation Trust Covenant and fenced to exclude stock. The remaining part of the site is within the Kaituna Spur Scenic Reserve (conservation unit no. N36031).

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants. The main threats to the ecological values of the site are: Chilean flame creeper, old mans beard and wilding conifers (radiata pine and macrocarpa). (Wildland Consultants unpubl. data 2014, Wilson 2011).</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling Chilean flame creeper, old mans beard and wilding conifers. These species are the highest priority species for control (Wilson 2011).</li> <li>Consider ongoing surveillance for other biodiversity pest plants such as sycamore and Darwin’s barberry and spur valerian (on rock outcrops).</li> </ul>	<ul style="list-style-type: none"> <li>In collaboration with BPCT and DOC, advice and guidance for landowner about pest plant monitoring and control.</li> <li>Assistance available as appropriate</li> </ul>
<ul style="list-style-type: none"> <li>Domestic stock. It is understood that the entire Banks Peninsula Conservation Trust covenant has been fenced to exclude stock.</li> </ul>	<ul style="list-style-type: none"> <li>Consider periodic fence inspections of the covenants perimeter fence and maintenance as required to ensure fences remain stock-proof.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Deer, goats and pigs</li> </ul>	<ul style="list-style-type: none"> <li>Consider monitoring the site for deer, goats and pigs (and their sign) and controlling them, if possible, when they are present within the site.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about control of deer, goats and pigs.</li> <li>In collaboration with DOC, assistance available as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Other pest animals. Possums, rabbits, hares,</li> </ul>	<ul style="list-style-type: none"> <li>Control of pest animals (e.g. by trapping,</li> </ul>	<ul style="list-style-type: none"> <li>In collaboration with BPCT and DOC, advice</li> </ul>

<p>stoats, mice, rats, hedgehogs.</p>	<p>poisoning or shooting) using a multi-species control programme would benefit native fauna (birds, lizards and larger invertebrates). However, due to the time and cost of establishing and maintaining such a control programme and the lack of barriers to invasion, only consider implementing an animal pest control programme if long-term, effective control can be ensured.</p>	<p>and guidance for landowner about pest animal monitoring and control.</p> <ul style="list-style-type: none"> <li>• Assistance available as appropriate.</li> </ul>
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**Assessment completed by:** Scott Hooson  
**Date:** 4 February 2015

**Statement completed by:** Scott Hooson  
**Date:** 4 February 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Indigenous Banks Peninsula Native Bush Bird Species Assemblage

Comparison of bird species recorded at the site (Wilson 2011, Wildland Consultants unpubl. data 2014a) with the “Banks Peninsula Native Bush Bird Species Assemblage” (Crossland 2014).

N.B. this is not a full inventory of the bird species that may use the site. Rather it is based on incidental observations during field visits.

Species recorded at the site are marked with a tick ✓.

	<b>Common name</b>	<b>Scientific Name</b>
✓	Australasian harrier	<i>Circus approximans</i>
✓	Bellbird	<i>Anthornis melanura melanura</i>
✓	Brown creeper	<i>Mohua novaeseelandiae</i>
✓	Grey warbler	<i>Gerygone igata</i>
	Morepork	<i>Ninox novaeseelandiae novaeseelandiae</i>
✓	New Zealand falcon	<i>Falco novaeseelandiae</i>
	New Zealand kingfisher	<i>Halcyon sancta vagans</i>
✓	New Zealand pigeon	<i>Hemiphaga novaeseelandiae novaeseelandiae</i>
✓	Shining cuckoo	<i>Chrysococcyx lucidus lucidus</i>
✓	Silvereye	<i>Zosterops lateralis lateralis</i>
✓	South Island fantail	<i>Rhipidura fuliginosa fuliginosa</i>
	South Island rifleman	<i>Acanthisitta chloris chloris</i>
✓	South Island tomtit	<i>Petroica macrocephala macrocephala</i>
✓	Tui	<i>Prothemadera novaeseelandiae novaeseelandiae</i>
✓	Welcome swallow	<i>Hirundo tahitica neoxena</i>



## Appendix 2: Plant Species List

Sourced from Wildland Consultants unpubl. data (2014).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Acaena novae-zelandiae</i>	red bidibidi
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum discolor</i>	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum novae-zealandiae</i>	kiokio
<i>Blechnum penna-marina</i>	little hard fern
<i>Blechnum procerum</i>	small kiokio
<i>Blechnum vulcanicum</i>	triangular hard fern
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Clematis paniculata</i>	puawananga
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma propinqua X robusta</i>	
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Cyathea smithii</i>	Smith's tree fern, katote
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dicksonia squarrosa</i>	wheki, rough tree fern
<i>Dracophyllum acerosum</i>	turpentine scrub
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Gaultheria antipoda</i>	bush snowberry
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Gunnera monoica</i>	native gunnera
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Helichrysum lanceolatum</i>	niniaio
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere



<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Hypolepis rufobarbata</i>	sticky pig fern
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea ericoides</i>	kanuka
<i>Lastreopsis glabella</i>	smooth shield fern
<i>Leptinella dioica</i>	button daisy
<i>Leptopteris hymenophylloides</i>	crepe fern, heruheru
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Lycopodium scariosum</i>	
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Metrosideros diffusa</i>	white climbing rata
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Myrsine australis</i>	red mapou, red matipo
<i>Paesia scaberula</i>	ring fern, pig root fern
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Pittosporum eugeniioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Pneumatopteris pennigera</i>	gully fern, pakau
<i>Poa cita</i>	silver tussock
<i>Podocarpus cunninghamii</i>	mountain totara, thin-barked totara
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pteridium esculentum</i>	bracken
<i>Pyrrhosia eleagnifolia</i>	leatherleaf fern
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Raoulia glabra</i>	mat daisy
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Schefflera digitata</i>	pate, seven-finger
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic Species</b>	
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal



<i>Arctium minus</i>	burdock
<i>Bellis perennis</i>	daisy
<i>Cerastium fontanum</i>	mouse-ear chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Clematis vitalba</i>	old man's beard
<i>Crepis capillaris</i>	hawksbeard
<i>Cupressus macrocarpa</i>	macrocarpa, Monterey cypress
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cytisus scoparius</i>	scotch broom
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris dilatata</i>	broad buckler fern
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Mycelis muralis</i>	wall lettuce
<i>Pilosella officinarum</i>	mouse-ear hawkweed
<i>Pinus radiata</i>	radiata pine, Monterey pine
<i>Plantago major</i>	broad-leaved plantain
<i>Prunella vulgaris</i>	selfheal
<i>Ranunculus repens</i>	creeping buttercup
<i>Ribes species</i>	currant
<i>Rubus fruticosus</i>	blackberry
<i>Rumex acetosella</i>	sheeps sorrel
<i>Solanum nigrum</i>	black nightshade
<i>Stellaria media</i>	chickweed
<i>Trifolium pratense</i>	red clover
<i>Trifolium repens</i>	white clover
<i>Tropaeolum speciosum</i>	Chilean flame creeper
<i>Ulex europaeus</i>	gorse



## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Lake Forsyth North Side

**Site number:** SES/H/18

**Physical address of site:** Off Christchurch Akaroa Road

#### **Summary of Significance:**

This site is significant because it contains a diverse range of representative indigenous vegetation communities that support nine indigenous plant species that are nationally At Risk, of which three are also endemic to Banks Peninsula, two species that are uncommon within the ecological district or region and four species that are at their southern national or regional distributional limits on Banks Peninsula. It also has four invertebrate species that are nationally At Risk, thirteen that are endemic to Banks Peninsula and one that is at its southern national distributional limit on Banks Peninsula. It has extensive basic igneous bluffs, scarps and rock outcrops, and seepages both of which are originally rare ecosystems nationally. It is part of an important network of indigenous forest, scrub and shrubland on the northern side of Lake Forsyth and buffers Lake Forsyth/Wairewa. It is important habitat for an assemblage of invertebrates that has a high proportion of species that are endemic to Banks Peninsula.

#### **Site Map**



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 160.56

**Central point (NZTM):** E1578457, N5150665

## Site Description

This site is located on the northern side of Lake Forsyth/Wairewa on very steep slopes above the Christchurch to Akaroa Highway. It includes a small amphitheatre-like side valley and numerous bluffs and scarps. The altitudinal range of the site is from near sea level to approximately 420 m above sea level. The Department of Conservation identified the site as a Recommended Area for Protection (Herbert RAP 16 – Forsyth Spur) (Wilson 1992).

The site is covered in a mosaic of indigenous dominated vegetation including second growth hardwood forest, shrubland, scrub, and tussockland. The main vegetation communities identified at the site by Walls unpubl. data (2014a,b) are:

- (Matai-lowland totara)/mixed secondary hardwood forest and treeland in gullies
- Mixed secondary broadleaved hardwood forest and treeland in gullies
- Secondary kanuka forest and treeland
- Small leaved shrubland and scrub on lowland hillslopes
- Small leaved shrubland/exotic grass species on lowland hillslopes
- Silver tussock-(hard tussock) tussockland on upper slopes
- (Prostrate kowhai-*Coprosma crassifolia*)/lichen sp.-(moss sp.) rockland on bluffs, scarps and rock outcrops
- (Lancewood)/lowland flax/*Carex secta* flaxland

A range of common indigenous forest bird species occur at the site: bellbird New Zealand wood pigeon, South Island fantail, grey warbler, Australasian harrier, welcome swallow, New Zealand pipit and silvereye. Skink species were also recorded in grassland habitats (Walls unpubl. data 2014 a, b).

## Extent of Site of Ecological Significance

The site includes the areas of second growth hardwood forest, shrubland, scrub, and tussockland.

## Assessment Summary

The Lake Forsyth North Side Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013)





Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

Although the vegetation within the site is secondary-growth, and has been modified by sheep grazing and exotic plants and animals, it is dominated by indigenous vegetation that supports a diverse range of indigenous plant species. The structure and composition of these vegetation communities are relatively intact and they are representative of seral communities in the ecological district.

Secondary broadleaved forest and treeland with kanuka occurs in the gullies. The canopy has a representative diversity of trees including ribbonwood, narrow-leaved lacebark, ngaio, titoki, lancewood, lemonwood, mahoe, kowhai and kaikomako, with lesser amounts of other species. At least 15 remnant matai and 4 adult totara trees are present in the northern part of the site. Although the understorey has been depleted by sheep grazing these forest communities are typical of those that would have been present at a baseline of 1840, although podocarps would probably have been more common.

Diverse indigenous shrubland and scrub dominated by *Coprosma crassifolia*, *C. propinqua*, *C. virescens*, *C. rigida*, *Carmichaelia australis*, niniao, ongaonga, prostrate kowhai and *Muehlenbeckia complexa* occupies much of the site. Although secondary, this community is only lightly to moderately grazed by sheep and is in good condition. It is representative of seral shrubland and scrub communities in the ecological district.

The extensive rock bluffs, scarps and outcrops throughout the site are still relatively intact and support representative bluff communities.

The silver tussock grasslands have abundant exotic pasture grasses and herbs between tussocks but they are extensive, particularly on the upper slopes and have a dense cover of silver tussock. There is a strong population of speargrass (*Aciphylla subflabellata*) in the highest (NE) part of the Hutchison property. The silver tussock grasslands are a good example of their type within the ecological district, especially at low altitude.

The site has an invertebrate assemblage that is highly representative of the composition that is expected for the vegetation communities present. Of 225



species recorded at the site (Wildland Consultants 2015 a,b) only four (1.8%) are exotic.

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

The site is extensive and is a large example of a mosaic of lowland second growth hardwood forest, shrubland, scrub, and tussockland in the Herbert Ecological District.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The indigenous forest within the site is significant under this criterion because it has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all other indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

Seral vegetation communities such as secondary kanuka forest and treeland and small leaved shrubland and scrub that occur within the site have expanded their range in the ecological district as a result of human disturbance. However, the extent of all indigenous woody vegetation in the ecological district is estimated to be only 10.9% (New Zealand Landcover Database (Version 4)).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports nine indigenous plant species that are nationally At Risk, of which three are also endemic to Banks Peninsula and two species that are uncommon within the ecological district or region. It has four invertebrate species that are nationally At Risk and thirteen species that are endemic to Banks Peninsula.

**Plants**

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Walls unpubl. data 2014a,b) are:

- *Aciphylla subflabellata* (At Risk - Declining) – a strong population grows in silver tussockland on the upper slopes of the Hutchison property.
- *Coprosma virescens* (At Risk - Declining)



- *Coprosma wallii* (At Risk - Declining)
- *Teucrium parvifolium* (At Risk – Declining)
- *Festuca actae* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Leptinella minor* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Pseudopanax ferox* (At Risk - Naturally Uncommon)
- *Senecio glaucophyllus* subsp. *basinudus* (At Risk - Naturally Uncommon)

Plant species recorded from the site (Walls unpubl. data 2014a,b) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Carex secta*
- *Pyrrosia eleagnifolia*

### Invertebrates

Nationally Threatened and At Risk invertebrate species recorded from the site (Wildland Consultants unpubl. data 2015 a, b) are:

- *Zelleria sphenota* (At Risk – Declining)
- *Dasyuris partheniata* (At Risk – Declining)
- *Gadira petraula* (At Risk - Naturally Uncommon)
- *Glyphipterix euastera* (At Risk - Naturally Uncommon)

Endemic invertebrate species recorded from the site (Wildland Consultants unpubl. data 2015 a, b) are:

- *Stanwellia* sp. (probably *S.kaituna*)
- *Megadromus guerinii*
- *Mimopeus granulatus*
- *Hemiandrus "peninsularis"* ground weta
- *Kikihia new species*
- *Aorangia isolata* (likely rare Banks Peninsula endemic, likely to be the male, which is undescribed. Known only from a single female from Akaroa (Wildland Consultants unpubl. data 2015b)
- Indeterminate. genus and species of golden harvestman - possible new Banks Peninsula endemic? never seen before (Wildland Consultants unpubl. data 2015b)
- *Phrynixus* sp. weevil
- *Undescribed genus 'Epitimetes'*
- *Maniho ngaitahu*
- *Kikihia new species*
- *Pseudocoremia modica*
- *Maoridrilis* sp. - possibly a Banks Peninsula endemic (Wildland Consultants unpubl. data 2015a)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.



There are four plant species that are at their southern national or regional distributional limits on Banks Peninsula (Wilson 2013) and one invertebrate species at its southern national distributional limit on Banks Peninsula.

Plant species at their southern national or regional distributional limits on Banks Peninsula are (Walls unpubl. data 2014a,b):

- *Alectryon excelsus* (southern national limit)
- *Hedycarya arborea* (southern regional limit)
- *Passiflora tetrandra* (southern national limit)
- *Piper excelsum* (southern national limit)

The invertebrate species at its southern national distributional limit on Banks Peninsula (Wildland Consultants unpubl. data 2015 a,b) is:

- *Zelanda kaituna* (southern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

There are extensive basic igneous bluffs, scarps and rock outcrops throughout the site that support indigenous vegetation (Walls unpubl. data 2014a,b). At a national scale these features are an originally rare ecosystem (Williams et al. 2007).

There are also lowland flax seepages with emergent young lancewoods and *Carex secta* on upper slopes (Walls unpubl. data 2014a,b). Some of these are extensive. Seepages and flushes are also an originally rare ecosystem on a national scale (Williams et al. 2007).

Walls unpubl. data (2014b) recorded an unusual hybrid ribbonwood (*Plagianthus regius* x *Plagianthus divaricata*) at the site. This unusual hybrid reflects the close proximity of *Plagianthus regius* on lowland hill slopes with *Plagianthus divaricata* on the shoreline of Lake Forsyth/Wairewa.

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

The site contains a high diversity of vegetation communities and habitat types, including rocklands, seepages, broadleaved forest, kanuka forest, treelands, scrub, shrublands, tussocklands and exotic grasslands. They exist as a mosaic across the site. Because of the altitudinal gradient from near sea level to over 400 m the indigenous plant species composition has coastal, lowland and



montane elements. One-hundred and two species were recorded during recent botanical surveys (Walls 2014 a,b). This high diversity of plant taxa reflects both the diversity of the vegetation communities and habitat types and the altitudinal gradient.

The southern part of the site has a relatively high diversity of invertebrates (Wildland Consultants unpubl. data 2015b).

## Ecological Context

### **8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

It is part of an important network of indigenous forest, scrub and shrubland extending from the southern end of Lake Forsyth/Wairewa around the eastern faces of High Bare Peak into the upper catchment. It is likely to provide an important ecological linkage for the dispersal of indigenous fauna (birds, lizards and invertebrates) and plants (via seed dispersal) along the north-western side of Lake Forsyth/Wairewa between Birdlings Flat and Kaitorete Spit and Banks Peninsula.

The site adjoins Lake Forsyth/Wairewa (SES/H/6), a lake of very high ecological value, and particularly as a habitat for indigenous fauna (although the Christchurch to Akaroa Highway passes between the lake and the site). Lake Forsyth/Wairewa is in a highly eutrophic state and reducing nutrient and sediment inputs is a high priority (Gray 2013). Maintaining vegetation cover on these slopes reduces these local inputs, but management within the wider catchment is also essential to address water quality issues.

### **9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. The only wetlands within the site are seepages on steep slopes dominated by lowland flax, with emergent young lancewoods and *Carex secta* (Walls unpubl. data 2014a,b). These are limited in extent and do not play an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.

### **10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site provides important habitat for a high diversity of indigenous invertebrates, including a high proportion of species that are endemic to Banks Peninsula. The rocklands, grasslands and shrublands provide good habitat for gecko and skinks (Walls unpubl. data 2014 a,b).

## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants. There are few species of concern within the site. Common broom occurs in the northern part of the site, elderberry occurs at low altitude and in low numbers, Sweet briar is present but is not an ecological threat (Walls unpubl. data 2014a,b).</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling broom and elderberry using methods that do not damage surrounding indigenous vegetation.</li> <li>Consider ongoing surveillance for other biodiversity pest plants such as old mans beard, sycamore, wilding pines, spur valerian, fennel and <i>Polypodium vulgare</i> which are known to be in the surrounding area.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowners about identification, monitoring and control of pest plants.</li> <li>Assistance available where possible.</li> </ul>
<ul style="list-style-type: none"> <li>A small number of goats have been observed on the site.</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing goats from the site. Goats are a serious threat to the ecological values of the site. They also have the potential to spread onto neighbouring properties and into other areas with high ecological values. Not removing goats poses a significant threat to the success of the multi-agency Banks Peninsula Feral Goat Eradication Programme.</li> </ul>	<ul style="list-style-type: none"> <li>Assistance to landowners with goat control, with their agreement.</li> </ul>
<ul style="list-style-type: none"> <li>Stock. Sheep graze the site at moderate and low intensity in the northern and southern parts of the site respectively. This appears to be preventing or impeding natural vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Consider the implications of stock grazing in relation to management of indigenous vegetation communities. Removing stock from the site would allow more natural vegetation</li> </ul>	<ul style="list-style-type: none"> <li>Discussions with landowners about the benefits to biodiversity of stock management options.</li> </ul>

regeneration, especially in forests, treelands, scrub and shrublands (Walls unpubl. data 2014a,b).	regeneration. But a higher level of pest plant surveillance and control would be required.	<ul style="list-style-type: none"><li>• Assistance available where possible.</li></ul>
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**Assessment completed by:** Scott Hooson  
**Date:** 27 January 2015

**Statement completed by:** Scott Hooson  
**Date:** 27 January 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List

List of plant species recorded during botanical surveys of the Millar and Hutchison properties (sourced from Walls unpubl. data (2014a,b)).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Aciphylla subflabellata</i>	speargrass
<i>Alectryon excelsus</i>	titoki
<i>Arthropodium candidum</i>	grass lily, rephinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Austroderia richardii</i>	toetoe
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum minus</i>	swamp kiokio
<i>Blechnum penna-marina</i>	little hard fern
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carex secta</i>	purei, tussock sedge
<i>Carmichaelia australis</i>	native broom, common broom
<i>Carpodetus serratus</i>	putaputaweta
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Convolvulus waitaha</i>	elfin bindweed
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma rotundifolia</i>	round-leaved coprosma
<i>Coprosma virescens</i>	mikimiki
<i>Coprosma wallii</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Corokia cotoneaster</i>	korokio
<i>Crassula sieberiana</i>	dwarf stonecrop
<i>Discaria toumatou</i>	matagouri, wild irishman
<i>Disphyma australe</i>	native iceplant, horokaka
<i>Epilobium nummulariifolium</i>	willow herb
<i>Festuca actae</i>	Banks Peninsula blue tussock
<i>Festuca novae-zelandiae</i>	fescue tussock
<i>Fuchsia excorticata</i>	tree fuchsia
<i>Griselinia littoralis</i>	broadleaf
<i>Haloragis erecta</i>	toatoa
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Hedycarya arborea</i>	pigeonwood
<i>Helichrysum lanceolatum</i>	ninia
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort



<i>Hydrocotyle moschata</i>	pennywort
<i>Hypolepis millefolium</i>	thousand-leaved fern
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Korthalsella lindsayi</i>	dwarf mistletoe
<i>Kunzea robusta</i>	kanuka
<i>Lagenophora pumila</i>	parani
<i>Leptinella dioica</i>	shore button
<i>Leptinella minor</i>	Banks Peninsula button daisy
<i>Linum monogynum</i>	rauhua
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Luzula banksiana var. orina</i>	woodrush
<i>Melicope simplex</i>	poataniwha
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Microlaena stipoides</i>	meadow rice grass, patiti
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Olearia paniculata</i>	akiraho
<i>Ophioglossum coriaceum</i>	adders tongue
<i>Oxalis exilis</i>	native oxalis
<i>Parietaria debilis</i>	
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine, kohia
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Phormium tenax</i>	flax, harakeke
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum eugenioides</i>	tarata, lemonwood
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Pneumatopteris pennigera</i>	gully fern
<i>Poa cita</i>	silver tussock
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax arboreus</i>	five-finger
<i>Pseudopanax crassifolius</i>	lancewood
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Pteridium esculentum</i>	bracken
<i>Pyrosia eleagnifolia</i>	leather leaf fern
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless lawyer, tataramoa
<i>Scandia geniculata</i>	climbing aniseed
<i>Schefflera digitata</i>	pate
<i>Senecio glaucophyllus</i>	yellow rock groundsel



<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Sophora prostrata</i>	prostrate kowhai, dwarf kowhai
<i>Teucrium parvifolium</i>	
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Viola cunninghamii</i>	native violet
<i>Wahlenbergia gracilis</i>	harebell
<b>Exotic Species</b>	
<i>Agrostis capillaris</i>	brown top
<i>Aira caryophylla</i>	silvery hair grass
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Anthriscus caucalis</i>	beaked parsley
<i>Bellis perennis</i>	daisy
<i>Bromus diandrus</i>	rippgut brome
<i>Cerastium glomeratum</i>	chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Critesion murinum</i>	barley grass
<i>Cynosurus echinatus</i>	rough dogstail
<i>Cytisus scoparius</i>	common broom
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Echium vulgare</i>	vipers bugloss
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Lolium perenne</i>	ryegrass
<i>Marrubium vulgare</i>	horehound
<i>Mycelis muralis</i>	wall lettuce
<i>Orobanche minor</i>	broomrape
<i>Petroselinum crispum</i>	wild parsley
<i>Polycarpon tetraphyllum</i>	allseed
<i>Rosa rubiginosa</i>	sweet brier/briar
<i>Rumex acetosella</i>	sheeps sorrel
<i>Sambucus nigra</i>	elderberry
<i>Silene gallica</i>	catchfly
<i>Silybum marianum</i>	variegated thistle
<i>Sisymbrium officinale</i>	hedge mustard
<i>Stellaria media</i>	chickweed
<i>Trifolium dubium</i>	suckling clover
<i>Trifolium repens</i>	white clover
<i>Verbascum thapsus</i>	woolly mullein
<i>Vicia sativa</i>	vetch
<i>Vittadinia gracilis</i>	purple fuzzweed

## Appendix 2: Invertebrate Species List for Mandalay Station

Sourced from Wildland Consultants unpubl. data (2015a)

Order	Family	Scientific Name	Common Name	Species Status
<b>Indigenous species</b>				
ANNELIDA	Megascolecidae	<i>Maoridrilis transalpinus</i>		
		<i>Maoridrilis sp.1</i>		possibly BP endemic species
TUBELLARIA	Geoplanidae	<i>Newzelandia sp. 1</i>		
		<i>Newzelandia sp. 2</i>		
MEGALOPTERA	Corydalidae	<i>Archichauliodes diversus</i>	dobsonfly	
NEUROPTERA	Hemerobiidae	<i>Drepanacra binocula</i>	lacewing	
		<i>Micromus tasmaniae</i>	lacewing	
HEMIPTERA	Tibicinidae	<i>Amphipsalta zealandica</i>	clapping cicada	
		<i>Amphipsalta strepitans</i>	rock cicada	
		<i>Kikihia new species</i>		endemic
	Miridae	<i>Chinamiris virescens</i>		
ORTHOPTERA	Tettigoniidae	<i>Conocephalus bilineatus</i>	katydid	
	Gryllidae	<i>Pteronemobius bigelowi</i>	cricket	
	Rhaphidophoridae	<i>Pleioplectron simplex</i>	cave weta	common

	Anostomatidae	<i>Hemiandrus "peninsularis"</i>		BP endemic
COLEOPTERA	Cerambycidae	<i>Prionoplus reticularis</i>	huhu	
	Carabidae	<i>Megadromus guerini</i>		BP endemic
		<i>Cicindela latecincta</i>	tiger beetle	
		<i>Holcaspis ellongella</i>		common
		<i>Demetridia deiffenbachii</i>		common
	Lucanidae	<i>Paralissotes reticulatus</i>	Reticulate stag beetle	
	Coccinellidae	<i>Coccinella leonina</i>	ladybird	
	Scarabaeidae	<i>Costelytra zelandica</i>	chafer	
		<i>Odontria striata</i>	striped chafer	
	Zopheridae	<i>Pristoderus bakewelli</i>		common
	Curculionidae	<i>Phrynixus sp.</i>	weevil	BP endemic
		Undescribed genus 'Epitimetes'		BP endemic
	Oedemeridae	<i>Thelyphassa nemoralis</i>		common
HYMENOPTERA	Formicidae	<i>Monomorium antarcticum</i>	ant	
	Ichneumonidae	<i>Netelia producta</i>	wasp	
LEPIDOPTERA	Mnesarchaeidae	<i>Mnesarchaea paracosma</i>		
	Hepialidae	<i>Wiseana copularis</i>	porina moth	
		<i>Wiseana umbraculata</i>	striped porina moth	
	Tineidae	<i>Erechthias fulguritella</i>		
		<i>Erechthias charadrota</i>		

		<i>Opogona omoscopa</i>		
		<i>Sagephora phortigera</i>		
	Glyphipterigidae	<i>Glyphipterix achlyoessa</i>		
		<i>Glyphipterix iocheaera</i>		
		<i>Glyphipterix euastera</i>		Naturally Uncommon
	Elachistidae	<i>Cosmiotes ombrodoxa</i>		
	Depressariidae	<i>Eutorna caryochroa</i>		
	Gelechiidae	<i>Anisoplaca achyrota</i>		
		<i>Kiwaia brontophora</i>		
	Oecophoridae	<i>Barea exarcha</i>		
		<i>Gymnobathra parca</i>		
		<i>Gymnobathra sarcoxantha</i>		
		<i>Gymnobathra hamatella</i>		
		<i>Izatha huttoni</i>		
		<i>Izatha katadiktya</i>		
		<i>Izatha convulsella</i>		
		<i>Leptocroca scholaea</i>		
		<i>Leptocroca species</i>		
		<i>Phaeosaces coarctatella</i>		
		<i>Tingena macarella</i>		
		<i>Tingena plagiarella</i>		
		<i>Trachypepla conspicuella</i>		
	Stathmopodidae	<i>Stathmopoda holochra</i>		
		<i>Stathmopoda horticola</i>		
	Tortricidae	<i>Capua semiferana</i>		
		<i>Cnephasia jactatana</i>		
		<i>Ctenopseustis obliquana</i>		

		<i>Epichorista siriana</i>		
		<i>Harmologa amplexana</i>		
		<i>Leucotenes coprosmae</i>		
		<i>Merophyas leucaniana</i>		
		<i>Planotortrix notophaea</i>		
		<i>Planotortrix excessana</i>		
		<i>New genus and species</i>		
	Thyrididae	<i>Morova subfasciata</i>		
	Crambidae	<i>Deana hybreasalis</i>		
		<i>Eudonia philerga</i>		
		<i>Eudonia leptalea</i>		
		<i>Eudonia sabulosella</i>		
		<i>Eudonia submarginalis</i>		
		<i>Eudonia aff. minualis</i>		
		<i>Gadira acerella</i>		
		<i>Glaucocharis lepidella</i>		
		<i>Orocrambus flexuosellus</i>		
		<i>Orocrambus ramosellus</i>		
		<i>Orocrambus vittellus</i>		
		<i>Scoparia chalicodes</i>		
		<i>Scoparia halopis</i>		
		<i>Scoparia minusculalis</i>		
		<i>Udea flavidalis</i>		
		<i>Udea marmarina</i>		
		<i>Uresiphita maorialis</i>	kowhai moth	
	GEOMETRIDAE	<i>Asaphodes aegrota</i>		
		<i>Asaphodes beata</i>		
		<i>Asaphodes chlamydota</i>		
		<i>Austrocidaria callichlora</i>		
		<i>Austrocidaria gobiata</i>		
		<i>Austrocidaria similata</i>		



		<i>Chloroclystis inductata</i>		
		<i>Chloroclystis sphragitis</i>		
		<i>Declana egregia</i>	zebra moth	
		<i>Declana floccosa</i>		
		<i>Declana leptomera</i>		
		<i>Declana junctilinea</i>		
		<i>Epiphyrne undosata</i>		
		<i>Epiphyrne verriculata</i>		
		<i>Epyaxa rosearia</i>		
		<i>Gellonia dejectaria</i>		
		<i>Homodotis megaspilata</i>		
		<i>Helastia cinerearia</i>		
		<i>Helastia corcularia</i>		
		<i>Helastia triphragma</i>		
		<i>Hydriomena deltoidata</i>		
		<i>Hydriomena rixata</i>		
		<i>Ischalis fortinata</i>		
		<i>Orthocylodon praefectata</i>		
		<i>Pasiphila bilineolata</i>		
		<i>Pasiphila muscosata</i>		
		<i>Pasiphila sandycias</i>		
		<i>Pasiphila urticae</i>		
		<i>Pseudocoremia indistincta</i>		
		<i>Pseudocoremia leucelaea</i>		
		<i>Pseudocoremia modica</i>		endemic
		<i>Pseudocoremia pergrata</i>		
		<i>Pseudocoremia suavis</i>		
		<i>Xanthorhoe semifissata</i>		
	Noctuidae	<i>Bityla defigurata</i>		
		<i>Feredayia graminosa</i>		
		<i>Graphania morosa</i>		
		<i>Graphania mutans</i>		
		<i>Graphania phricias</i>		

		<i>Graphania plena</i>		
		<i>Graphania ustistriga</i>		
		<i>Meterana decorata</i>		
		<i>Meterana levis</i>		
		<i>Meterana ochthistis</i>		
		<i>Meterana stipata</i>		
		<i>Persectania aversa</i>		
		<i>Proteuxoa comma</i>		
		<i>Tmetolophota arotis</i>		
		<i>Tmetolophota atristriga</i>		
		<i>Tmetolophota propria</i>		
		<i>Tmetolophota unica</i>		
	Nolidae	<i>Celama parvitis</i>		
	Erebidae	<i>Nyctemera annulata</i>	magpie moth	
		<i>Rhapsa scotoscialis</i>		
		<i>Schrankia costaestrigalis</i>		
	Lycaenidae	<i>Lycaena "common copper"</i>	common copper	
			Nymphalidae	Vanessa gonerilla
ODONATA	Coenagrionidae	<i>Xanthocnemis zelandica</i>	damselfly	
MANTODEA	Mantidae	<i>Orthodera novaezelandiae</i>	praying mantis	
PHASMATODEA	Phasmidae	<i>Clitarchus hookeri</i>	stick insect	
ARANEAE	Lycosidae	<i>Anoteropsis hilaris</i>	Spiders	common
	Gnaphosidae	<i>Zelanda kaituna</i>		BP southern most distribution

	Linyphiidae	<i>Pseudafroneta incerta</i>		Dunedin to Lewis Pass
	Amphinectidae	<i>Maniho ngaitahu</i>		BP endemic
	Agelenidae	? <i>Neoramia sp.</i>		unknown
	Nemesiidae	<i>Stanwellia sp. (probably S.kaituna)</i>		BP endemic
	Miturgidae	<i>Argoctenus sp.</i>		?share with Australia
	Araneidae	<i>Novaranaea queribunda</i>		throughout NZ
	Salticidae	<i>unknown species 1</i>		Unknown
	Thomisidae	<i>Sidymella sp. (probably S. angularis)</i>		throughout NZ
<b>Exotic species</b>				
LEPIDOPTERA	Tortricidae	<i>Cydia succedana</i>	gorse seed pod moth	
	Pieridae	<i>Pieris rapae</i>	white butterfly	

### Appendix 3: Invertebrate Species List for Hutchinson Property

Sourced from Wildland Consultants unpubl. data (2015b)

Order	Family	Scientific Name	Common Name	Species Status
<b>Indigenous species</b>				
MEGALOPTERA	Corydalidae	<i>Archichauliodes diversus</i>	dobsonfly	
NEUROPTERA	Hemerobiidae	<i>Drepanacra binocula</i>	lacewing	
HEMIPTERA	Tibicinidae	<i>Amphipsalta zealandica</i>	clapping cicada	
		<i>Amphipsalta strepitans</i>	rock cicada	
		<i>Kikihia new species</i>		endemic
	Pentatomidae	<i>Dictyotis caenosus</i>	shieldbug	
	Lygaeidae	<i>Nysius huttoni</i>		
		<i>Rhypodes anceps</i>		
	Tettigoniidae	<i>Conocephalus bilineatus</i>		
	Gryllidae	<i>Pteronemobius bigelowi</i>	cricket	
	Acrididae	<i>Phaulacridium marginale</i>	grasshopper	
MEGALOPTERA	Corydalidae	<i>Archichauliodes diversus</i>	dobsonfly	
NEUROPTERA	Hemerobiidae	<i>Drepanacra binocula</i>	lacewing	
HEMIPTERA	Tibicinidae	<i>Amphipsalta zealandica</i>	clapping cicada	

		<i>Amphipsalta strepitans</i>	rock cicada	
		<i>Kikihia new species</i>		endemic
	Pentatomidae	<i>Dictyotis caenosus</i>	shieldbug	
	Lygaeidae	<i>Nysius huttoni</i>		
		<i>Rhyodes anceps</i>		
	Tettigoniidae	<i>Conocephalus bilineatus</i>		
	Gryllidae	<i>Pteronemobius bigelowi</i>	cricket	
	Acrididae	<i>Phaulacridium marginale</i>	grasshopper	
COLEOPTERA	Cerambycidae	<i>Prionoplus reticularis</i>	huhu	
		<i>Zorion species</i>		
	Carabidae	<i>Holcaspis angustula</i>	ground beetles	
		<i>Demetrida dieffenbachi</i>		
		<i>Megadromus antarcticus</i>		
		<i>Megadromus guerinii</i>		BP endemic
		<i>Dicrochile atrata</i>		
	Zopheridae	<i>Pristoderus bakewelli</i>		
	Byrridae	<i>Epichorius sp.</i>		
	Scarabaeidae	<i>Pyronota festiva</i>	manuka beetle	
		<i>Costelytra zealandica</i>	grass grub beetle	
		<i>Odontria varicolourata</i>		
		<i>Odontria 'large'</i>		
	Dermestidae	<i>Trogoderma antennale</i>		
	Oedemeridae	<i>Thelyphassa nemoralis</i>		

	Curculionidae	<i>Cryptorhynchinae sp. indet. 1.</i> <i>Cryptorhynchinae sp. indet. 2.</i>		
	Tenebrionidae	<i>Mimopeus granulatus</i>		BP endemic
	Coccinellidae	<i>Veronicobious sp. 1</i> <i>Veronicobious sp. 2</i>		
ORTHOPTERA	Raphidophoridae	<i>Pleioplectron simplex</i>	cave weta	
	Anostostomatidae	<i>Hemiandrus "peninsularis"</i>	ground weta	BP endemic
HYMENOPTERA	Formicidae	<i>Monomorium antarcticum</i>	ant	
	Ichneumonidae	<i>Netelia producta</i>		
LEPIDOPTERA	Micropterigidae	<i>Sabatinca aenea</i>		
	Hepialidae	<i>Wiseana copularis</i> <i>Wiseana umbraculata</i>	porina moth striped porina moth	
	Psychidae	<i>Reductoderces species</i>	casemoth	
	Tineidae	<i>Erechthias fulguritella</i>		
	Glyphipterigidae	<i>Glyphipterix alchoyossa</i> <i>Glyphipterix oxymacaera</i>		
	Elachistidae	<i>Cosmiotes ombrodoca</i>		
	Lyonetiidae	<i>Bedellia psammitis</i>		
	Yponomeutidae	<i>Zelleria sphenota</i>		At Risk, Declining

	Gelechiidae	<i>Anisoplaca achyrot</i>		
		<i>Kiwaia brontophora</i>		
	Oecophoridae	<i>Barea exarcha</i>		
		<i>Gymnobathra omphalota</i>		
		<i>Gymnobathra hamatella</i>		
		<i>Gymnobathra parca</i>		
		<i>Gymnobathra sarcoxantha</i>		
		<i>Hierodoris s-fractum</i>		
		<i>Izatha huttoni</i>		
		<i>Izatha katadiktya</i>		
		<i>Izatha convulsella</i>		
		<i>Leptocroca scholaea</i>		
		<i>Tingena macarella</i>		
		<i>Tingena melinella</i>		
		<i>Tingena plagiata</i>		
		<i>Trachypepla inconspicuella</i>		
	Tortricidae	<i>Apoctena conditana</i>		
		<i>Capua semiferana</i>		
		<i>Cnephasia jactatana</i>		
		<i>Ctenopseustis obliquana</i>		
		<i>Catamacta gavisana</i>		
		<i>Epichorista siriana</i>		
		<i>Harmologa amplexana</i>		
		<i>Merophyas leucaniana</i>		
	Thyrididae	<i>Morova subfasciata</i>		
	Crambidae	<i>Antiscopa epicomia</i>		
		<i>Deana hybreasalis</i>		
		<i>Eudonia cymatias</i>		
		<i>Eudonia cataxesta</i>		

		<i>Eudonia feredayi</i>		
		<i>Eudonia luminatrix</i>		
		<i>Eudonia manganeutis</i>		
		<i>Eudonia leptalea</i>		
		<i>Eudonia sabulosella</i>		
		<i>Gadira acerella</i>		
		<i>Gadira petraula</i>		Naturally Uncommon
		<i>Glaucocharis auriscriptella</i>		
		<i>Glaucocharis interrupta</i>		
		<i>Glaucocharis lepidella</i>		
		<i>Glaucocharis pyrsophanes</i>		
		<i>Hygraula nitens</i>		
		<i>Orocrambus flexuosellus</i>		
		<i>Orocrambus ramosellus</i>		
		<i>Orocrambus vittellus</i>		
		<i>Udea flavidalis</i>		
		<i>Udea marmarina</i>		
		<i>Uresiphita maoralis</i>		
	GEOMETRIDAE	<i>Asaphodes aegrota</i>		
		<i>Asaphodes beata</i>		
		<i>Asaphodes chlamydata</i>		
		<i>Austrocidaria anguligera</i>		
		<i>Austrocidaria gobiata</i>		
		<i>Chloroclystis inductata</i>		
		<i>Dasyuris partheniata</i>		At Risk, Declining
		<i>Declana leptomera</i>		
		<i>Declana junctilinea</i>		
		<i>Epiphyrne undosata</i>		
		<i>Epiphyrne verriculata</i>		
		<i>Epyaxa lucidata</i>		
		<i>Epyaxa rosearia</i>		
		<i>Homodotis megaspilata</i>		
		<i>Helastia cinerearia</i>		



		<i>Helastia triphragma</i>		
		<i>Ischalis fortinata</i>		
		<i>Orthocydon praefectata</i>		
		<i>Pasiphila muscosata</i>		
		<i>Pasiphila urticae</i>		
		<i>Poecilasthena schistaria</i>		
		<i>Pseudocoremia indistincta</i>		
		<i>Pseudocoremia pergrata</i>		
		<i>Pseudocoremia suavis</i>		
		<i>Xanthorhoe semifissata</i>		
	Noctuidae	<i>Aletia moderata</i>		
		<i>Agrotis ipsilon</i>		
		<i>Bityla defigurata</i>		
		<i>Feredayia graminosa</i>		
		<i>Graphania beata</i>		
		<i>Graphania mutans</i>		
		<i>Graphania omoplaca</i>		
		<i>Graphania plena</i>		
		<i>Graphania ustistriga</i>		
		<i>Meterana coeleno</i>		
		<i>Meterana decorata</i>		
		<i>Meterana levis</i>		
		<i>Persectania aversa</i>		
		<i>Proteuxoa comma</i>		
		<i>Tmetolophota arotis</i>		
		<i>Tmetolophota atristriga</i>		
		<i>Tmetolophota unica</i>		
	Nolidae	<i>Celama parvitis</i>		
	Erebidae	<i>Nyctemera annulata</i>		magpie moth
		<i>Rhapsa scotoscialis</i>		

	Lycaenidae	<i>Lycaena "comon copper"</i>	common copper	
		<i>Lycaena feredayi</i>	glade copper	
	Nymphalidae	<i>Vanessa gonerilla</i>	red admiral	
MANTODEA	Mantidae	<i>Orthodera novaezelandiae</i>	praying mantis	
PHASMATODEA	Phasmidae	<i>Clitarchis hookeri</i>	stick insect	
ARANEAE			Spiders	
	Pisauridae	<i>Dolomedes minor</i>		Common throughout NZ
	Gnaphosidae	<i>Zelanda kaituna</i>		Banks Peninsula to Feilding
	Lycosidae	<i>Anoteropsis hilaris</i>		Common throughout NZ
		<i>Allotrochosina schauinslandi</i>		Common throughout NZ
	Nemesiidae	<i>Stanwellia sp. (probably S.kaituna)</i>		Banks Peninsula
	Linyphiidae	<i>Tenuiphantes tenuis</i>		Introduced and common
		<i>Pseudafroneta incerta</i>		Dunedin to Lewis Pass
	Zoropsodae	<i>Uliodon albopunctatus</i>		Common in NZ
	Thomisidae	<i>Diaea sp. (probably D. ambara)</i>		Common throughout NZ
	Salticidae	<i>unknown species 1</i>		unknown
	Amphinectidae	<i>Aorangia isolata</i>		likely rare BP endemic
	Thomisidae	<i>Sidymella sp. (probably S. angularis)</i>		Common throughout NZ
OPILIONES	Triaenonychidae	<i>Indet. genus &amp; sp.</i>	harvestman	new BP endemic?
COLLEMBOLA	Neanuridae	<i>?Holacanthella sp.</i>	giant springtail	?

Introduced species				
LEPIDOPTERA	Tineidae	<i>Monopis ethelella</i>		
	Geometridae	<i>Chloroclystis filata</i>		
	Pieridae	<i>Pieris rapae</i>	white butterfly	

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Lathams

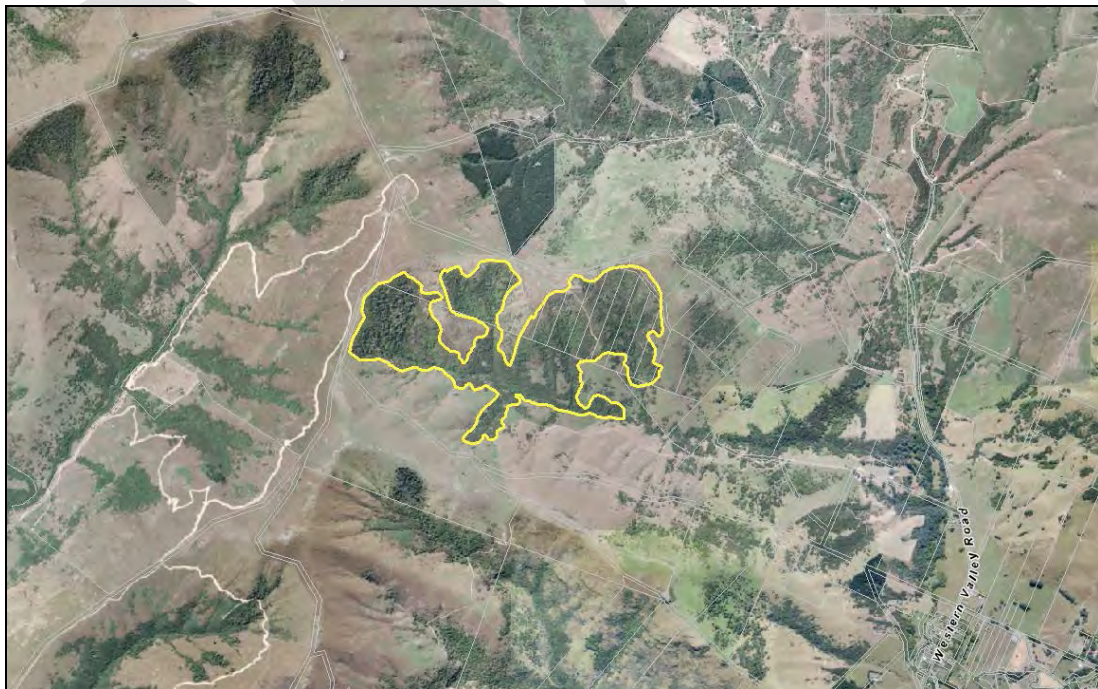
**Site number:** SES/H/19

**Physical address of site:** Western Valley Road, Little River

#### **Summary of Significance:**

The site is significant because it contains a large area of rare and representative indigenous forest including one of the best remnants of old-growth montane thin-barked totara/hardwood forest on Banks Peninsula. The site supports a high diversity of indigenous plant and invertebrate taxa including invertebrates that are nationally At Risk, endemic to Banks Peninsula and uncommon in the ecological district, a large number of plant species that are uncommon in the ecological district or region and a bird species that is uncommon in the ecological district. The site is well buffered, plays an important role in maintaining ecological processes in the wider landscape and is an important habitat for forest birds and invertebrates.

#### **Site Map**



## **Additional Site Information**

**Ecological District:** Herbert

**Area of SES (ha):** 123.67

**Central point (NZTM):** E1581881, N5156424

## **Site Description**

This site is located in a small unnamed valley on the western side of Western Valley, Little River. The valley drains into the Hukahuka Turoa Stream. It is largely on steep south and south-east facing slopes and in gullies in the upper part of the valley. The altitudinal range of the site is from approximately 200 to 660 m above sea level. The Department of Conservation identified the site as a Recommended Area for Protection (Herbert RAP 13 – Latham) (Wilson 1992).

The main vegetation communities identified at the site by (Wildland Consultants unpubl. data 2014a) are:

- Old-growth thin barked totara/mixed hardwood forest on montane slopes
- (Old-growth thin barked totara)/mixed hardwood forest on montane slopes
- Mixed broad-leaved second growth podocarp-hardwood forest on lowland and montane slopes
- Mixed secondary growth podocarp-hardwood forest/scrub
- Secondary growth kanuka forest.

The old-growth montane thin-barked totara/hardwood forest in the Wairewa BPCT covenant is one of the best remnants of its type left on Banks Peninsula (Walls 2010)

## **Extent of Site of Ecological Significance**

The site includes the old-growth montane thin barked totara/ mixed hardwood forest, montane (thin-barked totara)/mixed hardwood forest and scrub and the mixed secondary growth podocarp-hardwood forest and scrub in the upper catchment. It includes both of the BPCT covenants as well as the regenerating forest and scrub east of the Wairewa Extension Covenant. Kanuka forest in the lower valley floor is included in the site because it provides an important link between the areas of higher value forest on the upper slopes.

Connected areas of riparian secondary broad-leaved hardwood forest and kanuka forest downstream of the site are also likely to be significant. However, these areas were not surveyed and there is no up-to-date information to assess their significance. An ecological survey of these areas is recommended.

## **Assessment Summary**

The Lathams Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3 and 4), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The old-growth montane thin-barked totara/mixed hardwood forest in the Wairewa BPCT covenant is one of the best remnants of its type left on Banks Peninsula (Walls 2010). It has a dense canopy large emergent thin-barked totara trees and young thin-barked totara are abundant and regenerating vigorously around the margins. Occasional matai trees are present. The canopy and subcanopy contain a number of different hardwood species, and the understorey is relatively dense and contains a wide variety of small-leaved shrub species, ferns and native vines (Wildland Consultants unpubl. data 2014a).

The second growth forest and shrubland in the Wairewa Extension BPCT covenant and in the remainder of the site is typical of this vegetation community in the ecological district. The canopy is relatively intact and dense and contains a diverse range of regenerating broadleaved species; the most common species being lancewood, mountain totara, kohuhu, lemonwood/tarata, narrow-leaved lacebark, and mahoe. There are a small number of large emergent thin-barked totara trees within the BPCT covenant (Walls 2010, Wildland Consultants unpubl. data 2014a).

The secondary growth kanuka forest is not significant under this criterion. The canopy is dominated by kanuka and there are only occasional hardwood trees such as mahoe, lemonwood, and kowhai. The subcanopy and understorey vegetation is relatively sparse and consists mainly of unpalatable species (Wildland Consultants unpubl. data 2014a).

The site supports a representative assemblage of Banks Peninsula forest bird species (Walls 2010, Wildland Consultants unpubl. data 2014a). A reasonably high proportion of the species in the "Banks Peninsula native bush bird species assemblage" (Crossland unpubl. data 2014) have been recorded at the site (Appendix 1) even though no formal bird monitoring has been undertaken. Walls (2010) noted that the covenanted areas are also likely to be used by morepork, kingfisher, shining cuckoo, welcome swallow and perhaps tui.



The site also supports a representative assemblage of indigenous invertebrates. The species composition is highly characteristic of the species assemblages expected in these habitat types on Banks Peninsula. Of the 127 species recorded only three were exotic (Wildland Consultants unpubl. data 2014b). A list of the invertebrate species recorded at the site is provided in Appendix 2.

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

It is a moderately large example of indigenous forest in the context of the Herbert Ecological District.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The indigenous forest within the site is significant under this criterion because it has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all other indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

Of particular significance is the presence of montane old growth thin-barked totara forest within the site. Old growth forest (of any type) has been reduced to approximately 800 ha or <1% of its original extent on Banks Peninsula (Wilson 2009).

The old growth thin-barked totara at the head of the basin in the western-most gully (below Trig PP and Pt. 684) is also on a Chronically Threatened land environment (F3.3b) where <20% (17.6%) indigenous vegetation is left on this land environment nationally (Walker et al. 2007). The remainder of the site is on an At Risk land environment and is not significant at the level 4 land environment scale.

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports invertebrates that are nationally At Risk, endemic to Banks Peninsula and uncommon in the ecological district, a large number of plant species that are uncommon, either within the ecological district or region, and one bird species that is uncommon in the ecological district.

**Plants**



Wilson (unpubl. data. 1985) recorded *Tmesipteris horomaka* (Threatened - Nationally Critical and endemic to Banks Peninsula) at the site but it was not recorded by Wildland Consultants (unpubl. data 2014a) during a recent botanical survey of part of the site identified by Wilson (1992).

A number of plant species occur at the site (Wildland Consultants unpubl. data 2014a) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013):

- *Anisotome aromatica*
- *Blechnum colensoi*
- *Blechnum novae-zelandiae*
- *Epilobium brunnescens*
- *Epilobium pedunculare*
- *Histiopteris incisa*
- *Juncus novae-zelandiae*
- *Luzula picta*
- *Nematoceras trilobus*
- *Notogrammitis billardierei*
- *Olearia ilicifolia*
- *Schizeilema trifoliolatum*
- *Senecio wairauensis*

Walls (2010) also recorded the following plant species that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) with the BPCT covenants:

- *Blechnum colensoi* (Wairewa Covenant)
- *Blechnum novae-zelandiae* (Wairewa and Wairewa Extension Covenants)
- *Histiopteris incisa* (Wairewa Covenant)
- *Olearia ilicifolia* (Wairewa Extension Covenants)
- *Raukaua anomalus*
- *Tmesipteris tannensis* (Wairewa Covenant)
- *Wahlenbergia albomarginata* (Wairewa Covenant)

### **Birds**

One bird species that is uncommon in the Herbert ED occurs at the site Wildland Consultants unpubl. data 2014a):

- South Island rifleman.

### **Invertebrates**

Nationally At Risk invertebrate species recorded from the site (Wildland Consultants unpubl. data 2014b) are:

- *Zelandobius wardi* (Ward's stonefly) (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Cosmiotes helonoma* (grass runner) (At Risk – Relict)

Invertebrates recorded from the site (Wildland Consultants unpubl. data 2014) that are endemic to Banks Peninsula are:





- *Celatoblatta peninsularis* (Banks cockroach)
- *Zelandobius wardi* (Ward's stonefly)

Invertebrates recorded from the site (Wildland Consultants unpubl. data 2014) that are uncommon in the Herbert Ecological District are:

- *Argyrophenga antipodum* (tussock butterfly) (uncommon in ecological district) – one of three known locations on Banks Peninsula

**5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.***

The site is not significant under this criterion. There are no species at their distributional limits within Canterbury Region or nationally

**6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

The site is not significant under this criterion. It does not contain vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.

**Diversity and Pattern**

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

The diversity of vegetation communities and ecological sequences is moderate. There are several forest communities including old-growth montane totara-hardwood forest, montane (thin-barked totara)/mixed hardwood forest, secondary growth podocarp-hardwood forest and scrub and secondary growth kanuka forest. Despite the moderate number of vegetation communities the site contains a high diversity of indigenous plant taxa. Wildland Consultants (unpubl. data 2014a) recorded 95 indigenous plant species during a survey of part of the site. This included 20 ferns and 22 tree species (a list of the plant species recorded at the site is provided in Appendix 3). This diversity reflects the altitudinal sequence from 200 to 660 m above sea level, moist conditions on the upper slopes, the relatively intact understorey within those areas of the site that are fenced to exclude stock and the diversity of shrubs, grasses and sedges in forest edge ecotones and early successional vegetation communities.

The site also contains a diverse indigenous invertebrate fauna. A recent survey (Wildland Consultants unpubl. data 2014b) (which targeted moths and butterflies) found 127 species, of which 106 were moths and butterflies. A list of the invertebrate species recorded at the site is provided in Appendix 2.



## Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

It is a relatively large area that is well buffered by kanuka forest and secondary growth podocarp-hardwood forest and scrub.

Kanuka forest in the lower valley floor is significant under this criterion because it provides an important link between the areas of higher value forest on the upper slopes, and buffers and shades the stream that flows through the bottom of the valley.

The large size of the site and the relative intactness and diversity of the higher value forest within the site means it plays an important role in maintaining ecological processes in the wider landscape. It is also part of a network of ecological important old-growth forest in the wider area including in the head of Prices Valley and the Kaituna Spur and Waipuna Saddle Scenic Reserves. These areas are important 'stepping stones' for the movement and dispersal of mobile indigenous fauna such as New Zealand pigeon.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site.

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

This large area of forest, which includes old-growth podocarp forest and other areas of relatively intact secondary forest, provides important permanent habitat for a large number of indigenous forest birds. Those species recorded at the site are rifleman (which are uncommon in the ecological district), South Island tomtit, brown creeper, bellbird, New Zealand wood pigeon, Australasian harrier, South Island fantail, grey warbler, silvereye and New Zealand pipit (At Risk – Declining) (Walls 2010, Wildland Consultants unpubl. data 2014a). It also provides important seasonal feeding habitat for New Zealand pigeon.

The site also provides important habitat for a diverse range of indigenous invertebrates including species that are nationally At Risk, endemic to Banks Peninsula and uncommon in the ecological district (Wildland Consultants unpubl. data 2014b).

## Site Management

### Existing Protection Status

There are Two Banks Peninsula Conservation Trust Covenants within the site; the Wairewa Covenant (9.3 ha) and Wairewa Extension Covenant (11.2 ha). Remaining areas are not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Pest animals.</li> <li>• Goats. There are feral goats within the site (Wildland Consultants unpubl. data 2014a).</li> <li>• Possums. Possums numbers appear to be high relative to other areas on Banks Peninsula (Walls 2010, Wildland Consultants unpubl. data 2014a). They have caused severe damage to tree fuchsia in the past and thin-barked totara and understory seedlings have also been damaged by possums (Walls 2010).</li> </ul>	<ul style="list-style-type: none"> <li>• Consider removing goats. Goats are a serious threat to the ecological values of the site. They also have the potential to spread onto neighbouring properties and into other areas with high ecological values. Not removing goats poses a significant threat to the success of the multi-agency Banks Peninsula Feral Goat Eradication Programme.</li> <li>• Consider monitoring possum numbers within the site and maintaining possum numbers at low densities using one or a combination of spotlighting, bait stations or kill trapping.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with the landowner about the benefits to biodiversity of goat control.</li> <li>• Assistance for the landowner with goat control if agreed.</li> <li>• Advice and guidance for landowner about monitoring and control of possums, with assistance as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>• Biodiversity pest plants. There are very few weeds of concern within the covenants. Elderberry is rare and there is some gorse, including on the margins of the covenants (Walls 2010).</li> <li>• Other biodiversity pest plants recorded within the site are: burdock (several small plants near the stream in the kanuka forest),</li> </ul>	<ul style="list-style-type: none"> <li>• Gorse is not a threat to the ecological values of the site and control is not necessary.</li> <li>• Consider removing burdock which is a Restricted Pest in the ECan Regional Pest Management Strategy.</li> <li>• Consider ongoing weed surveillance for biodiversity pest plants such as sycamore and</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowner about pest plant monitoring and control.</li> <li>• Assistance where appropriate.</li> </ul>

(Wildland Consultants unpubl. data 2014a).	Darwin's barberry.	
<ul style="list-style-type: none"> <li>Fencing. BPCT covenants that cover part of the site are well fenced and free of domestic stock (Walls 2010). Stock have access to other areas of forest within the site.</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing other areas of forest and scrub to promote natural regeneration and improve understorey structure and diversity.</li> <li>Consider fencing the areas of exotic grass, regenerating scrub and treeland between the three large forest areas on the upper slopes (including the two BPCT covenants). Removing stock from these areas would promote natural regeneration and improve the shape of the site, increase its size, improve habitat connectivity and buffering and reduce threats associated with past habitat fragmentation including edge related effects.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the benefits of stock control for biodiversity and discussion about options available.</li> <li>Assistance available as appropriate.</li> </ul>

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**Date:** 30 January 2015

**Statement completed by:** Scott Hooson  
**Date:** 30 January 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Indigenous Banks Peninsula Native Bush Bird Species Assemblage

Comparison of bird species recorded at Lathams (Walls 2010, Wildland Consultants unpubl. data 2014a) with the “Banks Peninsula Native Bush Bird Species Assemblage” (Crossland 2014).

Species recorded at the study site are marked with a tick ✓.

	Common name	Scientific Name
✓	Australasian harrier	<i>Circus approximans</i>
✓	Bellbird	<i>Anthornis melanura melanura</i>
✓	Brown creeper	<i>Mohua novaeseelandiae</i>
✓	Grey warbler	<i>Gerygone igata</i>
	Morepork	<i>Ninox novaeseelandiae novaeseelandiae</i>
	New Zealand falcon	<i>Falco novaeseelandiae</i>
	New Zealand kingfisher	<i>Halcyon sancta vagans</i>
✓	New Zealand pigeon	<i>Hemiphaga novaeseelandiae novaeseelandiae</i>
	Shining cuckoo	<i>Chrysococcyx lucidus lucidus</i>
✓	Silvereye	<i>Zosterops lateralis lateralis</i>
✓	South Island fantail	<i>Rhipidura fuliginosa fuliginosa</i>
✓	South Island rifleman	<i>Acanthisitta chloris chloris</i>
✓	South Island tomtit	<i>Petroica macrocephala macrocephala</i>
	Tui	<i>Prothemadera novaeseelandiae novaeseelandiae</i>
	Welcome swallow	<i>Hirundo tahitica neoxena</i>



## Appendix 2: Invertebrate Species List

Sourced from Wildland Consultants unpubl. data (2014b)

\* = exotic species

ORDER/Family/genus/species	Common Name
<b>MEGALOPTERA</b>	dobsonfly
<b>Corydalidae</b>	
<i>Archichauliodes diversus</i>	
<b>NEUROPTERA</b>	lacewings
<b>Hemerobiidae</b>	
<i>Drepanacra binocula</i>	
* <i>Micromus tasmaniae</i>	
<b>HEMIPTERA</b>	
<b>Tibicinidae</b>	cicada
<i>Amphipsalta zelandica</i>	<i>clapping cicada</i>
<b>Acanthosomatidae</b>	
<i>Rhopalimorpha lineolaris</i>	
<b>Lygaeidae</b>	
<i>Nysius huttoni</i>	
<b>Miridae</b>	
<i>Bipuncticoris species</i>	
<b>ORTHOPTERA</b>	
<b>Tettigoniidae</b>	katydid
<i>Conocephalus bilineatus</i>	
<b>Gryllidae</b>	cricket
<i>Pteronemobius bigelowi</i>	
<b>Anastostomatidae</b>	
<i>Hemideina femorata</i>	
<b>COLEOPTERA</b>	
<b>Carabidae</b>	ground beetles
<i>Megadromus antarcticus</i>	
<b>Cerambycidae</b>	
<i>Prionoplus reticularis</i>	<i>huhu</i>
<b>Coccinellidae</b>	
<i>Coccinella leonina</i>	<i>ladybird</i>
<b>Elateridae</b>	click beetle
Species not identified?	large species found in forest
<b>Scarabaeidae</b>	chafers
<i>Costelytra zelandica</i>	
<i>Odontria striata</i>	<i>striped chafer</i>
<i>Odontria species</i>	
<i>Pyronota festiva</i>	
<b>HYMENOPTERA</b>	
<b>Ichneumonidae</b>	
<i>Netelia producta</i>	
<b>LEPIDOPTERA</b>	
<b>Hepialidae</b>	porina moths





<i>Wiseana copularis</i>	
<b>Nepticulidae</b>	
<i>Stigmella fulva</i>	
<b>Tineidae</b>	
<i>Erechthias charadrota</i>	
<i>Opogona comptella</i>	
<b>Psychidae</b>	
<i>Liothula omnivora</i>	
<b>Glyphipterigidae</b>	
<i>Glyphipterix alchoyossa</i>	
<i>Glyphipterix triselena</i>	
<i>Glyphipterix brachyacma</i>	
<i>Glyphipterix erastis</i>	
<b>Elachistidae</b>	
<i>Cosmiotes helonoma</i>	
<i>Cosmiotes ombrodoca</i>	
<b>Lyonetiidae</b>	
<i>Bedellia psammitis</i>	
<b>Gelechiidae</b>	
<i>Anisoplaca achyrota</i>	
<b>Oecophoridae</b>	
<i>Barea exarcha</i>	
<i>Gymnobathra hamatella</i>	
<i>Gymnobathra parca</i>	
<i>Gymnobathra calaginoso</i>	
<i>Gymnobathra tholodella</i>	
<i>Izatha huttoni</i>	
<i>Izatha katadiktya</i>	
<i>Leptocroca scholaea</i>	
<i>Sthamopoda aposema</i>	
<i>Sthamopoda horticola</i>	
<i>Tingena basella</i>	
<i>Tingena crotala</i>	
<i>Tingena melanamma</i>	
<i>Tingena marcida</i>	
<i>Tingena macarella</i>	
<i>Tingena siderodeta</i>	
<i>Trachypepla euryleucota</i>	
<b>Tortricidae</b>	leaf rollers
<i>Capua semiferana</i>	
<i>Cnephasia jactatana</i>	
<i>Ctenopseustis obliquana</i>	
<i>Epichorista siriana</i>	
<i>Harmologa amplexana</i>	
<i>Catamacta gavisana</i>	
<i>New genus and species</i>	
<b>Crambidae</b>	
<i>Antiscopa epicomia</i>	
<i>Deana hybreasalis</i>	
<i>Eudonia cymatias</i>	
<i>Eudonia dinodes</i>	
<i>Eudonia feredayi</i>	
<i>Eudonia luminatrix</i>	



<i>Eudonia minualis</i>	
<i>Eudonia philerga</i>	
<i>Eudonia leptalea</i>	
<i>Eudonia manganeutis</i>	
<i>Eudonia microphthalma</i>	
<i>Eudonia sabulosella</i>	
<i>Eudonia submarginalis</i>	
<i>Eudonia aff. minualis</i>	
<i>Glaucocharis auriscriptella</i>	
<i>Orocrambus flexuosellus</i>	
<i>Orocrambus ramosellus</i>	
<i>Scoparia halopis</i>	
<i>Scoparia minusculalis</i>	
<i>Udea flavidalis</i>	
<i>Udea marmarina</i>	
<i>Uresiphita maoralis</i>	
<b>GEOMETRIDAE</b>	
<i>Asaphodes beata</i>	
<i>Asaphodes chlamydota</i>	
<i>Austrocidaria anguligera</i>	
<i>Austrocidaria callichlora</i>	
<i>Austrocidaria gobiata</i>	
<i>Austrocidaria similata</i>	
* <i>Chloroclystis filata</i>	
<i>Chloroclystis inductata</i>	
<i>Declana egregia</i>	
<i>Declana junctilinea</i>	
<i>Elvia glaucata</i>	
<i>Epiphyrne undosata</i>	
<i>Epyaxa rosearia</i>	
<i>Gellonia dejectaria</i>	
<i>Gellonia pannularia</i>	
<i>Homodotis megaspilata</i>	
<i>Helastia cinerearia</i>	
<i>Helastia corcularia</i>	
<i>Hydriomena deltoidata</i>	
<i>Ischalis fortinata</i>	
<i>Pasiphila muscosata</i>	
<i>Pasiphila malachita</i>	
<i>Pasiphila sandycias</i>	
<i>Pasiphila urticae</i>	
<i>Poecilasthena schistaria</i>	
<i>Pseudocoremia fasciculata</i>	
<i>Pseudocoremia pergrata</i>	
<i>Pseudocoremia productata</i>	
<i>Pseudocoremia suavis</i>	
<i>Pseudocoremia lactiflua</i>	
<b>Noctuidae</b>	
<i>Graphania morosa</i>	
<i>Graphania mollis</i>	
<i>Graphania mutans</i>	
<i>Graphania omoplaca</i>	
<i>Graphania plena</i>	



<i>Graphania ustistriga</i>	
<i>Meterana decorata</i>	
<i>Meterana new species</i>	
<i>Persectania aversa</i>	
<i>Tmetolophota atristriga</i>	
<i>Tmetolophota sulcana</i>	
<b>Erebidae</b>	
<i>Celama parvitis</i>	
<i>Rhapsa scotoscialis</i>	
<b>Lycaenidae</b>	coppers/ blues
<i>Lycaena "comon copper" complex</i>	
<i>Zizina oxleyi</i>	
<b>Nymphalidae</b>	admirals
<i>Argyrophenga antipodum</i>	tussock
<i>Vanessa gonerilla</i>	red admiral
<i>Vanessa itea</i>	yellow admiral
<b>Pieridae</b>	white butterfly
<i>*Pieris rapae</i>	
<b>PLECOPTERA</b>	stonefly
<b>Gripopterygidae</b>	
<i>Zelandobius wardi</i>	
<b>PHASMIDA</b>	stick insect
<i>Clitarchus hookeri</i>	
<b>BLATTODEA</b>	cockroach
<b>Blattidae</b>	
<i>Celatoblatta peninsularis</i>	



### Appendix 3: Plant Species List

Sourced from Wildland Consultants unpubl. data (2014a).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Anisotome aromatica</i>	kopoti
<i>Aristotelia serrata</i>	wineberry, makomako
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Astelia fragrans</i>	bush lily, kakaha
<i>Austroderia richardii</i>	toetoe
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum colensoi</i>	Colenso's hard fern, peretao
<i>Blechnum discolor</i>	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum penna-marina</i>	little hard fern
<i>Blechnum novae-zelandiae</i>	kiokio
<i>Blechnum procerum</i>	small kiokio
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carex breviculmis</i>	grassland sedge
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carex forsteri</i>	cutty grass
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Clematis paniculata</i>	puawananga
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coriaria arborea</i>	tree tutu
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Crassula colligata</i>	stonecrop
<i>Cyathea smithii</i>	Smith's tree fern, katote
<i>Dicksonia squarrosa</i>	wheki
<i>Epilobium brunnescens</i> subsp. <i>brunnescens</i>	willow herb
<i>Epilobium nummulariifolium</i>	creeping willow herb
<i>Epilobium pedunculare</i>	willow herb
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Geranium aff. microphyllum</i>	native geranium
<i>Griselinia littoralis</i>	broadleaf, kapuka



<i>Hebe salicifolia</i>	koromiko
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Helichrysum lanceolatum</i>	niñiao
<i>Histiopteris incisa</i>	water fern
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Hypolepis millefolium</i>	thousand-leaved fern
<i>Hypolepis rufobarbata</i>	sticky pig fern
<i>Juncus edgariae</i>	leafless rush, wi
<i>Juncus novae-zelandiae</i>	dwarf rush
<i>Kunzea ericoides</i>	kanuka
<i>Lagenophora pinnatifida</i>	parani
<i>Lagenophora strangulata</i>	parani
<i>Leptopteris hymenophylloides</i>	crepe fern, heruheru
<i>Luzula picta</i>	woodrush
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rata
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myrsine australis</i>	red mapou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Nematoceras trilobum</i>	spider orchid
<i>Notogrammitis billardierei</i>	common strap fern
<i>Olearia ilicifolia</i>	NZ holly, hakeke
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	native oxalis
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Poa cita</i>	silver tussock
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus cunninghamii</i>	mountain totara, thin-barked totara
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pteridium esculentum</i>	bracken
<i>Pterostylis sp.</i>	green-hooded orchid
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rytidosperma species</i>	danthonia
<i>Schefflera digitata</i>	pate, seven-finger
<i>Schizilema trifoliolatum</i>	
<i>Senecio wairauensis</i>	native fireweed
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Uncinia rubra</i>	hook grass
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Urtica incisa</i>	bush nettle



<b>Exotic Species</b>	
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Arctium minus</i>	burdock
<i>Bellis perennis</i>	daisy
<i>Callitriche stagnalis</i>	starwort
<i>Cerastium glomeratum</i>	chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Juncus bufonius</i>	toad rush
<i>Juncus effusus</i>	soft rush
<i>Leontodon taraxacoides</i>	hawkbit
<i>Lolium perenne</i>	ryegrass
<i>Luzula multiflora</i>	woodrush
<i>Mimulus guttatus</i>	monkey musk
<i>Mimulus moschatus</i>	musk
<i>Mycelis muralis</i>	wall lettuce
<i>Nasturtium officinale</i>	watercress
<i>Pilosella officinarum</i>	mouse-ear hawkweed
<i>Poa annua</i>	annual poa
<i>Prunella vulgaris</i>	selfheal
<i>Sagina procumbens</i>	procumbent pearlwort
<i>Stellaria media</i>	chickweed
<i>Trifolium repens</i>	white clover
<i>Ulex europaeus</i>	gorse
<i>Veronica arvensis</i>	field speedwell
<i>Vicia sativa</i>	vetch



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Western Slopes of Mid Prices Valley

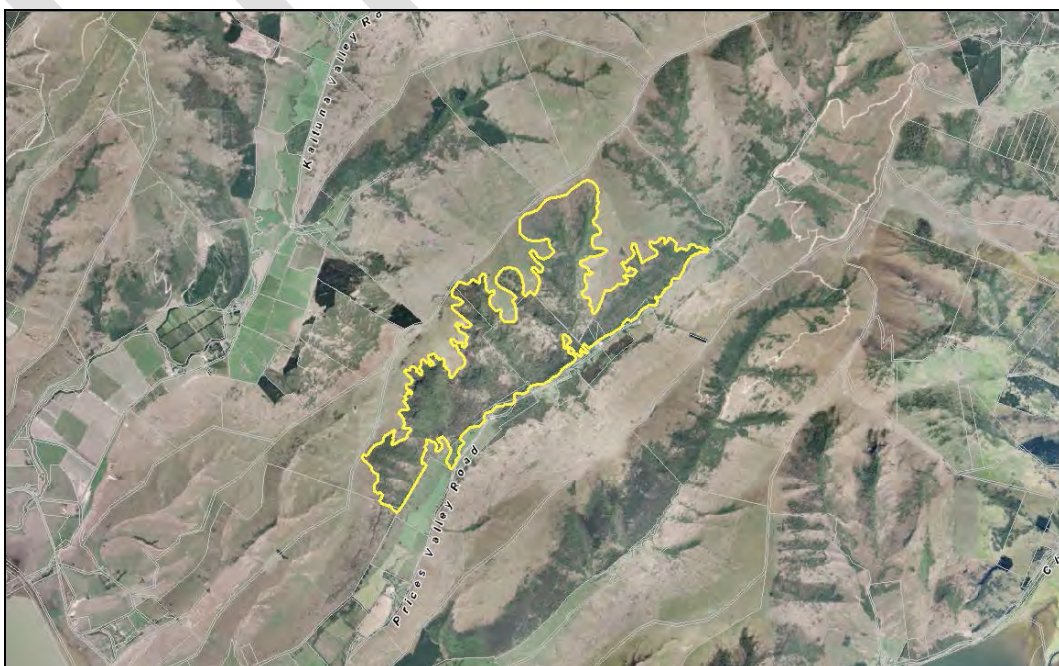
**Site number:** SES/H/20

**Physical address of site:** Prices Valley, Little River

#### Summary of Significance:

This site is significant because it contains a large area of relatively intact and diverse indigenous vegetation that includes rare and representative communities that support a very diverse range of indigenous taxa. This includes an outstanding number of nationally Threatened and At Risk indigenous plants, fish, aquatic invertebrates and terrestrial invertebrates (including large populations of some At Risk plant species), a number of plant and invertebrate species that are endemic to Banks Peninsula or uncommon within the ecological region or ecological district, seven plant species and two invertebrate species that are at their distributional limits on Banks Peninsula. It contains two ecosystems that are originally rare on a national scale. The site is well buffered, plays an important role in maintaining ecological processes in the wider landscape and is part of an important network of areas in Prices Valley and in the surrounding area. It also provides important habitat for indigenous forest birds, lizards and terrestrial invertebrates.

#### Site Map



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 290.61

**Central point (NZTM):** E1576984, N5154581

## Site Description

This site is the western side of Prices Valley above the Prices Valley QEII covenant. It covers an extensive area of steep forested slopes and gullies with rock bluffs and scarps with very high ecological values. The altitudinal range of the site is approximately 80 to 580 m above sea level. The Department of Conservation identified the site as a Recommended Area for Protection (Herbert RAP 11 – Lower Prices) (Wilson 1992).

The site is covered in a complex mosaic of indigenous dominated vegetation including remnant podocarp treeland, podocarp/broadleaved-hardwood forest, kanuka forest, treeland, scrub, shrublands, tussocklands and grasslands. The main vegetation communities identified at the site by Walls unpubl. data (2015) are:

- Kahikatea-matai-lowland totara/lowland ribbonwood-narrow leaved lacebark-kowhai treeland on lowland alluvial surfaces
- Matai-lowland totara/mixed broadleaf second-growth hardwood forest on lowland hill slopes
- Kanuka forest and treeland on lowland hill slopes
- Indigenous small-leaved scrub and shrubland on lowland hill slopes
- (Prostrate kowhai-*Coprosma crassifolia*)/lichens-(moss spp.) rockland on numerous cliffs, shelves and major outcrops of basaltic rock in the site.
- Indigenous small-leaved shrubs/silver tussock/exotic pasture on lowland hill slopes
- Silver tussock-hard tussock tussockland on hill slopes above 250m above sea level

It supports a very high diversity of plant taxa and is distinctive for the abundance of nationally and locally rare and uncommon species such as fierce lancewood, fragrant tree daisy, *Teucrium parvifolium* and bamboo grass. It is also of importance because of the high number of plant taxa that are at their distributional limits on Banks Peninsula.

## Extent of Site of Ecological Significance

The site includes the indigenous dominated vegetation communities on the western slopes of the site and the kahikatea-matai-lowland totara/lowland ribbonwood-narrow leaved lacebark-kowhai treeland growing amongst pasture on the valley floor.





## Assessment Summary

The Lower Prices Valley Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below). Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

Overall, the vegetation communities within the site are representative of those that would have been present in the Herbert Ecological District at a baseline of 1840. The site supports a complex mosaic of indigenous dominated vegetation including areas of old growth and secondary forest. These communities are regenerating strongly where stock access is impeded and support an outstanding diversity of plant taxa including a high number of nationally At Risk species and species at their distributional limits on Banks Peninsula.

Podocarp treeland comprised of large remnant kahikatea, matai and totara survive on the alluvial flats of the main valley amongst scattered broadleaved-hardwood trees. The canopy, understorey and ground tiers are completely absent and the large podocarp trees survive amongst grazed exotic pasture. However, lowland alluvial podocarp forest is extremely rare on Banks Peninsula. Although this vegetation community is highly degraded examples such as this are significant under this criterion.

The mature regenerating secondary forest and treeland on the slopes above the valley floor has remnant matai and totara trees and is characterised by canopy species such as lowland ribbonwood, narrow-leaved lacebark, ngaio, titoki, five-finger, fierce lancewood, tarata, broadleaf, mahoe, kowhai and kaikomako that are typical of this vegetation type in the ecological district. The undergrowth, although depleted by domestic stock and feral deer, is very dense and diverse in places (Walls unpubl. data 2015). Within these forested areas there is a high proportion of indigenous plant species. These communities are representative of regenerating lowland secondary forests in the ecological district.

The extensive rock outcrops and faces are still relatively intact structurally and compositionally (Walls unpubl. data 2015).

Other parts of the site reflect more recent farming practices. These areas are dominated by scrub and shrublands and silver and fescue tussock. Shrublands and scrub reflect past forest clearance and farming, but are extensive, in good



condition and composed almost exclusively of indigenous species that would have been present in 1840.

Tussock grassland on higher slopes have been modified by stock and exotic pasture grasses and herbs are abundant and foxglove is common. This vegetation community is not significant under this criterion.

The hill slopes and valley floor forest margins support an assemblage of indigenous invertebrates that is close in composition to what would be expected of lowland forest in the ecological district, although there are a few notable absences. It includes a particularly high number of species that are Threatened and At Risk, endemic to Banks Peninsula and uncommon in the ecological district. Of the 264 species recorded only nine (3.4%) were exotic (Wildland Consultants and Boffa Miskell unpubl. data 2015). Using Coleoptera as a sample group<sup>1</sup>, for the Wangan Hills valley floor and hill slopes indigenous Coleoptera species made up 94.8% and 96.3% of the total beetle fauna collected. These are very high proportions for predominantly secondary vegetation communities compared to other surveyed sites and indicate the invertebrate fauna is highly natural. A list of the invertebrate species recorded at the site is provided in Appendices 2 and 3.

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

The site is one of the most extensive areas of indigenous vegetation (podocarp/hardwood forest and treeland, second growth hardwood forest and treeland, kanuka forest and treeland, scrub, shrubland, and tussockland) in the Herbert Ecological District.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The forest within the site is significant under this criterion because forest has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

Large emergent remnant podocarps (kahikatea, matai, and lowland totara) occur on the valley floor and in gullies on the slopes. Remnants of old growth forest are extremely rare on Banks Peninsula. Old growth forest has been reduced to approximately 800 ha or <1% of its original extent on Banks Peninsula (Wilson

<sup>1</sup> The proportion of indigenous species to the total number of beetle species collected provides a useful indication of the intactness of the invertebrate fauna (Boffa Miskell and Wildland Consultants 2015).



2009). In particular remnant podocarp trees on the alluvial valley floor are extremely rare anywhere on Banks Peninsula (Wilson 1992) and even remnant trees growing amongst pasture are significant under this criterion.

Seral vegetation communities such as secondary kanuka forest and treeland and small leaved shrubland and scrub that occur within the site have expanded their range in the ecological district as a result of human disturbance. However, the extent of all indigenous woody vegetation in the ecological district is estimated to be only 10.9% (New Zealand Landcover Database (Version 4)).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports an outstanding number of nationally Threatened and At Risk indigenous species including plants, fish, aquatic invertebrates and terrestrial invertebrates. It also supports a number of plant and invertebrate species that are endemic to Banks Peninsula or uncommon within the ecological region or ecological district.

**Plants**

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site are:

- *Aciphylla subflabellata* (At Risk - Declining) – a few plants in tussockland on the upper slopes (Walls unpubl. data 2015)
- *Coprosma virescens* (At Risk - Declining) - abundant throughout the site (Walls unpubl. data 2015, Jensen unpubl. data 2014).
- *Olearia fragrantissima* (At Risk - Declining) – frequent in secondary broadleaved forest and treeland and in shrubland and scrub (Walls 2001, unpubl. data 2015)
- *Teucrium parvifolium* (At Risk - Declining) (Walls unpubl. data 2015, Jensen unpubl. data 2014)
- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to Banks Peninsula) (Walls unpubl. data 2015, Jensen unpubl. data 2014)
- *Festuca actae* (At Risk - Naturally Uncommon, endemic to Banks Peninsula) (Walls unpubl. data 2015)
- *Leptinella minor* (At Risk - Naturally Uncommon, endemic to Banks Peninsula) (Walls unpubl. data 2015)
- *Pseudopanax ferox* (At Risk – Naturally Uncommon) - abundant in secondary broadleaved forest and treeland and in shrubland and scrub (Walls unpubl. data 2015) (Walls unpubl. data 2015)
- *Senecio glaucophyllus subsp. basinudus* (At Risk - Naturally Uncommon) (Walls unpubl. data 2015)

Plant species recorded from the site (Walls unpubl. data 2015) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Australina pusilla* (Jensen unpubl. data 2014)
- *Carex secta* (Walls unpubl. data 2015)
- *Carex virgata* (Walls unpubl. data 2015)



- *Phlegmariurus varius* (Jensen unpubl. data 2014)
- *Lastreopsis velutina* (Walls unpubl. data 2015, Jensen unpubl. data 2014)
- *Leptospermum scoparium* (Jensen unpubl. data 2014)
- *Meliccytus micranthus* (Walls unpubl. data 2015)
- *Microlaena polynoda* (Walls unpubl. data 2015) - uncommon in Banks Ecological Region and in Canterbury (Wilson 1992)
- *Pellaea calidirupium* (Walls unpubl. data 2015) - rare in ecological district and region (Wilson 1992)
- *Pyrrosia eleagnifolia* (Walls unpubl. data 2015, Jensen unpubl. data 2014)
- *Raukaua anomalus* (Walls unpubl. data 2015)

### Invertebrates

Nationally Threatened and At Risk invertebrate species recorded from the site (Wildland Consultants and Boffa Miskell unpubl. data 2015) are:

- *Epichorista lindsayi* (Threatened - Nationally Endangered)
- New genus and species (*Teucrium* miner) (Threatened - Nationally Vulnerable)
- *Orchymontia banksiana* Ordish a cascade beetle (Threatened - Nationally Endangered)
- *Costachorema* caddisfly (Threatened - Nationally Vulnerable)
- New genus and species *Teucrium* miner (Threatened - Nationally Vulnerable)
- *Declana griseata* (At Risk - Declining)
- *Tatosoma agrionata* (At Risk - Declining)
- *Zelleria sphenota* (mistletoe miner) (At Risk - Declining)
- *Stathmopoda endotherma* (moth) (At Risk, Naturally Uncommon) (Patrick 2014)
- *Mimopeus granulatus* (Breme) darkling beetle (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Zeadelium zealandicum* (Bates) darkling beetle (At Risk - Naturally Uncommon)
- *Stanwellia kaituna* (spider) (Naturally Uncommon) (C. Vink pers. comm. 2014)
- *Cantuarina borealis* (spider) (Naturally Uncommon) (C. Vink pers. comm. 2014)

Endemic invertebrate species recorded from the site (Wildland Consultants and Boffa Miskell unpubl. data 2015) are:

- *Hemiandrus* sp. a ground weta BP endemic
- *Megadromus guerinii* (Chaudoir) a ground beetle BP endemic
- *Molopsida strenua* (Broun) a ground beetle southernmost known collection
- *Holcaspis elongella* (White) a ground beetle Canterbury endemic
- *Celatoblatta peninsularis* (cockroach) (endemic to Banks Peninsula)
- *Kikihia* new species (cicada) (endemic to Banks Peninsula)
- *Zelanda kaituna* (endemic to Banks Peninsula)
- *Stanwellia kaituna* (spider) (endemic to Banks Peninsula) (C. Vink pers. comm. 2014)
- *Cantuarina borealis* (spider) (endemic to Banks Peninsula) (C. Vink pers. comm. 2014)



Invertebrates recorded from the site (Wildland Consultants and Boffa Miskell unpubl. data 2015) that are uncommon in the Herbert Ecological District are:

- *Calicotis crucifera*
- *Nola parvitis*
- *Pasiphila rivalis*
- *Scoparia molifera*
- *Philocryptica polypodii*

### Fish

Nationally At Risk fish species (Goodman et al. 2014) recorded from the site (EOS unpubl. data 2015) are:

- Inanga (At Risk - Declining)
- Longfin (eel At Risk - Declining)
- Redfin bully (At Risk - Declining)

### Aquatic invertebrates

A nationally Threatened aquatic invertebrate (Grainger et al. 2014) was recorded in Prices Valley Stream (EOS unpubl. data 2015):

- *Orchymontia banksiana* (Threatened - Nationally Endangered)

### 5. **The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

The number of species at their distributional limits is a feature of the site. There are seven plant species that are at their distributional limits on Banks Peninsula (Wilson 2013) including five species are at their southern national distributional limits, one is at its southern regional limit and one is at its northern national limit. There is also two invertebrate species at their southern national distributional limits, including one which is a new southern limit.

### Plants

Species at their southern national distributional limits are:

- Titoki (*Alectryon excelsus*) (southern national limit) (Walls unpubl. data 2015)
- Akeake (*Dodonaea viscosa*) (southern national limit) (Walls unpubl. data 2015, Jensen unpubl. data 2014)
- Native passion vine (*Passiflora tetrandra*) (southern national limit) (Walls unpubl. data 2015)
- Kawakawa (*Piper excelsum*) (southern national limit) (Walls unpubl. data 2015, Jensen unpubl. data 2014)
- Shining spleenwort (*Asplenium oblongifolium*) (southern national limit) (Jensen unpubl. data 2014)

The species at its southern regional distributional limit is:



- Pigeonwood (*Hedycarya arborea*) (southern regional limit) (Walls unpubl. data 2015, Jensen unpubl. data 2014)

The species at its northern regional distributional limit is:

- Fragrant tree daisy (*Olearia fragrantissima*) (northern national limit) (Walls 2001, unpubl. data 2015)

### Invertebrates

Invertebrate species at their southern national distributional limits are:

- *Philocryptica polypodii* (southern national limit)
- "*Cnephasia*" *incessana* (new southern national limit)
- *Dysnocryptus pallidus* (Broun), fungus weevil at its (southern national limit)
- *Molopsida strenua* (Broun) a ground beetle (southernmost known collection)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

There are basic igneous bluffs, scarps and rock outcrops throughout the site that support indigenous vegetation (Walls unpubl. data 2015). At a national scale these features are an originally rare ecosystem (Williams et al. 2007). There are seepages and flush wetlands on the slopes above the basin at the head of the valley. These are also an 'originally rare' ecosystem on a national scale (Williams et al. 2007).

The site is distinctive for the abundance of species such as fierce lancewood, fragrant tree daisy, *Teucrium parvifolium* and bamboo grass that are otherwise uncommon on Banks Peninsula. It is also distinctive for the high number of plant taxa that are at their distributional limits on Banks Peninsula (refer to criterion 5) (Walls unpubl. data 2015, Jensen unpubl. data 2014).

### Diversity and Pattern

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site has a high diversity of vegetation communities and habitat types, including rocklands, seepages, broadleaved-hardwood forest with podocarps, kanuka forest, treelands, scrub, shrublands, tussocklands and grasslands. They occur as a mosaic across the site as a result of climatic variation associated with aspect and altitude, soil variation and disturbance. An altitudinal sequence of 500 m, from approximately 80 to 580 m above sea level, means there are coastal, lowland and montane elements in the vegetation. As a result of diversity of the

vegetation communities and the large altitudinal gradient the site supports an outstanding diversity of plant taxa. Recent (rapid) botanical surveys (Jensen unpubl. data 2014, Walls unpubl. data 2015) recorded 130 indigenous species within the site.

The site also contains a diverse indigenous invertebrate fauna. A recent relatively brief survey by Wildland Consultants and Boffa Miskell (2015) recorded 255 indigenous species. The diversity of indigenous beetle species is very high (93 species) on the valley floor and high on the hill slopes (77 species). This sample indicates a very species-rich indigenous invertebrate assemblage reflecting the diversity of indigenous vegetation communities and habitats. A list of the invertebrate species recorded at the site is provided in Appendices 2 and 3.

## Ecological Context

### **8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

It is a very large, relatively compact, area. The large size of the site and its high habitat diversity mean that it is sufficiently large to sustain the ecosystems present and that it plays an important role in maintaining ecological processes in the wider landscape. It is well buffered by regenerating indigenous scrub, shrubland and tussockland and these seral communities within the site provide connectivity between indigenous forest patches in the gullies.

The site is part of an important network of areas in Pricess Valley and in the surrounding area. Extensive areas of the western slopes of Pricess Valley are likely to be an important ecological corridor for indigenous fauna (birds, lizards and invertebrates) and for the dispersal of plants within the valley. In the wider area the site is part of a network of forested areas of high ecological value including the Kaituna Valley Scenic Reserve, Okana Valley, Waikoko Stream and Lathams that are important 'stepping stones' for the movement and dispersal of indigenous fauna such as New Zealand pigeon.

The vegetation within the site buffers Pricess Valley Stream, which provides habitat for indigenous aquatic fauna. The role that the established indigenous vegetation within the site plays in reducing sediment and nutrient into this stream is particularly important because it flows directly into the Kaituna Lagoon, Lake Ellesmere/Te Waihora. Catchment wide solutions for reducing nutrient inputs into this internationally important coastal lake is a priority for its management (Hughey and Taylor 2009).

### **9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. The only wetlands within the site are a few small flushes with *Carex secta* (Walls unpubl. data 2015). These are very limited in extent and do not meet the threshold for significance under this criterion.



**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is important permanent and seasonal habitat for a range of common indigenous birds. It includes a large area of relatively diverse indigenous vegetation including forest and mature podocarp trees (lowland totara, matai and kahikatea). Bird species that use the site for feeding and breeding are New Zealand pigeon, bellbird, South Island robin, grey warbler, South Island fantail, silvereve, welcome swallow, New Zealand pipit, New Zealand kingfisher, Australasian harrier, spur winged-plovers and white-faced heron (Walls unpubl. data 2015, Wilson 1992, Head n.d).

The site provides important habitat for diverse range of indigenous invertebrates and includes a particularly high number of species that are Threatened and At Risk, endemic to Banks Peninsula and uncommon in the ecological district (Wildland Consultants and Boffa Miskell 2015). It also provides important habitat for skinks and geckos (Walls unpubl. data 2015).

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## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Domestic stock:</li> <li>Existing fences are well maintained and streams on the property, including within the site, are being progressively fenced to exclude domestic stock. Sheep and cattle are grazed throughout the remainder of the site at moderate intensity. This is preventing or impeding natural vegetation regeneration, especially in the more accessible parts of the forests, treelands, scrub and shrublands (Walls unpubl. data 2015).</li> </ul>	<p>Continue fencing riparian stream margins. Consider implications of stock grazing in relation to management of indigenous vegetation communities. Removing stock from the site would allow more natural vegetation regeneration and promote understorey development of forested areas.</p>	<ul style="list-style-type: none"> <li>Advice and guidance for landowners about benefits to biodiversity of stock management options and stock fencing maintenance.</li> <li>Assistance where appropriate.</li> <li>Collaborate with ECan re. stock fencing along waterways.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants: In some areas property old man's beard is well established and widespread, elderberry occurs at low altitude but is uncommon and there are a few wilding pines (Walls unpubl. data 2015). <i>Cotoneaster simonsii</i>, Japanese honeysuckle, wilding radiata pines, macrocarpa and elderberry were recorded (Jensen unpubl.</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling old mans beard, wilding conifers, <i>Cotoneaster simonsii</i> and Japanese honeysuckle.</li> <li>Consider ongoing surveillance for other biodiversity pest plants such as Darwin's barberry.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowners about monitoring and control of pest plants.</li> <li>Assistance available where appropriate.</li> </ul>

<p>data 2014).</p>		
<ul style="list-style-type: none"> <li>• Pest animals: feral deer, rabbits, hares and possums were recorded within the site and other widespread pest animals are almost certainly present (Walls unpubl. data 2015).</li> </ul>	<ul style="list-style-type: none"> <li>• Control of pest animals (e.g. by trapping, poisoning or shooting) using a multi-species control programme would benefit native fauna (birds, lizards and larger invertebrates). However, due to the time and cost of establishing and maintaining such a control programme and the lack of barriers to invasion, only consider implementing an animal pest control programme if long-term, effective control can be ensured.</li> <li>• Consider monitoring the site for deer (and goats and pigs (and their sign)) and controlling them, if possible, when they are present within the site.</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowners about monitoring and control of pest animals.</li> <li>• Assistance available where possible.</li> </ul>
<ul style="list-style-type: none"> <li>• Sulphur-crested cockatoos. This species is numerous within the adjacent QEII covenant and also uses the site. Sulphur-crested cockatoos have the potential to alter the ecology of the site, for example by competing for fruits and seeds with native bird species, and as seed predators (Willems 1999).</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor cockatoo numbers.</li> <li>• Consider undertaking research (e.g. in collaboration with local universities) to determine the potential effects of cockatoos on the ecology of the site.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussions with landowners about cockatoo population and potential impact on ecosystems.</li> <li>• Collaborate with universities and landowners over the potential for a research and management programme.</li> </ul>



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**Assessment completed by:** Scott Hooson  
**Date:** 27 February 2015

**Statement completed by:** Scott Hooson  
**Date:** 27 February 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



## Appendix 1: Plant Species List

Plant species recorded during botanical surveys (sourced from Walls unpubl. data (2015) and Jensen unpubl. data (2014)).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Alectryon excelsus</i>	titoki
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Asplenium oblongifolium</i>	
<i>Australina pusilla</i>	
<i>Austroderia richardii</i>	toetoe
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum penna-marina</i>	little hard fern
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carex forsteri</i>	forest sedge
<i>Carex secta</i>	purei, tussock sedge
<i>Carex virgata</i>	tussock sedge
<i>Carmichaelia australis</i>	native broom, common broom
<i>Carpodetus serratus</i>	putaputaweta
<i>Cheilanthes sieberi</i>	hot rock fern
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Convolvulus waitaha</i>	elfin bindweed
<i>Coprosma areolata</i>	mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	scrub coprosma
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round-leaved coprosma
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Corokia cotoneaster</i>	korokio
<i>Crassula sieberiana</i>	dwarf stonecrop
<i>Dacrycarpus dacrydioides</i>	kahikatea
<i>Dichondra repens</i>	Mercury Bay weed
<i>Discaria toumatou</i>	matagouri, wild irishman
<i>Dodonaea viscosa</i>	akeake
<i>Epilobium nummulariifolium</i>	willow herb
<i>Festuca actae</i>	Banks Peninsula blue tussock



<i>Festuca novae-zelandiae</i>	fescue tussock
<i>Fuchsia excorticata</i>	tree fuchsia
<i>Griselinia littoralis</i>	broadleaf
<i>Haloragis erecta</i>	toatoa
<i>Haloregis erecta</i>	
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Hedycarya arborea</i>	pigeonwood
<i>Helichrysum lanceolatum</i>	niniao
<i>Hierochloe redolens</i>	karetu, holy grass
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Huperzia varia</i>	hanging clubmoss
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Hypolepis millefolium</i>	thousand-leaved fern
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Korthalsella lindsayi</i>	dwarf mistletoe
<i>Kunzea robusta</i>	kanuka
<i>Lagenophora pumila</i>	parani
<i>Lastreopsis velutina</i>	velvet fern
<i>Leptinella minor</i>	Banks Peninsula button daisy
<i>Leptospermum scoparium</i>	manuka
<i>Libertia ixioides</i>	native iris, mikoikoi
<i>Linum monogynum</i>	rauhua
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Luzula banksiana var. orina</i>	woodrush
<i>Melicope simplex</i>	poataniwha
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus micranthus</i>	shrub mahoe
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Microlaena polynoda</i>	bamboo grass
<i>Microlaena stipoides</i>	meadow rice grass, patiti
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Microtis unifolia</i>	
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	mapou
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Olearia fragrantissima</i>	fragrant tree daisy
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	native oxalis
<i>Parietaria debilis</i>	
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine, kohia
<i>Pellaea caliduripium</i>	
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Phormium tenax</i>	flax, harakeke
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum eugenioides</i>	tarata, lemonwood



<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Pneumatopteris pennigera</i>	gully fern
<i>Poa cita</i>	silver tussock
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax arboreus</i>	five-finger
<i>Pseudopanax crassifolius</i>	lancewood
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Pseudowintera colorata</i>	horopito
<i>Pteridium esculentum</i>	bracken
<i>Pterostylis graminea</i>	greenhood
<i>Pyrrosia eleagnifolia</i>	leather leaf fern
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Raukaua anomalus</i>	
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless lawyer, tataramoa
<i>Scandia geniculata</i>	climbing aniseed
<i>Schefflera digitata</i>	pate
<i>Senecio glaucophyllus</i>	yellow rock groundsel
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Sophora prostrata</i>	prostrate kowhai, dwarf kowhai
<i>Stellaria decipiens</i>	
<i>Streblus heterophyllus</i>	turepo, small-leaved milk tree
<i>Teucrium parvifolium</i>	
<i>Teucrydium parvifolium</i>	
<i>Uncinia leptostachya</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Viola cunninghamii</i>	native violet
<i>Wahlenbergia gracilis</i>	harebell
<b>Exotic Species</b>	
<i>Agrostis capillaris</i>	brown top
<i>Aira caryophyllea</i>	silvery hair grass
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Anthriscus caucalis</i>	beaked parsley
<i>Bellis perennis</i>	daisy
<i>Bromus diandrus</i>	rippgut brome
<i>Cerastium glomeratum</i>	chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Clematis vitalba</i>	old man's beard
<i>Cotoneaster simonsii</i>	Khasia berry
<i>Critesion murinum</i>	barley grass
<i>Cupressus macrocarpa</i>	macrocarpa
<i>Cynosurus echinatus</i>	rough dogstail
<i>Cytisus scoparius</i>	common broom
<i>Dactylis glomerata</i>	cocksfoot



<i>Digitalis purpurea</i>	foxglove
<i>Echium vulgare</i>	vipers bugloss
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Juglans regia</i>	walnut
<i>Leycesteria formosa</i>	Himalayan honeysuckle
<i>Lolium perenne</i>	ryegrass
<i>Lonicera japonica</i>	Japanese honeysuckle
<i>Marrubium vulgare</i>	horehound
<i>Mycelis muralis</i>	wall lettuce
<i>Orobanche minor</i>	broomrape
<i>Pinus radiata</i>	radiata pine, Monterey pine
<i>Rosa rubiginosa</i>	sweet brier/briar
<i>Rubus fruticosus</i> agg.	blackberry
<i>Rumex acetosella</i>	sheeps sorrel
<i>Sambucus nigra</i>	elderberry
<i>Silybum marianum</i>	variegated thistle
<i>Sisymbrium officinale</i>	hedge mustard
<i>Stellaria media</i>	chickweed
<i>Trifolium dubium</i>	suckling clover
<i>Trifolium repens</i>	white clover
<i>Ulex europaeus</i>	gorse
<i>Verbascum thapsus</i>	woolly mullein
<i>Vicia sativa</i>	vetch
<i>Vittadinia gracilis</i>	purple fuzzweed



## Appendix 2: Invertebrate Species List for the Mid Prices Valley “Flats”

Sourced from Wildland Consultants and Boffa Miskell unpubl. data (2015)

Note: Light trapping was only undertaken on the flats at the bottom of the hill slope on the western side of Mid Prices Valley.

Order	Family	Scientific Name	Common Name	Species Status
<b>Indigenous species</b>				
Orthoptera	Anostomatidae	Hemiandrus sp.	a ground weta	BP endemic
	Gryllidae	Bobilla sp.	small field cricket	
Blattodea			a cockroach	
Isoptera	Kalotermitidae	Kalotermes brouni Froggatt	drywood termite	
Mantodea	Mantidae	Orthodera novaezealandiae (Colenso)	NZ praying mantis	
Phasmatodea				
Hemiptera: Homoptera	Flatidae	Siphanta acuta (Walker)	green planthopper	
Hemiptera: Heteroptera	Acanthosomatidae	Oncacantias vittatus (Fabricius)	a shield bug	
	Aradidae	Ctenoneurus sp.	a flat bug	
		Aneurus sp.	a flat bug	
	Miridae	Romna sp.	a bent-backed bug	
	In			
	Reduviidae	Empicoris rubromaculatus (Blackburn)	thread bug	
		Ploiaria antipodum Bergroth	antipodean assassin bug	
	Rhyparochromidae	genus and species indet		

Megaloptera	Corydalidae	Archichauliodes diversus (Walker)	dobsonfly	
Neuroptera	Hemerobiidae	Micromus tasmaniae (Walker)	Tasmanian lacewing	
Coleoptera	Anobiidae	Leanobium flavomaculatum Espanol	a borer beetle	
		Leanobium undulatum (Broun)	a borer beetle	
		Ptinus sp.	a spider beetle	
		Xenocera sp.	a borer beetle	
	Anthribidae	Cacephatus incertus (White)	a fungus weevil	
		Dysnocryptus pallidus Broun	a fungus weevil	at it's Southern limit
		Hoherius meinertzhageni (Broun)	a fungus weevil	
		Pleosporius bullatus (Sharp)	a fungus weevil	
		Xenanthribus hirsutus Broun	a fungus weevil	
	Carabidae	Demetrida dieffenbachi (White)	a ground beetle	
		Holcaspis intermittens (Chaudoir)	a ground beetle	
		Megadromus guerinii (Chaudoir)	a ground beetle	BP endemic
		Molopsida strenua (Broun)	a ground beetle	southernmost known collection
		Notagonum submetallicum (White)		
	Cerambycidae	Astetholea lepturoides Bates	a longhorn beetle	
		Hybolasius vegetus (Broun)	a longhorn beetle	
		Psilocnaeia linearis (Bates)	a longhorn beetle	
		Spilotrogia nr pulchella (Bates)	a longhorn beetle	
		Zorion guttigerum (Westwood)	a flower longhorn	
	Cleridae	Lemida aptera (Sharp)	a checkered beetle	
		Phymatophaea longula Sharp	a checkered beetle	
	Coccinellidae	Coccinella leonina Fabricius	orangespotted ladybird	

		Rhyzobius forestieri (Mulsant)	a ladybird	
		Veronicobius acceptus (Broun)	a ladybird	
		Veronicobius sp.	a ladybird	
		Veronicobius sp. dark round	a ladybird	
		Veronicobius sp. dark elongate	a ladybird	
	Corylophidae	Sericoderus sp.	a hooded beetle	
	Cryptophagidae	Antarticotectus sp.	a silken fungus beetle	
		Micrambina' sp.	a silken fungus beetle	
	Curculionidae	Cossoninae indet.	a weevil	
		Cryptorhynchinae sp. indet.	a weevil	
		Entomininae sp. indet. 1	a weevil	
		Entomininae sp. indet. 2	a weevil	
		Entomininae sp. indet. 3	a weevil	
		Microcryptorhynchus sp.	a weevil	
		Pentarthrum sp 1	a weevil	
		Pentarthrum sp 2	a weevil	
		Peristoreus australis (Broun)	a flower weevil	
		Peristoreus sp. 1	a flower weevil	
		Peristoreus sp. 2	a flower weevil	
		Phloeophagosoma pedatum Wollaston	a weevil	
		Praolepra infusca Broun	a flower weevil	
		Praolepra squamosa Broun	a flower weevil	
		Psepholax sulcatus White	a pit weevil	
		Rhopalomerus antennalis (Broun)	a weevil	
	Elateridae	Conoderus exsul (Sharp)	pasture wireworm	
		Panspoeus guttatus Sharp	a click beetle	
	Histeridae	Parepierus sp.	a pill beetle	
	Hydraenidae	Orchymontia banksiana Ordish	a cascade beetle	Nationally endangered; range restricted
	Latridiidae	Bicava sp.	a mildew beetle	

		Corticaria sp.	a mildew beetle
		Corticaria hirtalis (Broun)	minute scavenger beetle
		Lithostygnus sp.	a mildew beetle
	Lucanidae	Paralissotes reticulatus (Westwood)	reticulate stag beetle
	Melyridae	Dasytes' sp. blue	a flower beetle
		Dasytes' sp. green	a flower beetle
	Mycetophagidae	Triphyllus' sp.	an ancient fungus beetle
	Nemonychidae	Rhinorhynchus rufulus (Broun)	a straight-horned weevil
	Oedemeridae	Selenopalpus aciphyllae Broun	a lax beetle
		Thelyphassa lineata (Fabricius)	a lax beetle
		Thelyphassa nemoralis (Broun)	a lax beetle
	Ptiliidae	Ptinella sp.	a feather-winged beetle
	Rhipiphoridae	Rhipistena lugubris Sharp	an antlered beetle
	Salpingidae	Salpingus bilunatus Pascoe	a bark mould beetle
	Scarabaeidae	Costelytra zealandica (White)	NZ grass grub
		Odontria australis Given	a chafer beetle
		Odontria varicolorata Given	a chafer beetle
		Saprosites communis (Broun)	a small dung beetle
	Scirtidae	Cyphon sp. "black tips"	a marsh beetle
		Cyphon sp. "plain"	a marsh beetle
		Cyphon sp. "small, rounder"	a marsh beetle
		Cyphon sp. "large dark"	a marsh beetle
	Scraptiidae	Nothotelus sp.	a soft leaping beetle
	Staphylinidae	Aleocharinae sp. indet. 1	a rove beetle
		Aleocharinae sp. indet. 2	a rove beetle
		Atheta sp.	a rove beetle
		Brachynopus scutellaris (Redtenbacher)	a rove beetle
		Coprostygnus sp.	a rove beetle
		Creophilus oculatus Fabricius	devil's coachhorse

		Falagria sp.	a rove beetle	
		Otagonia sp.	a rove beetle	
	Tenebrionidae	Artystona rugiceps Bates	a darkling beetle	
		Menimus sp.	a darkling beetle	
		Mimopeus granulatus (Breme)	a darkling beetle	BP endemic, listed as Naturally Uncommon, range restricted
		Mimopeus opaculus (Bates)	a false wireworm	
		Zeadelium zealandicum (Bates)	a darkling beetle	BP near endemic, listed as Naturally Uncommon; range restricted
	Trogosittidae			
		Rentonium sp.	a shield beetle	
	Zopheridae	Notocoxelus sp.	a rough mould beetle	
		Pristoderus bakewelli (Pascoe)	a rough mould beetle	
		Pristoderus nr plagiatus (Broun)	a rough mould beetle	
		Pristoderus sp.	a rough mould beetle	
		Pycnomerus sp.	a rough mould beetle	
Neuroptera	Hemerobiidae	Micromus tasmaniae (Walker)	Tasmanian lacewing	
Trichoptera	Leptoceridae	Hudsonema aliena	caddisfly	
	Leptoceridae	Triplectides obsoletus	caddisfly	
	Conoesucidae	Olinga feredayi	caddisfly	
		Pycnocentroides aureolus	caddisfly	
	Hydrobiosidae	Costachorema	caddisfly	Nationally Vulnerable
		Hydrobiosis sp.	caddisfly	
Ephemeroptera	Coloburiscidae	Coloburiscus humeralis	spiny gilled mayfly	
	Leptophlebiidae	<i>Deleatidium</i> near <i>angustum</i>	mayfly	
	Ichthybotidae	Ichthybotus bicolor		

Lepidoptera	Micropterigidae	Sabatinca aenea		
	Hepialidae	Wiseana copularis	porina moth	
		Wiseana umbraculata	striped porina moth	
	Nepticulidae	Stigmella kaimanua	parsonsia miner	uncommon in ED
	Tineidae	Lysiphragma howesii		
	Gracillariidae	new genus and species	Teucrium miner	Nationally Vulnerable
	Depressariidae	Eutorna caryochroa		
	Gelechiidae	Anisoplaca achyrotia		
	Oecophoridae	Barea exarcha		
		Gymnobathra hamatella		
		Izatha huttoni		
		Izatha katadiktya		
		Izatha copiosella		
		Phaeosaces apocrypta		
		Phaeosaces compsotya		
		Phaeosaces coarctatella		
		Tingena hoplodesma		
		Tingena macarella		
		Tingena plagiata		
	Pterophoridae	Pterophorus innotatalis		
		Platyptilia falcatalis	hebe plumemoth	
	Tortricidae	Pyrgotis plagiata		
				Capua semiferana
		Catamacta gavisana		
		Epichorista lindsayi		Nationally Endangered

		Harmologa scoliastes		
		Planotortrix excessana		
	Thyrididae	Morova subfasciata		
	Crambidae	Deana hybreasalis		
		Eudonia characta		
		Eudonia dinodes		
		Eudonia luminatrix		
		Eudonia philerga		
		Eudonia submarginalis		
		Eudonia aff. minualis		
		Gadira acerella		
		Glaucocharis auriscriptella		
		Glaucocharis interrupta		
		Glaucocharis lepidella		
		Glaucocharis chrysochyta		
		Orocrambus flexuosellus		
		Orocrambus ramosellus		
		Orocrambus vittellus		
		Scoparia halopis		
		Udea flavidalis		
		Udea marmarina		
		Uresiphita maoralis	kowhai moth	
	GEOMETRIDAE	Asaphodes beata		
		Asaphodes chlamydota		
		Austrocidaria callichlora		
		Austrocidaria gobiata		
		Chloroclystis inductata		
		Chloroclystis sphragitis		
		Cleora scriptaria		
		Declana egregia	South Island zebra moth	
		Declana griseata		At Risk, Declining

		<i>Declana floccosa</i>		
		<i>Declana junctilinea</i>		
		<i>Epiphyrne undosata</i>		
		<i>Epiphyrne verriculata</i>		
		<i>Gellonia dejectaria</i>		
		<i>Homodotis megaspilata</i>		
		<i>Helastia cinerearia</i>		
		<i>Helastia cryptica</i>		
		<i>Helastia triphragma</i>		
		<i>Hydriomena rixata</i>		
		<i>Ischalis fortinata</i>		
		<i>Pasiphila bilineolata</i>		
		<i>Pasiphila muscosata</i>		
		<i>Pasiphila lunata</i>		
		<i>Pasiphila sandycias</i>		
		<i>Pasiphila testulata</i>		
		<i>Pasiphila urticae</i>		
		<i>Poecilasthena schistaria</i>		
		<i>Pseudocoremia indistincta</i>		
		<i>Pseudocoremia pergrata</i>		
		<i>Pseudocoremia productata</i>		
		<i>Pseudocoremia rudisata</i>		
		<i>Pseudocoremia suavis</i>		
		<i>Xyridacma ustaria</i>		
	Noctuidae	<i>Bityla defigurata</i>		
		<i>Feredayia graminosa</i>		
		<i>Meterana levis</i>		
		<i>Persectania aversa</i>		
		<i>Proteuxoa comma</i>		
		<i>Tmetolophota unica</i>		
	Erebidae	<i>Rhapsa scotoscialis</i>		



Exotic species				
Dermaptera	Forficulidae	Forficula auricularia Linnaeus	European earwig	Dermaptera
Coleoptera				Coleoptera
	Archeocrypticidae	Archeocrypticus topali Kaszab		
	Brentidae	Exapion ulicis (Forster)	gorse seed weevil	
	Coccinellidae	Coccinella undecimpunctata Linnaeus	11-spotted ladybird	
	Curculionidae	Sitona discoideus Gyllenhal	Sitona weevil	
	Latridiidae	Aridius bifasciatum (Reitter)	a mildew beetle	
Lepidoptera	Lyonetiidae	Leucoptera spartifoliella (Hübner)	broom twigminer	Lepidoptera

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### Appendix 3: Invertebrate Species List for the Mid Prices Valley “Hill Slopes”

Sourced from Wildland Consultants and Boffa Miskell unpubl. data (2015)

Note: Light trapping was only undertaken on the flats at the bottom of the hill slope on the western side of Mid Prices Valley.

Order	Family	Scientific Name	Common Name	Species Status
<b>Indigenous species</b>				
Orthoptera	Anostostomatidae	Hemiandrus n.sp.	BP ground weta	
	Gryllidae	Bobilla sp.	small field cricket	
	Tettigoniidae	Conocephalus sp.	tussock katydid	
Isoptera	Kalotermitidae	Kalotermes brouni Froggatt	drywood termite	
Mantodea	Mantidae	Orthodera novaezealandiae (Colenso)	NZ praying mantis	
Phasmatodea				
Hemiptera: Homoptera	Flatidae			
Hemiptera: Heteroptera	Acanthosomatidae			
	Aradidae			
	Lygaeidae	Rhyodes cognatus Eyles		
	Miridae	Diomocoris maoricus (Walker)	a bent-backed bug	
		Sidnia kinbergi (Stal)	Australian crop mirid	
	Nabidae	Nabis maoricus (Walker)	Pacific damsel bug	
	Pentatomidae	Monteithiella humeralis (Walker)	a shield bug	

	Reduviidae			
	Rhyparochromidae	Targarema stali White		
Megaloptera	Corydalidae			
Neuroptera	Hemerobiidae	Micromus tasmaniae (Walker)	Tasmanian lacewing	
Coleoptera	Anobiidae	Leanobium flavomaculatum Espanol	a borer beetle	
		Sphinditeles sp.	a borer beetle	
		Anobiidae, gen. indet.	a borer beetle	
	Anthribidae	Cacephates vates (Sharp)	a fungus beetle	
		Hoherius meinertzhageni (Broun)	a fungus weevil	
		Pleosporius bullatus (Sharp)	a fungus weevil	
	Byrrhidae	Epichorius sp.	a moss beetle	
	Carabidae	Ctenognathus sp.	a ground beetle	
		Demetrida dieffenbachi (White)	a ground beetle	
		Holcaspis elongella (White)	a ground beetle	Canterbury endemic
		Megadromus antarcticus (Chaudoir)	metallic green ground beetle	
		Megadromus guerinii (Chaudoir)	a ground beetle	BP endemic
		Notagonum submetallicum (White)	submetallic ground beetle	
		Scopodes elaphroides White	a ground beetle	
	Cerambycidae			
		Ptinosa ptinoides (Bates)	a longhorn beetle	
		Somatidia antarctica (White)	a longhorn beetle	
		Spilotrogia nr pulchella (Bates)	a longhorn beetle	
		Stenellipsis sp.	a longhorn beetle	

		Zorion guttigerum (Westwood)	a flower longhorn	
	Chrysomelidae	Pilacolaspis sp.	a leaf beetle	
	Cleridae	Phymatophaea longula Sharp	a checkered beetle	
	Coccinellidae			
		Rhyzobius forestieri (Mulsant)	a ladybird	
		Veronicobius sp. dark round	a ladybird	
		Veronicobius acceptus (Broun)	a ladybird	
		Veronicobius sp. small pale	a ladybird	
	Corylophidae	Sericoderus sp.	a hooded beetle	
	Cryptophagidae	Paratomaria sp.	a silken fungus beetle	
	Curculionidae	Baeosomus sp.		
		Cryptorhynchinae sp. 1		
		Cryptorhynchinae sp. 2		
		Entiminae sp. 1, elongate		
		Entiminae sp. 2, chunky		
		Peristoreus australis (Broun)	a flower weevil	
		Peristoreus durus (Broun)	a flower weevil	
		Praolepra infusca Broun	a flower weevil	
		Praolepra squamosa Broun	a flower weevil	
		Psepholax coronatus White	a pit weevil	
		Psepholax sulcatus White	a pit weevil	
	Elatерidae	Conoderus exsul (Sharp)	pasture wireworm	
	Histeridae	Parepierus sp.	a pill beetle	
	Hydraenidae	Orchymontia banksiana Ordish	a cascade beetle	Nationally endangered; range restricted

	Latridiidae		
		Corticara hirtalis (Broun)	minute scavenger beetle
		Lithostygnus sp.	a mould beetle
	Lucanidae	Mitophyllus irroratus Parry	a stag beetle
		Mitophyllus parrianus Westwood	a stag beetle
	Melyridae	Dasytes' blue	a flower beetle
		Dasytes' green	a flower beetle
	Mycetophagidae	Triphyllus' sp. 1, plain	a hairy fungus beetle
		Triphyllus' sp. 2, pale tips	a hairy fungus beetle
		Triphyllus' sp. 3, figured	a hairy fungus beetle
	Nitidulidae	Epuraea sp.	a sap beetle
		Hisparonia hystrix (Sharp)	a sap beetle
		Soronia nr asperella (Broun)	a sap beetle
	Nemonychidae	Rhinorhynchus rufulus (Broun)	a straight-horned weevil
	Oedemeridae	Thelyphassa lineata (Fabricius)	a lax beetle
		Thelyphassa nemoralis (Broun)	a lax beetle
	Salpingidae	Salpingus bilunatus Pascoe	a bark mould beetle
	Scarabaeidae	Ataenius brouni Sharp	Broun's scarab
		Costelytra zealandica (White)	NZ grass grub
		Odontria varicolorata Given	a cockchaffer
		Pyronota festiva (Fabricius)	manuka beetle
		Pyronota edwardsi Sharp	manuka beetle
	Scirtidae	Cyphon sp. large dark	a marsh beetle
		Cyphon sp. dark tips	a marsh beetle
		Cyphon sp. zig-zag	a marsh beetle
		Cyphon sp. v large, black	a marsh beetle
	Scraptiidae	Nothotelus sp.	a soft leaping beetles

	Staphylinidae	Aleocharinae sp. 1, small, pale	a rove beetle	
		Aleocharinae sp. 2, robust, v short elytra	a rove beetle	
		Aleocharinae sp. 3, smaller, rounded elytra	a rove beetle	
		Brachynopus scutellaris (Redtenbacher)	a rove beetle	
		Maorothius sp.	a rove beetle	
		Stenomaliu' sp.	a rove beetle	
	Tenebrionidae	Artystona rugiceps Bates	a darkling beetle	
	Zopheridae	Colydiinae sp.	a rough mould beetle	
		Pristoderus bakewelli (Pascoe)	a rough mould beetle	
		Pycnomerus sp.	a rough mould beetle	
<b>Exotic species</b>				
Dermaptera	Forficulidae	Forficula auricularia Linnaeus	European earwig	Dermaptera
Coleoptera	Anthribidae	Euciodes suturalis Pascoe	cocksfoot stem borer	Coleoptera
	Curculionidae	Sitona discoideus Gyllenhal	sitona weevil	
	Staphylinidae	Gyrohyponus fracticornis (Müller)	a rove beetle	



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Mansons Peninsula

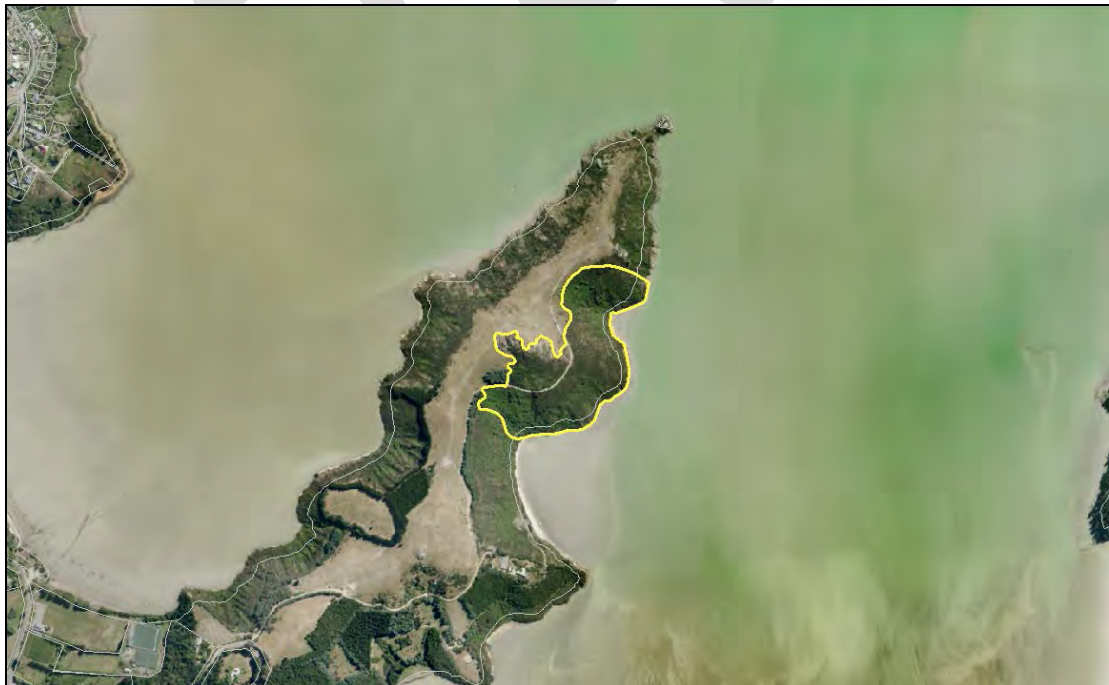
**Site number:** SES/H/21

**Physical address of site:** Governors Bay Teddington Road, Teddington, Lyttelton Harbour Basin

#### Summary of Significance:

This site is significant because it is the only known location for *Clematis marata* in the Banks Ecological Region. It also has indigenous vegetation communities that although degraded, are some of the best examples of their type in the ecological district. They occur on an Acutely Threatened land environment and support four nationally At Risk plant species and four plant species that are uncommon within the ecological district or region.

#### Site Map



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 15.7

**Central point (NZTM):** E1573090, N5168529

## Site Description

The site is situated on Mansons Peninsula, a small peninsula in Upper Lyttelton Harbour that extends north-east between the tidal mud-flats of Governors Bay and the Head of the Bay. The vegetation cover on the upper slopes and ridge of the Peninsula is exotic grassland while the steeper lower slopes are pre-dominantly covered in dense Scotch broom shrubland. However, there are some small areas of indigenous vegetation amongst this. These communities are described by Wildland Consultants (unpubl. data 2013) as:

- *Coprosma crassifolia*-*Muehlenbeckia complexa*-lowland flax/bracken shrubland on rocky ground around the trig.
- (Kanuka-cabbage tree)-mahoe-Scotch broom- *Muehlenbeckia australis* scrub in south-east-facing gullies.
- (Ngaio-akiraho)/*Coprosma crassifolia*-Scotch broom-*Muehlenbeckia complexa*-saltmarsh ribbonwood shrubland and herbaceous vegetation along the shoreline and coastal cliffs on the eastern side of the peninsula.

This site is botanically important because a small rocky outcrop within the site is the only known location for *Clematis marata* in the Banks Ecological Region and is also the type locality for this species (Wilson unpubl. data 1984).

## Extent of Site of Ecological Significance

The site includes the indigenous small-leaved shrubland on rocky ground around the trig (that supports *Clematis marata*), a small area of grassland to the south of the trig that has Spaniard (*Aciphylla subflabellata*), the regenerating native hardwood forest (mahoe) and Scotch broom scrub with emergent kanuka and cabbage trees in south-east-facing gullies, the mixed shrubland and herbaceous vegetation along the shoreline and coastal cliffs. Scotch broom-dominated between these indigenous vegetation communities has been included within the site because it helps to connect and buffer the indigenous vegetation and form a more cohesive site.

## Assessment Summary

The Mansons Peninsula Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is





ecologically significant because it meets the representativeness (criterion 1) and rarity/distinctiveness criteria (criteria 3, 4 and 6).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The shrubland on the rocky ground around the trig is significant under this criterion. Although small, it has retained a moderate diversity of indigenous shrubs and climbers and is typical of early successional shrublands associated with coastal/lowland rock outcrops in the Herbert Ecological District.

The indigenous hardwood scrub in the two south-east-facing gullies and the coastal shrubland and herbaceous vegetation along the shoreline and coastal cliffs on the eastern side of the peninsula are also significant under this criterion. Although they are highly degraded early successional communities there are very few other examples of their type in the ecological district.

There is insufficient information available to assess the representativeness of faunal assemblages against this criterion.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is not significant under this criterion. It is not a relatively large example of its type within the relevant ecological district.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The indigenous vegetation communities within the site are on an Acutely Threatened land environment (F3.1a) where 9.9% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

- 4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.



It supports four nationally At Risk plant species and four plant species that are uncommon within the ecological district or region.

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Wildland Consultants unpubl. data 2013) are:

- *Aciphylla subflabellata* (At Risk - Declining) – 6 plants recorded on the southern side of the trig
- *Coprosma virescens* (At Risk - Declining) – occasional throughout
- *Chenopodium allanii* (At Risk – Naturally Uncommon)
- *Senecio glaucophyllus* subsp. *basinudus* (At Risk – Naturally Uncommon)

Plant species recorded from the site (Wildland Consultants unpubl. data 2013) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Calystegia soldanella*
- *Clematis marata*
- *Leptospermum scoparium*
- *Pyrrosia eleagnifolia*

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is not significant under this criterion. Akeake (*Dodonaea viscosa*), which is at its southern distributional limit on Banks Peninsula (Wilson 2013), is present but has been planted (Wildland Consultants unpubl. data 2013).

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

A small rocky outcrop within the site is the only know location for *clematis marata* in the Banks Ecological Region (Wilson unpubl. data 1984, 2013).

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is not significant under this criterion. It does not contain a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients



## **Ecological Context**

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is not significant under this criterion. The habitats on Mansons Peninsula may play a minor role as an ecological corridor for common indigenous bird species moving between Quail Island and the mainland. However nearby Moepuku Peninsula is likely to be a much more important ecological linkage between the mainland and Quail Island for fauna.

- 9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. It does not have any wetland ecosystems.

- 10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess the site against this criterion.

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## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Incidental damage to, or loss of <i>Clematis marata</i> (e.g. during spray operations to control broom). The <i>Clematis marata</i> population at the site is the only known population on Banks Peninsula. It is very small and vulnerable to local extinction.</li> </ul>	<ul style="list-style-type: none"> <li>Progeny from the site have been raised from seed and are being kept in cultivation (J. Cartman <i>pers. comm.</i> 2015). A programme to establish this species in suitable habitats at other locations in the upper Lyttelton Harbour is recommended.</li> </ul>	<ul style="list-style-type: none"> <li>Council and ranger staff to support nursery staff to develop a programme to establish <i>Clematis marata</i> at other locations.</li> </ul>
<ul style="list-style-type: none"> <li>Restoration plantings have used indigenous plants that are not locally sourced (e.g. North Island kowhai (<i>Sophora tetraptera</i>)) or not appropriate for the site (e.g. <i>Olearia avicenniifolia</i>) (Wildland Consultants unpubl. data 2013).</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing indigenous plants that are not locally sourced (i.e. not found naturally in the ecological district) or not appropriate for the site and replacing them with appropriate and locally sourced indigenous species.</li> </ul>	<ul style="list-style-type: none"> <li>Provision of ecological advice and information for planting locally sourced indigenous species.</li> <li>Assistance available as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Wilding spread from exotic trees (radiata pine, macrocarpa, wattles) planted on the peninsula (Wildland Consultants unpubl. data 2013).</li> <li>There is a macrocarpa tree directly below the rock outcrop with <i>Clematis marata</i>. This tree may have the potential to shade-out the indigenous vegetation on the outcrop.</li> </ul>	<ul style="list-style-type: none"> <li>Consider controlling any wilding trees and removing the seed sources.</li> <li>Consider removing the macrocarpa below the rock outcrop with <i>Clematis marata</i>.</li> </ul>	<ul style="list-style-type: none"> <li>Guidance and advice for landowner about threat of wilding trees to indigenous ecosystems.</li> <li>Assistance available as appropriate</li> </ul>

<ul style="list-style-type: none"> <li>Biodiversity pest plants: Plants recorded from the vicinity of the site at the northern end of Mansons Peninsula include: Old mans beard, sycamore, scotch broom, boneseed, hawthorn, sweet briar, red flowering currant and blackberry (Wildland Consultants unpubl. data 2013).</li> </ul>	<ul style="list-style-type: none"> <li>A management priority is to ensure that the rock outcrop with <i>Clematis marata</i> remains free of biodiversity pest plants such as boneseed, broom and flowering currant. Appropriate control methods should be used to ensure there is no damage to indigenous vegetation.</li> <li>Consider controlling biodiversity pest plants. The highest priority species are old mans beard, sycamore and boneseed.</li> <li>Consider ongoing weed surveillance for biodiversity pest plants such as banana passionfruit and spur valerian.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the importance of the <i>Clematis marata</i> and options for its protection.</li> <li>Assistance available as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Existing access ways. There is a vehicle track that passes through the site east of the rock outcrop. This track provides access to the end of the peninsula.</li> </ul>	<ul style="list-style-type: none"> <li>The landowner will continue to be able to use and maintain this vehicle track.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the landowner is aware that existing tracks and access ways can be used and maintained.</li> </ul>



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**Assessment completed by:** Scott Hooson  
**Date:** 24 February 2015

**Statement completed by:** Scott Hooson  
**Date:** 24 February 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*



## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2013).

N.B. The plants species listed below were recorded during a botanical survey of the northern part of Mansons Peninsula, rather than from specifically within the site.

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena novae-zelandiae</i>	red bidibidi
<i>Aciphylla subflabellata</i>	speargrass, spaniard, kurikuri
<i>Apium prostratum</i>	NZ celery
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Calystegia soldanella</i>	shore bindweed
<i>Carmichaelia australis</i>	native broom, common broom
<i>Convolvulus waitaha</i>	grass convolvulus
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma robusta</i>	karamu
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Cortaderia richardii</i>	toetoe
<i>Disphyma australe</i>	NZ iceplant
<i>Discaria toumatou</i>	matagouri, wild irishman
<i>Dodonaea viscosa</i>	akeake
<i>Einadia allanii</i>	
<i>Einadia triandra</i>	pigweed
<i>Ficinia nodosa</i>	club rush, wiwi
<i>Haloragis erecta</i>	toatoa
<i>Helichrysum lanceolatum</i>	niniaio
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea ericoides</i>	kanuka
<i>Leptospermum scoparium</i>	manuka, tea tree
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Linum monogynum</i>	NZ linen flax
<i>Luzula banksiana var. orina</i>	woodrush
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	native oxalis
<i>Phormium tenax</i>	flax, harakeke
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Plagianthus divaricatus</i>	saltmarsh ribbonwood
<i>Plagianthus regius</i>	lowland ribbonwood, manatu



<i>Poa cita</i>	silver tussock
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pteridium esculentum</i>	bracken
<i>Pyrrosia eleagnifolia</i>	leatherleaf fern
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Sarcocornia quinqueflora</i> subsp. <i>quinqueflora</i>	glasswort
<i>Scandia geniculata</i>	climbing aniseed
<i>Senecio glaucophyllus</i> subsp. <i>basinudus</i>	groundsel
<i>Senecio glomeratus</i>	groundsel, fireweed
<i>Senecio minimus</i>	native fireweed
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<b>Exotic Species</b>	
<i>Acacia mearnsii</i>	black wattle
<i>Acacia melanoxylon</i>	Tasmanian blackwood
<i>Acer pseudoplatanus</i>	sycamore
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Atriplex prostrata</i>	orache
<i>Bromus diandrus</i>	riggut brome
<i>Chamaecytisus palmensis</i>	tree lucerne
<i>Chrysanthemoides monillifera</i>	boneseed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Clematis vitalba</i>	old man's beard
<i>Crataegus monogyna</i>	hawthorn
<i>Cupressus macrocarpa</i>	macrocarpa, Monterey cypress
<i>Cynosurus echinatus</i>	rough dogstail
<i>Cytisus scoparius</i>	Scotch broom
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Elymus scaber</i>	blue wheatgrass, patiti
<i>Foeniculum vulgare</i>	fennel
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Lepidium africanum</i>	peppergrass
<i>Lolium perenne</i>	ryegrass
<i>Marrubium vulgare</i>	horehound
<i>Orobanche minor</i>	broomrape
<i>Pinus radiata</i>	radiata pine, Monterey pine
<i>Plantago coronopus</i>	bucks horn plantain
<i>Ribes sanguineum</i>	red-flowering currant
<i>Reseda luteola</i>	wild mignonette
<i>Rosa rubiginosa</i>	sweet briar, briar rose





<i>Rubus fruticosus</i>	blackberry
<i>Sambucus nigra</i>	elderberry
<i>Sisyrinchium iridifolium</i>	blue pigroot
<i>Solanum chenopodioides</i>	velvety nightshade
<i>Sonchus oleraceus</i>	puha, smooth sow thistle
<i>Trifolium repens</i>	white clover
<i>Ulex europaeus</i>	gorse
<i>Verbascum thapsus</i>	woolly mullein
<i>Vittadinia gracilis</i>	purple fuzzweed
<i>Ulex europaeus</i>	gorse

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Mt Herbert Spur and Orton Bradley Park

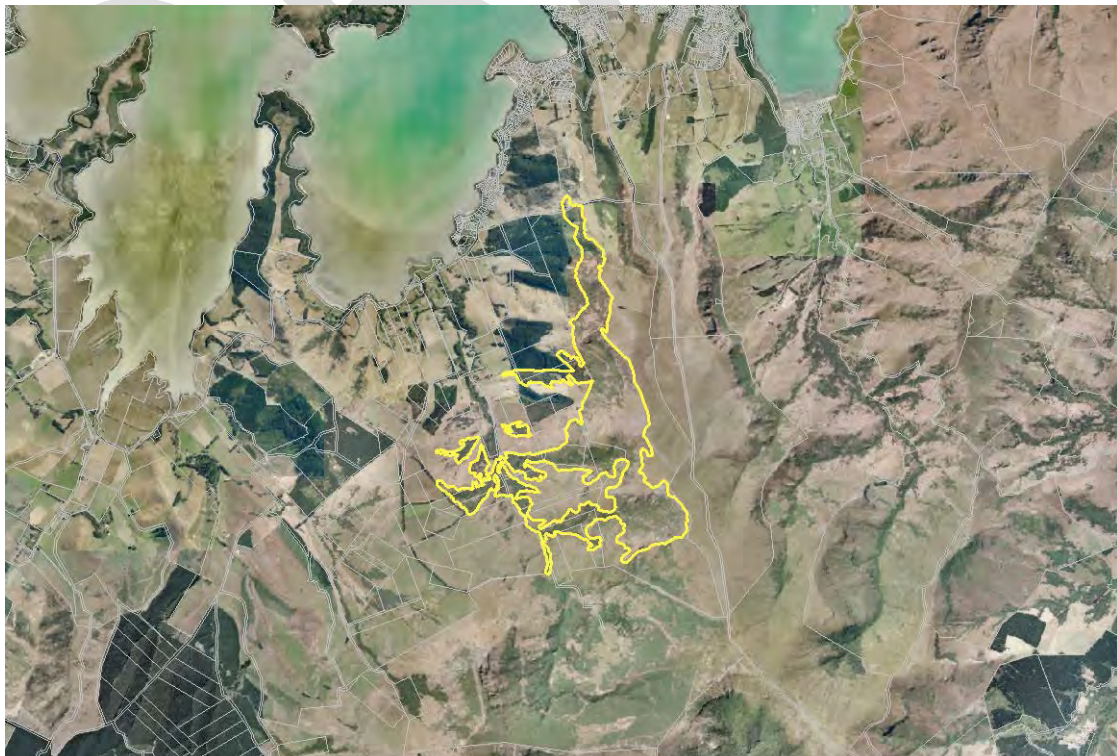
**Site number:** SES/H/22

**Physical address of site:** Mount Herbert Peak Road, Diamond Harbour

#### **Summary of Significance:**

This site is significant because it contains extensive indigenous bluff and scarp vegetation communities and connected rare and representative secondary hardwood forest. The majority of the site is on Acutely and Chronically Threatened land environments and is rare at the Level 4 land environment scale. The site supports a high diversity of indigenous vegetation communities and indigenous taxa including five nationally At Risk plant species (three are also endemic to Banks Peninsula), a large number of plants that are uncommon within the ecological district or region, nationally At Risk and endemic invertebrate species, at least four nationally At Risk fish species and another that is uncommon within the ecological district, as well as two nationally Threatened aquatic invertebrates. The site is well buffered and provides an important ecological linkage between lowland habitats in Lyttelton Harbour and the montane and sub-alpine habitats of Mt Herbert and Mt Bradley.

#### **Site Map**



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 231.3

**Central point (NZTM):** E1577957 N5165437

## Site Description

This site includes an extensive area of rocky bluffs and indigenous vegetation on the rim of the lower Diamond Harbour lava flow and several steep tributary gullies of Te Wharau Stream. It is situated on the western side of a broad spur extending north from the summit of Mt Herbert to Diamond Harbour and within gullies on both sides of Te Wharau Stream within Orton Bradley Park. The altitudinal range of the site is from approximately 80 to 580 m above sea level.

The vegetation is a mosaic of indigenous dominated vegetation including podocarp/hardwood forest and scrub, shrubland, tussockland and rock bluff vegetation. The main vegetation communities within the site (Wildland Consultants unpubl. data 2013, QEII 2009) are:

- (Lowland totara-matai)/mixed second growth hardwood forest and scrub on lowland hill slopes and gullies.
- Kanuka forest on lowland hill slopes and gullies
- Small-leaved indigenous lowland and montane shrublands and scrub.
- (Cabbage tree)/bracken-lowland flax-*Coprosma propinqua*-*C. crassifolia* fernland and shrubland on west-facing slopes below the rock bluffs.
- (Common native broom)/silver tussock-hard tussock-sweet vernal-browntop tussockland and grassland on north-facing slopes.
- Indigenous vegetation on rockland

The extensive rock bluff systems on the eastern side of the site support many specialist rock outcrop plants such as Banks Peninsula sun hebe (*Heliohebe lavaudiana*), *Brachyglottis lagopus*, *Vittadinia australis*, *Deyeuxia avenoides*, *Linum monogynum*, *Dichelachne crinita* and native woodrush (*Luzula banksiana* var. *orina*) (Wildland Consultants unpubl. data 2013).

## Extent of Site of Ecological Significance

The site includes the extensive rock bluff system and its vegetation on the Western side of Mt Herbert Spur, the secondary indigenous vegetation communities below the bluffs and the secondary hardwood forest, kanuka forest and seepage wetlands within Orton Bradley Park. The upper boundary of the site is the top of the rock bluffs and includes the small-leaved indigenous shrubland along the top of the spur. The QEII covenants and some areas of connected kanuka forest and indigenous scrub within Orton Bradley Park are included within the site.



## Assessment Summary

The Mt Herbert Spur Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The areas of secondary podocarp/hardwood forest are compositionally typical of the natural diversity of the Herbert Ecological District. They support a diverse range of indigenous plant species (QEII 2009) have a typical canopy of hardwood forest with tree species such as broadleaf, mahoe, kowhai, narrow-leaved lacebark, cabbage tree, kohuhu, and lancewood. A few remnant podocarp trees (matai and lowland totara are also present) (QEII 2009). Indigenous vegetation communities within the QEII covenants that have been protected from stock are now relatively intact and generally, natural ecological processes are functioning well and indigenous vegetation communities are regenerating and expanding.

The indigenous bluff communities on the western side of Mt Herbert Spur are representative. They contain specialised, unique and endemic Banks Peninsula plants that are typical of those that would have been present on bluffs and rock outcrops at an 1840 baseline.

Te Wharau Stream supports a representative assemblage of freshwater fish species (Bowie 2010).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

Although the Herbert Ecological District has extensive igneous rock bluffs and scarps, including those on Mt Herbert, Mt Evans and Mt Bradley, the rock bluffs and scarps on the western side of Mt Herbert spur support some of the most extensive indigenous bluff and scarp vegetation communities in the ecological district.



### Rarity/Distinctiveness

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The indigenous vegetation in the upper part of the site (above approximately 300 m) is on a Chronically Threatened land environment (F3.1b) where 12.2% indigenous vegetation is left on this land environment nationally (Walker et al. 2007). This land environment includes the majority of the rock bluffs, scarps and outcrops. The majority of the indigenous vegetation communities within Orton Bradley Park are on an Acutely Threatened land environment (F3.1a) where 9.9% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

In the context of the Herbert Ecological District the (lowland totara)/mixed second growth hardwood forest in the gullies within the site are significant under this criterion because indigenous forest it has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

The seral woody vegetation communities such as mixed second growth hardwood forest and scrub and small-leaved indigenous shrubland that occur within the site have expanded their range in the ecological district as a result of human disturbance. However, the extent of all indigenous woody vegetation in the ecological district is estimated to be only 10.9% (New Zealand Landcover Database (Version 4)).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports five nationally At Risk plant species (three are also endemic to Banks Peninsula), a large number of plants that are uncommon within the ecological district or region, nationally At Risk and endemic invertebrate species, at least four nationally At Risk fish species and another that is uncommon within the ecological district, as well as two nationally Threatened aquatic invertebrates.

### Plants

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site are:

- Grassland speargrass (*Aciphylla subflabellata*) (At Risk – Declining) – rare in grassland and tussockland (Wildland Consultants unpubl. data 2013)



- Banks Peninsula sun hebe (*Heliohebe lavaudiana*) (At Risk – Declining, endemic to Banks Peninsula) - occasional to frequent on rock-outcrops (Wildland Consultants unpubl. data 2013) and Orton Bradley Park (QEII 2009)
- Banks Peninsula blue tussock (*Festuca actae*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula) – rare to occasional on rock-outcrops (Wildland Consultants unpubl. data 2013)
- Banks Peninsula hebe (*Hebe strictissima*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula) - occasional on rock-outcrops (Wildland Consultants unpubl. data 2013) also in Orton Bradley Park (QEII 2009)
- Yellow rock groundsel (*Senecio glaucophyllus subsp. basinudus*) (At Risk - Naturally Uncommon) (QEII 2009)

Indigenous plant species have been recorded from the site that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- Bidibidi (*Acaena dumicola*) (Wildland Consultants unpubl. data 2013)
- *Carex secta* – Mt Herbert Spur and (Wildland Consultants unpubl. data 2013) and Orton Bradley Park (QEII 2009)
- *Carex solandri* - Orton Bradley Park (QEII 2009)
- Swamp sedge (*Carex virgata*) - Orton Bradley Park (QEII 2009)
- Woolly cloak fern (*Cheilanthes distans*) - Orton Bradley Park (QEII 2009)
- *Colobanthus strictus* (Wildland Consultants unpubl. data 2013)
- Tutu (*Coriaria sarmentosa*) (QEII 2009)
- Easter orchid (*Earina autumnalis*) (QEII 2009)
- New Zealand blueberry (*Dianella nigra*) – Big Rock, Orton Bradley Park (Bowie 2010)
- Climbing fuchsia (*Fuchsia perscandens*) (Wildland Consultants unpubl. data 2013)
- Comb fern (*Notogrammitis heterophylla*) (Wildland Consultants unpubl. data 2013)
- Willow herb (*Epilobium rotundifolium*) (QEII 2009)
- Manuka (*Leptospermum scoparium*) (QEII 2009)
- Porcupine scrub (*Melicytus aff. alpinus*) - Orton Bradley Park (QEII 2009)
- Blue tussock (*Poa colensoi*) (QEII 2009)
- Leatherleaf fern (*Pyrrosia eleagnifolia*) (QEII 2009)
- Waioriki (*Ranunculus glabrifolius*) (QEII 2009)
- Hook grass (*Uncinia scabra*) (QEII 2009)
- *Scleranthus uniflorus* (QEII 2009)
- *Scleranthus biflorus* (Wildland Consultants unpubl. data 2013)

### Invertebrates

Nationally At Risk invertebrate species recorded from the site are:

- *Gadira petraula* (At Risk - Naturally Uncommon), a rock face moth (Wildland Consultants unpubl. data 2013).
- *Samana acutata* (At Risk - Relict) – Orton Bradley Park (Bowie 2010)

Endemic invertebrate species recorded from the site are:

- *Holcaspis suteri* (a beetle) (endemic to Banks Peninsula) (Bowie 2010)



### Freshwater Fish

Nationally At Risk freshwater fish species (Goodman et al. 2014) recorded from Te Wharau Stream in Orton Bradley Park (Bowie 2010) are:

- Redfin bully (*Gobiomorphus huttoni*) (At Risk – Declining, uncommon in the ecological district)
- Inanga (*Galaxias maculatus*) (At Risk – Declining)
- Torrentfish (*Cheimarrichthys fosteri*) (At Risk – Declining)
- Longfin eel (*Anguilla dieffenbachia*) (At Risk – Declining)

Two other Nationally At Risk freshwater fish species have been recorded here in previous surveys between 1965 and 1985 that were not recorded during the 2009 survey (Bowie 2010):

- Bluegill bully (*Gobiomorphus hubbsi*) (At Risk – Declining)
- Koaro (*Galaxias brevipinnis*) (At Risk – Declining)

One freshwater fish species that is not nationally Threatened or At Risk but is uncommon in the Herbert Ecological District has been recorded from Te Wharau Stream in Orton Bradley Park (Bowie 2010):

- Giant bully (*Gobiomorphus gobioides*)

### Aquatic invertebrates

Two nationally Threatened aquatic invertebrates (Grainger et al. 2014) have been recorded from Te Wharau Stream in Orton Bradley Park (Bowie 2010):

- *Costachorema peninsulae* (caddisfly) (Nationally Vulnerable, endemic to Banks Peninsula)
- *Hydrobiosis styx* (caddisfly) (Nationally Vulnerable, endemic to Banks Peninsula and Christchurch)

#### **5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

It has five plant species that is at its southern national distributional limit on Banks Peninsula (Wilson 2013):

- Akeake (*Dodonaea viscosa*) (southern national limit) (QEII 2009)
- Woolly cloak fern (*Cheilanthes distans*) (southern national limit) (QEII 2009)
- Titoki (*Alectryon excelsus*) (southern national limit) (Wildland Consultants unpubl. data 2013)
- Native passion vine (*Passiflora tetrandra*) (southern national limit) (Wildland Consultants unpubl. data 2013, QEII 2009)
- Kawakawa (*Piper excelsum*) (QEII 2009)

#### **6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare**



***ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

The site is significant under this criterion.

There are extensive basic igneous bluffs, scarps and rock outcrops throughout the site that support specialised indigenous vegetation (Wildland Consultants unpubl. data 2013). At a national scale these features are an originally rare ecosystem (Williams et al. 2007).

There are seepage wetlands and flushes within the site (Bowie 2010, Wildland Consultants unpubl. data 2013) that, although relatively common on Banks Peninsula, are classified as 'originally rare' ecosystems at a national scale (Williams et al. 2007). Those wetlands that support indigenous vegetation communities are significant under this criterion.

## **Diversity and Pattern**

### ***7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

It supports a high diversity of indigenous plants. Ninety species were recorded during a recent botanical survey of the bluffs on Mt Herbert spur (Wildland Consultants unpubl. data 2013) and 121 species have been recorded from the QEII covenant (QEII 2009 *In*: Bowie 2010) (plant species lists for these areas are provided in Appendices 1 and 2). This high diversity of plant taxa reflects the mosaic of indigenous vegetation communities, differing levels of exposure and aspect and the altitudinal gradient from the valley floor at approximately 80 m to the top of the bluffs at 580 m above sea level.

The diverse range of terrestrial invertebrates supports a relatively diverse range of indigenous fauna. Fourteen species of indigenous birds have been recorded from the site (Appendix 3) and the diversity of indigenous terrestrial invertebrates is high (Bowie 2010).

Te Wharau Stream and its tributaries support a very high diversity of indigenous freshwater fish (9 species) relative to other Banks Peninsula streams (Bowie 2010). The diversity of caddisfly (Trichoptera) in streams at Orton Bradley Park is also very high. Twenty-six caddisfly species have been collected from Orton Bradley Park (Bowie 2010). This exceeds the diversity at other relatively intact Banks Peninsula streams including Kaituna River, Hinewai Reserve and Prices Stream (Bowie 2010).

## **Ecological Context**

### ***8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***





The site is significant under this criterion.

It provides important ecological linkages between the extensive and diverse areas of montane and sub-alpine habitats of Mt Bradley and Mt Herbert with areas of lowland forest such as podocarp/hardwood forest in QEII covenants in Orton Bradley Park and the Banks Peninsula Conservation Trust Covenants at the northern (lower) end of the spur and in lower Church Gully. The forest within the site supports large remnant podocarp trees and is part of an important network of feeding sites on Banks Peninsula for New Zealand pigeon (Bowie 2010).

Seral indigenous vegetation within the site such as small-leaved indigenous shrubland along the top of the spur above the rock bluffs and regenerating shrubland and bracken, with scattered cabbage trees, flax/harakeke, kanuka and other native trees below the bluffs buffer the secondary forest and rock bluff communities.

**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. With the exception of small seepages and flushes dominated by wiwi (*Juncus edgariae*) (Wildland Consultants unpubl. data 2013) there are no wetlands within the site.

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

Indigenous vegetation, including kanuka forest, within the site provides important habitat for common forest birds and a diverse range of common indigenous invertebrates including Canterbury tree weta, leaf-vein slugs and Banks Peninsula cockroach (Bowie 2010). It also provides important habitat for lizards (Bowie 2010).

Te Wharau Stream provides important habitat for a diverse range of freshwater fish species and aquatic invertebrates including nationally Threatened and At Risk species (Bowie 2010).

## Site Management

### Existing Protection Status

73.3 ha of Orton Bradley Park are protected by Queen Elizabeth II covenant (covenant no. 5-11-236). The remainder of the site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants: Occasional <i>Pinus radiata</i> spreading from neighbouring pine plantations, gorse (common at the northern end of the rock bluffs), sycamore, old man's beard, and <i>Pittosporum ralphii</i> a non-local native.</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing wilding pines to prevent further spread with ongoing surveillance and control as required.</li> <li>Consider controlling gorse on rock bluffs and outcrops where there are high value indigenous rock outcrop vegetation communities. Appropriate control methods should be used that do not damage the ecological values.</li> <li>Consider regular surveillance for, and control of high priority pest plants such as sycamore, old mans beard, Chilean potato vine, cotoneaster, Darwin's barberry, banana passionfruit and spur valerian (on rock outcrops and bluffs). Control using appropriate methods if/when detected.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about benefits to biodiversity of pest plant monitoring and control. Provide advice and guidance as needed.</li> <li>Assistance available as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Existing access ways. Farm and access tracks traverse the site and there are a number of popular walking tracks within Orton Bradley</li> </ul>	<ul style="list-style-type: none"> <li>The landowners and managers will continue to be able to use existing tracks and the public will be able to continue to use walking tracks in Orton Bradley Park. Any track maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the landowners/managers are aware that existing tracks and access ways can be maintained and used.</li> </ul>

Park.	should be undertaken to minimise damage to indigenous vegetation and habitats.	
<ul style="list-style-type: none"> <li>Rock climbers potentially use the bluffs within this site and could damage indigenous rock bluff communities.</li> </ul>	<ul style="list-style-type: none"> <li>Council to liaise with rock climbing groups to raise awareness of the importance of rock bluff communities and ensure any damage is minimised.</li> </ul>	<ul style="list-style-type: none"> <li>Provide awareness raising / interpretation for rock climbers to help them understand the values of the rock bluff communities.</li> </ul>
<ul style="list-style-type: none"> <li>Degradation of water quality within Orton Bradley Park (Bowie 2010)</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the riparian margins of Te Wharau Stream and its tributaries to stop cattle and sheep from contaminating the waterways. This would be beneficial for maintaining the high aquatic biodiversity values (Bowie 2010).</li> <li>Once fenced, planting the riparian margins of Te Wharau Stream could be considered to reduce sediment and nutrient inputs and buffer and shade the high aquatic ecology values.</li> </ul>	<ul style="list-style-type: none"> <li>Collaborate with ECan / CCC for advice and guidance about stock management, fencing and planting along waterways, with assistance as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Stock damage to indigenous vegetation communities (Bowie 2010)</li> </ul>	<ul style="list-style-type: none"> <li>Consider periodic fence inspections of the covenants and other fenced areas with maintenance as required to ensure fences remain stock-proof.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Consider restoration plantings in appropriate locations to buffer areas such as wetlands and connect isolated forest patches. Plantings should use appropriate, locally sourced species.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Animal pests (Bowie 2010)</li> </ul>	<ul style="list-style-type: none"> <li>Continue animal pest control and monitoring (Bowie 2010)</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowners about pest animal monitoring and control. Assistance where appropriate.</li> </ul>

<ul style="list-style-type: none"><li>Eucalyptus trees (Bowie 2010)</li></ul>	<ul style="list-style-type: none"><li>Consider removing the eucalyptus trees in the lower reaches of Magnificent Gully near the rocky outcrop north of Big Rock. The additional light would create more suitable habitat for lizards and allow regeneration of indigenous vegetation communities (Bowie 2010).</li></ul>	<ul style="list-style-type: none"><li>N/A</li></ul>
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**Assessment completed by:** Scott Hooson  
**Date:** 25 March 2015

**Statement completed by:** Scott Hooson  
**Date:** 25 March 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2013).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Acaena dumicola</i>	bidibidi, piripiri
<i>Aciphylla subflabellata</i>	speargrass, spaniard, kurikuri
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Anthosachne solandri</i>	blue wheatgrass
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Blechnum chambersii</i>	lance fern
<i>Brachyglottis lagopus</i>	groundsel
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carmichaelia australis</i>	native broom, common broom
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carex secta</i>	niggerhead, pukio
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Colobanthus strictus</i>	
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rotundifolia</i>	round-leaved coprosma
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Corokia cotoneaster</i>	korokio
<i>Cortaderia richardii</i>	toetoe
<i>Crassula sieberiana</i>	stone crop
<i>Ctenopteris heterophylla</i>	comb fern
<i>Deyeuxia avenoides</i>	oat grass
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	Mercury Bay weed, dichondra
<i>Discaria toumatou</i>	matagouri, wild irishman
<i>Euchiton audax</i>	native cudweed
<i>Festuca actae</i>	Banks Peninsula blue grass
<i>Festuca novae-zelandiae</i>	fescue tussock, hard tussock
<i>Fuchsia excorticata X perscandens</i>	shrubby fuchsia
<i>Fuchsia perscandens</i>	climbing fuchsia
<i>Galium propinquum</i>	native bedstraw
<i>Geranium aff. microphyllum</i>	native geranium
<i>Geranium brevicaule</i>	short-flowered cranesbill
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum lanceolatum</i>	ninia
<i>Heliohebe lavaudiana</i>	Banks Peninsula sun hebe



<i>Hierochloa redolens</i>	holy grass, karetu
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle montana</i>	pennywort
<i>Hydrocotyle moschata</i>	pennywort
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea ericoides</i>	kanuka
<i>Leptinella dioica</i>	button daisy
<i>Leucopogon fraseri</i>	dwarf heath, patotara
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Linum monogynum</i>	NZ linen flax
<i>Luzula banksiana</i> var. <i>orina</i>	woodrush
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myrsine australis</i>	red mapou, red matipo
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	native oxalis
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Phormium tenax</i>	flax, harakeke
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Poa cita</i>	silver tussock
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum oculatum</i>	shield fern
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudognaphalium luteoalbum</i>	jersey cudweed
<i>Pteridium esculentum</i>	bracken
<i>Ranunculus multiscapus</i>	grassland buttercup
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Rytidosperma species</i>	danthonia
<i>Scandia geniculata</i>	climbing aniseed
<i>Scleranthus biflorus</i>	
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Sophora prostrata</i>	dwarf kowhai, prostrate kowhai
<i>Stellaria decipiens</i>	chickweed
<i>Uncinia leptostachya</i>	hook grass
<i>Viola cunninghamii</i>	white violet
<i>Vittadinia australis</i>	white fuzzweed
<i>Wahlenbergia rupestris</i>	NZ harebell
<b>Exotic Species</b>	
<i>Acer pseudoplatanus</i>	sycamore
<i>Agrostis capillaris</i>	browntop
<i>Aira caryophylla</i>	silver hair grass





<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Arenaria serpyllifolia</i>	sandwort
<i>Bromus hordeaceus</i>	soft brome
<i>Cerastium fontanum</i>	mouse-ear chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Crepis capillaris</i>	hawksbeard
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Epilobium cinereum</i>	willow herb
<i>Festuca rubra</i>	red fescue
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Pilosella officinarum</i>	mouse-ear hawkweed
<i>Pinus radiata</i>	radiata pine, Monterey pine
<i>Pittosporum ralphii</i>	karo
<i>Rumex acetosella</i>	sheeps sorrel
<i>Sonchus oleraceus</i>	puha, smooth sow thistle
<i>Trifolium pratense</i>	red clover
<i>Trifolium repens</i>	white clover
<i>Ulex europaeus</i>	gorse
<i>Verbascum thapsus</i>	woolly mullein

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**Appendix 2: Plant Species List for Magnificent Gully, Waterfall Gully and Big Rock, Kowhai Gully, and upper Te Wharau Stream**

Sourced from QEII (2009) *In*: Bowie (2010).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Alectryon excelsus</i>	Titoki
<i>Aristotelia serrata</i>	Wineberry
<i>Asplenium appendiculatum</i>	Ground spleenwort
<i>Asplenium flabellifolium</i>	Necklace Fern
<i>Asplenium flaccidum</i>	Hanging Spleenwort
<i>Asplenium gracillimum</i>	Hen & Chicken Fern
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Astelia fragrans</i>	bush lilly
<i>Blechnum chambersii</i>	Lance fern
<i>Blechnum minus</i>	Swamp kiokio
<i>Blechnum procerum</i>	small kiokio
<i>Brachyglottis lagopus</i>	Mountain daisy
<i>Calystegia tuguriorum</i>	Climbing convolvulus, NZ bindweed
<i>Carex geminata</i>	Cutty grass
<i>Carex secta</i>	Green swamp tussock
<i>Carex solandri</i>	Forest Sedge
<i>Carex virgata</i>	Carex virgata
<i>Carpodetus serratus</i>	Marbleleaf
<i>Cheilanthes distans</i>	Woolly cloak fern
<i>Clematis foetida</i>	Native clematis
<i>Coprosma crassifolia</i>	Mikimiki
<i>Coprosma linariifolia</i>	Yellow wood
<i>Coprosma lucida</i>	Shining karamu
<i>Coprosma propinqua</i>	Mingimingi
<i>Coprosma rhamnoides</i>	Red-fruited mikimiki
<i>Coprosma robusta</i>	Karamu
<i>Coprosma rotundifolia</i>	Round-leaved coprosma
<i>Coprosma tayloriae</i>	
<i>Coprosma x cunninghamii</i>	
<i>Cordyline australis</i>	Cabbage tree
<i>Coriaria arborea</i>	Tree tutu
<i>Coriaria sarmentosa</i>	
<i>Cortaderia richardii</i>	Toetoe grass, toitoi
<i>Crassula sieberiana</i>	
<i>Cyathea dealbata</i>	Silver Fern, Ponga
<i>Cyathodes juniperina</i>	Mingimingi
<i>Deyeuxia avenoides</i>	Mountain oat grass
<i>Dianella nigra</i>	NZ Blueberry
<i>Dichelachne crinita</i>	Long-hair plume grass
<i>Dicksonia squarrosa</i>	Wheki, Brown Tree Fern
<i>Discaria toumatou</i>	Matagouri
<i>Dodonaea viscosa</i>	Akeake



<i>Earina autumnalis</i>	Easter orchid
<i>Echinopogon ovatus</i>	Forest hedgehog grass
<i>Eleocharis acuta</i>	Sharp spike sedge
<i>Epilobium pubens</i>	Willow herb
<i>Epilobium rotundifolia</i>	
<i>Fuchsia excorticata</i>	Fuchsia
<i>Gaultheria antipoda</i>	Bush snowberry
<i>Geranium microphyllum</i>	
<i>Gnaphalium involucreatum</i>	Creeping cudweed
<i>Gnaphalium limosum</i>	Creeping cudweed
<i>Griselinia littoralis</i>	Broadleaf
<i>Haloragis erecta</i>	Toatoa, fire weed
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Hedycarya arborea</i>	Pigeonwood
<i>Helichrysum lanceolatum</i>	Ninia
<i>Heliohebe lavaudiana</i>	Banks Peninsula hebe
<i>Hoheria angustifolia</i>	Narrow-leaved lacebark
<i>Hydrocotyle heteromeria</i>	NZ waxweed
<i>Hydrocotyle moschata</i>	
<i>Hydrocotyle novae-zelandiae</i>	NZ waxweed
<i>Juncus edgarii</i>	Rush
<i>Kunzea ericoides</i>	Kanuka
<i>Leptospermum scoparium</i>	Manuka
<i>Libertia ixioides</i>	New Zealand Iris
<i>Linum monogynum</i>	Linen flax
<i>Lophomyrtus obcordata</i>	Rohutu, NZ myrtle
<i>Luzula banksiana</i> var. <i>orina</i>	coastal woodrush
<i>Macropiper excelsum</i>	Pepperwood
<i>Melicope simplex</i>	Poataniwha
<i>Melicytus</i> aff. <i>alpinus</i>	Porcupine shrub
<i>Melicytus ramiflorus</i>	Mahoe
<i>Metrosideros diffusa</i>	Climbing rata
<i>Microsorium pustulatum</i>	Hound's tongue
<i>Microtis unifolia</i>	Onion-leaved orchid
<i>Muehlenbeckia australis</i>	Large-leaved pohuehue
<i>Myoporum laetum</i>	Ngaio
<i>Myrsine australis</i>	Mapou
<i>Olearia paniculata</i>	Golden akeake
<i>Parsonsia heterophylla</i>	Native jasmine
<i>Passiflora tetrandra</i>	NZ passionfruit
<i>Pellaea rotundifolia</i>	Button fern
<i>Pennantia corymbosa</i>	Kaikomako
<i>Pittosporum eugenoides</i>	Lemonwood
<i>Pittosporum tenuifolium</i>	Kohuhu
<i>Plagianthus regius</i>	Ribbonwood
<i>Pneumatopteris pennigera</i>	gully fern
<i>Poa cita</i>	Silver tussock
<i>Poa colensoi</i>	
<i>Poa matthewsii</i>	
<i>Podocarpus totara</i>	Totara
<i>Polystichum richardii</i>	common shield fern
<i>Prumnopitys taxifolia</i>	Matai
<i>Pseudopanax arboreus</i>	Five-finger



<i>Pseudopanax crassifolius</i>	Kohuhu, Black matipo
<i>Pteridium esculentum</i>	Bracken
<i>Pyrrosia eleagnifolia</i>	Leatherleaf Fern
<i>Ranunculus glabrifolius</i>	Silky alpine buttercup
<i>Ranunculus multiscapus</i>	Grassland buttercup
<i>Ranunculus reflexus</i>	Hairy buttercup
<i>Ripogonum scandens</i>	Supplejack
<i>Rubus cissoides</i>	Bush lawyer
<i>Rubus schmidelioides</i>	white-leaved lawyer
<i>Rubus squarrosus</i>	Leafless lawyer
<i>Scandia geniculata</i>	Scandia
<i>Schefflera digitata</i>	Pate
<i>Scleranthus uniflorus</i>	
<i>Senecio glaucophyllus</i> subsp. <i>basinudus</i>	
<i>Senecio quadridentatus</i>	Cotton fireweed
<i>Sophora microphylla</i>	Kowhai
<i>Stellaria decipiens</i>	NZ chickweed
<i>Streblus heterophyllus</i>	Streblus heterophyllus
<i>Thelymitra longifolia</i>	White Sun Orchid
<i>Triglochin striatum</i>	Arrow grass
<i>Uncinia leptostachya</i>	Hookgrass
<i>Uncinia scabra</i>	Hookgrass
<i>Uncinia uncinata</i>	Hook-grass
<i>Urtica incisa</i>	scrub nettle
<i>Viola cunninghamii</i>	mountain violet
<i>Vittadinia australis</i>	white fuzzweed
<b>Exotic Species</b>	
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Anthriscus caucalis</i>	Beaked parsley
<i>Berberis darwinii</i>	Darwin's Barberry
<i>Bromus diandrus</i>	rippgut brome
<i>Chamaecytisus palmensis</i>	Tree lucerne
<i>Clematis vitalba</i>	Old man's beard
<i>Dactylis glomerata</i>	cocksfoot
<i>Epilobium ciliatum</i>	Willow herb
<i>Eucalyptus</i> sp.	Gum
<i>Glyceria declinata</i>	blue sweet grass
<i>Holcus lanatus</i>	Yorkshire fog
<i>Juncus articulatus</i>	Jointed rush
<i>Juncus tenuis</i>	Slender rush
<i>Mimulus guttatus</i>	Monkey musk
<i>Myosotis laxa</i> subsp. <i>caespitosa</i>	Water forget-me-not
<i>Pinus radiata</i>	Pine
<i>Rumex crispus</i>	Yellow Dock
<i>Sagina procumbens</i>	Pearlwort
<i>Sambucus nigra</i>	Elderberry



**Appendix 3: Indigenous Birds recorded from Orton Bradley Park**

Sourced from Bowie (2010). Data collected by Nick Allen.

Common Name	Mar-04	Jun-04	Sep-04	Jan-05	Apr-05	Aug-05	Mar-06	Sep-06	Jan-07
White-faced heron			1				1	1	
Paradise shelduck		19	5	5	4	3	20	12	
Spur-winged plover	2	7	2	4	12	6	5	2	7
New Zealand pigeon		1		2		2	2	2	4
New Zealand kingfisher			2		1		2	3	
Welcome swallow				6	3	3	4		4
Grey warbler	9	6	8	8	9	11	8	6	3
South Island fantail	9	6	1	7	8	8	8	2	7
Silvereeye	16	34	16	18	33	9	40	2	8
Bellbird	9	8	6	8	9	9	7	8	3
Shining cuckoo				2					1
Black-backed gull						3	2		
Red-billed gull							1		
Pukeko								3	

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Okana Valley

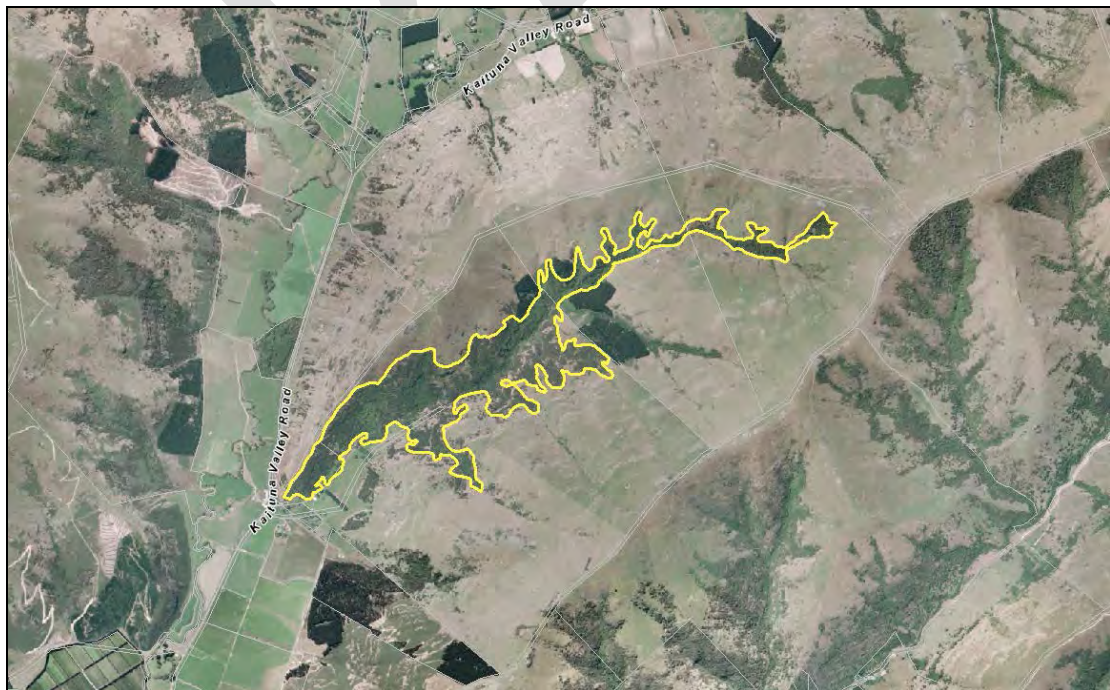
**Site number:** SES/H/23

**Physical address of site:** Okana Valley, Kaituna Valley, Little River

#### Summary of Significance:

This site is significant because it contains a relatively large area of representative and rare indigenous forest and a diverse range of indigenous vegetation communities on Acutely and Chronically Threatened land environments. These communities support nationally Threatened and At Risk plant, fish and aquatic invertebrates, several plant species that are uncommon within the ecological region or ecological district and four plant species at their distributional limits on Banks Peninsula. The site provides an important linkage between other areas of high ecological value in the surrounding area.

#### Site Map



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 162.4

**Central point (NZTM):** E1576288, N5156576

## Site Description

This site is located within a small valley on the eastern side of the Kaituna Valley. The valley faces in a generally south-western direction. The altitudinal range of the site is from approximately 20 to 520 m above sea level.

The riparian margins of Okana Stream and lower slopes of the catchment support indigenous forest. The main indigenous vegetation communities, as described by (Wildland Consultants unpubl. data 2012) are:

- Totara-matai-kahikatea/mixed hardwood forest
- Matai/mixed hardwood forest
- Narrow-leaved lacebark treeland with scattered kowhai and kanuka trees at the bottom of the valley alongside Okana Stream
- Secondary hardwood forest with a mixed canopy of kanuka and native hardwoods, and a subcanopy of small-leaved shrubs
- Secondary kanuka-kowhai forest on dry, north-facing slopes
- Kanuka forest on south facing slopes with an understorey of niniao and other small-leaved shrubs
- Kanuka/*Coprosma crassifolia*-*Coprosma virescens*-lowland flax shrubland on south-facing slopes and rock outcrops
- Secondary riparian mixed hardwood forest

## Extent of Site of Ecological Significance

The site includes the indigenous forest along the riparian margins of the Okana Stream and on the south-eastern and north-western faces of the Okana Valley. Areas of exotic pine plantations on the margins of the site are excluded.

## Assessment Summary

The Okana Valley Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below). Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8).



## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The areas of forest that contain emergent podocarps and areas of secondary hardwood forest within the site are representative of the natural diversity of the Herbert Ecological District.

The totara-matai-kahikatea/mixed hardwood is representative of the pre-1840 plant community structure and diversity of the Herbert Ecological District. There are a number of large (remnant) emergent podocarps near the bottom of the valley with good regeneration of all three species. It also has a diverse range of native hardwood tree species. The forest is particularly diverse and dense at the bottom of the valley around the stream where there is permanent moisture (Wildland Consultants unpubl. data 2012).

The patch of matai/mixed hardwood forest in the upper catchment also meets the threshold for significance under this criterion. Although the forest understorey has been modified by stock and is relatively bare, a number of remnant matai and totara have persisted here and are emergent over a mixed canopy of mahoe, kaikomako, broadleaf and five-finger (Wildland Consultants unpubl. data 2012).

Other areas of forest with kanuka and native hardwoods within the site contain a wide variety of native species and are typical of regenerating forest occurring at lower elevations on Banks Peninsula.

The secondary kanuka-kowhai forest on the dry, north-facing slopes of the site does not meet the threshold for significance under this criteria. It largely consists of kanuka forest over exotic grassland. The understorey below the kanuka is open and heavily grazed, with very few palatable species (Wildland Consultants unpubl. data 2012).

Okana Stream contains an assemblage of aquatic invertebrates that is characteristic of less modified catchments with continuous riparian vegetation. QMCI values for Okana Stream indicate that water quality is 'excellent', while MCI values for this stream indicate that water quality is 'good'. This stream supports an invertebrate community that includes sensitive mayfly, stonefly and caddisfly (EPT: Ephemeroptera, Plecoptera, Trichoptera) species, with an average of 49% of taxa being EPT and the abundance of EPT individuals an average of 61% (EOS unpubl. data 2014).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.





It is a large example of indigenous lowland forest in the context of the Herbert Ecological District.

### Rarity/Distinctiveness

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The indigenous forest within the site is significant under this criterion.

Indigenous forest has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest in the ED is estimated to be 10.9% including manuka and/or kanuka (New Zealand Landcover Database (Version 4)).

This site also meets this criterion at the Level IV land environment scale. The site supports indigenous forest that is entirely on Acutely and Chronically Threatened land environments (F3.1a and F3.1b) where 9.9 and 12.1% indigenous vegetation is left on these land environments respectively on a national scale (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports nationally Threatened and At Risk plant, fish and aquatic invertebrates and several plant species that are uncommon within the ecological region or ecological district.

### Plants

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Wildland Consultants unpubl. data 2012) are:

- *Coprosma virescens* (At Risk - Declining) - frequent throughout the site
- *Tupeia antarctica* (At Risk - Declining) - rare in mixed canopy hardwood forest with emergent podocarps
- *Pseudopanax ferox* (At Risk – Naturally Uncommon) - rare in secondary forest
- *Teucrium parvifolium* (At Risk - Declining) - (Boot 1998) recorded several isolated plants, a population of six plants, and a population of >15 plants

Plant species recorded from the site (Wildland Consultants unpubl. data 2012) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Blechnum novae-zelandiae*
- *Carex secta*



- *Carex virgata*
- *Euchiton sphaericus*
- *Hydrocotyle novae-zeelandiae*
- *Microlaena avenacea*
- *Pyrrosia eleagnifolia*
- *Rumex flexuosus*
- *Uncinia banksii*

### Fish

The Okana Stream, which flows through the site supports one nationally Threatened and two nationally At Risk (Goodman et al. 2014) fish species (Aquatic Ecology Ltd unpubl. data 2012):

- Lamprey (Threatened - Nationally Vulnerable)
- Longfin eel (At Risk – Declining)
- Inanga (At Risk – Declining)

### Aquatic Invertebrates

Okana Stream provides habitat for a Threatened - Nationally Vulnerable (Grainger et al. 2014) mayfly *Nesameletus vulcanus* (EOS unpubl. data 2014) that is also endemic to Banks Peninsula.

#### 5. ***The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.***

The site is significant under this criterion.

There are four species that are at their southern national or regional distributional limits on Banks Peninsula (Wilson 2013). These species are (Wildland Consultants unpubl. data 2012):

- Titoki (*Alectryon excelsus*) (southern national limit)
- Pigeonwood (*Hedycarya arborea*) (southern regional limit)
- Native passion vine (*Passiflora tetrandra*) (southern national limit)
- Kawakawa (*Piper excelsum*) (southern national limit)

#### 6. ***Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.***

The site is significant under this criterion.

There are basic igneous bluffs, scarps and rock outcrops within the site that support indigenous vegetation (Wildland Consultants unpubl. data 2012). These features are an originally rare ecosystem at a national scale (Williams et al. 2007).

### Diversity and Pattern

#### 7. ***Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has***



***changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

It contains a high diversity of indigenous ecosystem types. The pattern of these vegetation communities across the site is driven by several factors including (but not limited to) aspect, moisture availability, slope and historic human disturbance. The site also has an almost continuous, but modified sequence of indigenous forest from the Kaituna Valley floor at approximately 20 m above sea level to the head of Okana Valley at 520 m above sea level. Some of the less modified communities such as the totara-matai-kahikatea/mixed hardwood forest and secondary hardwood forest have a high diversity of indigenous plant taxa. In total, 111 indigenous plant species were recorded at the site during a brief botanical survey (Wildland Consultants unpubl. data 2012).

**Ecological Context**

***8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The site provides an important linkage between other areas of high ecological value in the surrounding area, particularly between the old growth lowland podocarp forest in Kaituna Valley Scenic Reserve and the extensive areas of regenerating secondary forest and scrub with podocarp hardwood forest in Prices Valley. Remnant podocarp trees (kaihikatea, lowland totara and matai) within the site provide an important seed source for dispersal into other forest remnants. The forest within the site also provides continuous riparian cover to Okana Stream from its headwaters to where it meets the Kaituna Valley.

Okana Stream is an important ecological corridor for at least three species of migratory freshwater fish; longfin eel, lamprey, and inanga (Aquatic Ecology Ltd unpubl. data 2012). The ecological linkage between the coast and the catchment is essential for these fish.

***9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site.

***10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess the site against this criterion.

## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Biodiversity pest plants: Old mans beard, wilding pines, cherry plum, elderberry, english ivy, <i>Cotoneaster simonsii</i> and <i>Gunnera tinctoria</i> all occur within the site (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>• Consider controlling biodiversity pest plants using appropriate control methods that will minimise damage to indigenous vegetation. The highest priority species for control is old man's beard. There are extensive and dense infestations of this species throughout the lower part of the site. Other priority species are wilding pines, ivy and cotoneaster.</li> <li>• Consider ongoing weed surveillance for biodiversity pest plants such as Darwin's barberry.</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowners about the benefits to biodiversity of pest plant monitoring and control.</li> <li>• Assistance available where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>• Domestic stock. The lower end of the valley has been retired from grazing, however much of the remaining area that was surveyed is grazed by sheep (Wildland Consultants unpubl. data 2012).</li> </ul>	<ul style="list-style-type: none"> <li>• Consider fencing the site to keep stock out and promote recovery of the understorey.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with landowners about benefits to biodiversity of stock management options.</li> <li>• Assistance where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>• Pine plantations on the margins of the site.                             <ul style="list-style-type: none"> <li>○ Spread of wilding pines into the site.</li> <li>○ Damage to indigenous vegetation within</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Consider ongoing surveillance for and control of wilding pines.</li> <li>• Ensure forestry contractors are aware of the significant ecological site adjoining the pine</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowner(s)/ forestry contractor(s) prior to harvesting of plantation forestry about protection of biodiversity values associated with forestry operations.</li> </ul>

the site during harvesting operations.	plantations and use harvesting methods that minimise any potential adverse effects associated with harvesting.	
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**Assessment completed by:** Scott Hooson  
**Date:** 18 February 2015

**Statement completed by:** Scott Hooson  
**Date:** 18 February 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2012).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena juvenca</i>	bidibidi, pipiripi
<i>Alectryon excelsus</i>	titoki
<i>Arthropodium candidum</i>	grass lily, repehinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum novae-zealandiae</i>	kiokio
<i>Blechnum procerum</i>	small kiokio
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carmichaelia australis</i>	native broom, common broom
<i>Carex forsteri</i>	cutty grass
<i>Carex secta</i>	niggerhead, pukio
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Carex virgata</i>	swamp sedge
<i>Cheilanthes sieberi</i>	rock fern
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Coriaria arborea</i>	tree tutu
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	Mercury Bay weed, dichondra
<i>Dicksonia squarrosa</i>	wheki, rough tree fern
<i>Discaria toumatou</i>	matagouri, wild irishman
<i>Echinopogon ovatus</i>	hedgohog grass
<i>Epilobium species</i>	willow herb
<i>Euchiton sphaericus</i>	
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Fuchsia excorticata X perscandens</i>	shrubby fuchsia
<i>Griselinia littoralis</i>	broadleaf, kapuka





<i>Haloragis erecta</i>	toatoa
<i>Hebe salicifolia</i>	koromiko
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum lanceolatum</i>	niniao
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle moschata</i>	pennywort
<i>Hydrocotyle novae-zeelandiae</i>	pennywort
<i>Hypolepis ambigua</i>	pig fern
<i>Hypolepis rufobarbata</i>	sticky pig fern
<i>Ileostylus micranthus</i>	green mistletoe
<i>Juncus edgariae</i>	leafless rush, wi
<i>Kunzea ericoides</i>	kanuka
<i>Leptinella dioica</i>	button daisy
<i>Leptopteris hymenophylloides</i>	crepe fern, heruheru
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Lophomyrtus obcordata</i>	rohutu, NZ myrtle
<i>Luzula banksiana</i>	woodrush
<i>Macropiper excelsum</i>	kawakawa
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Metrosideros diffusa</i>	white climbing rata
<i>Microlaena avenacea</i>	bush rice grass
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Microtis unifolia</i>	onion orchid, maikaika
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia, pohuehue
<i>Myrsine australis</i>	red mapou, red matipo
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	native oxalis
<i>Parietaria debilis</i>	NZ pellitory
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Phormium tenax</i>	flax, harakeke
<i>Pittosporum eugeniioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Pneumatopteris pennigera</i>	gully fern, pakau
<i>Poa imbecilla</i>	weak poa
<i>Poa matthewsii</i>	
<i>Podocarpus totara</i>	lowland totara
<i>Polystichum neozelandicum</i>	shield fern
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prumnopitys taxifolia</i>	matai
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Pterostylis species</i>	green-hooded orchid
<i>Pyrrosia eleagnifolia</i>	leatherleaf fern
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Raoulia glabra</i>	mat daisy
<i>Ripogonum scandens</i>	supplejack, kareao



<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Rumex flexuosus</i>	Maori dock, NZ dock, runa
<i>Rytidosperma clavatum</i>	danthonia, bristle grass
<i>Schefflera digitata</i>	pate, seven-finger
<i>Senecio minimus</i>	native fireweed
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Streblus heterophyllus</i>	small-leaved milk tree, turepo
<i>Tupeia antarctica</i>	green mistletoe
<i>Uncinia banksii</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Urtica incisa</i>	bush nettle
<b>Exotic Species</b>	
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Arctium minus</i>	burdock
<i>Bromus diandrus</i>	rippgut brome
<i>Bromus hordeaceus</i>	soft brome
<i>Carex ? muricata</i>	coastal tree broom
<i>Cerastium glomeratum</i>	chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Clematis vitalba</i>	old man's beard
<i>Cotoneaster simonsii</i>	cotoneaster, khasia berry
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Elymus scaber</i>	blue wheatgrass, patiti
<i>Erodium cicutarium</i>	storksbill
<i>Foeniculum vulgare</i>	fennel
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Gunnera tinctoria</i>	Chilean rhubarb
<i>Hedera helix</i>	ivy
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Iris foetidissima</i>	stinking iris, roast beef plant
<i>Juncus acuminatus</i>	sharp-fruited rush
<i>Linum bienne</i>	pale flax
<i>Lolium perenne</i>	ryegrass
<i>Mimulus guttatus</i>	monkey musk
<i>Mycelis muralis</i>	wall lettuce
<i>Pilosella officinarum</i>	mouse-ear hawkweed
<i>Pinus radiata</i>	radiata pine, Monterey pine
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Polycarpon tetraphyllum</i>	allseed
<i>Prunus cerasifera</i>	cherry plum



<i>Prunella vulgaris</i>	selfheal
<i>Ranunculus repens</i>	creeping buttercup
<i>Rosa rubiginosa</i>	sweet briar, briar rose
<i>Rytidosperma racemosum</i>	danthonia
<i>Sambucus nigra</i>	elderberry
<i>Silybum marianum</i>	variegated thistle
<i>Solanum chenopodioides</i>	velvety nightshade
<i>Stellaria media</i>	chickweed
<i>Trifolium repens</i>	white clover
<i>Ulex europaeus</i>	gorse
<i>Verbascum thapsus</i>	woolly mullein
<i>Vittadinia gracilis</i>	purple fuzzweed

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Waipuna Saddle

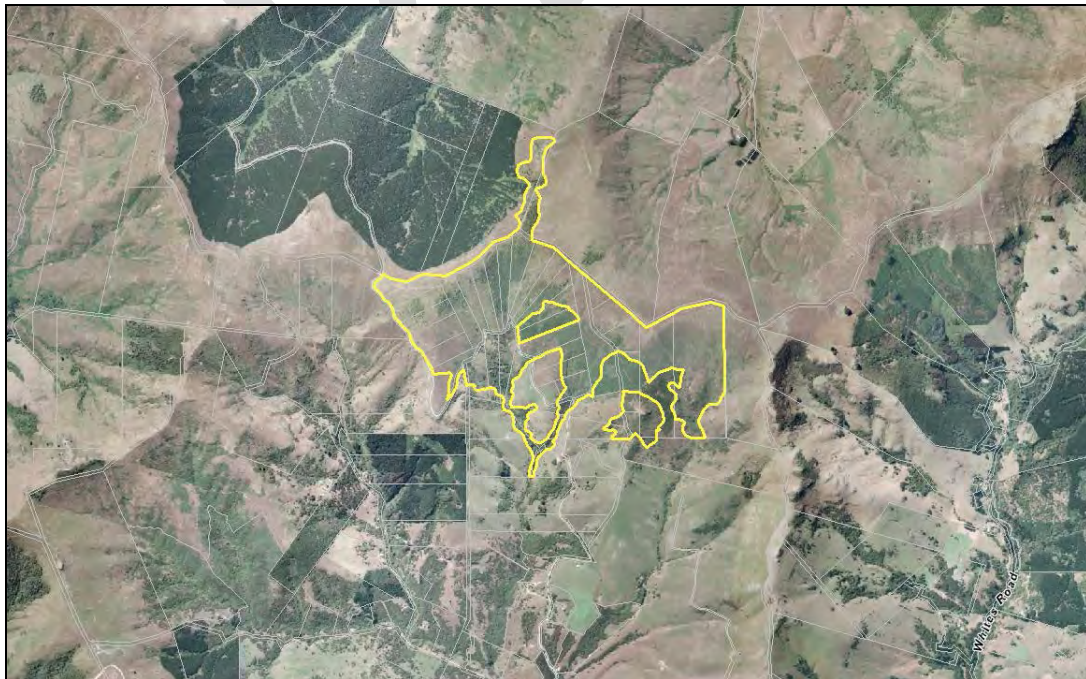
**Site number:** SES/H/24

**Physical address of site:** Upper Port Levy Valley

#### **Summary of Significance:**

The site is significant because it contains rare and representative indigenous vegetation communities, including old growth montane podocarp forest. It is botanically diverse and supports five At Risk – Declining plant species (three of which are endemic to Banks Peninsula), an outstanding number of plant species that are uncommon in the ecological district or region and two at their southern distributional limit. It has basic igneous bluffs, and rock outcrops that nationally, are an originally rare ecosystem. It also contributes to an important ecological network and provides important habitat for indigenous forest birds.

#### **Site Map**



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 146.47

**Central point (NZTM):** E1583132, N5159547

## Site Description

This site is located between Port Levy Saddle and Waipuna Saddle. It includes the summit ridge rising to Pt. 738 and Trig KK, Trig W and the steep head of the catchment on the southern side of the ridge down to approximately 300 m above sea level. The Department of Conservation identified most of the site as a Recommended Area for Protection (Herbert RAP 9 – Waipuna) (Wilson 1992).

The main indigenous vegetation communities, as identified by Jensen and Webster (2014a) and Wilson (1992) are:

- Thin-bark totara/mixed hardwood forest on montane hill slopes
- Montane podocarp and podocarp/hardwood treeland on hill slopes
- Mixed broadleaved second-growth hardwood forest on lowland and montane hill slopes
- Broadleaved hardwood treeland on lowland and montane hill slopes
- Native open shrubland on montane hill slopes

See Jensen and Webster (2014a) for a more detailed description of these vegetation communities and their distribution within the BPCT covenant.

Indigenous bird species recorded during 5 minute bird counts at the site are bellbird, brown creeper, silvereye, welcome swallow, South Island tomtit, grey warbler, Australasian harrier, and South Island fantail. In addition, New Zealand falcon have been sighted on several occasions, and wood pigeons visit the site when tree fuchsia is in fruit (Jensen and Webster 2014a).

## Extent of Site of Ecological Significance

The site includes an area of old growth thin-bark totara forest, containing the only known surviving adult New Zealand cedar/kaikawaka on Banks Peninsula, and a good example of indigenous rock bluff vegetation at the northern end of the site from approximately Trig KK to Trig W. It includes the Waipuna Bush BPCT (with the exception of an area of exotic dominated grassland above Western Valley Road on the western side of the covenant. It includes the scrub and forest communities within the QEII Trust covenant and the grassland, scrub and old growth forest within the Waipuna Saddle Scenic Reserve. Broad-leaved hardwood forest along the riparian



margins of two headwater tributaries on the southern boundary of the site (south of the BPCT boundary) is within the site.

Macrocarpa plantations within the Waipuna Saddle Scenic Reserve are part of the connecting habitat but are excluded as they are not ecologically significant and detract from the ecological values of the site. An area of exotic pasture on either side of Western valley Road within the QEII covenant and on the adjoining BPCT covenant are also not significant and are excluded from the site.

## Assessment Summary

The Waipuna Saddle Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

Remnants of old growth montane thin-bark totara/mixed hardwood forest and podocarp and podocarp/hardwood treeland occur within the site (Jensen and Webster 2014a, Head n.d.). These are highly representative of the pre-1840 composition in both plant community structure and plant community diversity of the Herbert Ecological District. Adjoining the old growth forest are secondary forest communities that are regenerating post disturbance, in particular totara, fuschia, pepper tree, and small-leaved shrubland dominated by *Coprosma* species. Although secondary, these communities are representative of seral communities in the ecological district. Representative bluff communities containing specialised, unique and endemic Banks Peninsula plant are also present (Head n.d.).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It is a relatively large example of a mosaic of old growth podocarp forest, regenerating shrublands, broadleaved second-growth hardwood forest and



treeland and regenerating small-leaved shrublands in the Herbert Ecological District.

#### Rarity/Distinctiveness

### **3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The indigenous vegetation on the ridgeline above Waipuna Saddle is on a Chronically Threatened land environment (F3.3b) where 17.6% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

The indigenous forest within the site is also significant under this criterion because it has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all other indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

Of particular significance is the presence of montane old growth forest (thin-barked totara forest and podocarp hardwood forest) within the site. Old growth forest has been reduced to approximately 800 ha or <1% of its original extent on Banks Peninsula (Wilson 2009).

### **4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

Five plant species have been recorded from the site that are nationally At Risk. Three of these are also endemic to Banks Peninsula. An outstanding number of species are also uncommon within the ecological district or region.

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site are:

- *Aciphylla subflabellata* (At Risk – Declining) (Jensen unpubl. data (2015))
- *Coprosma wallii* (At Risk – Declining) (Jensen unpubl. data (2015))
- *Heliohebe lavaudiana* (At Risk – Declining, endemic to Banks Peninsula) - good populations of the species occur in rock bluff communities (Head n.d.).
- *Festuca actae* (At Risk - Naturally Uncommon, endemic to Banks Peninsula) (Jensen unpubl. data 2015)
- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to Banks Peninsula) (Jensen unpubl. data 2015)

Forty vascular plant species have been recorded from the site (Jensen unpubl. data 2015) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013). They are:



- *Anisotome aromatica*
- *Australina pusilla*
- *Blechnum colensoi*
- *Blechnum volcanicum*
- *Celmisia gracilentia*
- *Chaerophyllum novae-zelandiae*
- *Chaerophyllum ramosum*
- *Coriaria sarmentosa*
- *Dicksonia fibrosa* (Rare in ecological district and region (Wilson 1992))
- *Epilobium brunnescens*
- *Epilobium rotundifolium*
- *Epilobium tenuipes*
- *Gonocarpus montanus*
- *Histiopteris incisa*
- *Hymenophyllum multifidum*
- *Hymenophyllum sanguinolentum* 'Canterbury'
- *Juncus novae-zelandiae*
- *Kelleria dieffenbachia*
- *Leptecophylla juniperina*
- *Leptospermum scoparium*
- *Leptinella squalida* subsp. *mediana*
- *Libocedrus bidwillii* (vulnerable in the ecological region (Wilson 1992))
- *Luzula picta*
- *Lycopodium fastigiatum*
- *Lycopodium scariosum*
- *Lycopodium volubile*
- *Nematoceras macranthum*
- *Nertera depressa*
- *Notogrammitis billardierei*
- *Notogrammitis heterophylla*
- *Olearia ilicifolia*
- *Ozothamnus leptophyllus*
- *Paesia scaberula*
- *Phlegmariurus varius*
- *Plantago raoulii*
- *Schizeilema trifoliolatum*
- *Scleranthus brockiei*
- *Senecio wairauensis*
- *Sticherus cunninghamii* (rare and local in the ecological district and region (Wilson 1992))
- *Viola filicaulis*

The presence of the only known surviving adult New Zealand cedar/kaikawaka (*Libocedrus bidwillii*) on Banks Peninsula is an outstanding feature of this site (Wilson 1992). This tree is estimated to be 300+ years old (Wilson 1992).

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.





There are two plant species that are at their southern national distributional limit on Banks Peninsula (Wilson 2013). These species are (Jensen unpubl. data 2015):

- *Piper excelsum* (southern national limit)
- *Dracophyllum acerosum* (southern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

At the northern end of the site, in the vicinity of Trig W and within the Waipuna Saddle Scenic Reserve there are basic igneous bluffs, and rock outcrops that support a good example of indigenous rock bluff vegetation (Wilson unpubl. data 1986). At a national scale, basic cliffs, scarps and tors are an originally rare ecosystem (Williams et al. 2007).

#### Diversity and Pattern

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

It is botanically diverse reflecting climatic variation associated with aspect and altitude, soil variation and human disturbance. It also contains a vegetation sequence from 300 m to over 700 m above sea level where lowland cool temperate forest grades into upper cool temperate forest. The diversity of indigenous habitats and the altitudinal sequence is reflected in the diversity of the indigenous plant taxa. Comprehensive botanical surveys within the BPCT covenant have identified 176 vascular plant species (Jensen unpubl. data (2015).

#### Ecological Context

**8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is significant under this criterion.

It is a large compact area that is well buffered by regenerating forest and indigenous shrubland and exotic gorse scrub.

The large size of the site and its habitat diversity mean it plays an important role in maintaining ecological processes in the wider landscape. It is part of a network of areas of high ecological value in the wider area including the Kaituna Spur, Mt Sinclair, Mt Sinclair and Whatarangi Totara Scenic Reserves that are important



'stepping stones' for the movement and dispersal of indigenous fauna (Head n.d.).

**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. There are no wetlands within the site.

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

The old growth forest and tree fuchsia within the site provides important seasonal feeding habitat for New Zealand pigeon, habitat for New Zealand falcon (At Risk – Recovering) (Robertson et. al 2012) and feeding and breeding habitat for a range of other common forest bird species (Jensen and Webster 2014a).

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## Site Management

### Existing Protection Status

The majority of the site is protected by a BPCT covenant, a QEII Trust covenant and the Waipuna Saddle Scenic Reserve. An area of old growth thin-bark totara forest, containing the only known surviving adult New Zealand cedar/kaikawaka on Banks Peninsula, and a good example of indigenous rock bluff vegetation at the northern end of the site from approximately Trig KK to Trig W is not legally protected. An area of broadleaved hardwood forest in a gully on the southern boundary of the site (south of the BPCT boundary) is also not legally protected.

The BPCT covenant has a detailed covenant management plan (Jensen and Webster 2014a) and a comprehensive ecological monitoring programme using transects and permanent plots was established in January 2013 (see Jensen and Webster 2014b for more information).

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Stock. The perimeter of the BPCT covenant is fenced in its entirety and sections of this fence have been upgraded on any boundary where stock penetration is a potential risk (Jensen and Webster 2014a). There is no information on stock access to the remaining areas of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Continue periodic inspections of the condition of the perimeter fence around the covenant with maintenance as required.</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>
<ul style="list-style-type: none"> <li>Forestry plantations. There are several exotic macrocarpa plantations within the Waipuna Saddle Scenic Reserve (Head n.d.).</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing these plantations ensuring damage to the surrounding ecological values are minimised. Consider appropriate methods for minimising or remedying the potential for the introduction and establishment of biodiversity pest plants during and after harvesting.</li> </ul>	<ul style="list-style-type: none"> <li>When opportunities arise, discuss benefits to biodiversity of reduction of surrounding plantations with landowners, and options for alternatives.</li> </ul>

<ul style="list-style-type: none"> <li>Biodiversity pest plants are very rare within the BPCT covenant. Pest plants recorded within the covenant include: ash, holly, macrocarpa, male fern, elderberry, gorse, grey and crack willow, Chilean flame creeper, <i>Gunnera tinctoria</i>, <i>Pinus radiata</i> and <i>Thuja plicata</i> have been recorded within the BPCT covenant. Regular and ongoing control of weeds is being carried out by the landowners. All weeds observed have been removed or are being controlled (Jensen and Webster 2014a).</li> </ul>	<ul style="list-style-type: none"> <li>Continue weed control and monitoring.</li> <li>Consider ongoing weed surveillance for other biodiversity pest plants such as Darwin's barberry and sycamore that are known to occur in the surrounding area.</li> </ul>	<ul style="list-style-type: none"> <li>In collaboration with BPCT provide advice, guidance and assistance where appropriate to landowners about pest plant monitoring and control.</li> </ul>
<ul style="list-style-type: none"> <li>Pest animals. Possums, rabbits, hares, stoats, mice, rats, hedgehogs, and red deer have been recorded within the BPCT covenant (Jensen and Webster 2014a). These pest animals represent either a threat to birds, or lizards, or the vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>Consider monitoring the site for feral deer, goats and pigs (and their sign) and controlling them, if possible, when they are present within the site.</li> <li>Control of pest animals (e.g. by trapping, poisoning or shooting) using a multi-species control programme would benefit native fauna (birds, lizards and larger invertebrates). However, due to the time and cost of establishing and maintaining such a control programme and the lack of barriers to invasion, only consider implementing an animal pest control programme if long-term, effective control can be ensured.</li> </ul>	<ul style="list-style-type: none"> <li>In collaboration with BPCT provide advice, guidance and assistance where appropriate to landowners about pest animal monitoring and control.</li> </ul>
<ul style="list-style-type: none"> <li>There is a small 'day hut' on the property (Jensen and Webster 2014a).</li> </ul>	<ul style="list-style-type: none"> <li>The owners of the property will be able to continue to use this hut.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the landowner is aware that the hut can continue to be used.</li> </ul>
<ul style="list-style-type: none"> <li>Clearance of roadside vegetation within the road reserve where Western Valley Road passes through the covenant (Jensen and</li> </ul>	<ul style="list-style-type: none"> <li>Council to ensure that damage to indigenous roadside vegetation beyond the road envelope is minimised during Council roadside</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

Webster 2014a).	mowing/maintenance.	
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**Assessment completed by:** Scott Hooson  
**Date:** 23 January 2015

**Statement completed by:** Scott Hooson  
**Date:** 23 January 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Plant Species List

Plant species recorded from the Waipuna Bush BPCT covenant (sourced from Jensen unpubl. data (2015)).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, pipiripi
<i>Acaena novae-zelandiae</i>	red bidibidi
<i>Aciphylla subflabellata</i>	grassland speargrass
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Anisotome aromatica</i>	kopoti
<i>Aristotelia serrata</i>	wineberry, makomako
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Asplenium richardii</i>	Richard's spleenwort
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Australina pusilla</i>	
<i>Austroderia richardii</i>	toetoe
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum colensoi</i>	Colenso's hard fern, peretao
<i>Blechnum discolor</i>	crown fern, piupiu
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum minus</i>	swamp kiokio
<i>Blechnum penna-marina</i>	little hard fern
<i>Blechnum procerum</i>	small kiokio
<i>Blechnum vulcanicum</i>	triangular hard fern
<i>Calystegia tuguriorum</i>	NZ bindweed, pōwhiwhi
<i>Carex forsteri</i>	cutty grass
<i>Carpodetus serratus</i>	marbleleaf, putaputaweta
<i>Celmisia 'rhizomatous'</i>	
<i>Celmisia gracilentia</i>	slender mountain daisy, pekapeka
<i>Chaerophyllum colensoi</i>	mountain myrrh
<i>Chaerophyllum novae-zelandiae</i>	myrrh
<i>Chaerophyllum ramosum</i>	myrrh
<i>Clematis foetida</i>	yellow clematis
<i>Clematis paniculata</i>	puawananga
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma lucida</i>	karamu
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma robusta</i>	karamu
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma wallii</i>	bloodwood, mikimiki





<i>Coprosma x cunninghamii</i> ( <i>C propinqua</i> x <i>C robusta</i> )	
<i>Cordyline australis</i>	cabbage tree, ti kouka
<i>Coriaria arborea</i>	tree tutu
<i>Coriaria arborea x sarmentosa</i>	
<i>Coriaria sarmentosa</i>	tutu
<i>Corokia cotoneaster</i>	korokio
<i>Crassula sieberiana</i>	stonecrop
<i>Cyathea colensoi</i>	rough tree fern, mountain tree fern
<i>Cyathea smithii</i>	Smith's tree fern, katote
<i>Deyeuxia avenoides</i>	oat grass
<i>Dicksonia fibrosa</i>	wheki-ponga, golden tree fern
<i>Dracophyllum acerosum</i>	turpentine scrub
<i>Epilobium atriplicifolium</i>	willow herb
<i>Epilobium brunnescens</i>	willow herb
<i>Epilobium pubens</i>	willow herb
<i>Epilobium rotundifolium</i>	willow herb
<i>Epilobium tenuipes</i>	willow herb
<i>Euchiton audax</i>	native cudweed
<i>Festuca actae</i>	Banks Peninsula blue tussock
<i>Fuchsia excorticata</i>	tree fuchsia, kotukutuku
<i>Gaultheria antipoda</i>	bush snowberry
<i>Gaultheria depressa</i>	snowberry
<i>Geranium brevicaule</i>	short-flowered cranesbill
<i>Geranium microphyllum</i>	
<i>Gonocarpus montanus</i>	
<i>Griselinia littoralis</i>	broadleaf, kapuka
<i>Gunnera monoica</i>	native gunnera
<i>Haloragis erecta</i>	toatoa
<i>Hebe salicifolia</i>	koromiko
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Helichrysum lanceolatum</i>	niniaio
<i>Hierochloa redolens</i>	holy grass, karetu
<i>Histiopteris incisa</i>	water fern, matata
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Huperzia varia</i>	clubmoss
<i>Hydrocotyle microphylla</i>	
<i>Hydrocotyle moschata</i>	pennywort
<i>Hymenophyllum multifidum</i>	filmy fern
<i>Hymenophyllum sanguinolentum</i> 'Canterbury'	filmy fern
<i>Hypolepis ambigua</i>	pig fern
<i>Hypolepis millefolium</i>	thousand-leaved fern
<i>Hypolepis rufobarbata</i>	sticky pig fern
<i>Ileostylus micranthus</i>	green mistletoe
<i>Isolepis habra</i>	
<i>Juncus edgariae</i>	leafless rush, wi
<i>Juncus novae-zelandiae</i>	dwarf rush
<i>Kelleria dieffenbachii</i>	
<i>Kunzea robusta</i>	kanuka
<i>Lagenophora strangulata</i>	parani
<i>Lemna disperma</i>	common duckweed



<i>Leptecophylla juniperina</i>	prickly mikimiki
<i>Leptinella squalida</i>	button daisy
<i>Leptinella 'upland dioica'</i>	
<i>Leptopteris hymenophylloides</i>	crepe fern, heruheru
<i>Leptospermum scoparium</i>	manuka, tea tree
<i>Leptostigma setulosum</i>	
<i>Leucopogon fraseri</i>	dwarf heath, patotara
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Libocedrus bidwillii</i>	pahautea, kaikawaka, NZ cedar
<i>Lobelia angulata</i>	pratia
<i>Luzula banksiana var. orina</i>	woodrush
<i>Luzula picta</i>	woodrush
<i>Luzula rufa</i>	woodrush
<i>Lycopodium fastigiatum</i>	alpine clubmoss, mountain clubmoss
<i>Lycopodium scariosum</i>	creeping clubmoss
<i>Lycopodium volubile</i>	climbing clubmoss, waewaekoukou
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rata
<i>Microlaena avenacea</i>	bush rice grass
<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Microtis unifolia</i>	onion orchid, maikaika
<i>Muehlenbeckia australis</i>	large-leaved pohuehue
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Nematoceras macranthum</i>	spider orchid
<i>Nertera depressa</i>	nertera
<i>Notogrammitis billardierei</i>	common strap fern
<i>Notogrammitis heterophylla</i>	comb fern
<i>Olearia ilicifolia</i>	NZ holly, hakeke
<i>Ophioglossum coriaceum</i>	adder's tongue
<i>Ozothamnus leptophyllus</i>	tauhinu, cottonhead
<i>Paesia scaberula</i>	ring fern, pig root fern
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Phormium tenax</i>	flax, harakeke
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum eugenioides</i>	lemonwood, tarata
<i>Pittosporum tenuifolium</i>	kohuhu, black matipo
<i>Plantago raoulii</i>	native plantain
<i>Poa cita</i>	silver tussock, wi
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus cunninghamii</i>	mountain tōtara, thin-barked tōtara
<i>Podocarpus cunninghamii x P. nivalis</i>	
<i>Polystichum vestitum</i>	prickly shield fern, puniu
<i>Prasophyllum colensoi</i>	leek orchid
<i>Prumnopitys taxifolia</i>	matai, black pine
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax colensoi</i>	mountain five-finger
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pteridium esculentum</i>	bracken, rarahū, rauaruhe
<i>Pterostylis areolata</i>	green-hooded orchid



<i>Pterostylis graminea</i>	green-hooded orchid
<i>Pterostylis montana</i>	green-hooded orchid
<i>Ranunculus foliosus</i>	buttercup
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Raoulia glabra</i>	mat daisy
<i>Raoulia subsericea</i>	turf mat daisy, turf scabweed
<i>Raukaua anomalus</i>	
<i>Rubus cissoides</i>	bush lawyer, tataramoa
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rytidosperma gracile</i>	danthonia
<i>Rytidosperma unarede</i>	danthonia
<i>Schefflera digitata</i>	pate, seven-finger
<i>Schizeilema trifoliolatum</i>	
<i>Scleranthus brockiei</i>	
<i>Senecio glomeratus</i>	native groundsel, fireweed
<i>Senecio minimus</i>	native fireweed
<i>Senecio wairauensis</i>	native fireweed
<i>Sophora microphylla</i>	small-leaved kowhai
<i>Stellaria parviflora</i>	New Zealand chickweed
<i>Sticherus cunninghamii</i>	umbrella fern, waekura, tapuwae kotuku
<i>Streblus heterophyllus</i>	small-leaved milk tree, turepo
<i>Thelymitra longifolia</i>	white sun orchid
<i>Uncinia rubra</i>	hook grass
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Urtica incisa</i>	bush nettle
<i>Viola cunninghamii</i>	white violet
<i>Viola filicaulis</i>	forest violet
<b>Exotic Species</b>	
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Agrostis stolonifera</i>	creeping bent
<i>Aira caryophylla</i>	silvery hair grass
<i>Aira praecox</i>	early hair grass
<i>Anthosachne scabra</i>	blue wheatgrass
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Bellis perennis</i>	daisy
<i>Carduus pycnocephalus</i>	slender winged thistle
<i>Centaureum erythraea</i>	centaury
<i>Cerastium fontanum</i>	mouse-ear chickweed
<i>Cirsium arvense</i>	Californian thistle
<i>Cirsium vulgare</i>	Scotch thistle
<i>Crepis capillaris</i>	hawksbeard
<i>Critesion murinum</i>	barley grass
<i>Cupressus macrocarpa</i>	macrocarpa, Monterey cypress
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cytisus scoparius</i>	scotch broom
<i>Dactylis glomerata</i>	cocksfoot
<i>Dianthus armeria</i>	Deptford pink
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern



<i>Erythranthe guttata</i>	monkey musk
<i>Erythranthe moschata</i>	musk
<i>Festuca rubra</i>	Chewings fescue
<i>Fraxinus excelsior</i>	ash
<i>Galium aparine</i>	cleavers
<i>Glyceria declinata</i>	glaucous sweetgrass
<i>Gunnera tinctoria</i>	Chilean rhubarb
<i>Hieracium lepidulum</i>	tussock hawkweed
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochaeris radicata</i>	catsear
<i>Ilex aquifolium</i>	holly
<i>Juncus articulatus</i>	jointed rush
<i>Juncus bufonis</i>	toad rush
<i>Juncus effusus</i>	soft rush
<i>Leontodon taraxacoides</i>	hawkbit
<i>Linum catharticum</i>	purging flax
<i>Lolium perenne</i>	ryegrass
<i>Luzula congesta</i>	
<i>Mycelis muralis</i>	wall lettuce
<i>Pilosella officinarum</i>	mouse-ear hawkweed
<i>Pinus radiata</i>	radiata pine, Monterey pine
<i>Plantago lanceolata</i>	narrow-leaved plantain
<i>Poa annua</i>	annual poa
<i>Poa pratensis</i>	Kentucky blue grass
<i>Prunella vulgaris</i>	selfheal
<i>Ranunculus repens</i>	creeping buttercup
<i>Rubus fruticosus</i> agg.	blackberry
<i>Rumex acetosella</i>	sheeps sorrel
<i>Rytidosperma racemosum</i>	danthonia
<i>Sagina procumbens</i>	procumbent pearlwort
<i>Salix cinerea</i>	grey willow
<i>Sambucus nigra</i>	elderberry
<i>Thuja plicata</i>	
<i>Trifolium dubium</i>	suckling clover
<i>Trifolium pratense</i>	red clover
<i>Trifolium repens</i>	white clover
<i>Tropaeolum speciosum</i>	Chilean flame creeper
<i>Ulex europaeus</i>	gorse
<i>Vicia hirsuta</i>	hairy vetch
<i>Vicia sativa</i>	vetch
<i>Vulpia bromoides</i>	vulpia hair grass, brome fescue

## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Whiskey Gully

**Site number:** SES/H/25

**Physical address of site:** Little Pigeon Bay Road, Pigeon Bay

#### **Summary of Significance:**

This site is significant because it contains relatively diverse and moderately representative secondary hardwood forest and small-leaved shrubland that supports one nationally Threatened plant species and seven At Risk plant species as well as several other plant species that are endemic to Banks Peninsula, uncommon within the ecological district or region and at their distributional limits. It has indigenous vegetation on basic cliffs and scarps which are an originally rare ecosystem nationally, and the upper part of the gully is on Acutely and Chronically Threatened land environments.

#### **Site Map**



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 20.37

**Central point (NZTM):** E1591451, N5167171

## Site Description

This site is located in a steep generally north-east facing gully directly above the sea on the western side of Pigeon Bay north of Holmes Bay. The altitudinal range of the site is from sea level to 200 m above sea level. There is an ephemeral stream on the gully floor.

The main indigenous vegetation communities, as described by Wildland Consultants unpubl. data (2012) are:

- (Kowahi-lowland ribbonwood- narrow-leaved lacebark-shining broadleaf)/*Coprosma virescens*-*Coprosma crassifolia*-corokia forest-shrubland mosaic on steep south-east-facing coastal and lowland hill slopes and rocky bluffs.
- *Coprosma virescens* - *C. crassifolia* - common native broom shrubland on steep on coastal and lowland hill slopes.
- *Kanuka* - *Coprosma virescens* - *C. crassifolia* scrub on steep coastal slopes.
- A mosaic of *Coprosma virescens* - *C. crassifolia*/cocksfoot-sweet vernal shrubland and exotic grassland on very steep cliffs and rock outcrops.
- *Coprosma virescens* - *C. crassifolia*/bracken

These communities are described in more detail below (from Wildland Consultants unpubl. data 2012).

The densest and most diverse forest occurs on steeper ground in the upper part of the gully and along the ephemeral stream. The most abundant canopy species are kowhai, lowland ribbonwood and narrow-leaved lacebark, while two species of mikimiki and corokia are the most common shrub species. Several species of climber are common. The site contains a sizeable population of shining broadleaf (uncommon in the ecological region) that is probably the largest population on Banks Peninsula.

The middle of the site is covered in fairly dense native shrubland dominated by small-leaved *Coprosma* species, native broom, corokia and niniao. Native climbers are very frequent throughout the area. Occasional kanuka, kowhai, lowland ribbonwood and narrow-leaved lacebark trees occur here, and there are a few shining broadleaf in the upper part of this area. There are also some open areas of exposed rock and exotic grassland.

Kanuka forms a discontinuous canopy over small-leaved shrubs on steep slopes near the sea in the north-eastern part of the site. The vegetation cover is patchy and there are some areas of bare rock.

A mosaic of small-leaved shrubland and exotic grassland occurs on steep cliffs and rock outcrops on the north-facing slopes of the gully. This vegetation type contains large areas of bare rock, with patchy trees and shrubs over exotic grassland. Occasional shining broadleaf are present and the exotic pigs ear is abundant.

Dense patches of bracken with scattered native trees and shrubs occur on the north-facing slopes of the gully. The bracken is colonising areas of exotic pasture grassland adjacent to forest and shrubland. Occasional small-leaved coprosmas/mikimiki and trees such as narrow-leaved lacebark and lowland ribbonwood have also spread into this area.

### **Extent of Site of Ecological Significance**

The site includes the forest, scrub, shrubland, fernland and rock bluffs within Whiskey Gully. The upper (north-western) boundary of the site is the boundary between the forest/shrubland and the exotic grassland. The exotic pine plantation is excluded from the site and is the northern boundary of the site. The coastline marks the eastern boundary. The steep rocky bluffs on the southern side of Whiskey Gully are included within the site.

There is insufficient information available to assess the significance of the indigenous vegetation communities along the steep coastal slopes and bluffs north of the site.

### **Assessment Summary**

The Whiskey Gully Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criterion 1), rarity/distinctiveness (criteria 3, 4, 5 and 6) and diversity and pattern criteria (criterion 7).

### **Assessment against Significance Criteria**

#### **Representativeness**

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The site secondary hardwood forest and small-leaved shrubland within the site is significant under this criterion.



The mosaic of secondary hardwood forest and small-leaved shrubland within the site is moderately representative and typical of mid-successional indigenous dominated coastal and lowland vegetation communities on steep slopes and rocky bluffs. These communities support a diverse range of indigenous plant species, including several that are nationally Threatened and At Risk or uncommon within the ecological region. Although there are some exotic grasses and herbs present, there is no evidence of stock and these vegetation communities are relatively intact.

**2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is not significant under this criterion. It is not a relatively large example of its type in the ecological district.

**Rarity/Distinctiveness**

**3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

There is no accurate information to assess the change in extent of indigenous scrub and shrublands within the ecological district, but indigenous coastal shrublands have been vastly reduced in extent and most of those that remain are very small highly modified fragments (Lettink 2013). Further, the extent of all woody indigenous vegetation (as a percentage of the ecological district) as mapped by the New Zealand Landcover Database (Version 4) is only 10.9%.

The top of the gully is significant under this criterion at the Level IV land environment scale because it is on Acutely and Chronically Threatened land environments (F3.1a and F3.1b) where <20% indigenous vegetation is left on these land environments nationally (Walker et al. 2007). The remainder of the site is not significant at the Level IV land environment scale. It is on an At Risk land environment where 20 – 30% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. *Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.***

The site is significant under this criterion.

A number of plant species have been recorded from the site that are nationally Threatened, At Risk, endemic, or uncommon either within the ecological district or region.

One nationally Threatened and seven At Risk plant species (de Lange et al. 2013) occur at the site (Wildland Consultants unpubl. data 2012) and three of these are endemic to Banks Peninsula:

- *Anemanthele lessoniana* (Threatened - Nationally Vulnerable)





- *Aciphylla subflabellata* (At Risk - Declining)
- *Coprosma virescens* (At Risk - Declining)
- *Chenopodium allanii* (At Risk – Naturally Uncommon)
- *Festuca actae* (At Risk – Naturally Uncommon, endemic to Banks Peninsula)
- *Hebe strictissima* (At Risk – Naturally Uncommon, endemic to Banks Peninsula)
- *Leptinella minor* (At Risk – Naturally Uncommon, endemic to Banks Peninsula)
- *Pseudopanax ferox* (At Risk – Naturally Uncommon)

A further five plant species occur at the site (Wildland Consultants unpubl. data 2012) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013):

- *Fuchsia perscandens*
- *Griselinia lucida* (probably the largest population on Banks Peninsula Wildland Consultants unpubl. data 2012)
- *Leptospermum scoparium*
- *Microlaena polynoda*
- *Tetragonia implexicoma*
- *Uncinia affinis*

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are five plant species at their southern national distributional limits on Banks Peninsula (Wildland Consultants unpubl. data 2012):

- *Alectryon excelsus* (southern national limit)
- *Asplenium oblongifolium* (southern national limit)
- *Griselinia lucida* (southern regional limit)
- *Piper excelsum* (southern national limit)
- *Passiflora tetrandra* (southern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

There are extensive igneous bluffs and scarps throughout the site. At a national scale, basic cliffs, scarps and tors are an originally rare ecosystem (Williams et al. 2007). Where indigenous vegetation occurs on these features within the site they are significant under this criterion.

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has**



***changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

The site supports a number of early- to mid-successional indigenous dominated vegetation communities. The composition of these communities varies across the site reflecting factors such as proximity to the coast, the substrate (particularly the occurrence of rock surfaces) and soil depth, exposure, aspect and moisture availability. Seventy seven indigenous species were recorded during a recent botanical survey (Wildland Consultants unpubl. data 2012). Of these, the high diversity of shrubs, ferns and grasses is notable.

**Ecological Context**

***8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is not significant under this criterion. The regenerating indigenous coastal/lowland hardwood forest, scrub, shrubland, fernland and rockland that make up the site is part of a network of fragmented patches of forest, scrub, shrubland and bluffs in the wider landscape. However, its role as part of an ecological network is not important enough to meet the threshold for significance under this criterion.

The site is also directly above the coast and connected to the marine environment. It is likely to play a localised role in reducing sediment and nutrient run-off into the coastal marine environment. However, this role is not important enough to meet the threshold for significance under this criterion.

***9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site.

***10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess the site against this criterion.

## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants. Pigs ear on rock outcrops, boxthorn and sweet briar.</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing boxthorn and sweet briar where it is possible to do this safely.</li> <li>Effective control of pigs ear may not be feasible given the steep bluffy terrain and the extent and abundance of this species. Consider containing pigs ear to coastal cliffs to protect rock out-crop and shrubland values at higher elevations.</li> <li>Consider ongoing surveillance for other biodiversity pest plants including spur valerian, banana passionfruit, old mans beard and Japanese honeysuckle that are known to occur in the surrounding area.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about monitoring and control of pest plants.</li> <li>Assistance available as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Wilding pines. There is the potential for wilding pines to establish from seed from the pine plantation on the northern side of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Consider carrying-out regular surveillance for wilding pines and remove any that establish.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the biodiversity benefits of wilding pine control and assistance as needed.</li> </ul>



## References

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**Assessment completed by:** Scott Hooson  
**Date:** 20 January 2015

**Statement completed by:** Scott Hooson  
**Date:** 20 January 2015

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



## Appendix 1: Plant Species List

Sourced from Wildland Consultants unpubl. data (2012).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Aciphylla subflabellata</i>	grassland spaniard
<i>Alectryon excelsus</i>	titoki
<i>Anemanthele lessoniana</i>	wind grass
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Asplenium oblongifolium</i>	shining spleenwort, huruhuruwhenua
<i>Blechnum chambersii</i>	lance fern
<i>Calystegia tuguriorum</i>	NZ bindweed
<i>Carmichaelia australis</i>	native broom, common broom
<i>Carex</i> sp.	
<i>Cheilanthes sieberi</i>	rock fern
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma propinqua</i>	mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Corokia cotoneaster</i>	korokio
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	Mercury Bay weed, dichondra
<i>Einadia allanii</i>	
<i>Epilobium</i> species	willow herb
<i>Festuca actae</i>	Banks Peninsula blue grass
<i>Fuchsia perscandens</i>	climbing fuchsia
<i>Geranium</i> aff. <i>microphyllum</i>	native geranium
<i>Griselinia lucida</i>	shining broadleaf, puka
<i>Haloragis erecta</i>	toatoa
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum lanceolatum</i>	niniaio
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Juncus distegus</i>	wiwi
<i>Juncus edgariae</i>	leafless rush, wi
<i>Korthalsella lindsayi</i>	dwarf mistletoe
<i>Kunzea ericoides</i>	kanuka
<i>Leptinella minor</i>	Banks Peninsula button daisy
<i>Leptospermum scoparium</i>	manuka, tea tree
<i>Luzula</i> species	woodrush
<i>Macropiper excelsum</i>	kawakawa
<i>Melicytus ramiflorus</i>	mahoe, whiteywood
<i>Melicope simplex</i>	poataniwha
<i>Microlaena polynoda</i>	bamboo rice grass



<i>Microsorium pustulatum</i>	hounds tongue, kowaowao
<i>Muehlenbeckia complexa</i>	scrub pohuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red mapou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping mapou
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	native oxalis
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parietaria debilis</i>	NZ pellitory
<i>Passiflora tetrandra</i>	native passion vine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikomako, ducks foot
<i>Phormium tenax</i>	flax, harakeke
<i>Pittosporum tenuifolium</i>	kohukohu, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, manatu
<i>Poa cita</i>	silver tussock
<i>Poa matthewsii</i>	
<i>Polystichum neozelandicum</i>	shield fern
<i>Polystichum oculatum</i>	shield fern
<i>Pseudopanax ferox</i>	fierce lancewood
<i>Pteridium esculentum</i>	bracken
<i>Rubus schmidelioides</i>	bush lawyer, tataramoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tataramoa
<i>Rytidosperma clavatum</i>	danthonia, bristle grass
<i>Rytidosperma unarede</i>	danthonia, bristle grass
<i>Scandia geniculata</i>	climbing aniseed
<i>Sophora microphylla</i>	kowhai, small-leaved kowhai
<i>Sophora prostrata</i>	dwarf kowhai, prostrate kowhai
<i>Streblus heterophyllus</i>	small-leaved milk tree, turepo
<i>Tetragonia implexicoma</i>	climbing shore spinach
<i>Uncinia affinis</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Wahlenbergia gracilis</i>	NZ harebell
<b>Exotic species</b>	
<i>Agrostis capillaris</i>	brown top
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Arrhenatherum elatius</i>	tall oat grass
<i>xCarpophyma mutabilis</i>	ice plant hybrid
<i>Cirsium arvense</i>	Californian thistle
<i>Cotyledon orbiculata</i>	pig's ear, elephant's ear
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Dryopteris filix-mas</i>	male fern
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochoeris radicata</i>	catsear
<i>Lycium ferocissimum</i>	boxthorn
<i>Marrubium vulgare</i>	horehound
<i>Pilosella officinarum</i>	mouse-ear hawkweed



<i>Rosa rubiginosa</i>	sweet briar, briar rose
<i>Rumex acetosella</i>	sheeps sorrel
<i>Sonchus oleraceus</i>	puha, smooth sow thistle
<i>Stellaria media</i>	chickweed
<i>Stipa species</i>	
<i>Verbascum thapsus</i>	woolly mullein
<i>Vittadinia gracilis</i>	purple fuzzweed

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## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Wild Cattle Hill and Maori Gully

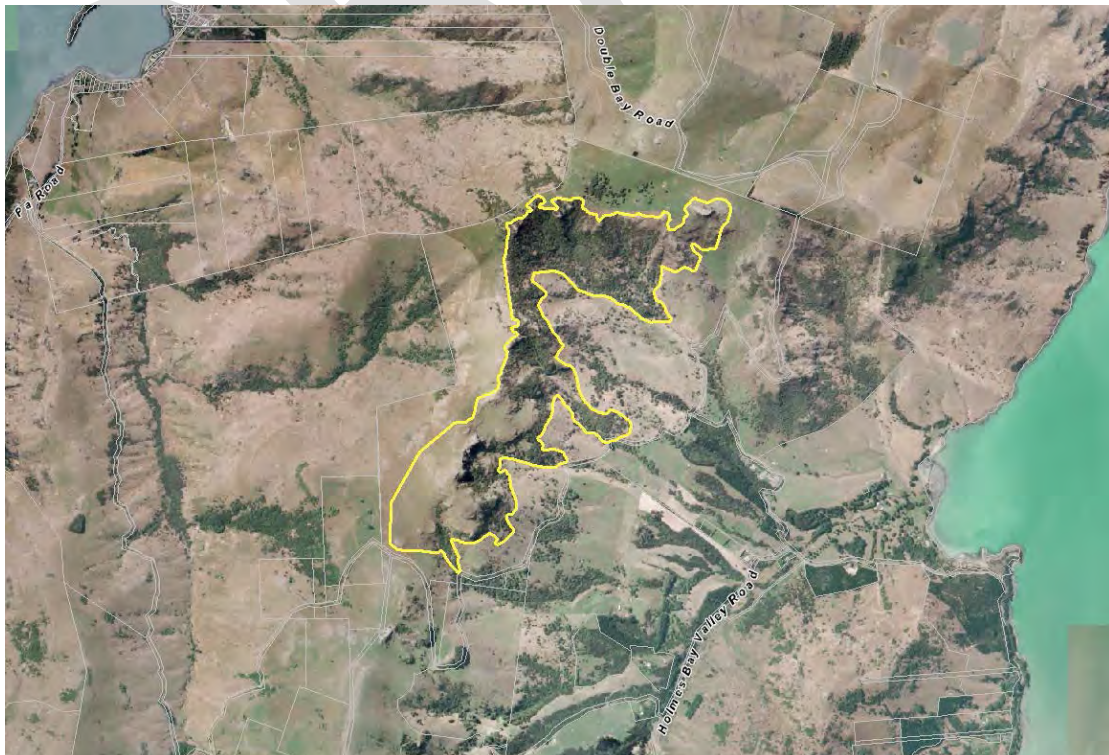
**Site number:** SES/H/26

**Physical address of site:** Holmes Bay Valley Road, Pigeon Bay

#### Summary of Significance:

The site is significant because it contains a diverse range of representative indigenous vegetation communities, some of which are rare at the ecological district and Level 4 land environment scales. It is a large example of lowland - montane indigenous forest in the ecological district and has basic igneous bluffs, scarps and rock outcrops and volcanic boulderfield ecosystems which are originally rare ecosystems. It supports a diverse range of plant taxa including six nationally At Risk plant species, several plant species that are uncommon within the ecological district or region and one that is at its distributional limit. It provides important habitat for a range of indigenous fauna and is part of an important network of habitats and provides a seasonal food source for some bird species.

#### Site Map





## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 109.2

**Central point (NZTM):** E1588723, N5165012

## Site Description

The site is located between Pigeon Bay and Port Levy on the main ridgeline and upper eastern slopes and gullies above Holmes Bay. It includes the basin-like head of Maori Gully, Wild Cattle Hill and the spurs and gullies in between. The altitudinal range of the site is from approximately 220 to 600 m above sea level. 27.4 ha of the head of Maori Gully is protected by the Maori Gully Banks Peninsula Conservation Trust (BPCT) covenant.

The main vegetation communities within the site (Walls et al. 2008) are:

- (Lowland totara-thin-barked totara-matai)/mixed broadleaved-hardwood forest and treeland on lowland and montane slopes and gullies
- Indigenous small-leaved shrubland on lowland and montane slopes
- Rock bluff, outcrop and boulderfield communities
- Silver tussock grassland.

The following description of the site is from Walls et al. (2008).

The head of Maori Gully contains diverse second-growth broadleaved-hardwood forest dominated by lowland ribbonwood (*Plagianthus regius*), narrow-leaved lacebark (*Hoheria angustifolia*), mahoe (*Meliccytus ramiflorus*), broadleaf (*Griselinia littoralis*), kaikomako (*Pennantia corymbosa*), kowhai (*Sophora microphylla*) and tree fuchsia (*Fuchsia excorticata*) with a few emergent remnant podocarp trees (totara (*Podocarpus totara*), thin-barked totara (*Podocarpus cunninghamii*) and matai (*Prumnopitys taxifolia*)). The indigenous vegetation within the BPCT covenant has ferns, shrubs and tree seedlings that are regenerating in the undergrowth.

East of Maori Gully is an elevated volcanic rock outcrop. It has bluffs with columnar jointing and an extensive boulderfield of distinctly rounded boulders. The rock surfaces of the bluffs and boulders support complex lichen communities and some moss species. Amongst the boulders are a range of indigenous shrub and tree species.

Maori Gully and Wild Cattle Hill are connected by continuous forest and treeland along and below the main ridgeline. This is characterised by a diverse range of indigenous tree species such as lowland ribbonwood, narrow-leaved lacebark, mahoe, ngaio (*Myoporum laetum*), broadleaf, kaikomako and kowhai with a few totara.

There are shrublands around the forest edges and amongst the treeland, especially on the main ridge. These shrublands are comprised of *Coprosma virescens*, thick-leaved coprosma (*C. crassifolia*), round-leaved coprosma (*C. rotundifolia*), mikimiki (*C. propinqua*), *C. wallii* (bloodwood), niniao (*Helichrysum lanceolatum*), poataniwha



(*Melicope simplex*), porcupine shrub (*Melicytus alpinus*), korokio (*Corokia cotoneaster*), weeping mapou (*Myrsine divaricata*), ongaonga (*Urtica ferox*) and shrubby fuchsia (*Fuchsia excorticata x perscandens*). Vines include large-leaved pohuehue and scrub pōhuehue (*Muehlenbeckia australis* and *M. complexa*), bush lawyer (*Rubus* spp.), native jasmine (*Parsonsia heterophylla* and *P. capsularis*) and yellow clematis (*Clematis foetida*).

There are extensive areas of rock bluffs, scarps and outcrops along the upper ridgeline. These support communities of lichens and mosses and a variety of small trees, shrubs, ferns and plants such as sun orchids (*Thelymitra* spp.) and the yellow-rock daisy *Brachyglottis lagopus*.

At the southern end of the site, around Wild Cattle Hill, is extensive silver tussock (*Poa cita*) grassland. Although grazed it is dense and in places has native inter-tussock plants.

### Extent of Site of Ecological Significance

The site includes the elevated volcanic rock outcrop east of Maori Gully and the matrix of indigenous vegetation linking it to the Maori Gully BPCT covenant. It includes the forest, treeland and scrub within and buffering the covenant, and the forest, treeland, scrub, silver tussock grassland and rock bluffs and scarps extending south along the eastern faces of the main ridge to Wild Cattle Hill. It also includes the representative silver tussock grassland on the western and southern slopes of Wild Cattle Hill.

### Assessment Summary

The Wild Cattle Hill Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

### Assessment against Significance Criteria

#### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is highly representative of a range of ecosystems typical of the ecological district, including rocky bluffs, scarps and outcrops, regenerating native forest, treelands, shrublands and silver tussock grasslands. The forest in



Maori Gully, which is fenced and largely protected by a BPCT covenant, has remnant mature podocarps and the understorey is rapidly regenerating. It was considered by Walls et al. (2008) to be one of the better remaining examples of regenerating secondary forest with remnant mature podocarps. The silver tussock grassland surrounding Wild Cattle Hill is a good example of its type. It is dense in places and has indigenous inter-tussock plants (Walls et al. 2008). Walls et al. (2008) also considered the elevated volcanic rock outcrop east of Maori Gully to be highly representative and an outstanding example of its type.

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

It is a large example of lowland-montane indigenous forest in the Herbert Ecological District.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The indigenous forest and the indigenous vegetation along the main ridgeline is significant under this criterion.

In the context of the Herbert Ecological District the (podocarp)/mixed broadleaved-hardwood forest and treeland is significant under this criterion because indigenous forest has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

The indigenous vegetation along the main ridgeline is on a Chronically Threatened land environment (F3.3b) where 17.6% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports six nationally At Risk plant species and several plant species that are uncommon within the ecological district or region.

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site are:

- Grassland speargrass (*Aciphylla subflabellata*) (Wilson unpubl. data b)



- Climbing groundsel (*Brachyglottis sciadophila*) (At Risk – Declining) (Wiser unpubl. data, Wilson unpubl. data b)
- Bloodwood (*Coprosma wallii*) (At Risk – Declining) (Walls et al. 2008, Wiser unpubl. data, Wilson unpubl. data a,b) - common along the main ridge and includes some very large old specimens (Walls et al. 2008)
- *Coprosma virescens* (Walls et al. 2008, Wilson unpubl. data a,b)
- Banks Peninsula hebe (*Hebe strictissima*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula) (Wiser unpubl. data, Wilson unpubl. data a,b)
- Yellow rock groundsel (*Senecio glaucophyllus subsp. basinudus*) (At Risk - Naturally Uncommon) (Wiser unpubl. data)

Indigenous plant species have been recorded from the site that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- Australina pusilla (Wilson unpubl. data b)
- Bidibidi (*Acaena dumicola*) (Wiser unpubl. data)
- Slender mountain daisy (*Celmisia gracilentia*) (Wiser unpubl. data)
- Filmly fern (*Hymenophyllum sanguinolentum*) (Wiser unpubl. data)
- Clubmoss (*Phlegmariurus varius*) (Wiser unpubl. data)
- Leatherleaf fern (*Pyrrosia eleagnifolia*) (Wiser unpubl. data)
- *Trisetum lepidum* (Wiser unpubl. data)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

It has one plant species that is at its distributional limit on Banks Peninsula (Wilson 2013):

- Pigeonwood (*Hedycarya arborea*) (southern regional limit) (Wilson unpubl. data a)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

The site has basic igneous bluffs, scarps and rock outcrops and volcanic boulderfield ecosystems (Walls et al 2008, Wiser unpubl. data). At a national scale they are originally rare ecosystems (Williams et al. 2007).

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.



The site has an altitudinal sequence from approximately 220 to 600 m above sea level and supports a high diversity of vegetation communities, habitats and species (Walls et al. 2008).

The rock bluffs, scarps and outcrops support a high diversity of indigenous plant taxa. Walls et al. (2008) commented on the surprisingly high diversity of micro-environments within elevated volcanic rock outcrop east of Maori Gully and Wiser (unpubl. data) recorded 53 species on rock outcrops within the site.

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The site is surrounded by indigenous vegetation (particularly forest and scrub) in the wider landscape. In this context it is likely to be part of an important network of habitats for indigenous fauna. Mature lowland totara, thin-barked totara and matai are provide a seasonal food source for New Zealand pigeon, and trees such as fuchsia and kowhai provide food source for species such as bellbird. Within the site forest and treeland along and below the main ridgeline provide a linkage between Maori Gully and Wild Cattle Hill.

The site is reasonably well buffered by treeland and indigenous shrublands and is naturally protected by its steep topography (Walls et al. 2008).

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

The site is significant under this criterion.

The site is part of a landscape that has a relatively high proportion of indigenous cover that provides important feeding and breeding habitat for a relatively large number of indigenous bird species. Bellbird, New Zealand pigeon, grey warbler, brown creeper, South Island fantail, silvereye, New Zealand kingfisher, Australasian harrier, New Zealand pipit (At Risk – Declining), paradise shelduck, pukeko and welcome swallow use the habitats within, and in the vicinity of the site (Walls et al. 2008).

The rock bluffs and outcrops provide good habitat for lizards and invertebrates (Walls et al. 2008).

## Site Management

### Existing Protection Status

Part of the site (27.4 ha) is protected by the Maori Gully Banks Peninsula Conservation Trust covenant. The remainder of the site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants:</li> <li>There are relatively few biodiversity pest plants within the site. There was a large adult pine within the covenanted area. Elderberry is also present and has the potential to spread rapidly (Walls et al. 2008).</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing the single pine from the covenanted area to prevent further spread. Control of elderberry could be considered, particularly in shrublands and rock outcrops, but is not a high priority.</li> <li>Consider ongoing surveillance for other biodiversity pest plants including sycamore, cotoneaster and grey willow (all present in Holmes Bay Valley) and weeds such as old man's beard, banana passionfruit, Chilean flame creeper and Darwin's barberry (Walls et al. 2008).</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance if requested by landowner about benefits to biodiversity of monitoring and controlling pest plants.</li> <li>Assistance as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Domestic stock. Stock have access to most of the site, although the Maori Gully covenant is fenced off and the bluffs are naturally protected (Walls et al. 2008).</li> </ul>	<ul style="list-style-type: none"> <li>It is understood that the property is farmed with the objective of integrating productive pastoral farming with conservation of natural values. Under this regime stock get the benefit of the shelter but the property is stocked to a level that allows retention of the native trees, shrubs and tussocks (Walls et al. 2008).</li> </ul>	<ul style="list-style-type: none"> <li>Discussions with landowner about the benefits to biodiversity of stock management options in identified areas.</li> <li>Assistance available where appropriate.</li> </ul>

	<p>However, in the long term, forests, treelands and shrublands routinely used by stock may not be able to persist without protection.</p> <ul style="list-style-type: none"> <li>• Consider fencing forested areas to promote seedling recruitment, understorey development and the long-term persistence of indigenous vegetation cover.</li> </ul>	
<ul style="list-style-type: none"> <li>• Pest animals. Goats deer and pigs are virtually non-existent on the property and possums and rabbits are routinely controlled, and are at low numbers (Walls et al. 2008). Other pest animals such as hedgehogs, stoats, cats and rats are likely to be present within the site and are a threat to the ecological values of the site.</li> </ul>	<ul style="list-style-type: none"> <li>• Control of pest animals (e.g. by trapping, poisoning or shooting) using a multi-species control programme would benefit native fauna (birds, lizards and invertebrates). However, due to the time and cost of establishing and maintaining such a control programme and the lack of barriers to invasion, only consider implementing an animal pest control programme if long-term, effective control can be ensured.</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowner about monitoring and controlling pest animals. Discussions and assistance offered if appropriate.</li> </ul>

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<sup>1</sup> [www.ecan.govt.nz/publications/Plans/ecological-significance-indigenous-vege-canterbury.pdf](http://www.ecan.govt.nz/publications/Plans/ecological-significance-indigenous-vege-canterbury.pdf)





**Assessment completed by:** Scott Hooson  
**Date:** 30 March 2015

**Statement completed by:** Scott Hooson  
**Date:** 30 March 2015

**Statement updated by:** XXX  
**Date:** XXX

*Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.*

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## Appendix 1: Wild Cattle Hill Rock Outcrop Plant Species List

Source: Wiser unpubl. data.

Data were collected during surveys of rock faces in the montane zone (i.e. altitudes > 500 m) of Banks Peninsula from 1998 to 2001 by Susan Wiser and her team, as part of a research programme funded by the then New Zealand Foundation for Research, Science and Technology.

Note: surveys covered rock outcrops and the vegetation surrounding each outcrop.

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena dumicola</i>	bidibidi, piri-piri
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium bulbiferum</i>	hen and chicken's fern
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Blechnum chambersii</i>	lance fern
<i>Brachyglottis sciadophila</i>	climbing groundsel
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carpodetus serratus</i>	marbleleaf, putaputāwētā
<i>Celmisia gracilentia</i>	slender mountain daisy, pekapeka
<i>Clematis foetida</i>	yellow clematis
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma lucida</i>	karamū
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma rubra</i>	mikimiki
<i>Coprosma sp. (t)</i>	
<i>Coprosma wallii</i>	bloodwood, mikimiki
<i>Crassula sieberiana</i>	stonecrop
<i>Deyeuxia avenoides</i>	oat grass
<i>Dichelachne crinita</i>	plume grass
<i>Elymus sp.</i>	
<i>Fuchsia colensoi</i>	
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Griselinia littoralis</i>	broadleaf, kāpuka
<i>Haloragis erecta</i>	toatoa
<i>Hebe salicifolia</i>	koromiko
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum lanceolatum</i>	niniao
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle heteromeria</i>	pennywort
<i>Hymenophyllum sanguinolentum</i>	filmy fern



<i>Kunzea robusta</i>	kānuka
<i>Luzula banksiana</i> var. <i>orina</i>	woodrush
<i>Melicope simplex</i>	poataniwha
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rātā
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Muehlenbeckia australis</i>	large-leaved pōhuehue
<i>Muehlenbeckia complexa</i>	scrub pōhuehue, wire vine
<i>Myrsine australis</i>	red māpou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping māpou
<i>Olearia paniculata</i>	akiraho
<i>Parsonsia</i> spp.	native jasmine
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Phlegmariurus varius</i>	clubmoss
<i>Pittosporum eugenioides</i>	lemonwood, tarātā
<i>Pittosporum tenuifolium</i>	kōhūhū, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, mānatu
<i>Poa cita</i>	silver tussock, wī
<i>Poa imbecilla</i>	weak poa
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus cunninghamii</i>	thin-barked totara, mountain totara
<i>Polystichum vestitum</i>	prickly shield fern, pūniu
<i>Pseudopanax colensoi</i>	mountain five-finger
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pterostylis species</i>	green-hooded orchid
<i>Pyrrosia eleagnifolia</i>	leatherleaf fern
<i>Rubus cissoides</i>	bush lawyer, tātarāmoa
<i>Rubus schmidelioides</i>	bush lawyer, tātarāmoa
<i>Rytidosperma clavatum</i>	danthonia, bristle grass
<i>Rytidosperma unarede</i>	danthonia
<i>Schefflera digitata</i>	patē, seven-finger
<i>Senecio glaucophyllus</i> subsp. <i>Basinudus</i>	yellow rock groundsel
<i>Senecio quadridentatus</i>	cotton fireweed, pekapeka
<i>Stellaria parviflora</i>	native chickweed
<i>Trisetum lepidum</i>	
<i>Urtica ferox</i>	ongaonga, tree nettle
<b>Exotic species</b>	
<i>Achillea millefolium</i>	yarrow
<i>Agrostis capillaris</i>	brown top
<i>Aira caryophylla</i>	silvery hair grass
<i>Anthoxanthum odoratum</i>	sweet vernal
<i>Aphanes inexpectata</i>	parsley piert
<i>Arenaria serpyllifolia</i>	sandwort
<i>Bellis perennis</i>	daisy
<i>Bromus hordeaceus</i>	soft brome
<i>Cerastium fontanum</i>	mouse-ear chickweed
<i>Cirsium vulgare</i>	Scotch thistle



<i>Claytonia perfoliata</i>	miners lettuce
<i>Crepis capillaris</i>	hawksbeard
<i>Critesion murinum</i>	barley grass
<i>Cynosurus cristatus</i>	crested dogstail
<i>Cynosurus echinatus</i>	rough dogstail
<i>Dactylis glomerata</i>	cocksfoot
<i>Digitalis purpurea</i>	foxglove
<i>Galium aparine</i>	cleavers
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Holcus lanatus</i>	Yorkshire fog
<i>Hypochaeris radicata</i>	catsear
<i>Lolium perenne</i>	ryegrass
<i>Mycelis muralis</i>	wall lettuce
<i>Poa annua</i>	annual poa
<i>Poa pratensis</i>	Kentucky blue grass
<i>Rumex acetosella</i>	sheeps sorrel
<i>Rumex obtusifolius</i>	broad-leaved dock
<i>Sagina procumbens</i>	procumbent pearlwort
<i>Sonchus asper</i>	prickly sow thistle
<i>Sonchus oleraceus</i>	pūhā, smooth sow thistle
<i>Stellaria media</i>	chickweed
<i>Trifolium dubium</i>	suckling clover
<i>Trifolium glomeratum</i>	clustered clover
<i>Trifolium repens</i>	white clover
<i>Verbascum thapsus</i>	woolly mullein
<i>Veronica arvensis</i>	field speedwell
<i>Vulpia bromoides</i>	vulpia hair grass, brome fescue, squirrel-tailed fescue
<i>Vulpia myuros</i>	vulpia hair grass, rats tail fescue



## The Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Mt Bradley

**Site number:** SES/H/28

**Physical address of site:** Kaituna Valley Road

#### Summary of Significance:

This site is significant because it contains very diverse and representative indigenous vegetation growing on an originally rare ecosystem (basic igneous bluffs, scarps and rock outcrops) that is also a large example of its type in the ecological district. It supports six nationally Threatened and At Risk plant species (two of which are endemic to Banks Peninsula), a large number of plant species that are uncommon within the ecological district or region and two plant species at their distributional limits on Banks Peninsula. The site is part of an important linkage of indigenous montane and sub-alpine habitats along the Mt Bradley – Mt Herbert ridgeline and it directly adjoins other areas of high ecological value.

#### Site Map



## **Additional Site Information**

**Ecological District:** Herbert

**Area of SES (ha):** 98.6

**Central point (NZTM):** E1576517, N5162250

## **Site Description**

This site includes the plateau-like summit and steep rock cliffs and scarps of Mt Bradley (855 m) west of Mt Herbert. The Sign of the Packhorse Scenic Reserve (conservation no. M36135) protects the southern side of the summit. Te Wharau and Waiake Streams drain the northern slopes of Mt Bradley and tributaries of the Kaituna River drain the southern slopes. The site is part of an area that the Department of Conservation identified as a Recommended Area for Protection (Herbert RAP 5 – Mount Bradley) (Wilson 1992).

The main vegetation communities within the site are:

- Fescue tussock grassland
- Indigenous vegetation on rockland
- Exotic gorse scrub

## **Extent of Site of Ecological Significance**

The site includes the summit of Mt Bradley and the rock bluffs and scarps surrounding it.

## **Assessment Summary**

The Mt Bradley Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8).



## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The rock cliffs and scarps surrounding the summit of Mt Bradley support indigenous plant communities that are representative and characteristic of these communities in the Herbert Ecological District. They act as refugia for a variety of predominantly indigenous shrubs, herbs and ferns. With the exception of gorse invasion, they are largely unmodified and include a full range of unique and specialised bluff plant communities, including subalpine species, and species endemic to the Peninsula, some of which are classified as nationally At Risk (Wiser unpubl. data).

Wilson (1992) commented on the “good summit tussockland” which “contains a strong upper montane floristic element” and listed a number of indigenous upper montane species he recorded at the site. Recent (2010) aerial photographs show much of the summit and eastern faces of Mt Bradley are now covered in dense exotic gorse scrub. Survey work is required to determine whether these tussocklands are still representative.

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

Although the Herbert Ecological District has extensive igneous rock bluffs and scarps, including those on Mt Herbert and Mt Evans the indigenous bluff and scarp vegetation communities on Mt Bradley support are extensive and a large example of upper montane rockland vegetation communities in the Herbert Ecological District.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is not significant under this criterion. There is very little accurate information available on the former and present extent of montane rock bluff and tussock grassland communities (Harding (2009) estimates both the original and present extent of lowland/montane rockland as being <1% of the ecological district). However, it is unlikely they have been reduced to less than 20% of their former extent in the Region, or ecological district.



The site is not significant at the level 4 Land environment scale. It is on an At Risk land environment (F3.3a) where 21.1% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports three nationally Threatened plant species, three nationally At Risk plant species (two are also endemic to Banks Peninsula) and a large number of plant species that are uncommon within the ecological district or region.

Nationally Threatened and At Risk plant species (de Lange et al. 2013) recorded from the site (Wiser unpubl. data) are:

- Annual fern (*Anogramma leptophylla*) (Threatened - Nationally Vulnerable)
- Dwarf carrot (*Daucus glochidiatus*) (Threatened - Nationally Vulnerable)
- Turnip-rooted geranium (*Geranium retrorsum*) (Threatened - Nationally Vulnerable)
- Banks Peninsula sun hebe (*Heliohebe lavaudiana*) (At Risk – Declining, endemic to Banks Peninsula)
- Banks Peninsula hebe (*Hebe strictissima*) (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- Yellow rock groundsel (*Senecio glaucophyllus* subsp. *basinudus*) (At Risk - Naturally Uncommon)

Indigenous plant species have been recorded from the site (Wiser unpubl. data - unless cited otherwise) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- Aromatic aniseed (*Anisotome aromatica*)
- Limestone spleenwort (*Asplenium lyallii*)
- Richard's spleenwort (*Asplenium richardii*)
- Spleenwort (*Asplenium trichomanes*)
- Mountain kiokio (*Blechnum montanum*)
- Kiokio (*Blechnum novae-zelandiae*)
- New Zealand bitter cress (*Cardamine corymbosa*)
- *Carex flagellifera*
- Broad-leaved bush tussock (*Chionochloa conspicua*)
- Tutu (*Coriaria sarmentosa*)
- Bladder fern (*Cystopteris tasmanica*)
- Slender mountain daisy (*Celmisia gracilentia*)
- Turpentine scrub (*Dracophyllum acerosum*)
- Willow herb (*Epilobium brunnescens*)
- Willow herb (*Epilobium rotundifolium*)
- Lily of the valley shrub (*Gaultheria crassa*)
- Mountain aniseed (*Gingidia montana*)
- Filmly fern (*Hymenophyllum multifidum*)
- Filmly fern (*Hymenophyllum sanguinolentum*)
- Hypericum gramineum





- *Koeleria novozelandica*
- *Lachnagrostis* sp.<sup>1</sup>
- Spider orchid (*Nematoceras macranthum*)
- Nertera (*Nertera depressa*)
- Dwarf strap fern (*Notogrammitis crassior*)
- Comb fern (*Notogrammitis heterophylla*)
- Parahebe lyallii
- Clubmoss (*Phlegmariurus varius*)
- Poa breviglumis
- Blue tussock (*Poa colensoi*)
- Leatherleaf fern (*Pyrrosia eleagnifolia*)
- Danthonia (*Rytidosperma buchananii*)
- Danthonia (*Rytidosperma corinum*)
- Native fireweed (*Senecio wairauensis*)
- *Stenostachys gracilis* (Wilson 2001)
- Hook grass (*Uncinia clavata*)
- Hook grass (*Uncinia silvestris*)

Wilson (1992) recorded a number of other indigenous plant species from the site, including the tussockland that Wisser (unpubl. data) did not record in her survey of the rock outcrops at the site.

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

It has two plant species that are at their distributional limits on Banks Peninsula (Wilson 2013):

- Danthonia (*Rytidosperma corinum*) (northern regional limit)
- Turpentine scrub (*Dracophyllum acerosum*) (southern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

Mt Bradley has extensive basic igneous bluffs, scarps and rock outcrops that support specialised indigenous vegetation (Wisser unpubl. data). At a national scale these features are an originally rare ecosystem (Williams et al. 2007).

<sup>1</sup> All of the *Lachnagrostis* species are uncommon on Banks Peninsula



## Diversity and Pattern

- 7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion. Wisser (unpubl. data) recorded a very high diversity of indigenous plant taxa (126 species) from the rock outcrops and surrounding vegetation within the site.

## Ecological Context

- 8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The site is part of an important linkage of indigenous montane and sub-alpine habitats along the Mt Bradley – Mt Herbert ridgeline. It also directly adjoins other areas of high ecological value in the upper catchments of Te Wharau and Waiake Valleys and forests on the upper slopes of the Kaituna Valley (including within the Sign of the Packhorse Scenic Reserve).

- 9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site

- 10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess this site against this criterion.

## Site Management

### Existing Protection Status

The Sign of the Packhorse Scenic Reserve (conservation no. M36135) protects the southern side of the summit of Mt Bradley. The majority of the site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Biodiversity pest plants.</li> <li>• Gorse is now extensive and will continue to expand into remaining indigenous tussockland and rock bluff vegetation communities.</li> <li>• Wilson (1992) recorded mouse-ear hawkweed in the tussockland and noted that it appeared to be spreading.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider controlling gorse on rock bluffs and outcrops where there are high value indigenous rock outcrop vegetation communities. Appropriate control methods should be used that do not damage the ecological values.</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowner about benefits to biodiversity of pest plant monitoring and control, particularly gorse.</li> <li>• Assistance available where appropriate.</li> </ul>



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**Assessment completed by:** Scott Hooson  
**Date:** 25 March 2015

**Statement completed by:** Scott Hooson  
**Date:** 25 March 2015

**Statement updated by:** XXX  
**Date:** XXX

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## Appendix 1: Mt Bradley Rock Outcrop Plant Species List

Source: Wiser (unpubl. data).

Data were collected during surveys of rock faces in the montane zone (i.e. altitudes > 500 m) of Banks Peninsula from 1998 to 2001 by Susan Wiser and her team, as part of a research programme funded by the then New Zealand Foundation for Research, Science and Technology.

Note: surveys covered rock outcrops and the vegetation surrounding each outcrop. Exotic species were not recorded.

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Anisotome aromatica</i>	kopoti
<i>Anogramma leptophylla</i>	annual fern
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Asplenium lyallii</i>	limestone spleenwort
<i>Asplenium richardii</i>	Richard's spleenwort
<i>Asplenium trichomanes</i>	spleenwort
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum montanum</i>	mountain kiokio
<i>Blechnum novae-zelandiae</i>	kiokio
<i>Blechnum procerum</i>	small kiokio
<i>Brachyglottis lagopus</i>	groundsel, yellow rock daisy
<i>Cardamine corymbosa</i>	NZ bitter cress
<i>Cardamine debilis</i>	NZ bitter cress
<i>Carex flagellifera</i>	Glen Murray tussock
<i>Carex forsteri</i>	cutty grass
<i>Carpodetus serratus</i>	marbleleaf, putaputawētā
<i>Celmisia gracilentia</i>	slender mountain daisy, pekapeka
<i>Cheilanthes sieberi</i>	rock fern
<i>Chionochloa conspicua</i>	hunangamoho, broad-leaved bush tussock
<i>Coprosma x cunninghamii</i>	
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma lucida</i>	karamū
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma rigida</i>	stiff coprosma
<i>Coprosma robusta</i>	karamū
<i>Coprosma rubra</i>	mikimiki



<i>Coprosma species (t)</i>	
<i>Coriaria sarmentosa</i>	tutu
<i>Corokia cotoneaster</i>	korokio
<i>Austroderia richardii</i>	toetoe
<i>Crassula sieberiana</i>	stonecrop
<i>Cystopteris tasmanica</i>	bladder fern
<i>Daucus glochidiatus</i>	dwarf carrot
<i>Deyeuxia avenoides</i>	oat grass
<i>Dichelachne crinita</i>	plume grass
<i>Dichondra repens</i>	dichondra
<i>Discaria toumatou</i>	matagouri, wild irishman, tūmatakuru
<i>Dracophyllum acerosum</i>	turpentine scrub
<i>Epilobium brunnescens</i>	willow herb
<i>Epilobium pubens</i>	willow herb
<i>Epilobium rotundifolium</i>	willow herb
<i>Euchiton audax</i>	native cudweed
<i>Fuchsia x colensoi</i>	
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Gaultheria crassa</i>	lily of the valley shrub
<i>Gaultheria depressa var. novae-zelandiae</i>	snowberry
<i>Geranium retrorsum</i>	turnip-rooted geranium
<i>Geranium sessiliflorum</i>	
<i>Gingidia montana</i>	mountain aniseed
<i>Griselinia littoralis</i>	broadleaf, kāpuka
<i>Haloragis erecta</i>	toatoa
<i>Hebe salicifolia</i>	koromiko
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Helichrysum lanceolatum</i>	ninia
<i>Heliohebe lavaudiana</i>	Banks Peninsula sun hebe
<i>Hierochloe redolens</i>	holy grass, kāretu
<i>Hydrocotyle moschata</i>	pennywort
<i>Hymenophyllum multifidum</i>	filmy fern
<i>Hymenophyllum sanguinolentum</i>	filmy fern
<i>Hypericum gramineum</i>	
<i>Koeleria novozelandica</i>	
<i>Kunzea ericoides</i>	kānuka
<i>Lachnagrostis species</i>	wind grass
<i>Leucopogon fraseri</i>	dwarf heath, pātōtara
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Linum monogynum</i>	NZ linen flax
<i>Luzula banksiana var. orina</i>	woodrush
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Microtis unifolia</i>	onion orchid, maikaika
<i>Myrsine australis</i>	red māpou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping māpou
<i>Nematoceras macranthum</i>	spider orchid
<i>Nertera depressa</i>	nertera
<i>Notogrammitis crassior</i>	dwarf strap fern
<i>Notogrammitis heterophylla</i>	comb fern



<i>Oxalis exilis</i>	yellow oxalis
<i>Parahebe lyallii</i>	
<i>Parsonsia species</i>	native jasmine
<i>Phlegmariurus varius</i>	clubmoss
<i>Phormium cookianum</i>	mountain flax, wharariki
<i>Pittosporum eugenioides</i>	lemonwood, tarātā
<i>Pittosporum tenuifolium</i>	kōhūhū, black matipo
<i>Pneumatopteris pennigera</i>	gully fern, pākau
<i>Poa breviglumis</i>	
<i>Poa cita</i>	silver tussock, wī
<i>Poa colensoi</i>	blue tussock
<i>Poa imbecilla</i>	weak poa
<i>Podocarpus cunninghamii</i>	thin-barked totara, mountain totara
<i>Polystichum richardii</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, pūniu
<i>Pseudognaphalium luteoalbum</i>	jersey cudweed
<i>Pseudopanax colensoi</i>	mountain five-finger
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pyrrosia eleagnifolia</i>	leatherleaf fern
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Raoulia glabra</i>	mat daisy
<i>Rubus cissoides</i>	bush lawyer, tātarāmoa
<i>Rubus schmidelioides</i>	bush lawyer, tātarāmoa
<i>Rytidosperma buchananii</i>	danthonia, bristle grass
<i>Rytidosperma clavatum</i>	danthonia, bristle grass
<i>Rytidosperma corinum</i>	danthonia, bristle grass
<i>Rytidosperma gracile</i>	danthonia
<i>Rytidosperma unarede</i>	danthonia
<i>Senecio glaucophyllus</i> subsp. <i>basinudus</i>	yellow rock groundsel
<i>Senecio glomeratus</i>	native groundsel, fireweed
<i>Senecio quadridentatus</i>	cotton fireweed, pekapeka
<i>Senecio wairauensis</i>	native fireweed
<i>Stellaria parviflora</i>	native chickweed
<i>Thelymitra longifolia</i>	white sun orchid
<i>Uncinia clavata</i>	hook grass
<i>Uncinia silvestris</i>	hook grass
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Vittadinia australis</i>	white fuzzweed
<i>Wahlenbergia gracilis</i>	

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Mt Evans

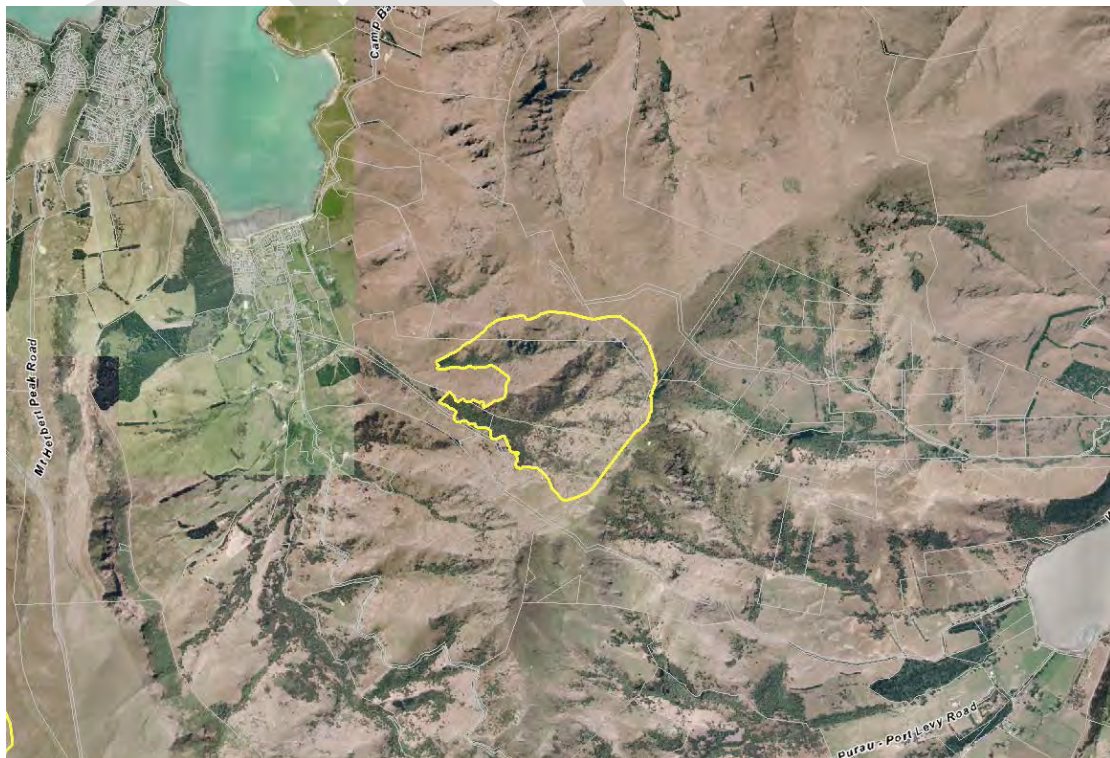
**Site number:** SES/H/29

**Physical address of site:** Purau Port Levy Road

#### Summary of Significance:

The site is significant because it contains both representative and rare indigenous vegetation growing on an originally rare ecosystem (basic igneous bluffs, scarps and rock outcrops) that is also a large example of its type in the ecological district. It supports the largest known population of the Threatened - Nationally Critical Lyttelton forget-me-not (*Myosotis lytteltonensis*), another eight nationally At Risk plant species, (six Threatened and Risk species are also endemic to Banks Peninsula) and several plant species that are uncommon within the ecological district or region and three plant species that are at their distributional limits on Banks Peninsula. The site provides an important linkage between the western slopes of Mt Evans and other areas of high ecological value on its eastern slopes.

#### Site Map





## **Additional Site Information**

**Ecological District:** Herbert

**Area of SES (ha):** 102.3

**Central point:** E1581862 N5167188

## **Site Description**

This site is in Purau Bay on the steep western slopes of Mt Evans above and east of the Purau – Port Levy Road. It encompasses very steep, west-facing, drought-prone slopes, bluffs and gullies rising from about 160 m to 703 m at the summit of Mount Evans (Wilson 1992) and two tributary streams that flow into Purau Stream. The site is part of a larger area that was identified by the Department of Conservation as a Recommended Area for Protection (Herbert RAP 2 – Mount Evans) (Wilson 1992).

The main vegetation communities within the site (Wilson 1992) are:

- Mixed broadleaved second-growth hardwood forest and treeland on lowland hill slopes
- Kanuka-dominant second-growth hardwood forest and treeland on lowland hill slopes
- Montane podocarp and podocarp/hardwood treeland on hill slopes
- Small-leaved scrub and shrubland on lowland and montane hill slopes
- Short tussockland on lowland and montane hill slopes
- Fernland on lowland hill slopes
- Lowland flaxland on lowland hill slopes
- Lowland and montane rockland communities

## **Extent of Site of Ecological Significance**

The site includes the forest, scrub, shrublands, fernland, tussock grassland and the extensive rock bluff and outcrop vegetation communities in the two gullies on the western slopes of Mt Evans from approximately 160 m to its summit.

The Department of Conservation included the contiguous steep slopes and rock bluffs to the north and south of this site (Wilson's sites 25 and 27) within the Mt Evans Recommended Area for Protection (Herbert RAP 2) (Wilson 1992). There is no available up-to-date information on these sites, and only a limited amount of information in Wilson's unpublished survey data for these areas. However, based on Wilson (1992) and his for these areas, they were of high ecological value when he surveyed them and are likely to be significant. They are contiguous with this site and are a logical extension to it if they are significant. Survey and assessment of these two areas is a high priority.



## Assessment Summary

The Mt Evans Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 8).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The extensive rock bluffs and scarps within the site support indigenous plant communities that are representative and characteristic of these communities in the Herbert Ecological District. They act as refugia for a variety of indigenous shrubs, herbs and grasses and ferns. With the exception of exotic plants, including grasses and broom (Pender 1999a,b), they are relatively intact and support a full range of unique and specialised rock bluff plants, including a high proportion of nationally Threatened and At Risk species, and species endemic to Banks Peninsula (Pender 1999b, Wilson unpubl. data, no date).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

The igneous bluff and scarp vegetation communities on Mt Evans (as well as those connected bluff systems to the north and south of the site) are extensive and support rock bluff and rock outcrop vegetation communities that together are a very large example of their type in the Herbert Ecological District.

### Rarity/Distinctiveness

- 3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

In the context of the Herbert Ecological District the mixed broadleaved second-growth hardwood forest in the gullies and small areas of montane podocarp and podocarp/hardwood treeland within the site are significant under this criterion because indigenous forest it has been reduced to less than 20% of its former



extent in the ecological district. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

The seral woody vegetation communities such as mixed second growth hardwood forest and small-leaved indigenous scrub and shrubland that occur within the site have expanded their range in the ecological district as a result of human disturbance. However, the extent of all indigenous woody vegetation in the ecological district is estimated to be only 10.9% (New Zealand Landcover Database (Version 4)).

The site is not significant at the level 4 Land environment scale. It is on an At Risk land environment (F3.3a) where 21.1% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports one Threatened - Nationally Critical plant species, eight nationally At Risk plant species and several plant species that are uncommon within the ecological district or region.

Nationally Threatened and At Risk plant species (de Lange et al. 2013) recorded from the site are:

- Lyttelton forget-me-not (*Myosotis lytteltonensis*) (Threatened - Nationally Critical, endemic to Banks Peninsula) – the site supports the largest known population of *Myosotis lytteltonensis* (Threatened - Nationally Critical) (Pender 1999 a,b, Wilson unpubl. data, no date) (estimated to be between 200-300 plants (Pender 1999a, Anon. no date)).
- *Coprosma virescens* (At Risk – Declining) (Wilson unpubl. data, no date)
- Banks Peninsula sun hebe (*Heliohebe lavaudiana*) (At Risk – Declining, endemic to Banks Peninsula) (Pender 1999b, Wilson unpubl. data, no date)
- Banks Peninsula blue tussock (*Festuca actae*) (At Risk – Naturally Uncommon, endemic to Banks Peninsula) (Pender 1999b, Wilson unpubl. data, no date)
- Banks Peninsula hebe (*Hebe strictissima*) (At Risk – Naturally Uncommon, endemic to Banks Peninsula) (Wilson unpubl. data, no date)
- *Gingidia enysii* var. *peninsulare* (At Risk – Naturally Uncommon, endemic to Banks Peninsula) (Wilson unpubl. data, no date)
- Banks Peninsula button daisy (*Leptinella minor*) (At Risk – Naturally Uncommon, endemic to Banks Peninsula) (Wilson unpubl. data, no date)
- *Myosotis spathulata* (At Risk – Naturally Uncommon) (Wilson unpubl. data, no date)
- Yellow rock groundsel (*Senecio glaucophyllus* subsp. *basinudus*) (At Risk – Naturally Uncommon) (Wilson unpubl. data, no date)



Indigenous plant species have been recorded from the site (Wilson unpubl. data no date) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- Common maidenhair (*Adiantum cunninghamii*)
- *Australina pusilla*
- Slender mountain daisy (*Celmisia gracilentia*)
- Tutu (*Coriaria sarmentosa*)
- Climbing fuchsia (*Fuchsia perscandens*)
- Spider orchid (*Nematoceras macranthum*)
- Comb fern (*Notogrammitis heterophylla*)
- Blue tussock (*Poa colensoi*)
- Danthonia (*Rytidosperma corinum*)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

It has three plant species (Wilson unpubl. data no date) that are at their distributional limits on Banks Peninsula (Wilson 2013):

- Kawakawa (*Piper excelsum*) (southern national limit)
- Pigeonwood (*Hedycarya arborea*) (southern regional limit)
- Danthonia (*Rytidosperma corinum*) (northern regional limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

Mt Evans has extensive basic igneous bluffs, scarps and rock outcrops that support a diverse range of highly specialised indigenous vegetation (Pender 1999b, Wilson unpubl. data, no date). At a national scale these features are an originally rare ecosystem (Williams et al. 2007).

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

It includes a continuous altitudinal sequence that includes lowland secondary-growth forest and scrub, montane scrub, fernland, tussock grassland and rock bluff communities from approximately 160 m to 703 m at the summit of Mt Evans. The altitudinal and associated climatic gradient (encompassing lowland and montane environments), aspect and topographic variation means the site supports a relatively high diversity of indigenous vegetation communities. It has a



remarkable dry climate flora, with plants of more moist conditions at higher elevations (Wilson unpubl. data, no date). A list of the plant taxa recorded within the site (Wilson unpubl. data, no date) is provided in Appendix 1.

The rock bluff communities support a relatively high diversity of specialist rock outcrop plant species including a proportion of nationally Threatened and At Risk, endemic and locally uncommon species (Wilson unpubl. data, no date).

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The indigenous vegetation within the site and on the summit of Mt Evans provides an important linkage between the western slopes and other areas of high ecological value on its eastern slopes. The riparian forest, treeland and scrub in the gullies within the site also buffers the headwaters of two tributaries of Purau Stream that flow from the upper slopes of Mt Evans.

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess this site against this criterion.

## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Decline or loss of the <i>Myosotis lytteltonensis</i> (Threatened - Nationally Critical) population. Threats include biodiversity pest plants (e.g. scotch broom (<i>Cytisus scoparius</i>)), introduced grasses and browsing animals such as sheep, goats, rabbits, hares and possibly possums (Pender 1999 a,b).</li> </ul>	<ul style="list-style-type: none"> <li>Consider implementing a programme to reduce threats to the survival of the species such as regular control of exotic woody weeds and annual releasing from introduced grasses.</li> <li>DOC and/or Council to consider undertaking ongoing regular monitoring of the population.</li> <li>Continue to propagate seedlings<sup>1</sup> and establish this species in other suitable habitats at other locations on Banks Peninsula and the Port Hills.</li> <li>Consider promoting applied research (i.e. in collaboration with Universities) to benefit the management of this species.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about benefits to biodiversity of pest plant monitoring and control.</li> <li>Assistance available where possible.</li> <li>With landowner agreement, collaborate with other agencies and Universities to undertake propagation and research.</li> </ul>
<ul style="list-style-type: none"> <li>Goats</li> </ul>	<ul style="list-style-type: none"> <li>Consider removing goats. Goats are a serious threat to the ecological values of the site. They also have the potential to spread onto neighbouring properties and into other areas with high ecological values. Not removing</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with the landowner about the benefits to biodiversity of goat control.</li> <li>Assistance for the landowner with goat control if agreed.</li> </ul>

<sup>1</sup> *Myosotis lytteltonensis* is easily propagated by germinating seeds (refer to Pender 1999b for information on propagation and cultivation).

	<p>goats poses a significant threat to the success of the multi-agency Banks Peninsula Feral Goat Eradication Programme.</p>	
<ul style="list-style-type: none"> <li>Domestic stock. Stock are likely to be preventing natural regeneration of indigenous vegetation communities where they are accessible to them. However, much of the more intact rock bluff vegetation is naturally protected by the steep terrain.</li> </ul>	<ul style="list-style-type: none"> <li>Wilson (1992) commented that adequate protection of many of the ecological values within the site could be achieved by continuing present farming practices (moderate grazing by sheep).</li> <li>However, fencing the secondary-growth forest in the gullies to keep stock out would promote seedling recruitment and recovery of the understorey.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about benefits to biodiversity of stock management options and provide advice, guidance and assistance where appropriate.</li> </ul>

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**Assessment completed by:** Scott Hooson  
**Date:** 27 March 2015

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**Statement updated by:** XXX  
**Date:** XXX

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**Appendix 1: Plant Species List for Mt Evans, Purau Slopes (Site 8)**

Source: Wilson unpubl. data (no date).

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Adiantum cunninghamii</i>	maidenhair
<i>Aristolelia serrata</i>	wineberry, makomako
<i>Australina pusilla</i>	
<i>Blechnum penna-marina</i>	little hard fern
<i>Brachyglottis lagopus</i>	groundsel, yellow rock daisy
<i>Calystegia tuguriorum</i>	NZ bindweed, pōwhiwhi
<i>Carmichaelia australis</i>	native broom, common broom
<i>Carpodetus serratus</i>	marbleleaf, putaputāwētā
<i>Celmisia gracilentia</i>	slender mountain daisy, pekapeka
<i>Clematis afoliata</i>	leafless clematis
<i>Clematis foetida</i>	yellow clematis
<i>Colobanthus buchananii</i>	
<i>Convolvulus waitaha</i>	grass convolvulus
<i>Coprosma areolata</i>	mingimingi, mikimiki
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma virescens</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, tī kōuka
<i>Coriaria sarmentosa</i>	tutu
<i>Corokia cotoneaster</i>	korokio
<i>Euchiton audax</i>	native cudweed
<i>Festuca actae</i>	Banks Peninsula blue tussock
<i>Fuchsia excorticata x perscandens</i>	
<i>Fuchsia perscandens</i>	climbing fuchsia
<i>Geranium microphyllum</i>	
<i>Gingidia enysii</i>	
<i>Heliohebe lavaudiana</i>	Banks Peninsula sun hebe
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Korthalsella lindsayi</i>	dwarf mistletoe
<i>Kunzea ericoides</i>	kānuka
<i>Leptinella minor</i>	Banks Peninsula button daisy
<i>Leptecophylla juniperina</i>	prickly mikimiki
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Lophomyrtus obcordata</i>	rōhutu, NZ myrtle
<i>Melicope simplex</i>	poataniwha
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rātā
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Myoporum laetum</i>	ngaio
<i>Myosotis lytteltonensis</i>	Lyttelton forget-me-not



<i>Myosotis spathulata</i>	
<i>Myrsine divaricata</i>	weeping matipo, weeping māpou
<i>Nematoceras macranthum</i>	spider orchid
<i>Notogrammitis heterophylla</i>	comb fern
<i>Oxalis exilis</i>	yellow oxalis
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Phormium cookianum</i>	mountain flax, wharariki
<i>Piper excelsum</i>	kawakawa
<i>Plagianthus regius</i>	lowland ribbonwood, mānatu
<i>Poa cita</i>	silver tussock, wī
<i>Poa colensoi</i>	blue tussock
<i>Poa imbecilla</i>	weak poa
<i>Podocarpus cunninghamii</i>	mountain tōtara, thin-barked tōtara
<i>Podocarpus totara</i>	lowland tōtara
<i>Polytrichum sp.</i>	
<i>Pteridium esculentum</i>	bracken, rārahu, rauaruhe
<i>Rubus cissoides</i>	bush lawyer, tātarāmoa
<i>Rubus schmidelioides</i>	bush lawyer, tātarāmoa
<i>Rubus squarrosus</i>	leafless bush lawyer, tātarāmoa
<i>Rytidosperma corinum</i>	danthonia, bristle grass
<i>Senecio glaucophyllus subsp. basinudus</i>	yellow rock groundsel
<i>Sophora microphylla</i>	small-leaved kōwhai
<i>Sophora prostrata</i>	dwarf kōwhai, prostrate kōwhai
<i>Stellaria decipiens</i>	native chickweed
<i>Thelymitra longifolia</i>	white sun orchid
<i>Uncinia leptostachya</i>	hook grass
<b>Exotic species</b>	
<i>Anthriscus caucalis</i>	beaked parsley
<i>Carduus pycnocephalus</i>	slender winged thistle
<i>Claytonia perfoliata</i>	miners lettuce
<i>Crataegus monogyna</i>	hawthorn
<i>Dryopteris filix-mas</i>	male fern
<i>Geranium molle</i>	dovesfoot cranesbill
<i>Hypochaeris glabra</i>	smooth catsear
<i>Melanoselenium sp.</i>	
<i>Myosotis stricta</i>	forget-me-not
<i>Sherardia arvensis</i>	field madder
<i>Silybum marianum</i>	variegated thistle
<i>Solenogyne gunnii</i>	
<i>Stuartina muelleri</i>	
<i>Ulex europaeus</i>	gorse

## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Northern Side of Holmes Bay

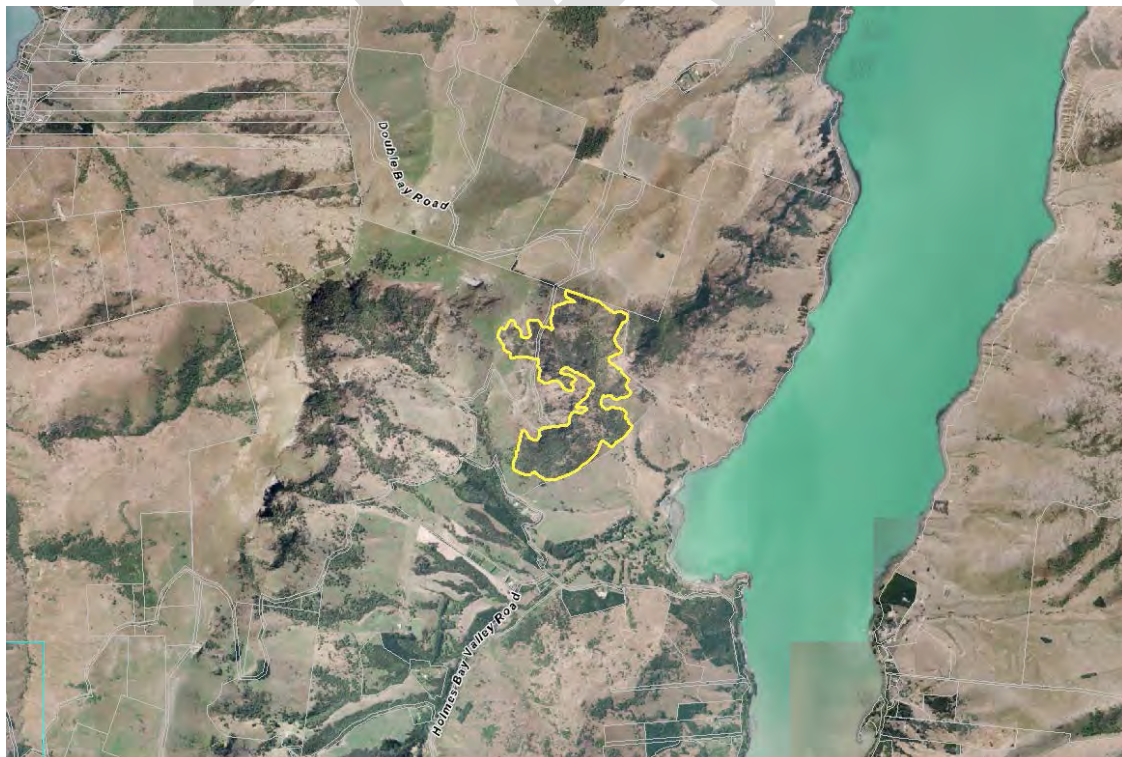
**Site number:** SES/H/27

**Physical address of site:** 98 Holmes Bay Valley Road, Pigeon Bay

#### Summary of Significance:

This site is significant because it contains representative lowland second-growth forest, treeland and shrublands and is a moderately large example of its type. Indigenous forest has been reduced to less than 20% of its former extent in the ecological district and region. The site has considerable habitat and species diversity and supports three nationally At Risk plant species, one of which is at its northern distributional limit on Banks Peninsula. It contributes to an important ecological linkage and is well buffered.

#### Site Map



## Additional Site Information

**Ecological District:** Herbert

**Area of SES (ha):** 47.0

**Central point (NZTM):** E1590412 N5165296

## Site Description

The site is located on south and east-facing moderately steep to steep slopes and the head of a basin-like catchment on the northern side of Holmes Bay in Pigeon Bay. Part of the site extends over the rounded but rocky ridge on the western side of Little Pigeon Bay Road. The altitudinal range of the site is from approximately 100 to 300 m above sea level.

The main vegetation communities identified by (Walls et al. 2008) are:

- Mixed second-growth broadleaved-hardwood forest and treeland
- Kanuka forest
- Lowland small-leaved indigenous scrub and shrubland

The following description of the site is from Walls et al. (2008).

There is a small population - at least nine trees - of the nationally At Risk fragrant tree daisy (*Olearia fragrantissima*) in a localised area on the hillside in the south-western part of the site within characteristic second-growth tree-shrubland of kowhai (*Sophora microphylla*), ngaio (*Myoporum laetum*), narrow-leaved lacebark (*Hoheria angustifolia*), lowland ribbonwood (*Plagianthus regius*), rohutu (*Lophomyrtus obcordata*), weeping matipo (*Myrsine divaricata*), poataniwha (*Melicope simplex*), kanuka (*Kunzea robusta*), fierce lancewood (*Pseudopanax ferox*), *Coprosma virescens*, mikimiki (*C. propinqua*) and *prostrate kowhai* (*Sophora prostrata*).

There is kanuka forest in the lower gully with trees of lowland ribbonwood, narrow-leaved lacebark, ngaio, kowhai and kaikomako (*Pennantia corymbosa*), and a few secondary lowland totara (*Podocarpus totara*).

The upper gully contains secondary broadleaved-hardwood forest and treeland dominated by lowland ribbonwood, narrow-leaved lacebark, mahoe (*Melicytus ramiflorus*), kowhai, broadleaf (*Griselinia littoralis*) and kaikomako. This is fringed and intermingled with scrub and open shrubland composed of *Coprosma virescens*, *C. crassifolia*, *C. rotundifolia*, *C. propinqua*, niniao (*Helichrysum lanceolatum*), poataniwha, porcupine shrub (*Melicytus alpinus*), korokio (*Corokia cotoneaster*), weeping mapou and ongaonga (*Urtica ferox*). This shrubland extends up onto the ridge crest.

On steep rock and within thickets there are various small ferns, shrubs and tree seedlings. Vines include large-leaved pohuehue (*Muehlenbeckia australis*), scrub pōhuehue (*Muehlenbeckia complexa*), bush lawyer (*Rubus* spp.), native jasmine (*Parsonsia* sp.) and yellow clematis (*Clematis foetida*).



## Extent of Site of Ecological Significance

The site includes the forest, treeland and scrub and shrublands on the south and east-facing slopes on the eastern side of Little Pigeon Bay Road. An area of indigenous scrub and shrubland amongst volcanic boulderfields on the western side of Little Pigeon Bay Road is also included within the site.

The boundaries of this site logically extend north beyond the mapped site boundaries to include a large area of similar connected habitat that was identified by Hugh Wilson (Site 560). This area is highly likely to be ecologically significant but there is no available up-to-date information to assess its significance. An ecological survey and assessment of this area is recommended.

## Assessment Summary

The Northern Side of Holmes Bay Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criterion 8).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The site is highly representative of lowland second-growth forest, treeland and shrublands in the ecological district (Walls et al. 2008).

- 2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

It is a moderately large example of lowland second-growth forest, treeland, scrub and shrublands in the Herbert Ecological District and meets the threshold for significance.

### Rarity/Distinctiveness



**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The site is significant under this criterion.

The indigenous forest and treeland and the indigenous vegetation in the lowest part of the site is significant under this criterion.

In the context of the Herbert Ecological District the mixed second-growth broadleaved-hardwood forest and treeland is significant under this criterion because indigenous forest has been reduced to less than 20% of its former extent in the ecological district. Banks Peninsula, including the Herbert Ecological District, was almost entirely forested prior to the arrival of humans (Harding 2009, Wilson 2013). The present extent of all indigenous forest (excluding manuka and/or kanuka) in the ED is estimated to be 7% (10.9% including manuka and/or kanuka) (New Zealand Landcover Database (Version 4)).

Most of the site is not significant at the Level 4 land environment scale, but the indigenous vegetation in the lowest part of the site is on a Chronically Threatened land environment (F3.1b) where 12.2% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

Three nationally At Risk plant species (de Lange et al. 2013) were recorded within the site by Walls et al. (2008):

- *Coprosma virescens* – abundant within the site
- Fierce lancewood (*Pseudopanax ferox*)
- Fragrant tree daisy (*Olearia fragrantissima*) (At Risk – Declining, uncommon in the ecological district and region) – there is a small population of at least nine trees in a localised area on the hillside in the south-western part of the site.

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

It has one plant species that is at its distributional limit on Banks Peninsula (Wilson 2013):

- Fragrant tree daisy (*Olearia fragrantissima*) (northern distributional limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**



The site is significant under this criterion.

It has basic igneous bluffs and rock outcrops (Walls et al 2008) and volcanic boulderfields. At a national scale they are originally rare ecosystems (Williams et al. 2007). Where these features support indigenous vegetation they are significant under this criterion.

### Diversity and Pattern

**7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.***

The site is significant under this criterion.

Walls et al. (2008), who surveyed the site, commented that it has considerable habitat and species diversity.

### Ecological Context

**8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The site is surrounded by indigenous vegetation (particularly forest and scrub) in the wider landscape. It provides an important linkage between Wild Cattle Hill /Maori Gully and a large area of connected coastal-lowland second-growth forest, treeland, scrub and shrublands on steep slopes and bluffs north of the site.

Core areas of the site are buffered by treeland and indigenous scrub and shrublands and parts of the site are naturally protected by the steep topography (Walls et al. 2008).

**9. *A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.***

The site is not significant under this criterion. There are no wetlands within the site

**10. *Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.***

There is insufficient information to assess the site against this criterion.



## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Biodiversity pest plants. Hawthorn, sweet briar and elderberry are potential weeds at the site, but are currently in low numbers (Walls et al. 2008).</li> </ul>	<ul style="list-style-type: none"> <li>Control of hawthorn, sweet briar and elderberry could be considered, particularly in shrublands and rock outcrops.</li> <li>Consider ongoing surveillance for other higher priority biodiversity pest plants including sycamore, cotoneaster and grey willow (all present in Holmes Bay Valley) and old man's beard, banana passionfruit, Chilean flame creeper and Darwin's barberry that do not currently grow within the site (Walls et al. 2008).</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about benefits to biodiversity of monitoring and control of pest plants.</li> <li>Assistance available where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Domestic stock. Stock have access to the site, although bluffs and steeper parts of the site are naturally protected (Walls et al. 2008).</li> </ul>	<ul style="list-style-type: none"> <li>It is understood that the property is farmed with the objective of integrating productive pastoral farming with conservation of natural values. Under this regime stock get the benefit of the shelter but the property is stocked to a level that allows retention of the native trees, shrubs and tussocks (Walls et al. 2008). However, in the long term, forests, treelands and shrublands routinely used by stock may not be able to persist without protection.</li> </ul>	<ul style="list-style-type: none"> <li>Discussions with landowner about the benefits to biodiversity of stock management options in identified areas.</li> <li>Assistance available where appropriate.</li> </ul>

	<ul style="list-style-type: none"> <li>Consider fencing forested areas to promote seedling recruitment, understorey development and the long-term persistence of indigenous vegetation cover.</li> </ul>	
<ul style="list-style-type: none"> <li>Lack of recruitment of fragrant tree daisy and fierce lancewood (Walls et al. 2008). (Note that (Walls 2001) found that stock, rabbits and hares were completely inhibiting recruitment of fragrant tree daisy at this site in 2001. However, healthy seedlings were found in 2008 indicating the grazing regime at the time was beneficial in lowering competition from grasses without preventing regeneration (Walls et al. 2008)).</li> </ul>	<ul style="list-style-type: none"> <li>Consider monitoring the recruitment of fragrant tree daisy and fierce lancewood within the site and undertaking adaptive management to determine the best management regime. Management could include:                             <ul style="list-style-type: none"> <li>Stocking at a level where recruitment of these species can occur.</li> <li>Installing stock-proof (and ideally rabbit-proof) fencing around the area of forest/scrub with fragrant tree daisy.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Discussions with landowner about options for protection and possible enhancement of fragrant tree daisy.</li> <li>Assistance available where appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Pest animals. Goats, deer and pigs are virtually non-existent on the property and possums and rabbits are routinely controlled, and are at low numbers. Other pest animals such as hedgehogs, stoats, cats and rats are likely to be present within the site (Walls et al. 2008) and are a threat to the ecological values of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Control of pest animals (e.g. by trapping, poisoning or shooting) using a multi-species control programme would benefit native fauna (birds, lizards and invertebrates). However, due to the time and cost of establishing and maintaining such a control programme and the lack of barriers to invasion, only consider implementing an animal pest control programme if long-term, effective control can be ensured.</li> </ul>	<ul style="list-style-type: none"> <li>Advice and guidance for landowner about monitoring and controlling pest animals.</li> <li>Discussions and assistance offered if appropriate.</li> </ul>



## References

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<sup>1</sup> [www.ecan.govt.nz/publications/Plans/ecological-significance-indigenous-vege-canterbury.pdf](http://www.ecan.govt.nz/publications/Plans/ecological-significance-indigenous-vege-canterbury.pdf)



**Assessment completed by:** Scott Hooson  
**Date:** 31 March 2015

**Statement completed by:** Scott Hooson  
**Date:** 31 March 2015

**Statement updated by:** XXX  
**Date:** XXX

*Please note this statement is based on information available at the time of writing.  
Due to the dynamic nature of ecosystems, future reassessment of the site may be  
necessary to reflect any changes in knowledge of its ecological significance.*

DRAFT



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Lake Ellesmere/Te Waihora and margins

**Site number:** SES/E/1

#### Summary of Significance:

Lake Ellesmere/Te Waihora is the largest coastal lake habitat in New Zealand and is recognised as being internationally significant for its birdlife abundance and diversity, nationally significant for its wetland vegetation and of regional significance for its indigenous fish fauna. It is an originally rare ecosystem and supports very extensive and representative, rare and distinctive freshwater and saltmarsh vegetation communities and representative and distinctive bird and fish assemblages. It provides habitat for an outstanding number of nationally Threatened and At Risk plant, bird and fish species and is a very important habitat for very large numbers of bird species including international and internal migrants, waterfowl and wetland species.

#### Site Map



## **Additional Site Information**

**Ecological District:** Ellesmere

**Area of SES (ha):** 7390.50

**Central point (NZTM):** E1566050, N5149838

## **Site Description<sup>1</sup>**

Lake Ellesmere/Te Waihora is a large brackish, shallow coastal lake approximately 20 km south of Christchurch City on the southern side of Banks Peninsula. The lake is separated from the Pacific Ocean by a shingle barrier, the Kaitorete Spit and is at or near sea level with an average depth of 1.4 metres. The lake bed covers around 20,000 hectares and it is the largest coastal lake habitat in New Zealand, and New Zealand's fifth largest lake by area. A total of thirty seven rivers, streams and artificial drains flow into the lake. Five of these are major waterways: the Selwyn, Irwell, LII and Halswell Rivers and Harts Creek. Groundwater supply is also an important contributor to the lake (Cromarty and Scott 1995).

The average depth of the lake ranges from 2.5 to 4.5 m, and water levels continually change throughout the year because of seasonal changes in rainfall, catchment inputs and evaporation rates, and because of mechanical opening of the lake to the sea. Daily fluctuations occur in response to changes in wind direction. Strong prevailing winds result in the lake waters being permanently turbid (Cromarty and Scott 1995).

Lake Ellesmere/Te Waihora is one of New Zealand's most important wetland systems. The outstanding values of the lake are recognised in a National Water Conservation Order as: habitat for wildlife, indigenous wetland vegetation and fish; and as being of significance in accordance with tikanga Māori in respect of Ngāi Tahu history, mahinga kai and customary fisheries. Internationally Lake Ellesmere/Te Waihora is significant for its birdlife abundance and diversity and nationally for its wetland vegetation (Hughey and Taylor 2009).

The extensive freshwater swamplands which once surrounded Lake Ellesmere/Te Waihora have been almost entirely drained and developed into farmland since European colonisation, and little now remains except for some tiny areas scattered around the lake shoreline at Yarr's Flat, Hart's Creek and Lakeside.

At present, approximately 86% of the lakeshore wetland is estuarine (brackish coastal lagoon). The remaining 14% is freshwater wetland, mostly palustrine swamp, marsh and fen, with small areas of freshwater lacustrine marsh habitats in the vicinity of inflows (ECan 2007). The most abundant wetland vegetation types around Lake Ellesmere/Te Waihora (in order of abundance) and their extent in hectares (in brackets) (Grove et al. 2012) are:

<sup>1</sup> This section relates to the whole of Lake Ellesmere/Te Waihora, not just the part of the lake that is within the Council's administrative boundary.



- Saltmarsh herbfield (2,253)
- Three square reedland (401)
- Marsh ribbonwood shrubland (387)
- Saltmarsh grassland (331)
- Wet pasture (159)
- Sea rush rushland (155)
- *Juncus edgariae* rushland (136)
- Crack willow-dominant forest and treeland (70)
- Grey willow-dominant forest and treeland (70)
- Mixed rushes and sedges (59)
- Raupō reedland (39)
- Oioi restiad rushland (11)
- Harakeke flaxland (9)
- *Bolboschoenus caldwellii* reedland (8)

The dominant submerged plant species are *Ruppia megacarpa* and *Stuckenia pectinata* (Cromarty and Scott 1995).

### Extent of Site of Ecological Significance

The site includes all of the lake and its margins that support wetland vegetation communities that are within the Christchurch City boundary. The remainder of Lake Ellesmere/Te Waihora is within Selwyn District. However, it is recommended that that entire lake and its wetland margins are managed as a single site.

### Assessment Summary

The Lake Ellesmere/Te Waihora Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below). Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8, 9 and 10).

### Assessment against Significance Criteria

#### Representativeness

1. ***Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

It is internationally significant for its birdlife abundance and diversity, nationally significant for its wetland vegetation and of regional significance for its indigenous fish fauna (Hughey and Taylor 2009).



Lake Ellesmere/Te Waihora's margins have been modified, but still contain extensive, diverse and good quality examples of a range of indigenous freshwater and saltmarsh vegetation communities and habitats for indigenous fauna (ECan 2007).

With regard to birds, Lake Ellesmere/Te Waihora is of international significance because of its large size, representative bird communities, populations of threatened species and special wildlife characteristics (Cromarty and Scott 1995, O'Donnell 1985, 2000). It provides habitat for a diverse and highly representative assemblage of wetland and coastal birds. Waterfowl, grebes, pelagic seabirds, cormorants and shags, herons and allies, raptors, rails, arctic waders, native waders, gulls and terns were all recorded during recent surveys between 2006 and 2008 (Crossland et al. *in prep.*) (Appendix 1). A list of the bird species recorded between the Halswell River Mouth and the tip of Kaitorete Spit during formal Council monitoring (Crossland unpubl. data) is provided in Appendix 2.

It also provides habitat for a diverse and representative indigenous fish assemblage comprised of both freshwater and marine species (Appendix 3). Forty seven species of indigenous fish (including 19 indigenous freshwater and estuarine species and 20 marine species) have been recorded from the lake and its tributary system (Jellyman and Smith 2009).

**2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.***

The site is significant under this criterion.

At approximately 20,000 ha<sup>2</sup> it is the largest coastal lake habitat in New Zealand and the only very large area of its type in New Zealand. This habitat type is uncommon in New Zealand, and most brackish coastal lagoons are very small. Lake Ellesmere/Te Waihora is also the fifth largest lake in New Zealand by area (Cromarty and Scott 1995).

**Rarity/Distinctiveness**

**3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.***

The site is significant under this criterion.

Wetland ecosystems have been reduced to less than 20% of their former extent at the ecological district, regional and freshwater biogeographic unit scales. Ausseil et al. (2008) estimate that wetlands have been reduced to 10.6% of their original extent in the Canterbury Region and 7.0% in the Canterbury freshwater biogeographic unit. ECan (2007) estimate that more than 80% of Lake Ellesmere/Te Waihora's previous wetland extent has been lost since European settlement.

The site is also significant at the Level 4 land environment scale. Indigenous freshwater wetland vegetation on the margins of Lake Ellesmere/Te Waihora are

<sup>2</sup> There is significant variation in surface area, depending upon water level (Cromarty and Scott 1995)





situated on a Chronically Threatened land environment (I3.3a) where 10-20% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports an outstanding number of nationally Threatened and At Risk plant, bird and fish species.

Nationally Threatened and At Risk plant species (de Lange et al. 2013) recorded from Lake Ellesmere/Te Waihora (McEwen 1987, ECan 2007) include:

- *Lepilaena bilocularis* (Threatened – Nationally Vulnerable) (McEwen 1987)
- Ladies tress orchid (*Spiranthes novae-zelandiae*) (Threatened – Nationally Vulnerable) (McEwen 1987, ECan 2007)
- Swamp nettle (*Urtica linearifolia*) (At Risk – Declining) (ECan 2007)
- Native musk (*Mimulus repens*) (At Risk – Naturally Uncommon) (McEwen 1987, ECan 2007)
- *Ruppia megacarpa* (At Risk – Naturally Uncommon) (McEwen 1987, Cromarty and Scott 1995)
- *Stuckenia pectinata* (At Risk – Naturally Uncommon) (Cromarty and Scott 1995)

Species that are uncommon within the ecological district include:

- Bladderwort (*Utricularia dichotoma*) (ECan 2007)
- Forked sundew (*Drosera binata*) (ECan 2007)
- *Machaerina rubiginosa* (McEwen 1987, ECan 2007)
- *Schoenoplectus tabernaemontani* (McEwen 1987)
- Square sedge (*Lepidosperma australe*) (McEwen 1987)

**Birds**

Unless stated otherwise, the following information on bird species that are either Threatened or At Risk nationally, or threatened, at risk or uncommon in the ecological district are sourced from formal Council monitoring (Crossland unpubl. data 2013, 2015 a,b) between the Halswell River Mouth and the tip of Kaitorete Spit.

Nationally Threatened bird species (Robertson et al. 2012) are:

- Black stilt (Threatened - Nationally Critical, threatened and uncommon in the ED)
- Black-billed gull (Threatened - Nationally Critical, and at risk in the ED)
- White heron (Threatened - Nationally Critical, and uncommon at risk in the ED)
- Grey duck (Threatened - Nationally Critical, and threatened and uncommon in the ED)
- Black-fronted tern (Threatened - Nationally Endangered and threatened and uncommon in the ED)



- Australasian bittern (Threatened - Nationally Endangered and threatened and uncommon in the ED) (Hughey and O'Donnell 2009)
- Australasian crested grebe (Threatened - Nationally Vulnerable and at risk and uncommon in the ED)
- Banded dotterel (Threatened - Nationally Vulnerable)
- Caspian tern (Threatened - Nationally Vulnerable, and at risk in the ED)
- Red knot (Threatened - Nationally Vulnerable and uncommon in the ED)
- Pied cormorant (Threatened - Nationally Vulnerable)
- Red-billed gull (Threatened - Nationally Vulnerable)
- Wrybill (Threatened - Nationally Vulnerable, and at risk and uncommon in the ED)

Nationally At Risk (Robertson et al. 2012) bird species<sup>3</sup> that use the lake its margins are:

- Eastern bar-tailed godwit (At Risk - Declining)
- New Zealand pied oystercatcher (At Risk - Declining)
- Pied stilt (At Risk - Declining)
- White-fronted tern (At Risk – Declining, and at risk in the ED)
- Black cormorant (At Risk - Naturally Uncommon)
- Royal spoonbill (At Risk - Naturally Uncommon)
- Marsh crake (At Risk – Relict, and at risk and uncommon in the ED) (Hughey and O'Donnell 2009)
- Spotless crake (At Risk – Relict, and at risk and uncommon in the ED) (Hughey and O'Donnell 2009)
- Variable oystercatcher (At Risk - Recovering)

Bird species that occur within the site (Crossland unpubl. data) that are uncommon within the Ellesmere Ecological District (but not nationally Threatened or At Risk) are:

- Asiatic whimbrel
- Curlew sandpiper
- Gull-billed tern
- Pacific golden plover
- Pectoral sandpiper
- Red-necked stint
- Sharp-tailed sandpiper
- Turnstone
- White-winged black tern

## **Fish**

Nationally Threatened and At Risk freshwater fish species (Goodman et al. 2014) recorded from Lake Ellesmere/Te Waihora and diadromous<sup>4</sup> species that occur in the catchment (Jellyman and Smith 2008) include:

- Lamprey (Threatened - Nationally Vulnerable)

<sup>3</sup> Although for mobile fauna such as birds, species classified as nationally At Risk do not meet the threshold for significance (Wildland Consultants 2013).

<sup>4</sup> Includes anadromous, catadromous, 'marginally' catadromous (i.e. inanga) and amphidromous species



- Longfin eel (At Risk - Declining)
- Torrentfish (At Risk - Declining)
- Koaro (At Risk - Declining)
- Inanga (At Risk - Declining)
- Bluegill bully (At Risk - Declining)
- Stokell's smelt (At Risk - Naturally Uncommon)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

One plant species is at its southern regional distributional limit (and southern limit in eastern South Island):

- Giant umbrella sedge (*Cyperus ustulatus*) (McEwen 1987, ECan 2007)

Three bird species are at their distributional limits at the site (Crossland unpubl. data):

- Curlew sandpiper (southern annual national limit)
- White-winged black tern (southern annual national limit)
- Spotless crane (Lake Ellesmere's shoreline is the southern regional breeding limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

Lake Ellesmere/Te Waihora is sufficiently distinctive to have its own ecological district (Ellesmere Ecological District) within the Canterbury Plains Ecological Region (McEwen 1987).

Lake Ellesmere is an example of a coastal lake, or 'Waituna type lagoon' (Kirk and Lauder 2000). These brackish lagoons are uncommon nationally (Cromarty and Scott 1995) and lagoons are identified by Williams et al. (2007) as an originally rare ecosystem.

The wetland communities on the lake margin are also highly distinctive and contain a very high diversity of micro-habitats that have developed as a result of inundation by brackish water and salinity gradients. The lake's margin is also an originally rare ecosystem (Williams et al. 2007).

Lake Ellesmere/Te Waihora's bird assemblages are distinctive internationally (O'Donnell 1985, 2000).



## Diversity and Pattern

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.

It supports a high diversity of indigenous wetland vegetation types and habitats. Sixty-three different vegetation types were described during a survey in 2007 (Grove and Pompei, 2009).

The principal environmental factors controlling the diversity of vegetation communities, habitats and fauna in and around Lake Ellesmere/Te Waihora are lake water levels, water surface area, elevation in relation to inundation, salinity, nutrients, turbidity, dissolved oxygen, lakebed sediment movement and substrate composition (DOC and TRONT 2005).

Lake Ellesmere/Te Waihora supports an outstanding diversity of birds. Including nationally or locally extinct species, at least 202 species (including 186 native species) have been recorded at the lake or in peripheral habitats, or as stragglers along Kaitorete Spit (Crossland unpubl. data 2010) (see the attached checklist in Appendix 4). Species richness is greater than that recorded for any other locality in New Zealand.

The diversity of indigenous fish (including both freshwater and marine species) is also very high. Nineteen species of indigenous freshwater and estuarine fish and 20 marine species have been recorded from the lake and its tributary system (Jellyman and Smith 2008).

Together, Lake Ellesmere/Te Waihora and Kaitorete Spit are part of a distinctive, ecological sequence from coastal dunes systems dominated by pingao, to the indigenous grassland, shrubland and mossfield-cushionfield-stonefield dryland habitats on Kaitorete Spit to the saltmarsh wetland communities on the margin of Te Waihora.

## Ecological Context

**8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is significant under this criterion.

Lake Ellesmere/Te Waihora is ecologically linked to other areas of high ecological value including its lakeshore wetlands, native dryland and dune vegetation on Kaitorete Spit, its tributaries and plains spring-fed tributary streams.

The lake and its wetlands are a critical part of an ecological network of river mouths, estuaries and coastal lagoons along the South Island's east coast that



provide a network of habitats for large numbers of indigenous bird species including international and internal migrants, waterfowl and wetland species.

Wetland communities on the margins of the lake also provide an important role in buffering the lake from external influences, the most important of which is excessive nutrient inputs from surrounding land.

Sixteen of the fish species recorded from the lake are diadromous (require access to the sea at some stage of their life history) (Jellyman and Smith 2008). The connection between the lake and sea is very important for these species.

**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is significant under this criterion.

Lake Ellesmere/Te Waihora is of special value in maintaining the genetic and ecological diversity of the region because of its large size, diversity of microhabitats and very high species richness (Cromarty and Scott 1995). As for criterion 8, the wetland communities on the margins of the lake provide an important role in buffering the lake's shallow water ecosystem from external influences such as excessive nutrient inputs and sedimentation.

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

Lake Ellesmere/Te Waihora is an internationally significant wildlife habitat (Hughey and Taylor 2009) and it is recognised as an outstanding wildlife habitat in the National Water Conservation Order (1990).

The lake and associated wetlands is of international significance for birds (Hughey and Taylor 2009). It is often recognised as New Zealand's single most important habitat for wetland birds based on species richness and the numbers of birds it supports. It has the greatest species richness known for any locality in New Zealand (O'Donnell 1985, Cromarty and Scott 1996). A maximum of 93,000 wetland birds have been recorded at the site (O'Donnell 2000). This would appear to be the highest verified total of birds recorded from any New Zealand wetland (*In: Crossland et al. in prep*).

The site provides key feeding, breeding, moulting, post-breeding flocking and migration staging habitat for a large number of indigenous bird species, both seasonally and permanently, including during critical stages in their biological cycles. For example Lake Ellesmere is recognised as the most important staging site for Wrybill in the South Island (O'Donnell 1985, Dowding and Moore 2006, Crossland et al. 2012). The lake supports the largest breeding colony of royal spoonbills in New Zealand (134 nests were counted during the 2013/2014 breeding season) (Thompson and Schweigman 2014). It also provides wintering habitat for migratory shorebirds from the Arctic (during the New Zealand summer) and nationally important wintering habitat for waders (Cromarty and Scott 1995).



The lake supports a sizeable proportion of the New Zealand populations of at least 17 species of waterfowl, including two species of herons, six species of swans, geese and ducks, five species of international migratory shorebirds, four species of indigenous shorebirds and one endemic species of gull (O'Donnell 1985, Cromarty and Scott 1995).

Lake Ellesmere/Te Waihora is of regional significance for indigenous fish (Hughey and Taylor 2009). Forty seven species of indigenous fish have been recorded from the lake and its tributary system (including both freshwater and marine species) (Jellyman and Smith 2008).

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## Site Management

### Existing Protection Status

Within the Christchurch City boundary the lake bed and its margins are owned or administered by:

- Environment Canterbury
- Christchurch City Council
- Department of Conservation
- Private land owners

Within this area parts of the lake and its margins are protected as reserves or covenants. Important protected areas are:

- Kaitorete Spit Reserve (Christchurch City Council)
- Lakelands Wildlife Reserve (conservation unit M36185) (DOC)
- Motukarara Rail Trail Conservation Area (conservation unit M36151) (DOC)
- Kaitorete Spit Conservation Area (conservation unit M36486) (DOC)
- Waihora Scientific Reserve (conservation unit M37010) (DOC)
- QEII covenant (covenant number 5-11-053)
- Kaitorete Spit Reserves (Environment Canterbury)

## Site Management

The importance of Lake Ellesmere/Te Waihora is recognised in a National Water Conservation Order, which lists the lakes outstanding features as wildlife habitat, habitat for indigenous wetland vegetation and fish, and significance in relation to tikanga Māori in respect of Ngāi Tahu history, mahinga kai and customary fisheries. All regional policy statements, regional plans and district plans must be consistent with the provisions of the Water Conservation Order. A significant amount of lake margin land, approximately 35%, is administered by the Department of Conservation and, under the Ngāi Tahu Claims Settlement Act 1998, ownership of the non-DOC administered crown-owned lake bed was returned to Te Rūnanga o Ngāi Tahu. All of these lands are managed under the Te Waihora Joint Management Plan prepared by Te Rūnanga o Ngāi Tahu and the Department of Conservation<sup>5</sup>. The catchment for the lake is large and activities throughout the catchment may impact on the lake and its tributaries. Many organisations play an important role in the governance and management of Te Waihora and its catchment. These include organisations with a statutory role (namely, Environment Canterbury, Selwyn District Council, Christchurch City Council, Department of Conservation, Ministry for Primary Industries, Fish & Game NZ, and Te Rūnanga o Ngāi Tahu), non-statutory organisations, and a range of interest groups whose views are taken into consideration (Hughey and Taylor 2009).

Because of the importance and size of Lake Ellesmere/Te Waihora and the number of agencies, organisations and stakeholders involved in its management, a co-ordinated approach to management of the site is crucial. It is therefore important that

<sup>5</sup> In addition to the Te Waihora Joint Management Plan (DOC and TRONT 2005) there are a large number of other management plans that guide the management of specific areas, reserves, resources and species within the site.



the area of Lake Ellesmere/Te Waihora that is within Christchurch City administrative boundary is not managed in isolation from the remainder of the site. It is recommended that the Council ensure that the other relevant agencies, organisations and stakeholders are informed of the identification of the area within the Christchurch City boundary as a Site of Ecological Significance.

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**Assessment completed by:** Scott Hooson  
**Date:** 12 November 2014

**Statement completed by:** Scott Hooson  
**Date:** 12 November 2014

**Statement updated by:** XXX  
**Date:** XXX

PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.



**Appendix 1: Bird Species Groups Recorded at Lake Ellesmere/Te Waihora, February 2006, 2007 and 2008.**

Source: Crossland et al. (in prep.)

<b>Species Group</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Waterfowl	29,831	32,278	29,121
Grebes	5	11	6
Pelagic seabirds	1	0	0
Cormorants and shags	265	300	109
Hérons and allies	243	316	248
Raptors	58	31	18
Rails	28	11	23
Arctic waders	539	293	208
Native waders	5,181	4,948	7,459
Gulls	2,285	1,536	1,826
Terns	290	193	156
<b>Total</b>	<b>38,726</b>	<b>39,917</b>	<b>39,175</b>

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## Appendix 2: Bird Species List

Bird species recorded between the Halswell River Mouth and the tip of Kaitorete Spit during formal Council monitoring (Source: Crossland unpubl. data n.d. a,b,c).

\* denotes introduced species

Species
Asiatic whimbrel
Australasian crested grebe
Australasian harrier
Banded dotterel
Bar-tailed godwit
Black cormorant
Black stilt
Black swan
Black-backed gull
Black-billed gull
Black-fronted tern
*Canada goose
Caspian tern
Chestnut-breasted shelduck
Common greenshank
Common tern
Curlew sandpiper
*Feral goose
Grey duck
Grey teal
Gull-billed tern
Little cormorant
Little egret
Little tern
*Mallard/grey duck
*Mute swan
New Zealand dotterel
New Zealand kingfisher
New Zealand pied oystercatcher
New Zealand scaup
New Zealand shoveler
Pacific golden plover
Paradise shelduck
Pectoral sandpiper
Pied cormorant
Pied stilt
Pukeko
Red knot
Red-billed gull
Red-necked stint



Royal spoonbill
Sanderling
Sharp-tailed sandpiper
Spotted shag
Spur-winged plover
Turnstone
Variable oystercatcher
Welcome swallow
White heron
White-faced heron
White-fronted tern
White-winged black tern
Wrybill

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**Appendix 3: Fish Species Recorded from Lake Ellesmere/Te Waihora, and the Selwyn District Council**

Source: Jellyman and Smith (2009)

\* denotes introduced species

<b>Species</b>	<b>Lake Ellesmere (T), Selwyn Catchment (S)</b>
<b>Freshwater/estuarine species</b>	T,S
Yelloweye mullet	T,S
Shortfin eel	T,S
Longfin eel	T,S
*Goldfish	T,S
Torrentfish	T,S
Giant kokopu?	?
Koaro	T
Banded kokopu	T
Inanga	T,S
Canterbury galaxias	S
Lamprey	T,S
Upland bully	S
Common bully	T,S
Giant bully	T,S
Estuarine triplefin	T
Canterbury mudfish	S
Common smelt	T,S
Stokells smelt	T
Black flounder	T
Koura	S
*Perch	T,S
*Brook char	S
*Brown Trout	T,S
*Rudd	T
*Cattfish	T
*Tench	T
*Chinook salmon	T
<b>Marine species</b>	
Kahawai	T
Yellowbelly flounder	T
Sand flounder	T
Greenback flounder	T
Common sole	T
Sprat	T
Hake	T
Sand stargazer	T
Estuarine stargazer	T
Sand eel	T
Red cod	T



Basking shark	T
Rig	T
Elephant fish	T
Spiny dogfish	T
Skate	T
Globefish	T
Spotty	T
Warehou	T
Red gurnard	T
Sand eel	T
Red cod	T

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#### Appendix 4: Checklist of Lake Ellesmere Bird Species

This list includes all bird species that have been recorded at the lake or in peripheral habitats, or as stragglers along Kaitorete Spit and species that are now nationally or locally extinct.

Sourced from Crossland unpubl. data (2010).

Species	Origin	Status	Breeding
<b>Australasian Crested Grebe</b> (NZ) <i>Podiceps cristatus australis</i>	NZ	RS	B
<b>New Zealand Dabchick</b> (NZ) <i>Poliiocephalus rufpectus</i>	NZ	Ex	
<b>Snowy Albatross</b> (O) <i>Diomedea exulans.</i>			
<b>Gibson's Albatross</b> (NZ) <i>Diomedea gibsoni.</i>			
<b>Antipodean Albatross</b> (NZ) <i>Diomedea antipodensis.</i>			
<b>Northern Royal Albatross</b> (NZ) <i>Diomedea sanfordi.</i>			
<b>Southern Royal Albatross</b> (NZ) <i>Diomedea epomophora</i>			
<b>Campbell Albatross (Mollymawk)</b> (NZ) <i>Diomedea melanophrys impavida</i>			
<b>Black-browed Albatross (Mollymawk)</b> (NZ) <i>Diomedea melanophrys melanophrys</i>			
<b>Salvin's Albatross (Mollymawk)</b> (NZ) <i>Thalassarche salvini</i>			
<b>White-capped Albatross (Mollymawk)</b> (NZ) <i>Thalassarche steadi</i>			
<b>Buller's Albatross (Mollymawk)</b> (NZ) <i>Thalassarche bulleri</i>			
<b>Light-mantled Sooty Albatross</b> (NZ) <i>Phoebetria palpebrata</i>			
<b>Northern Giant Petrel</b> (NZ) <i>Macronectes halli</i>			
<b>Southern Giant Petrel</b> (O) <i>Macronectes giganteus</i>			
<b>Buller's Shearwater</b> (NZ) <i>Puffinus bulleri</i>			
<b>Sooty Shearwater</b> (NZ) <i>Puffinus grieseus</i>	NZ	RV*	
<b>Short-tailed Shearwater</b> (Au) <i>Puffinus tenuirostris</i>			
<b>Flesh-footed Shearwater</b> (NZ) <i>Puffinus carneipes</i>			
<b>Fluttering Shearwater</b> (NZ) <i>Puffinus gavia</i>			
<b>Hutton's Shearwater</b> (NZ) <i>Puffinus huttoni</i>			
<b>Common Diving Petrel</b> (NZ) <i>Pelecanoides urinatrix urinatrix</i>			
<b>White-chinned Petrel</b> (NZ) <i>Procellaria aequinoctialis</i>			





<b>Westland Petrel</b> (NZ) <i>Procellaria westlandica</i>			
<b>Kerguelen Petrel</b> (O) <i>Lugensa brevirostris</i>			
<b>Antarctic Fulmar</b> (O) <i>Fulmarus glacialisoides</i>	O	V*	
<b>Snares Cape Petrel</b> (NZ) <i>Daption capense australe</i>			
<b>Southern Cape Petrel</b> (O) <i>Daption capense capense</i>			
<b>Blue Petrel</b> (O) <i>Halobaena caerulea</i>			
<b>Fairy Prion</b> (NZ) <i>Pachyptila turtur</i>			
<b>Fulmar Prion</b> (NZ) <i>Pachyptila crassirostris</i>			
<b>Fulmar Prion</b> (NZ) <i>Pachyptila crassirostris</i>			
<b>Broad-billed Prion</b> (NZ) <i>Pachyptila vittata</i>	NZ	V*	
<b>Thin-billed Prion</b> (NZ) <i>Pachyptila belcheri</i>			
<b>Thin-billed Prion</b> (NZ) <i>Pachyptila belcheri</i>			
<b>Salvin's Prion</b> (NZ) <i>Pachyptila salvini</i>			
<b>Salvin's Prion</b> (NZ) <i>Pachyptila salvini</i>			
<b>Mottled Petrel</b> (NZ) <i>Pterodroma inexpectata</i>			
<b>Mottled Petrel</b> (NZ) <i>Pterodroma inexpectata</i>			
<b>Black-winged Petrel</b> (NZ) <i>Pterodroma nigripennis</i>			
<b>Black-winged Petrel</b> (NZ) <i>Pterodroma nigripennis</i>			
<b>White-headed Petrel</b> (NZ) <i>Pterodroma lessonii</i>			
<b>White-headed Petrel</b> (NZ) <i>Pterodroma lessonii</i>			
<b>Grey-faced Petrel</b> (NZ) <i>Pterodroma macroptera</i>			
<b>Grey-faced Petrel</b> (NZ) <i>Pterodroma macroptera</i>			
<b>Grey-backed Storm Petrel</b> (NZ) <i>Oceanites nereis</i>			
<b>Grey-backed Storm Petrel</b> (NZ) <i>Oceanites nereis</i>			
<b>White-faced Storm Petrel</b> (NZ) <i>Pelagodroma marina</i>			
<b>White-faced Storm Petrel</b> (NZ) <i>Pelagodroma marina</i>			
<b>Wilson's Storm Petrel</b> (NZ) <i>Oceanites oceanicus</i>			
<b>Wilson's Storm Petrel</b> (NZ) <i>Oceanites oceanicus</i>			
<b>Yellow-eyed Penguin</b> (NZ) <i>Megadyptes antipodes</i>	NZ	Ir	
<b>Little Blue Penguin</b> (NZ)	NZ	Ir	



<i>Eudyptula minor</i> sub.sp.			
<b>White-flipped Penguin</b> (NZ) <i>Eudyptula minor albosignata</i>	NZ	RV	
<b>Eastern Rockhopper Penguin</b> (NZ) <i>Eudyptes chrysocome filholi</i>	NZ	V	
<b>Fiordland Crested Penguin</b> (NZ) <i>Eudyptes pachrynchus</i>	NZ	V	
<b>Erect-crested Penguin</b> (NZ) <i>Eudyptes sclateri</i>	NZ	V	
<b>Australian Pelican</b> (Au) <i>Pelecanus conspicillatus conspicillatus</i>	Au	V	
<b>Australasian Gannet</b> (NZ) <i>Morus serrator</i>	NZ	S*	
<b>Brown Booby</b> (P) <i>Sula leucogaster</i>	O	V	
<b>Black Cormorant</b> (NZ) <i>Phalacrocorax carbo novaehollandiae</i>	NZ	RS	B
<b>Pied Cormorant</b> (NZ) <i>Phalacrocorax varius varius</i>	NZ	RV	
<b>Little Black Cormorant</b> (NZ) <i>Phalacrocorax sulcirostris</i>	NZ	V	
<b>Little Cormorant</b> (NZ) <i>Phalacrocorax melanoleucos brevirostris</i>	NZ	RS	B
<b>Spotted Shag</b> (NZ) <i>Stictocarbo punctatus punctatus</i>	NZ	RV	
<b>Stewart Island Shag</b> (NZ) <i>Leucocarbo carunculatus</i>	NZ	V	
<b>White-faced Heron</b> (NZ) <i>Ardea novaehollandiae novaehollandiae</i>	NZ	RS	B
<b>White Heron</b> (NZ) <i>Egretta alba modesta</i>	NZ	S	
<b>Intermediate Egret</b> (Au) <i>Egretta intermedia</i>	Au	V	
<b>Little Egret</b> (Au) <i>Egretta garzetta</i>	Au	Ir	
<b>Reef Heron</b> (NZ) <i>Egretta sacra sacra</i>	NZ	V	
<b>Cattle Egret</b> (Au) <i>Bubulcus ibis coromandus</i>	Au	S	
<b>Nankeen Night Heron</b> (NZ) <i>Nycticorax caledonicus</i>	NZ/Au	V	
<b>Australasian Bittern</b> (NZ) <i>Botaurus poiciloptilus</i>	NZ	RS	B
<b>Glossy Ibis</b> (Au) <i>Plegadis falcinellus</i>	Au	S	
<b>Australian White Ibis</b> (Au) <i>Threskiornis molucca</i>	Au	V	
<b>Royal Spoonbill</b> (NZ) <i>Platalea regia</i>	NZ	RS	
<b>Mute Swan</b> (I) <i>Cygnus olor</i>	I	R	B
<b>Black Swan</b> (NZ) <i>Cygnus atratus</i>	NZ	RS	B
<b>Canada Goose</b> (I) <i>Branta canadensis maxima</i>	I	RS	B
<b>Greylag (Feral) Goose</b> <i>Anser anser</i>	I	R	B
<b>Cape Barren Goose</b> (I) <i>Cereopsis novaehollandiae</i>	I	V	



<b>Paradise Shelduck</b> (NZ) <i>Tadorna variegata</i>	NZ	RS	B
<b>Chestnut-breasted Shelduck</b> (NZ) <i>Tadorna tadornoides</i>	NZ/Au	Ir	
<b>Mallard</b> (I) <i>Anas platyrhynchos platyrhynchos</i>	I	RS	B
<b>Grey Duck</b> (NZ) <i>Anas superciliosa superciliosa</i>	NZ	RS	B
<b>Grey Teal</b> (NZ) <i>Anas gracilis</i>	NZ	RS	B
<b>Brown Teal</b> (NZ) <i>Anas aucklandica chlorotis</i>	NZ	Ex	
<b>New Zealand Shoveler</b> (NZ) <i>Anas rhynchotis variegata</i>	NZ	RS	B
<b>New Zealand Scaup</b> (NZ) <i>Aythya novaeseelandiae</i>	NZ	RS	B
<b>White-eyed Duck</b> (Au) <i>Aythya australis</i>	NZ/Au	V	
<b>Australasian Harrier</b> (NZ) <i>Circus approximans</i>	NZ	RS	B
<b>New Zealand Falcon</b> (NZ) <i>Falco novaeseelandiae</i>	NZ	V	
<b>Nankeen Kestrel</b> (Au) <i>Falco cenchroides cenchroides</i>	Au	V	
<b>California Quail</b> (I) <i>Callipepla californica brunnescens</i>	I	R	B
<b>Red-legged Partridge</b> (I) <i>Alectoris rufa</i>	I	Ex	
<b>Grey Partridge</b> (I) <i>Perdix perdix</i>	I	Ex	
<b>Ring-necked Pheasant</b> (I) <i>Phasianus colchicus</i>	I	R	B
<b>New Zealand Quail</b> (NZ) <i>Cortunix novaezelandiae novaezelandiae</i>	NZ	Ex	
<b>Feral Chicken</b> (I) <i>Gallus gallus</i>	I	R	
<b>Banded Rail</b> (NZ) <i>Rallus philippensis assimilis</i>	NZ	Ex	
<b>Buff Weka</b> (NZ) <i>Gallirallus australis hectori</i>	NZ	Ex	
<b>Spotless Crake</b> (NZ) <i>Porzana tabuensis plumbea</i>	NZ	R	B
<b>Ballion's Crake</b> (NZ) <i>Porzana pusilla affinis</i>	NZ	RS	B
<b>Purple Swamphen</b> (NZ) <i>Porphyrio porphyrio melanotus</i>	NZ	RS	B
<b>Australasian Coot</b> <i>Fulica atra australis</i>	NZ	V	
<b>Australian Painted Snipe</b> (Au) <i>Rostratula australis</i>	Au	V	
<b>South Island Pied Oystercatcher</b> (NZ) <i>Haematopus ostralegus finschi</i>	NZ	RS	B
<b>Variable Oystercatcher</b> <i>Haematopus unicolor</i>	NZ	RV	
<b>Pied Stilt</b> (NZ) <i>Himantopus himantopus leucocephalus</i>	NZ	RS	B
<b>Black Stilt</b> (NZ) <i>Himantopus novaezelandiae</i>	NZ	S	
<b>Red-necked Avocet</b> (NZ- formerly)	NZ/Au	Ex	



<i>Recurvirostra novaehollandiae</i>			
<b>Oriental Pratincole (M)</b> <i>Glareola maldivarum</i>	NH	V	
<b>New Zealand Plover (NZ)</b> <i>Charadrius obscurus</i>	NZ	V	
<b>Double-banded Plover (NZ)</b> <i>Charadrius bicinctus bicinctus</i>	NZ	RS	B
<b>Red-capped Dotterel (Au)</b> <i>Charadrius ruficapillus</i>	NZ/Au	V	
<b>Black-fronted Dotterel (NZ)</b> <i>Charadrius melanops</i>	NZ	S	
<b>Large Sand Plover (M)</b> <i>Charadrius leschenaultii</i>	NH	V	
<b>Mongolian Plover (M)</b> <i>Charadrius mongolus</i>	NH	V	
<b>Oriental Plover (M)</b> <i>Charadrius veredus</i>	NH	V	
<b>Wrybill (NZ)</b> <i>Anarhynchus frontalis</i>	NZ	S	
<b>Pacific Golden Plover (M)</b> <i>Pluvialis fulva</i>	NH	S	
<b>Masked Lapwing</b> <i>Vanellus miles novaehollandiae</i>	NZ	RS	B
<b>Turnstone (M)</b> <i>Arenaria interpres</i>	NH	S	
<b>Japanese Snipe (M)</b> <i>Gallinago hardwickii</i>	NH	V	
<b>Red Knot (M)</b> <i>Calidris canutus canutus</i>	NH	S	
<b>Great Knot (M)</b> <i>Calidris tenuirostris</i>	NH	V	
<b>Sanderling (M)</b> <i>Calidris alba</i>	NH	V	
<b>Stilt Sandpiper (M)</b> <i>Calidris himantopus</i>	NH	V	
<b>Curlew Sandpiper (M)</b> <i>Calidris ferruginea</i>	NH	S	
<b>Sharp-tailed Sandpiper (M)</b> <i>Calidris acuminata</i>	NH	S	
<b>Pectoral Sandpiper (M)</b> <i>Calidris melanotos</i>	NH	S	
<b>Red-necked Stint (M)</b> <i>Calidris rufficollis</i>	NH	S	
<b>Little Stint (M)</b> <i>Calidris minuta</i>	NH	V	
<b>Long-toed Stint (M)</b> <i>Calidris subminuta</i>	NH	V	
<b>Eastern Curlew (M)</b> <i>Numenius madagascariensis</i>	NH	Ir	
<b>Asiatic Whimbrel (M)</b> <i>Numenius phaeopus variegatus</i>	NH	V	
<b>American Whimbrel (M)</b> <i>Numenius hudsonicus</i>		??	
<b>American Whimbrel (M)</b> <i>Numenius hudsonicus</i>		??	
<b>Little Whimbrel (M)</b> <i>Numenius minutus</i>	NH	V	
<b>Eastern Bar-tailed Godwit (M)</b> <i>Limosa lapponica baueri</i>	NH	S	



<b>Asiatic Black-tailed Godwit (M)</b> <i>Limosa limosa melanuroides</i>	NH	Ir	
<b>Hudsonian Godwit (M)</b> <i>Limosa haemastica</i>	NH	Ir	
<b>Alaskan Tattler (M)</b> <i>Tringa incana</i>		??	
<b>Alaskan Tattler (M)</b> <i>Tringa incana</i>		??	
<b>Siberian Tattler (M)</b> <i>Tringa brevipes</i>	NH	V	
<b>Common Greenshank (M)</b> <i>Tringa nebularia</i>	NH	V	
<b>Marsh Sandpiper (M)</b> <i>tringa stagnatilis</i>	NH	V	
<b>Lesser Yellowlegs (M)</b> <i>Tringa flavipes</i>	NH	V	
<b>Terek Sandpiper (M)</b> <i>Tringa terek</i>	NH	V	
<b>Eastern Broad-billed Sandpiper (M)</b> <i>Limicola falcinellus sibiricus</i>	NH	V	
<b>Ruff (M)</b> <i>Philomachus pugnax</i>	NH	V	
<b>Grey Phalarope (M)</b> <i>Phalaropus fulicarius</i>	NH	V	
<b>Red-necked Phalarope (M)</b> <i>Phalaropus lobatus</i>	NH	V	
<b>Wilson's Phalarope (M)</b> <i>Phalaropus tricolor</i>	NH	V	
<b>Brown (Sub-Antarctic) Skua (NZ)</b> <i>Catharacta skua lonnbergi</i>	NZ	V	
<b>South Polar Skua (O)</b> <i>Catharacta maccormicki</i>	O	V	
<b>Arctic Skua (M)</b> <i>Stercorarius parasiticus</i>	NH	S	
<b>Pomarine Skua (M)</b> <i>Stercorarius pomarinus</i>	NH	S	
<b>Long-tailed Skua (M)</b> <i>Stercorarius longicaudus</i>	NH	V	????
<b>Black-backed Gull (NZ)</b> <i>Larus dominicanus dominicanus</i>	NZ	RS	B
<b>Red-billed Gull (NZ)</b> <i>Larus scopulinus</i>	NZ	RS	
<b>Black-billed Gull (NZ)</b> <i>Larus bulleri</i>	NZ	S	
<b>White-winged Black Tern (M)</b> <i>Chlidonias leucopterus</i>	NH	S	
<b>Black-fronted Tern (NZ)</b> <i>Sterna albobriata</i>	NZ	S	
<b>Caspian Tern (NZ)</b> <i>Sterna caspia</i>	NZ	RS	B
<b>White-fronted Tern (NZ)</b> <i>Sterna striata</i>	NZ	RS	B
<b>Fairy Tern (NZ)</b> <i>Sterna nereis davisae</i>	NZ	Ex	
<b>Eastern Little Tern (NZ)</b> <i>Sterna albifrons sinensis</i>	NH	Ir	
<b>New Zealand Pigeon (NZ)</b> <i>Hemiphaga novaeseelandiae novaeseelandiae</i>	NZ	V	
<b>Feral Rock Pigeon (I)</b>	I	R	B



<i>Columba livia</i>			
<b>Sulphur-crested Cockatoo</b> (I) <i>Cacatua galerita</i>	I	R	B
<b>South Island Kaka</b> (NZ) <i>Nestor meridionalis meridionalis</i>	Ex		
<b>Red-crowned Parakeet</b> (NZ) <i>Cyanoramphus novaezelandiae novaezelandiae</i>	Ex		
<b>Yellow-crowned Parakeet</b> (NZ) <i>Cyanoramphus auriceps auriceps</i>	Ex		
<b>Shining Cuckoo</b> (NZ) <i>Chrysococcyx lucidus lucidus</i>	NZ	S	B
<b>Long-tailed Cuckoo</b> (NZ) <i>Eudynamys taitensis</i>	NZ	V	
<b>Morepork</b> (NZ) <i>Ninox novaeseelandiae novaeseelandiae</i>	NZ	Ex	
<b>Little Owl</b> (NZ) <i>Athene noctua</i>	I	R	B
<b>New Zealand Kingfisher</b> (NZ) <i>Halcyon sancta vagans</i>	NZ	RS	B
<b>Skylark</b> (I) <i>Alauda arvensis</i>	I	RS	B
<b>Welcome Swallow</b> (NZ) <i>Hirundo tahitica neoxena</i>	NZ	RS	B
<b>New Zealand Pipit</b> (NZ) <i>Anthus novaeseelandiae novaeseelandiae</i>	NZ	RS	B
<b>Black-faced Cuckoo-shrike</b> (Au) <i>Coracina novaehollandiae</i>	Au	V	
<b>Dunnock</b> (I) <i>Prunella modularis</i>	I	R	B
<b>Blackbird</b> (I) <i>Turdus merula</i>	I	RS	B
<b>Song Thrush</b> (I) <i>Turdus philomelos</i>	I	RS	B
<b>South Island Fernbird</b> (NZ) <i>Bowdleria punctata punctata</i>	Ex		
<b>Grey Warbler</b> (NZ) <i>Gerygone igata</i>	NZ	RS	B
<b>South Island Fantail</b> (NZ) <i>Rhipidura fuliginosa fuliginosa</i>	NZ	RS	B
<b>Silvereye</b> (NZ) <i>Zosterops lateralis lateralis</i>	NZ	RS	B
<b>Bellbird</b> (NZ) <i>Anthornis melanura melanura</i>	NZ	S	
<b>Yellowhammer</b> (I) <i>Emberiza citrinella</i>	I	RS	B
<b>Cirl Bunting</b> (I) <i>Emberiza cirlus</i>	I	S	
<b>Chaffinch</b> (I) <i>Fringilla coelebs</i>	I	RS	B
<b>Greenfinch</b> (I) <i>Carduelis chloris</i>	I	RS	B
<b>Goldfinch</b> (I) <i>Carduelis carduelis</i>	I	RS	B
<b>Redpoll</b> (I) <i>Carduelis flammea</i>	I	RS	B
<b>House Sparrow</b> (I) <i>Passer domesticus</i>	I	RS	B
<b>Starling</b> (I) <i>Sturnus vulgaris</i>	I	RS	B



<b>White-backed Australian Magpie (I)</b> <i>Gymnorhina tibicen hypoleuca</i>	I	RS	B
<b>Rook (I)</b> <i>Corvus frugilegus</i>	I	V	

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## **Christchurch District Plan Site of Ecological Significance**

### **Site Significance Statement**

**Site name:** Kaitorete Spit

**Site number:** SES/E/2

**Physical address of site:** Kaitorete Spit, Birdlings Flat

#### **Summary of Significance:**

This site is significant because it contains highly representative and distinctive dune communities and representative and rare dryland grassland and shrubland communities that are large examples of their type and occur almost entirely on an Acutely Threatened land environment. There are also four originally rare ecosystems within the site. The vegetation communities and habitats support an outstanding number of indigenous plants, birds, lizards and terrestrial invertebrates that are either nationally Threatened, At Risk, uncommon within the ecological district or endemic to the Spit, as well as several plants and invertebrates that are at their distributional limits. It provides important habitat for indigenous birds, lizards and terrestrial invertebrates. The site contains an ecological sequence from the intact coastal dunes to semi-natural grasslands and the internationally significant Lake Ellesmere/Te Waihora. Being a barrier spit it is topographically well buffered by the sea and Lake Ellesmere/Te Waihora.

#### **Site Map:**





## Additional Site Information

**Ecological District:** Ellesmere

**Area of SES (ha):** 4259.89

**Central point NZTM:** E1562274, N5146467

## Site Description

Kaitorete Spit is a mixed sand and gravel barrier that lies immediately to the west of Banks Peninsula and separates Te Waihora (Lake Ellesmere) from the Pacific Ocean. The spit is a depositional barrier bar formed by the longshore drift of river gravels originating from the Rakaia River. It is approximately 27 kms long, and tapers from a width of 5 kms at its eastern end to 250 m at its western end (Davis 2002). It covers an area of approximately 4,855 ha. The spit is within the Ellesmere Ecological District.

The coastal margin is characterised by a shingle beach, an extensive fore- and back dune ecosystem and sand flats. The dunes themselves are generally 3-5 m above sea level and decrease in size to the east. The tallest dunes are up to 15m in height. The active dune system is comprised of active foredunes and more stable inner dunes and there is an older system of deflating dunes about 100m inland of the active dunes (Davis 2002).

Beyond the dunes are substantial areas of extensively grazed semi-natural dryland grassland dominated by danthonia (*Rytidosperma*) with bracken fernland, tussockland, mossfield, cushionfield, stonefield and shrubland as well as some developed pasture and cultivated fields that extend to Te Waihora. These communities contain a high diversity of native plant species including a high number of nationally Threatened, At Risk species and endemic species.

Overall, Kaitorete Spit is recognised as having nationally significant ecological values and is considered to be a national priority for conservation (e.g. Johnson 1992, Davis 2002). There is nowhere else in New Zealand where there is a sequence of coastal dunes dominated by pingao, through semi-natural indigenous grassland to a wetland of international importance.

## Extent of Site of Ecological Significance

The site includes the shingle beach above mean high water springs along the entire length of the spit and the dune ecosystem behind it which is comprised of active fore-dunes, deflation hollows, and the more stable inner dunes and sand flats. It also includes the un-cultivated semi-natural dryland grassland communities and other associated indigenous vegetation communities such as shrublands (including the extensive area of *Muehlenbeckia astonii* shrubland), bracken fernland, mossfields, cushionfields and stonefields.



The inland boundary of the site adjoins the Lake Ellesmere/Te Waihora and Margins site (SES/E/1). The boundary between the two sites is the well defined boundary between the lake margin wetlands and the dryland vegetation communities.

Developed and cultivated paddocks towards the eastern end of the spit, north of Jones and Bayleys Roads and on the Bayley's property near the western end of the spit (west of the residential dwelling) do not contain significant ecological features or values and are not part of the site.

Dwellings and associated garden areas, farm sheds and other buildings, the utility areas surrounding these buildings and existing exotic tree plantations are also excluded from the site.

## Assessment Summary

The Kaitorete Spit Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8, 9 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

The coastal dunes are highly representative of the composition and structure of these communities at the 1840 baseline are have one of the best examples of pingao dominated dune systems in New Zealand (Johnson 1992). Pingao is the dominant vegetation on the dunes as exotic marram grass has now been contained to just a few sites along the spit (Jensen 2007). The relatively intact dune communities support a number of Threatened and At Risk and endemic plant, lizard and invertebrate species.

The strand line is occupied by only a few species. These include pingao seedlings (*Desmoschoenus spiralis*), sand sedge (*Carex pumila*), shore bindweed (*Calystegia soldanella*) and exotics such as saltwort (*Salsola kali*) and sea rocket (*Cakile edentula*) (Davis 2002).

The foredunes are dominated by extensive pingao, with harestalk, shore bindweed, catsear and some sand sedge. Threatened species such as sand tussock (*Poa billardiarei*) and a woolly head (*Craspedia* "Kaitorete") are less



common. In deflation hollows vegetation is sparse and comprises scabweed (*Raoulia australis*), catsear, sheep's sorrel, haretail, scattered pingao, silver tussock (*Poa cita*) and the small grass *Zoysia minima*.

The rear-dunes are more stable and dominated by pohuehue (*Muehlenbeckia complexa*) and *Carmichaelia appressa*. Scattered pingao is present along with species such as shore bindweed, catseye and sorrel. (Davis 2002).

Beyond the dunes are substantial areas of semi-natural grassland. Although the dominant grasses are introduced species such as *Rytidosperma caespitosa* and *Austrostipa nodosa* the grasslands are a mosaic of cushionfield, mossfield and stonefield vegetation. The cover of indigenous mossfields is particularly high in places. The dryland communities contain a relatively high diversity of indigenous plants including several indigenous moss species, *Crassula siberiana*, *Raoulia australis*, *R. monroi* *Melicytus alpinus*, *Carmichaelia appressa*, *Muehlenbeckia complexa*, *M. axillaris* (on stony ridges) *M. astonii*, matagouri and bracken. The pre-european vegetation of the grasslands would have been structurally similar to the existing vegetation but there would have been more silver tussock, native *Rytidosperma* species and matagouri (Burrows, 1969). Although modified by grazing and the presence of introduced plant species, the dryland communities are the best and largest remaining example of grassland, cushionfield, mossfield and stonefield communities on dryland stony/recent soils in Canterbury.

The stony beach ridges at the eastern end of Kaitorete Spit are the only known example of this ecosystem type in Canterbury (the only other known example in the South Island is at Rarangi in Marlborough) (Landcare Research website). Although the beach ridges within the site have been degraded by grazing and the presence of introduced plant species, in conjunction with similar connected areas in the Birdlings Flat Shrublands Site, they are one the best examples of stony beach ridge vegetation in New Zealand and are highly representative.

The lizard fauna of the spit is representative. Four of the five lizard species known to occur on Banks Peninsula occur within the site (Lettink 2004, Lettink et al. 2008)).

**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

The sand dunes support the largest continuous population of pingao in New Zealand (Courtney 1983).

Kaitorete Spit supports by far the largest area of dry grassland communities that support indigenous vegetation on this land environment in the Ellesmere Ecological District and the largest area in the Canterbury Region. Other examples are either very limited in extent or are highly fragmented.

The site supports the largest population of *Muehlenbeckia astonii* (Threatened - Nationally Endangered) in New Zealand (Wardle 1999, Dutton 2007).

Including Birdlings Flat, the site has the largest coastal shrubland in Canterbury (Lettink 2013) (and is the only known example of stony beach ridges in the ecological district and the Canterbury Region).



The site supports the largest population of the small grass *Zoysia minima* in New Zealand (Davis 2002).

### Rarity/Distinctiveness

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

The entire site meets this criterion at the Level IV land environment scale.

The vast majority of Kaitorete Spit is on an Acutely Threatened land environment (J2.1b) where only 2.5% indigenous vegetation is left on this land environment nationally. Minor areas along the inland margin of the spit and in the vicinity of Birdlings Flat are on a Chronically Threatened land environment (J2.1d) where 10.4 % indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

There are coastal shrublands on shingle beach ridges at the eastern end of the site. Coastal shrublands are likely to have been reduced to less than 20% of their former extent in the Region and the ecological district. There are very few intact coastal shrublands remaining on Banks Peninsula (Lettink 2013).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports a large number of indigenous species, including plants, birds, lizards and terrestrial invertebrates that are either nationally Threatened, At Risk, uncommon nationally and/or within the Ellesmere Ecological District or endemic to Kaitorete Spit. These species are listed below.

#### Plants

Nationally Threatened, At Risk (de Lange et al. 2013) and uncommon plant species recorded from the site are:

- *Muehlenbeckia astonii* (Threatened - Nationally Endangered) - shrublands, largely on private farmland are the national stronghold for this species (Wardle 1999, Dutton 2007). 3,411 plants were recorded on the spit in 2007 (Dutton 2007).
- *Craspedia* (c) CHR 529115; Kaitorete) (Nationally Endangered) (and endemic to Kaitorete Spit) – confined to stable deflation hollows (Jensen and Donoghue 2003)
- *Geranium retrorsum* (Threatened-Nationally Vulnerable) – occurs in dryland grasslands (Jensen unpubl. data 2015, Canterbury Botanical Society 2014)
- *Daucus glochidiatus* (Nationally Vulnerable) – occurs in shrubland and grassland habitats on the Spit (Canterbury Botanical Society 2014).
- Pingao (*Ficinia spiralis*) (At Risk - Declining) – the population on the dunes is the largest continuous population in New Zealand (Courtney 1983)



- *Carmichaelia corrugata* (Declining) (and uncommon on Kaitorete Spit)
- *Muehlenbeckia ephedroides* (At Risk - Declining) – occurs on the shingle beach and in dryland grasslands and shrublands.
- *Poa billardierei*, (At Risk - Declining) – occurs in the foredunes and the strand zone (Davis 2002)
- *Raoulia monroi* (At Risk - Declining) – occurs in open sand and stonefield habitats within dryland grassland communities (Jensen 2007, Grove 2012, Canterbury Botanical Society 2014, Jensen unpubl. data 2015).
- *Acaena buchananii* (At Risk-Declining, uncommon in Ellesmere ED and the only known location on the Canterbury Plains) – occurs in dryland grasslands (Canterbury Botanical Society 2014, Wildland Consultants and Boffa Miskell unpubl. data 2015)
- *Carmichaelia appressa* (At Risk - Naturally Uncommon) (and rare in Canterbury) (Wilson 1992) – occurs in back dunes and dryland grasslands (Jensen 2007, Canterbury Botanical Society 2014, Wildland Consultants and Boffa Miskell unpubl. data 2015)
- *Colobanthus brevisepalis* (At Risk - Naturally Uncommon) - occurs in dryland grasslands (Jensen unpubl. data 2015, Canterbury Botanical Society 2014)
- *Leptinella serrulata* (At Risk - Naturally Uncommon) - occurs in dryland grasslands (Canterbury Botanical Society 2014)

There are three plant species that are endemic to Kaitorete Spit:

- *Craspedia* “kaitorete” (also Nationally Endangered)
- *Pimelea* aff. *prostrata* “Kaitorete” – occurs in semi stable deflation hollows and on sandy flats behind the dunes (Jensen and Donoghue 2003, Jensen 2007)
- *Galium* “kaitorete” – patchy distribution in semi stable deflation hollows and on sandy flats behind the dunes (Jensen and Donoghue 2003)

The broom *Carmichaelia appressa* is almost endemic to Kaitorete Spit (Davis 2002).

Some of the plant species that occur at the site that are uncommon within the Ellesmere Ecological District are:

- Kowhai (only one tree known to occur naturally on Kaitorete Spit) (Taylor 1996)
- Ngaio (Taylor 1996)
- *Hypoxis* ‘new species’? (uncommon in Ellesmere ED, possibly a threatened species?) – occurs in dryland grasslands (Canterbury Botanical Society 2014)
- *Geranium brevicaule* – occurs in dryland grasslands Wildland Consultants and Boffa Miskell unpubl. data 2015)
- *Carex comans* – occurs in dryland grasslands Wildland Consultants and Boffa Miskell unpubl. data 2015)

## Birds

Nationally Threatened bird species (Robertson et al. 2012) that nest in dune and grassland habitats (Davis 2002) are:

- Banded dotterel (Nationally Vulnerable)



- Caspian tern (Nationally Vulnerable)
- White-fronted tern (At Risk - Declining)
- Red-billed gull (Threatened - Nationally Vulnerable)

One nationally At Risk (Robertson et al. 2012) bird species nests in dune and grassland habitats (Davis 2012)<sup>1</sup>:

- New Zealand pipit (At Risk - Declining)

### Lizards

The grasslands, shrublands and dunes on Kaitorete Spit site provides very important habitat for lizards. Of the four species recorded on Kaitorete Spit (Freeman 1994, Lettink 2004, Lettink et al. 2008) three are nationally Threatened or At Risk (Hitchmough et al. 2013) and one is also endemic to the Canterbury Region. These species are:

- Central Canterbury spotted skink (*Oligosoma aff. lineocellatum* "central Canterbury") (Nationally Vulnerable) – this species has been recorded from coastal shrubland behind the sand dunes on the southern side of the DOC Scientific Reserve approximately 1.5 km west of Birdlings Flat (Lettink et al. 2008)
- Common skink clade 5 (*Oligosoma aff. polychroma* Clade 5) (At Risk - Declining);
- Canterbury gecko (*Woodworthia cf brunnea*) (At Risk - Declining).

### Invertebrates

Nationally Threatened and At Risk invertebrate species (Hitchmough et al. 2014) recorded from the site (Wildland Consultants 2012, unless cited otherwise) are:

- *Kiwaia* "plains jumper" (moth) (Threatened - Nationally Endangered, uncommon in the ecological district)
- *Stathmopoda albimaculata* (moth) (Threatened - Nationally Endangered, uncommon in the ecological district)
- *Kupea electilis* (moth) (Threatened - Nationally Vulnerable, species and genus endemic to Kaitorete Spit - known from 10 sites spread along the dunes (Wildland Consultants 2012).
- *Gadira leucophthalma* (Threatened - Nationally Vulnerable, uncommon in the ecological district)
- *Ericodesma aerodona* (moth) (At Risk - Declining, uncommon in the ecological district)
- Red katipo spider (*Latrodectus katipo*) (At Risk - Declining) - Kaitorete Spit is the national stronghold for this species. It is widespread in the foredunes (Patrick 2002, Heatherington 2014).
- *Samana acutata* (moth) (At Risk – Relict, uncommon in the ecological district) – present in shrublands within the site.
- *Kiwaia jeanae* (moth) (At Risk – Naturally Uncommon, endemic to Kaitorete Spit)
- *Bityla sericea* (moth) (At Risk – Naturally Uncommon, uncommon in the ecological district).

<sup>1</sup> Although for mobile fauna such as birds, species classified as nationally At Risk do not meet the threshold for significance (Wildland Consultants 2013).



- *Eurythecta robusta* (At Risk – Naturally Uncommon) (Wildland Consultants and Boffa Miskell unpubl. data 2015)

Endemic invertebrate species, some of which are also nationally Threatened and At Risk (and listed above) that have been recorded from the site (Patrick 1994) are:

- *Kiwaia jeanae*
- *Siythris niphazela*
- *Kupea electilis* - species and genus endemic to Kaitorete Spit - known from 10 sites spread along the dunes (Wildland Consultants 2012)
- *Notoreas* new species?
- *Tingena* sp.

Invertebrates recorded from the site that are uncommon in the Ellesmere Ecological District include:

- *Notoreas simplex* (moth) - very local distribution with larvae on *Pimelea* aff. *prostrata* (kaitorete)
- *Weeleus acutus* (antlion) - occurs in back dune (Wildland Consultants and Boffa Miskell unpubl. data 2015)
- *Arctesthes catapyrrha* - only record for Kaitorete Spit and Banks Peninsula (Wildland Consultants and Boffa Miskell unpubl. data 2015)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are three plant species that are at their distributional limits on Kaitorete Spit and at least five invertebrates.

Plants at their distributional limits on Kaitorete Spit (Davis 2002) are:

- *Akeake* (*Dodonea viscosa*) (southern national limit)
- *Muehlenbeckia astonii* (southern national limit)
- *Carmichaelia appressa* (northern national limit)

Terrestrial invertebrates at their distributional limits on Kaitorete Spit (Wildland Consultants 2012) (excluding species that are endemic to the spit - which are listed under criterion 4) are:

- *Kiwaia* "plains jumper" (moth) (northern national limit)
- *Gadira leucophthalma* (moth) (southern national limit)
- *Notoreas simplex* (moth) (south-eastern national limit)
- *Ericodesma aerodona* (moth) (southern national limit)
- *Stathmopoda albimaculata* (moth) (northern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.



The Spit is sufficiently distinctive for some to suggest that it warrants its own ecological district (Davis 2002).

Four ecosystems within the site are originally rare ecosystems (Williams et al. 2007): active sand dunes<sup>2</sup>, dune deflation hollows, shingle beaches and stony beach ridges.

The beach along the entire length of the coastal margin is a shingle beach. The dune systems behind this are active sand dunes dominated by pingao there are also dune deflation hollows within the dune system. The eastern end of the spit supports indigenous vegetation on stony beach ridges<sup>3</sup>. Stony beach ridges are an originally rare ecosystem (Williams et al. 2007).

Kaitorete Spit also supports distinctive vegetation and fauna assemblages.

The vegetation of the spit is distinctive. It has adapted to a harsh environment characterised by low precipitation, high summer temperatures, low humidity and strong and persistent winds and salt spray. The vegetation has a number of species that are prostrate or low growing (e.g. *Pimelea* aff. *prostrata* "Kaitorete", *Carmichaelia appressa*, *Carmichaelia corrugata* and *Muehlenbeckia ephedroides*) or appear seasonally and then die-off. It has a high proportion of species that are nationally Threatened and At Risk and endemic to the site (refer to criterion 4 and 5). The site is also distinctive in that all five species of *Muehlenbeckia* are present (Partridge 2001).

Dunes and shrublands within the site provide habitat for distinctive invertebrate communities, particularly moths (Wildland Consultants 2012). The dune systems support a high diversity of indigenous moths, and a large number of species are nationally Threatened and At Risk, endemic to Kaitorete Spit, at their distributional limits (refer to criterion 4 and 5) or species usually found in montane and sub-alpine environments. Native dune and grass specialist moths predominate and many common and widespread lowland moth species are either scarce or absent, highlighting the general aridity of the area and the naturalness of the flora. Over 30 of the moth species are diurnal and fly fast and low around their host plant or sunbathing on the hot bare sand. *Kiwaia jeanae* and *Kiwaia* "plains jumper" are a special feature of the moth fauna of Kaitorete Spit. These small, brachypterous moths jump rather than fly (Patrick 1994).

The also site provides habitat for a distinctive assemblage of indigenous lizard species. It supports four of the five lizard species known to occur on Banks Peninsula and is the only site on Banks Peninsula and in the Canterbury Region with this particular assemblage of species (Lettink 2004, Lettink et al. 2008).

## Diversity and Pattern

### **7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

<sup>2</sup> Although Williams et al. (2007) note that the rarity of active sand dunes at a national scale may be questionable.

<sup>3</sup> The area east of the Scientific Reserve is within the Birdlings Flat site, however those areas within and west of the Scientific Reserve, are within the Kaitorete Spit site.





The site is significant under this criterion.

There is a distinct vegetation pattern across Kaitorete Spit from the coastal margin to the margin of Lake Ellesmere/Te Waihora. These vegetation patterns are driven by the processes that relate to the formation of the barrier, including substrate type and depth and elevation, current coastal and lagoon processes and historic human disturbance. From the coast to Lake Ellesmere the sequence includes active foredunes, stable back dunes, sand flats, semi-natural indigenous dryland grasslands, a raised undulating gravel Speight ridge supporting remnant shrublands, dryland grasslands, saltmarsh ribbonwood shrublands, tall saltmarsh and salt meadow vegetation and mudflats.

The dune and grassland communities are naturally species poor, but relative to other examples the dune communities support a high diversity of species. This reflects their relative intactness and the absence of exotic marram from large areas of the dunes which has displaced many coastal dune species from similar dune habitats.

The dryland grassland communities also contain a relatively high diversity of plant species for dryland communities of their type, and have retained a good cover of native herbs (including rare species such as *Daucus glochidiatus* and *Geranium retrorsum*), which have been lost from the majority of similar dry grasslands in lowland Canterbury.

Some habitats support diverse invertebrate assemblages (Patrick 1994, Davis 2002). At least 126 species of *Lepidoptera* have been recorded from Kaitorete Spit. The coastal dunes support a particularly diverse *Lepidoptera* assemblage (Patrick 1994). More modified dryland habitats are less diverse (Wildland Consultants and Boffa Miskell unpubl. data 2015).

The site also supports a diverse lizard assemblage. Four lizard species occur within the site (Lettink 2004, Lettink et al. 2008).

## Ecological Context

### **8. Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.**

The site is significant under this criterion.

It contains an ecological sequence from the coastal strand zone to Lake Ellesmere/Te Waihora that includes active foredunes, stable back dunes, sand flats, semi-natural indigenous grasslands and shrublands to saltmarsh and salt meadow vegetation.

The indigenous vegetation on the dune system provides a continuous ecological corridor of approximately 27 km in length that is important for indigenous fauna, particularly invertebrates (including flightless species) and lizards. It provides an ecological link to the connected high value shrublands at Birdlings Flat.



The site is buffered by the sea and Ellesmere/Te Waihora. Together they act as a barrier to animal pest and biodiversity pest plant threats.

**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is significant under this criterion.

Environment Canterbury Reserve land at the western end of the spit supports a complex mosaic of dryland and wetland environments. These wetlands are connected to the significant wetlands on the margin of Lake Ellesmere/Te Waihora that are within the Lake Ellesmere/Te Waihora and margins Site (SES/E/1).

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion. It provides important habitat for indigenous birds, lizards and terrestrial invertebrates.

The dryland grassfield-mossfield-herbfield vegetation between the margin of Te Waihora and Bayleys Road is an important seasonal habitat for banded dotterel (Threatened – Nationally Vulnerable). Kaitorete Spit is the last non-braided river habitat in Canterbury where the species still occurs in significant numbers (A. Crossland *pers. comm* 2014). This species gathers here in large numbers over the winter months. Kaitorete Spit is also an important breeding site for this species. Over 100 pairs breed on the spit (Crossland 2014a) in undeveloped dryland grassland, mossfield and herbfield communities in the Council Reserve adjacent to Lake Ellesmere/Te Waihora (Crossland unpubl. data 2014b) and along the coastal margin (DOC unpubl. data 2014).

Kaitorete Spit is a very important habitat for indigenous invertebrates. It has a very diverse invertebrate fauna and highly unique and nationally important assemblage of dune system *Lepidoptera*. A total of 130 species of *Lepidoptera* have been recorded from Kaitorete Spit, 126 of which are resident natives (Patrick 1994). The coastal dunes are also a national stronghold for red katipo spider (*Latrodectus katipo*) (At Risk – Declining). The abundance of katipo at Kaitorete Spit is attributed to the extensive cover of the native sand-binding sedge *Ficinia spiralis* (Patrick 2002), the lack of development on the spit, and the scarcity of marram grass (Heatherington 2014).

The site provides important habitat for four lizard species; Canterbury gecko, Central Canterbury spotted skink, common skink clade 5 and McCann's skink. The spotted skink population on Kaitorete Spit is currently the largest population known from Banks Peninsula and the greater Christchurch Area (Lettink et al. 2008).

## Site Management

### Existing Protection Status

Kaitorete Spit is owned or administered by:

- Private landowners
- Ngai Tahu (Taumutu runanga)
- Department of Conservation
- Environment Canterbury
- Christchurch City Council
- Land Information New Zealand - on the coastal side of Birdlings Flat

There are a number of areas protected by reserves:

Reserves on the Lake Ellesmere/Te Waihora side of Kaitorete Spit are:

- Kaitorete Spit Reserve (Christchurch City Council)
- Waihora Scientific Reserve (conservation unit M37010) (DOC)
- Kaitorete Spit Conservation Area (Timber Depot and Landing Area Reserve) (conservation unit M36486) (DOC) – west of the Christchurch City Council Reserve
- Kaitorete Spit Conservation Area (conservation unit M37031) (DOC) – adjacent to Bayleys Road, west of Waihora Scientific Reserve
- Kaitorete Spit Reserves (Environment Canterbury) – along the margin of Lake Ellesmere/Te Waihora

Reserves on the coastal side of Kaitorete Spit are:

- Kaitorete Spit Conservation Area (conservation unit M37023) (DOC) – seaward margin, western end
- Pacific Ocean Foreshore Kaitorete Spit Conservation Area (conservation unit M37009) (DOC) – middle of the seaward margin
- Kaitorete Spit Conservation Area Marginal Strip (conservation unit M37029) (DOC) – seaward margin, eastern end

- Kaitorete Spit Scientific Reserve (conservation unit M37011) (DOC) – inland of the seaward margin, western end of the marginal strip
- Kaitorete Spit Scientific Reserve (conservation unit M37014) (DOC) – west of Birdlings Flat settlement and inland of the seaward margin

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>• Biodiversity pest plants including marram, boxthorn, tree lupin, boxthorn, gorse, broom and wilding pines.</li> <li>• Garden escapes from Birdlings Flat settlement are likely to be an ongoing threat.</li> </ul>	<ul style="list-style-type: none"> <li>• Department of Conservation to continue control of biodiversity pest plants (such as marram and tree lupin) along the coastal dunes.</li> <li>• Consider controlling the biodiversity pest plants already present at the site. Woody species are a priority for control in the low stature grassland and shrubland environments at the site.</li> <li>• Birdlings Flat community to consider continuing the control work they are doing in the vicinity of the settlement.</li> <li>• Consider regular surveillance for new weed incursions, particularly garden escapes from Birdlings Flat and Taumutu.</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance to landowners about monitoring and control of pest plants.</li> <li>• Raise awareness with neighbours about impacts on biodiversity of garden escapes.</li> <li>• Assistance available where possible.</li> </ul>
<ul style="list-style-type: none"> <li>• Pest animals. Those known to occur on the Spit are rabbits, hares, feral cats, ferrets, stoats, weasels, European hedgehog, rats, mice and possums (Davis 2002).</li> <li>• Rabbits and hares are widespread in the dunes and grasslands and rabbits have been numerous in the past (Davis 2002).</li> </ul>	<ul style="list-style-type: none"> <li>• Consider monitoring hare and rabbit densities across the spit. If rabbit control is required consider a joint agency/landowner control operation.</li> <li>• Council, DOC and ECan to consider continuing seasonal control (trapping) of predatory animal pests surrounding important nesting sites at the tip of the Spit and Crescent Island.</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance to landowners about monitoring and control of pest animals.</li> <li>• Assistance available where possible.</li> </ul>

	<ul style="list-style-type: none"> <li>Consider implementing a multi-species animal pest control programme to control feral cats, ferrets, stoats, weasels, European hedgehogs and rats to protect birds (particularly on the margins of Lake Ellesmere/Te Waihora) and lizards. The site is well buffered by the sea and Lake Ellesmere/Te Waihora so re-invasion is likely to be less of an issue than at other sites. Priority areas are likely to be the margins of the lake, coastal dunelands, and shrublands.</li> </ul>	
<ul style="list-style-type: none"> <li>Domestic stock.</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing the coastal dunes to keep stock out.</li> <li>Consider reducing stocking rates in areas where stocking rates are high.</li> <li>To maintain or enhance indigenous vegetation communities consider grazing sheep in preference to cattle.</li> <li>For dryland grassland and shrubland areas consider either controlled, light sheep grazing during the growing season to reduce rank exotic grass, or removing grazing from some areas.</li> <li>Consider establishing robust, but simple monitoring to evaluate the effects of grazing and different grazing regimes on the indigenous vegetation communities within the site.</li> </ul>	<ul style="list-style-type: none"> <li>Discussions with landowners about the benefits to biodiversity of different options for stock management.</li> </ul>
<ul style="list-style-type: none"> <li>Fire</li> </ul>	<ul style="list-style-type: none"> <li>Council should consider developing a fire response plan for the Spit in consultation with DOC and landowners to ensure a rapid</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>

	<p>response to fire on the Spit.</p> <ul style="list-style-type: none"> <li>• Consider erecting suitable signs in key locations to highlight the danger of fires, and seek people’s co-operation.</li> <li>• The fire risk should be part of wider discussions with Birdlings flat and Taumutu residents, and 4WD/ off-road motorbikes clubs.</li> </ul>	
<ul style="list-style-type: none"> <li>• Declining populations of lizards, particularly spotted skink.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider undertaking predator control at key locations to reduce the number of cats, hedgehogs, mustelids and rodents (Lettink et al 2008).</li> <li>• Consider undertaking regular monitoring at key locations to assess population distribution, size and trends (Lettink et al 2008).</li> <li>• Consider undertaking additional surveys for new populations of spotted skink in the scattered shrublands present along the hind dunes on Kaitorete Spit (Lettink et al 2008).</li> </ul>	<ul style="list-style-type: none"> <li>• Advice and guidance for landowners about protection of lizard habitats.</li> <li>• Discussion with landowners about continued research and monitoring of lizards by agencies/universities.</li> <li>• Assistance available where possible</li> </ul>
<ul style="list-style-type: none"> <li>• Loss or decline of threatened and endemic plant species. Several threatened species that are endemic to the spit, or where the Kaitorete Spit population is nationally significant, may require specific recovery programmes to ensure their long-term survival.</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate management may need to be considered including habitat manipulation, erection of enclosures, restoration planting, seed collection, removal of plants for artificial propagation, captive breeding, pest control and studies on population dynamics and recruitment.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion with landowners about benefits to biodiversity of different management options.</li> <li>• Assistance where possible</li> </ul>
<ul style="list-style-type: none"> <li>• Loss of <i>Muehlenbeckia astonii</i> plants and lack of recruitment.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider legally protecting at least part of the <i>Muehlenbeckia astonii</i> population.</li> <li>• Consider grazing sheep in preference to cattle</li> </ul>	<ul style="list-style-type: none"> <li>• Discussions with landowners about protection and enhancement of <i>Muehlenbeckia astonii</i> populations.</li> </ul>

	<p>to prevent damage to shrubs</p> <ul style="list-style-type: none"> <li>• Consider rabbit and hare control in the area, or erecting rabbit proof fencing.</li> <li>• Consider methods to initiate seed germination and seedling development</li> <li>• Consider supplementary planting of progeny raised from seed collected from the site into appropriate rabbit-fenced habitats. Follow up releasing from rank grass is also likely to be required until seedlings are tall enough.</li> <li>• The Department of Conservation should continue to monitor plants inside and outside the existing enclosures.</li> </ul>	<ul style="list-style-type: none"> <li>• Assistance available where possible.</li> </ul>
<ul style="list-style-type: none"> <li>• Damage to dunes and dune vegetation by off-road motorbikes and 4WD vehicles (Davis 2002, Hooson 2003)</li> </ul>	<ul style="list-style-type: none"> <li>• Consider prohibiting the use of road motorbikes and 4WD vehicles on coastal dunes.</li> <li>• Consider options for restricting the use of off-road vehicles on dryland areas and reserves to existing tracks (with the exception of land owners and managers).</li> </ul>	<ul style="list-style-type: none"> <li>• Discussions with landowners about the benefits to biodiversity about the restriction of motor vehicles away from sensitive areas.</li> <li>• Ensure that landowners are aware that they are able to continue to use and maintain existing tracks and access ways.</li> </ul>
<ul style="list-style-type: none"> <li>• Existing shelterbelts and existing pine plantations.</li> </ul>	<ul style="list-style-type: none"> <li>• Landowners will be able to trim or fell existing shelterbelts and existing pine plantations.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure that landowners are aware of this.</li> </ul>



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**Assessment completed by:** Scott Hooson  
**Date:** 12 March 2015

**Statement completed by:** Scott Hooson  
**Date:** 12 March 2015

**Statement updated by:** XXX  
**Date:** XXX

Please note this statement is based on information available at the time of writing. Due to the dynamic nature of ecosystems, future reassessment of the site may be necessary to reflect any changes in knowledge of its ecological significance.

<sup>4</sup> [www.ecan.govt.nz/publications/Plans/ecological-significance-indigenous-vege-canterbury.pdf](http://www.ecan.govt.nz/publications/Plans/ecological-significance-indigenous-vege-canterbury.pdf)



## Christchurch District Plan Site of Ecological Significance

### Site Significance Statement

**Site name:** Lion Rock

**Site number:** SES/PH/1

**Physical address of site:** Upper Allandale, Governors Bay

#### Summary of Significance:

The site is significant because it is a large example of rare and representative indigenous vegetation in the Port Hills Ecological District. It has a high diversity of indigenous plant and invertebrate taxa and supports a nationally Threatened invertebrate species of *Lepidoptera*, a number of nationally At Risk plant, invertebrate and fish species and plant and invertebrate species that are endemic to Banks Peninsula or uncommon within the ecological district or region. It has five species that are at their southern national or regional distributional limits on Banks Peninsula and has distinctive montane scrub and bluff vegetation associated with basic igneous bluffs, scarps and rock outcrops. The site contributes to an important ecological linkage and provides an important buffering function to Allandale Stream.

#### Site Map



## **Additional Site Information**

**Ecological District:** Port Hills

**Area of SES (ha):** 93.97

**Central Point (NZTM):** E1569977, N5166784

## **Site Description**

This site is located on the Port Hills above Allandale off Bamfords Road at Living Springs. It includes the rock bluffs and scarps below the Summit Road and the forested and regenerating vegetation on the upper and lower slopes. The altitudinal range of the site is from approximately 40 to 524 m above sea level. The Department of Conservation identified the site as a Recommended Area for Protection (Port Hills RAP 5 – Living Springs) (Wilson 1992). Wilson (1992) commented that it “is an outstanding area for the Port Hills”.

The main vegetation communities identified at the site by Jensen unpubl. data (2014) are:

- (Kahikatea-matai-totara)/secondary kanuka and mixed hardwood forest
- Secondary kanuka dominant forest
- Secondary mixed hardwood forest
- Rock bluff and outcrop herbfield and shrubland
- Bracken fernland/grassland

Indigenous birds recorded at the site during the botanical survey are bellbird, South Island fantail, and New Zealand pigeon (Jensen unpubl. data 2014).

## **Extent of Site of Ecological Significance**

The site includes the secondary forest in the lower gullies and the montane scrub, grassland and rock bluff vegetation on the upper slopes. It also includes the regenerating bracken fernland that links and buffers the rock bluffs and forest on the upper slopes. Areas of exotic plantations, the Living Springs complex and other dwellings and planted amenity gardens associated with dwellings are excluded from the site.

There are several large patches of second-growth kanuka forest south of Bamfords Road. These areas are likely to be ecologically significant. However, they were not surveyed and there is no information to assess their significance. An ecological survey and assessment of these areas is recommended.



## Assessment Summary

The Lion Rock Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitats of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8 and 10).

## Assessment against Significance Criteria

### Representativeness

- 1. Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.**

The site is significant under this criterion.

Much of the forest within Living Springs has now been fenced and the understorey is regenerating strongly. The forest in the gully below the Living Springs buildings is highly representative. It has a dense understorey and several large remnant kahikatea, matai and totara. Less palatable species such as *Urtica ferox* are more common in the more open upper kanuka forest that has been fenced more recently. The forest occupying the head of the valley below the crater rim has a representative composition and structure and is typical of the ecological district. Fuchsia, broadleaf, narrow-leaved lacebark and lowland ribbonwood form the canopy with pepper tree, mahoe, kaikomako and *Coprosma rubra* also common (Jensen unpubl. data 2014).

The montane scrub and rock bluff vegetation is also representative and one of few examples of its type in the ecological district. The rock bluff vegetation supports a diverse range of specialised species such as *Raoulia monroi*, *Senecio glaucophyllus subsp basinudus*, *Brachyglottis lagopus*, *Geranium brevicaulis*, *Huperzia varia*, *Notogrammitis heterophylla*, *Metrosideros diffusa*, *Scleranthus uniflora* and *Scleranthus biflorus*, *Vittadinia australis* and *Colobanthus strictus* (Jensen unpubl. data 2014).

The site supports indigenous invertebrates that are characteristic of the range of habitats within the site and that reflect the altitudinal sequence from lowland forest to montane scrub, grassland and rock bluffs. It has many invertebrates that are characteristic of Banks Peninsula, including several of the endemic species (Wildland Consultants unpubl. data 2014).



**2. Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.**

The site is significant under this criterion.

It contains a large example of secondary kanuka and mixed hardwood forest in the Port Hills Ecological District.

**Rarity/Distinctiveness**

**3. Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.**

All of the indigenous forest (including kanuka forest) within the site is significant under this criterion.

Forest has been reduced to less than 20% of its former extent in the ecological district. The Port Hills Ecological District is thought to have been almost entirely forested prior to the arrival of humans. Only small areas of tall tussockland and shrubs on bluffs and minor areas of wetland, rockland and coastal herbfield would not have been forested (Harding 2009). The present extent of all indigenous forest in the ecological district (including manuka and kanuka) is estimated to be 9% (New Zealand Landcover Database (Version 4)).

The lower and mid altitude forest in the gullies is also on Acutely and Chronically Threatened land environments (F3.1a and F3.1b) where there is 9.9 and 12.2% indigenous vegetation is left these land environments nationally (Walker et al. 2007).

**4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.**

The site is significant under this criterion.

It supports a nationally Threatened invertebrate species of *Lepidoptera*, a number of nationally At Risk plant, invertebrate and fish species and plant and invertebrate species that are endemic to Banks Peninsula or uncommon within the ecological district or region.

**Plants**

Nationally At Risk plant species (de Lange et al. 2013) recorded from the site (Jensen unpubl. data 2014) are:

- *Aciphylla subflabellata* (At Risk - Declining) – there are high densities in the grassland between the Summit Road and the bluffs.
- *Hebe strictissima* (At Risk - Naturally Uncommon, endemic to Banks Peninsula) - occasional amongst boulders around Lions Head.
- *Heliohebe lavaudiana* (At Risk – Declining, endemic to Banks Peninsula) - rare on the rock outcrops



- *Hymenophyllum australe* (At Risk - Naturally Uncommon, rare in ecological region (Wilson 1992))
- *Leptinella minor* (At Risk - Naturally Uncommon, endemic to Banks Peninsula)
- *Raoulia monroi* (At Risk - Declining) - rare on rocks above Lions Head
- *Senecio glaucophyllus subsp. basinudus* (At Risk - Naturally Uncommon) - rare on rocks above Lions Head

Plant species recorded from the site (Jensen unpubl. data 2014) that are “uncommon to rare or very local” on Banks Peninsula (Wilson 2013) are:

- *Colobanthus strictus*
- *Hymenophyllum dilatatum* (rare in Canterbury (Wilson 1992)) - this is one of only two known sites for this species on Banks Peninsula (Hugh Wilson, 2013)
- *Hymenophyllum multifidum*
- *Hymenophyllum sanguinolentum*
- *Kahikatea (Dacrycarpus dacrydioides)* (uncommon in ecological district)
- *Lachnagrostis lyallii*
- *Microlaena avenacea*
- *Notogrammitis heterophylla*
- *Phlegmariurus varius*
- *Scleranthus biflorus*
- *Scleranthus uniflorus*

### **Invertebrates**

Nationally Threatened and At Risk invertebrate species recorded from the site (Wildland Consultants unpubl. data 2014) are:

- *Stathmopoda albimaculata* (Threatened - Nationally Endangered)
- *Orthodera novaezealandiae* (praying mantis) (At Risk – Declining)
- *Dasyuris partheniata* (speargrass moth) (At Risk – Recovering)

Invertebrates recorded from the site (Wildland Consultants unpubl. data 2014) that are endemic to Banks Peninsula are:

- *Kikihia* new species (green cicada) (endemic to Banks Peninsula)
- *Asterivora* new species (Banks Peninsula jet) (endemic to Banks Peninsula)
- *Dichromodes cynica* (rock face moth) (endemic to Banks Peninsula)

Invertebrates recorded from the site (Wildland Consultants unpubl. data 2014) that are uncommon in the Port Hills Ecological District are:

- *Nola parvitis*
- *Argyrophenga antipodum* (tussock butterfly) (uncommon in the ecological district) - only known population on the Port Hills

### **Fish**

Two nationally At Risk indigenous freshwater fish species have been recorded in the Allandale Lane Stream (EOS unpubl. data 2013):



- inanga (At Risk – Declining) – the lower reaches are a spawning site for this species (Golder Associates Ltd. 2012)
- blue gill bully (At Risk – Declining)

**5. The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.**

The site is significant under this criterion.

There are five species that are at their southern national or regional distributional limits on Banks Peninsula (Wilson 2013). These species are (Jensen unpubl. data 2014):

- *Alectryon excelsus* (southern national limit)
- *Asplenium oblongifolium* (southern national limit)
- *Dracophyllum acerosum* (southern national limit)
- *Hedycarya arborea* (southern regional limit)
- *Piper excelsum* (southern national limit)

**6. Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.**

The site is significant under this criterion.

The crater rim bluff system on the upper slopes of the site has distinctive montane scrub and bluff vegetation associated with basic igneous bluffs, scarps and rock outcrops. At a national scale, basic cliffs, scarps and tors are originally rare ecosystems (Williams et al. 2007). Montane scrub and bluff vegetation is of very restricted occurrence in the Port Hills Ecological District (Wilson 1992).

The shady rock faces under forest below Lion Rock and the crater rim bluff system support also support a distinctive association of filmy ferns (*Hymenophyllum australe*, *H dilatatum*, *H multifidum* and *H sanguinolentum*) (Wilson unpubl. data n.d., Koller and Tripp 2010, Jensen unpubl. data 2014). Damp shady faces such as these are of restricted occurrence on the Port Hills and all four species are rare on the Port Hills and in the Banks Ecological Region. This site is the only known location on the Port Hills for *H. dilatatum* and *H. australe* and there are only one and two other known sites of *H. dilatatum* and *H. australe* in the Banks Ecological Region respectively (Koller and Tripp 2010, Wilson 2013).

**Diversity and Pattern**

**7. Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.**

The site is significant under this criterion.





It has an altitudinal sequence from approximately 40 m to over 520 m above sea level. This altitudinal gradient is reflected in the composition of the vegetation. Warm coastal species such as ngaio, titoki, kawakawa and shining spleenwort grow in the forest in the lower gullies while montane species such as thin-barked totara and *Dracophyllum acerosum* are found in the montane scrub and bluff vegetation surrounding Lion Rock at the top of the site.

There are a number of vegetation communities within the site, including (kahikatea-matai-totara)/secondary kanuka and mixed hardwood forest, secondary kanuka dominant forest, secondary mixed broadleaved hardwood forest, montane scrub, rock bluff and outcrop communities and bracken fernland/grassland. These communities reflect, among other things, the altitudinal gradient, proximity to the coast, human disturbance, the occurrence of outcropping rock and bluff systems, aspect and moisture availability.

As a result the site contains a high diversity of indigenous plant taxa (Jensen unpubl. data 2014). One-hundred and thirty two indigenous plant species were recorded from the site by Jensen unpubl. data (2014). A list of these species is provided in Appendix 1.

The site also contains a high diversity of invertebrates compared to other sites on both the Port Hills and Banks Peninsula. A recent survey (Wildland Consultants unpubl. data 2014) (which targeted moths and butterflies) found 113 species, of which 93 were moths and butterflies. A list of the invertebrate species recorded at the site is provided in Appendix 2.

## Ecological Context

### **8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.***

The site is significant under this criterion.

The indigenous vegetation communities along the upper slopes of the site are part of a network of otherwise largely protected indigenous vegetation and habitats that provide an important ecological corridor around the crater rim/summit of the Port Hills.

The site also has a continuously vegetated corridor of indigenous vegetation from the summit of the Port Hills that extends down onto the lower slopes within Lyttelton Harbour (from approximately 520 to 40 m above sea level). This is an important linkage for indigenous fauna.

This vegetated corridor also provides almost continuous riparian cover in the Allandale catchment that buffers the Allandale Stream and its tributaries from land-use effects such as increased nitrogen and phosphorus and sedimentation. Riparian buffering and shading of the waterways in this catchment is important because they provide habitat for indigenous freshwater fish (EOS unpubl. data 2013) and there is an inanga spawning site in the lower reaches (Golder Associates Ltd. 2012).



The Allandale Lane Stream is an important aquatic corridor for indigenous freshwater fish. It provides habitat for at least five species of migratory freshwater fish (shortfin eel, common bully, bluegill bully, inanga, and banded kokopu) (EOS unpubl. data 2013). The ecological linkage between the coast and the catchment is essential for these fish.

**9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.**

The site is not significant under this criterion. There are no wetlands within the site.

**10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.**

The site is significant under this criterion.

It provides important habitat for a diverse range of indigenous invertebrates that the range of lowland to montane habitats within the site. This includes a Threatened - Nationally Endangered species, two nationally At Risk species, three species that are endemic to Banks Peninsula and another two that are uncommon within the ecological district.

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## Site Management

### Existing Protection Status

The site is not legally protected.

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> <li>Stock. Almost all the areas of high ecological value at Living Springs have now been fenced to keep stock out (Jensen unpubl. data 2014).</li> </ul>	<ul style="list-style-type: none"> <li>Consider fencing any remaining areas to promote natural regeneration of the understorey.</li> </ul>	<ul style="list-style-type: none"> <li>Discussion with landowner about the benefits to biodiversity of fencing the remainder of the site.</li> <li>Assistance as appropriate.</li> </ul>
<ul style="list-style-type: none"> <li>Biodiversity pest plants. There is a small amount of old mans beard in the gully below the Living Springs buildings. An occasional hawthorn is present on the forest edges. Wilding pines are becoming established on the bluffs. <i>Polypodium vulgare</i> is becoming established on rock outcrops above the Living Springs track (Jensen unpubl. data 2014).</li> </ul>	<ul style="list-style-type: none"> <li>Control biodiversity pest plants using appropriate methods. Priority species for control are old mans beard and wilding pines.</li> <li>Consider ongoing weed surveillance for biodiversity pest plants such as Darwin's barberry, banana passionfruit, spur valerian, <i>Bomarea</i> and cotoneaster.</li> </ul>	<ul style="list-style-type: none"> <li>Guidance and advice for landowner about effective and appropriate weed control methods.</li> <li>Guidance for landowner on the identification of weeds.</li> </ul>
<ul style="list-style-type: none"> <li>Spread of garden plants from amenity gardens</li> </ul>	<ul style="list-style-type: none"> <li>Monitor (and control) the spread of any 'garden escapes' into the site.</li> </ul>	<ul style="list-style-type: none"> <li>Guidance and advice for landowner about monitoring and control of garden escapes.</li> </ul>
<ul style="list-style-type: none"> <li>Wilson (unpubl. data n.d.) recorded non-local and hybrid natives.</li> </ul>	<ul style="list-style-type: none"> <li>Consider planting only locally sourced and appropriate indigenous plants.</li> <li>Consider removing any species that are potentially invasive and could threaten the ecological values and genetic integrity of the</li> </ul>	<ul style="list-style-type: none"> <li>Provision to landowner of ecological advice and information packages for planting (e.g. 'Plant Me Instead').</li> </ul>

	species native to the site.	
<ul style="list-style-type: none"> <li>Forestry plantations and other exotic trees. There are small areas of exotic plantations in the gully near the Living Springs Complex and other areas with mature exotic tree species.</li> </ul>	<ul style="list-style-type: none"> <li>These exotic plantations are excluded from the site. Depending on the species, they may have the potential to spread. Harvesting methods should aim to minimise damage to the surrounding ecological values.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>
<ul style="list-style-type: none"> <li>Walking and mountain biking tracks. There are a number of walking and mountain bike tracks throughout Living Springs.</li> </ul>	<ul style="list-style-type: none"> <li>Landowners will be able to use and maintain existing tracks but should ensure that disturbance to areas of indigenous vegetation is minimised.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the landowners are aware that existing tracks can be used and maintained.</li> </ul>

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**Assessment completed by:** Scott Hooson  
**Date:** 29 January 2015

**Statement completed by:** Scott Hooson  
**Date:** 29 January 2015

**Statement updated by:** XXX  
**Date:** XXX

*PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.*

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## Appendix 1: Indigenous Plant Species List

Sourced from Jensen unpubl. data (2014).

N.B. exotic species were not recorded during this survey.

Scientific Name	Common Name(s)
<b>Indigenous species</b>	
<i>Acaena anserinifolia</i>	bidibidi, piripiri
<i>Acaena juvenca</i>	bidibidi, piripiri
<i>Acaena novae-zelandiae</i>	red bidibidi
<i>Aciphylla subflabellata</i>	grassland speargrass
<i>Alectryon excelsus</i>	titoki
<i>Anaphalioides bellidioides</i>	everlasting daisy, hells bells
<i>Aristotelia serrata</i>	wineberry, makomako
<i>Arthropodium candidum</i>	grass lily, rephinapapa
<i>Asplenium appendiculatum</i>	ground spleenwort
<i>Asplenium flabellifolium</i>	necklace fern
<i>Asplenium flaccidum</i>	hanging spleenwort, raukatauri
<i>Asplenium gracillimum</i>	
<i>Asplenium hookerianum</i>	Hooker's spleenwort
<i>Asplenium oblongifolium</i>	shining spleenwort, huruhuruwhenua
<i>Astelia fragrans</i>	kakaha, bush lily
<i>Athnosachne solandri</i>	native wheatgrass, blue wheatgrass
<i>Austroderia richardii</i>	toetoe
<i>Blechnum chambersii</i>	lance fern
<i>Blechnum fluviatile</i>	kiwakiwa
<i>Blechnum procerum</i>	small kiokio
<i>Brachyglottis lagopus</i>	groundsel, yellow rock daisy
<i>Calystegia tuguriorum</i>	NZ bindweed, pōwhiwhi
<i>Carex forsteri</i>	cutty grass
<i>Carmichaelia australis</i>	native broom, common broom
<i>Carpodetus serratus</i>	marbleleaf, putaputāwētā
<i>Clematis foetida</i>	yellow clematis
<i>Colobanthus strictus</i>	
<i>Coprosma crassifolia</i>	thick-leaved coprosma, mikimiki
<i>Coprosma dumosa</i>	mikimiki
<i>Coprosma linariifolia</i>	yellow-wood
<i>Coprosma lucida</i>	karamū
<i>Coprosma propinqua</i>	mingimingi, mikimiki
<i>Coprosma rhamnoides</i>	mingimingi, mikimiki
<i>Coprosma robusta</i>	karamū
<i>Coprosma rotundifolia</i>	round-leaved coprosma, mikimiki
<i>Coprosma rubra</i>	mikimiki
<i>Cordyline australis</i>	cabbage tree, tī kōuka
<i>Coriaria arborea</i>	tree tutu
<i>Crassula colligata</i>	stonecrop
<i>Cyathea dealbata</i>	silver fern, ponga
<i>Cyathea smithii</i>	Smith's tree fern, kātote



<i>Dacrycarpus dacrydioides</i>	kahikatea, white pine
<i>Dichelachne crinita</i>	plume grass
<i>Dracophyllum acerosum</i>	turpentine scrub
<i>Epilobium pubens</i>	willow herb
<i>Festuca novae-zelandiae</i>	fescue tussock, hard tussock
<i>Fuchsia excorticata</i>	tree fuchsia, kōtukutuku
<i>Gaultheria antipoda</i>	bush snowberry
<i>Geranium brevicaule</i>	short-flowered cranesbill
<i>Griselinia littoralis</i>	broadleaf, kāpuka
<i>Haloragis erecta</i>	toatoa
<i>Hebe salicifolia</i>	koromiko
<i>Hebe strictissima</i>	Banks Peninsula hebe
<i>Hedycarya arborea</i>	pigeonwood, porokaiwhiri
<i>Helichrysum filicaule</i>	slender everlasting daisy
<i>Helichrysum lanceolatum</i>	niñiao
<i>Heliohebe lavaudiana</i>	Banks Peninsula sun hebe
<i>Hierochloa redolens</i>	holy grass, kāretu
<i>Hoheria angustifolia</i>	narrow-leaved lacebark, houhere
<i>Hydrocotyle sp.</i>	pennywort
<i>Hymenophyllum australe</i>	filmy fern
<i>Hymenophyllum dilatatum</i>	filmy fern, matua mauku
<i>Hymenophyllum multifidum</i>	filmy fern
<i>Hymenophyllum sanguinolentum</i>	filmy fern
<i>Kunzea robusta</i>	kānuka
<i>Lachnagrostis lyallii</i>	mountain wind grass
<i>Lastreopsis velutina</i>	velvet fern
<i>Leptinella dioica x squalida</i>	
<i>Leptinella minor</i>	Banks Peninsula button daisy
<i>Leucopogon fraseri</i>	dwarf heath, pātōtara
<i>Libertia ixioides</i>	mikoikoi, native iris
<i>Lophomyrtus obcordata</i>	rōhutu, NZ myrtle
<i>Luzula banksiana var. orina</i>	woodrush
<i>Luzula rufa</i>	woodrush
<i>Melicope simplex</i>	poataniwha
<i>Melicytus alpinus</i>	porcupine shrub
<i>Melicytus ramiflorus</i>	māhoe, whiteywood
<i>Metrosideros diffusa</i>	white climbing rātā
<i>Microlaena avenacea</i>	bush rice grass
<i>Microsorium pustulatum</i>	hounds tongue, kōwaowao
<i>Muehlenbeckia australis</i>	large-leaved pōhuehue
<i>Muehlenbeckia complexa</i>	scrub pōhuehue, wire vine
<i>Myoporum laetum</i>	ngaio
<i>Myrsine australis</i>	red māpou, red matipo
<i>Myrsine divaricata</i>	weeping matipo, weeping māpou
<i>Notogrammitis heterophylla</i>	comb fern
<i>Olearia paniculata</i>	akiraho
<i>Oxalis exilis</i>	yellow oxalis
<i>Parsonsia capsularis</i>	native jasmine, akakaikiore
<i>Parsonsia heterophylla</i>	native jasmine, akakaikiore
<i>Pellaea rotundifolia</i>	round-leaved fern, tarawera
<i>Pennantia corymbosa</i>	kaikōmako, ducks foot
<i>Phlegmariurus varius</i>	clubmoss





Bottom of Form	
<i>Phormium cookianum</i>	mountain flax, wharariki
<i>Phormium tenax</i>	flax, harakeke
<i>Piper excelsum</i>	kawakawa
<i>Pittosporum eugenioides</i>	lemonwood, tarātā
<i>Pittosporum tenuifolium</i>	kōhūhū, black matipo
<i>Plagianthus regius</i>	lowland ribbonwood, mānatu
<i>Pneumatopteris pennigera</i>	gully fern, pākau
<i>Poa cita</i>	silver tussock, wī
<i>Poa matthewsii</i>	Matthew's poa
<i>Podocarpus cunninghamii</i>	mountain tōtara, thin-barked tōtara
<i>Podocarpus totara</i>	lowland tōtara
<i>Polystichum oculatum</i>	shield fern
<i>Polystichum vestitum</i>	prickly shield fern, pūniu
<i>Prasophyllum colensoi</i>	leek orchid
<i>Prumnopitys taxifolia</i>	mataī, black pine
<i>Pseudognaphalium luteoalbum</i>	jersey cudweed
<i>Pseudopanax arboreus</i>	five-finger, whauwhaupaku
<i>Pseudopanax colensoi</i>	mountain five-finger
<i>Pseudopanax crassifolius</i>	lancewood, horoeka
<i>Pseudowintera colorata</i>	horopito, peppertree
<i>Pteridium esculentum</i>	bracken, rārahu, rauaruhe
<i>Ranunculus reflexus</i>	hairy buttercup, maruru
<i>Raoulia glabra</i>	mat daisy
<i>Raoulia monroi</i>	fan-leaved mat daisy
<i>Ripogonum scandens</i>	supplejack, kareao
<i>Rubus cissoides</i>	bush lawyer, tātarāmoa
<i>Rubus schmidelioides</i>	bush lawyer, tātarāmoa
<i>Schefflera digitata</i>	patē, seven-finger
<i>Scleranthus biflorus</i>	Canberra grass
<i>Scleranthus uniflorus</i>	
<i>Senecio glaucophyllus</i> subsp. <i>basinudus</i>	yellow rock groundsel
<i>Solanum laciniatum</i>	poroporo
<i>Sophora microphylla</i>	small-leaved kōwhai
<i>Stellaria decipiens</i>	native chickweed
<i>Thelymitra longifolia</i>	white sun orchid
<i>Uncinia uncinata</i>	hook grass
<i>Urtica ferox</i>	ongaonga, tree nettle
<i>Vittadinia australis</i>	white fuzzweed
<i>Wahlenbergia gracilis</i>	



## Appendix 2: Invertebrate Species List

Sourced from Wildland Consultants unpubl. data (2014)

\* = exotic species

<b>NEUROPTERA</b>	lacewings
<b>Hemerobiidae</b>	
<i>Drepanacra binocula</i>	
* <i>Micromus tasmaniae</i>	
<b>HEMIPTERA</b>	
<b>Tibicinidae</b>	cicada
<i>Amphipsalta zelandica</i>	<i>clapping cicada</i>
<i>Kikihia new species</i>	
<i>Kikihia rosea</i>	
<b>Miridae</b>	
<i>Chinamiris species</i>	
<b>ORTHOPTERA</b>	
<b>Tettigoniidae</b>	katydid
<i>Conocephalus bilineatus</i>	
<b>Gryllidae</b>	cricket
<i>Pteronemobius bigelowi</i>	
<b>Acrididae</b>	grasshoppers
<i>Sigaus campestris</i>	
<b>COLEOPTERA</b>	
<b>Carabidae</b>	ground beetles
<i>Neocicindella latecincta</i>	<i>tiger beetle</i>
<b>Cerambycidae</b>	
<i>Prionoplus reticularis</i>	<i>huhu</i>
<b>Coccinellidae</b>	
<i>Coccinella leonina</i>	<i>ladybird</i>
<b>Curculionidae</b>	weevils
<i>Eugnomus dispar</i>	
<b>Scarabaeidae</b>	chafers
<i>Costelytra zelandica</i>	
<i>Odontria striata</i>	<i>striped chafer</i>
<b>HYMENOPTERA</b>	
<b>Formicidae</b>	ant
<i>Monomorium antarcticum</i>	
<b>Ichneumonidae</b>	
<i>Netelia producta</i>	
<b>Pompilidae</b>	spider wasp
<i>Priocnemis carbonarius</i>	
<b>Colletidae</b>	native bee
<i>Leioproctus huakiwi</i>	
<b>LEPIDOPTERA</b>	
<b>Nepticulidae</b>	
<i>Stigmella kaimanua</i>	
<b>Tineidae</b>	
<i>Endopthora omogramma</i>	
<i>Erechthias fulguritella</i>	



<i>Erechthias acrodina</i>	
<i>Eschatotypa derogatella</i>	
<i>Opogona omoscopa</i>	
<i>Sagephora phortigera</i>	
<b>Cosmopterigidae</b>	
<i>Microcolona limodes</i>	
<b>Glyphipterigidae</b>	
<i>Glyphipterix cionophora</i>	
<i>Glyphipterix triselena</i>	
<i>Glyphipterix erastis</i>	
<b>Lyonetiidae</b>	
<i>Bedellia psammitis</i>	
<b>Plutellidae</b>	
<i>Plutella antiphona</i>	
<b>Carposinidae</b>	
<i>Heterocrossa philpotti</i>	
<b>Depressariidae</b>	
* <i>Agonopterix umbellana</i>	
<i>Nymphostola galactina</i>	
<b>Gelechiidae</b>	
<i>Anisoplaca achyrotia</i>	
<b>Oecophoridae</b>	
<i>Gymnobathra flavidella</i>	
<i>Gymnobathra tholodella</i>	
<i>Leptocroca scholaea</i>	
<i>Stathmopoda albimaculata</i>	
<i>Tingena plagiata</i>	
<i>Tingena basella</i>	
<i>Tingena ophiodyras</i>	
<i>Trachypepla photinella</i>	
<i>Trachypepla galaxias</i>	
<b>Pterophoridae</b>	plumemoth
<i>Aciptilia monospilalis</i>	
<i>Stenoptilia orites</i>	
<b>Choreutidae</b>	jets
<i>Asterivora new species</i>	
<b>Tortricidae</b>	leaf rollers
<i>Apoctena flavescens</i>	
<i>Capua semiferana</i>	
* <i>Cydia succedana</i>	
<i>Epichorista siriana</i>	
<i>Harmologa amplexana</i>	
<b>Pyralidae</b>	
* <i>Stericta carbonalis</i>	
<b>Crambidae</b>	
<i>Deana hybreasalis</i>	
<i>Eudonia dinodes</i>	
<i>Eudonia philerga</i>	
<i>Eudonia leptalea</i>	
<i>Eudonia sabulosella</i>	
<i>Eudonia submarginalis</i>	
<i>Orocrambus flexuosellus</i>	
<i>Orocrambus lewisi</i>	



<i>Orocrambus ramosellus</i>	
<i>Orocrambus vittellus</i>	
<i>Orocrambus vulgaris</i>	
<i>Scoparia exilis</i>	
<i>Scoparia minusculalis</i>	
<i>Scoparia ustimcaula</i>	
<i>Sceliodes cordalis</i>	
<i>Udea flavidalis</i>	
<i>Udea marmarina</i>	
<i>Uresiphita maoralis</i>	
<b>GEOMETRIDAE</b>	
<i>Austrocidaria similata</i>	
* <i>Chloroclystis filata</i>	
<i>Chloroclystis inductata</i>	
<i>Cleora scriptaria</i>	
<i>Dasyuris partheniata</i>	
<i>Declana floccosa</i>	
<i>Declana leptomera</i>	
<i>Dichromodes cynica</i>	
<i>Elvia glaucata</i>	
<i>Epiphyrne undosata</i>	
<i>Epiphyrne verriculata</i>	
<i>Epyaxa lucidata</i>	
<i>Gellonia dejectaria</i>	
<i>Homodotis megaspilata</i>	
<i>Helastia cinerearia</i>	
<i>Hydriomena deltoidata</i>	
<i>Ischalis fortinata</i>	
<i>Pasiphila muscosata</i>	
<i>Pseudocoremia lactiflua</i>	
<i>Sarisa muriferata</i>	
<b>Noctuidae</b>	
<i>Agrotis ipsilon</i>	
<i>Bityla defigurata</i>	
<i>Feredayia graminosa</i>	
<i>Graphania insignis</i>	
<i>Graphania morosa</i>	
<i>Graphania mutans</i>	
<i>Graphania nullifera</i>	
<i>Graphania plena</i>	
<i>Graphania ustistriga</i>	
<i>Meterana ochthistis</i>	
<i>Meterana stipata</i>	
<i>Persectania aversa</i>	
<i>Tmetolophota atristriga</i>	
<i>Tmetolophota propria</i>	
<i>Tmetolophota steropastis</i>	
<i>Tmetolophota sulcana</i>	
<b>Erebidae</b>	
<i>Celama parvitis</i>	
<i>Nyctemera annulata</i>	magpie moth
<i>Rhapsa scotoscialis</i>	
<b>Lycaenidae</b>	coppers/ blues



<i>Lycaena "comon copper" complex</i>	
<i>Zizina oxleyi</i>	
<b>Nymphalidae</b>	admirals
<i>Argyrophenga antipodum</i>	tussock
<i>Vanessa gonerilla</i>	red admiral
<i>Vanessa itea</i>	yellow admiral
<b>Pieridae</b>	white butterfly
* <i>Pieris rapae</i>	
<b>MANTODEA</b>	praying mantis
<i>Orthodera novaezelandiae</i>	
<b>PHASMIDA</b>	stick insects
<i>Clitarchus hookeri</i>	

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