northbarker
ECOSYSTEM SERVICES

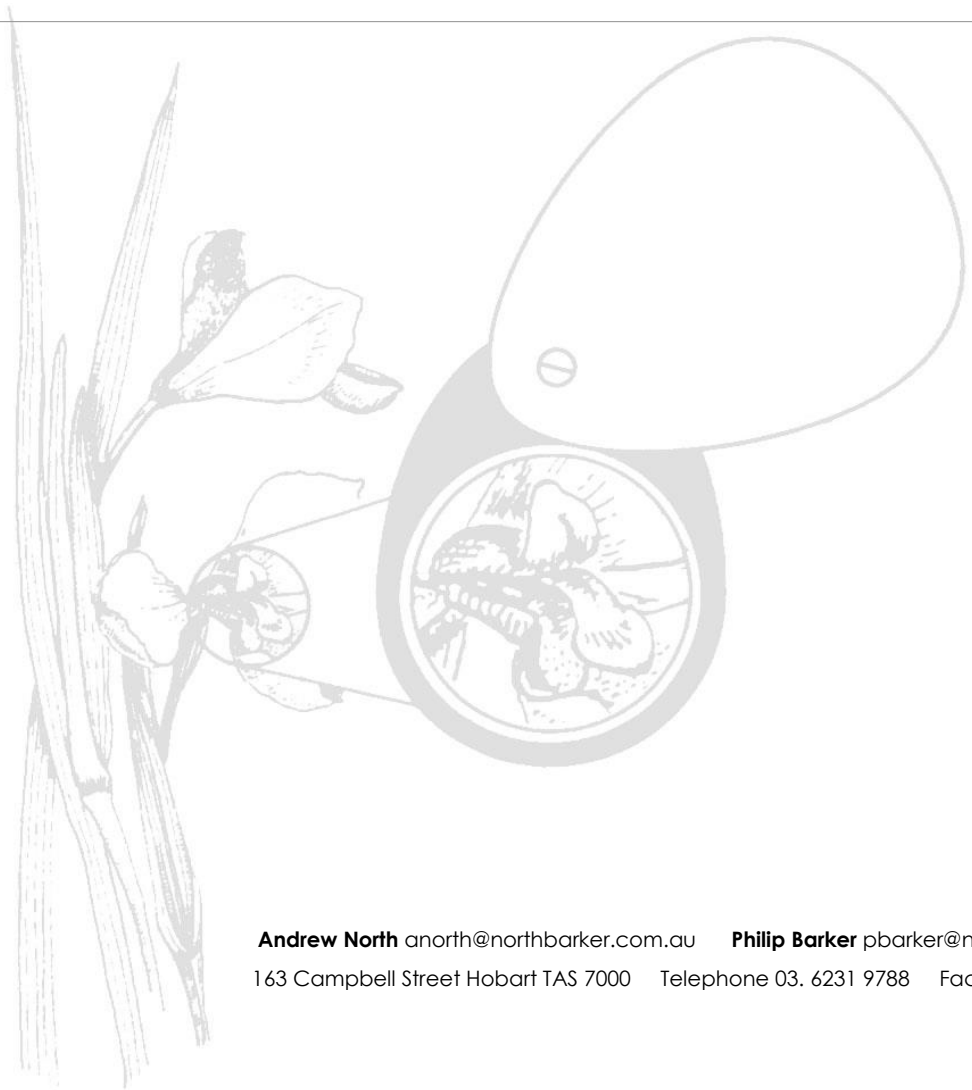
Ecclestone Road subdivision

Natural Values Assessment

6 February 2019

For 6ty°

SIX001



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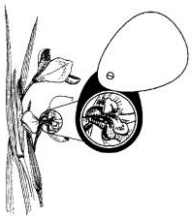

Summary

A 22-lot subdivision is planned for Ecclestone Road in Riverside, in northern Tasmania. This will involve the clearing of native vegetation. North Barker Ecosystem Services (NBES) have been contracted to survey flora and fauna values on the site and identify potential constraints. A summary of the findings, impact and recommendations is as follows:

Vegetation communities

The planned development will impact 12.47 and 0.11 ha of DAD and NBA communities, respectively. Neither of these communities are protected under any Act. To minimise the impact to the communities that remain in the area, and to reduce the spread of weeds and pathogens in general it is recommended that:

- All occurrences of declared weeds are treated prior to works.
- Best practice construction hygiene[1] should be practiced to prevent the spread of weed propagules in contaminated soil.
- Follow-up weed control implemented 6-12 months after works to treat any individuals that have colonised the disturbance area.

Threatened flora

Brunonia australis - listed rare under the Tasmanian Threatened Species Protection Act 1995 - occurs in three of the 22 lots: a total of 50 plants in 4 locations. A 'permit to take' will be required for impact to thee plants. No flora listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBCA) are likely to be impacted by this development.

Threatened fauna

Although no presence or sign (e.g. scats, nests) of threatened fauna species listed on the EPBCA or TSPA were observed within the study area, it is possible that quolls, Tasmanian devil, eastern-barred bandicoot, masked owl and Tasmanian wedge-tailed eagle occur in the study area. The clearance of the < 13 ha of vegetation is not expected to have a significant impact on any EPBCA or TSPA listed species. A single tree hollow, potentially suitable for masked owl, was located in the study area but is outside the impact area.

[1] DPIPWE 2015

Contents

1 Introduction

1.1 Background

6ty° Pty Ltd have requested a natural values assessment for a proposed 22-lot subdivision on Ecclestone Road, Riverside (Property ID 7655464, Title Reference 43468/1). The development will require the clearance of native vegetation, with a subsequent risk that values protected under environmental legislation may be affected. As a result, North Barker Ecosystem Services (NBES) have been contracted to survey flora and fauna values on the site and identify potential constraints. The site is zoned as Low Density Residential and is subject to the Biodiversity Code Under the West Tamar Interim Planning Scheme 2013.

1.2 Study area

The study area is in Riverside, Launceston in northern Tasmania (Figure 1). It is in the Tasmanian Northern Midlands bioregion[2] in the West Tamar City Council and is approximately 36.95 ha in extent.

The mean annual rainfall for Launceston (Kings Meadows) is 693 mm (Bureau of Meteorology). The site is at ~ 170 m asl and is relatively flat with a gentle north-east aspect. There is a small creek in the south east of the study area. The geology is Jurassic dolerite.

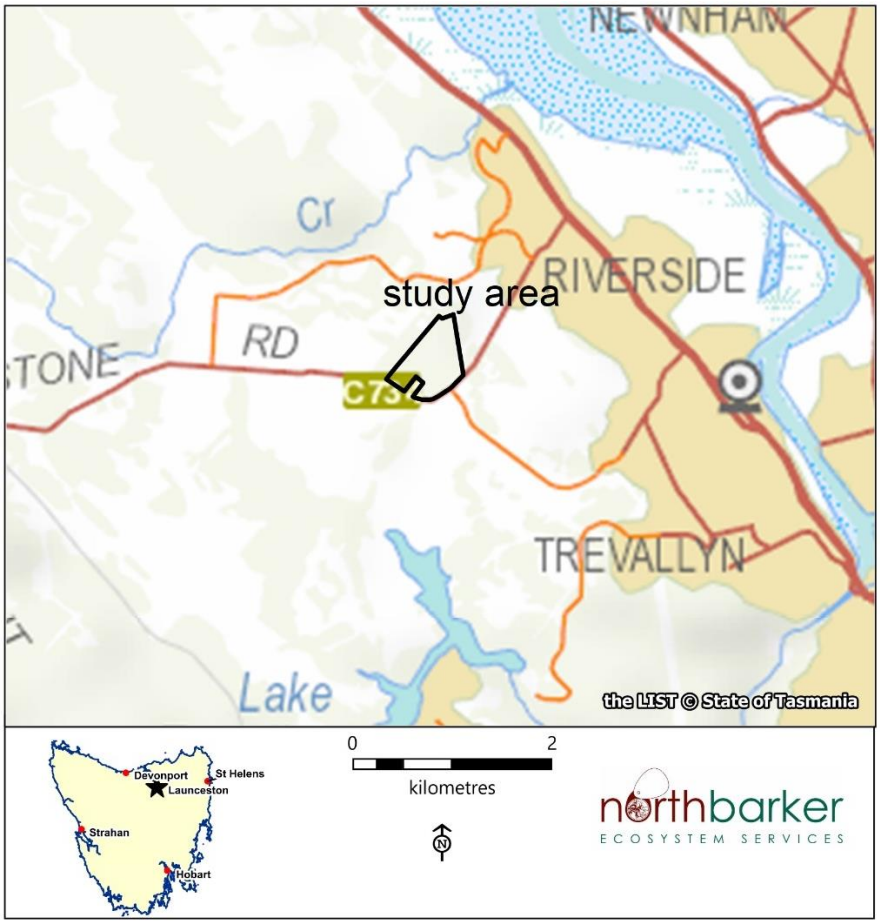

Figure 1: study area near Riverside in Launceston

[2] IBRA 7 (2012)

2 Methods

The following sources were used for biological records for the region:

- TASVEG version 3.0 digital layer[3];
- Natural Values Atlas (NVA) - all threatened species records within 5 km of the study area and threatened fauna considered possible to occur in suitable habitat[4];
- EPBCA Matters of National Environmental Significance database - a 5 km buffer was used to search for potential values[5];

2.1 Botanical Survey

This assessment was undertaken in accordance with the *Guidelines for Natural Values Surveys*[6]. Field work was carried out on the 26th of June 2018 and on 13th November 2018. Native vegetation was mapped in accordance with units defined in TASVEG 3.1[7]. Vascular plants were recorded in accordance with the current census of Tasmanian plants[8]. The site was mapped using a meandering area search technique[9]. Particular attention was given to habitats suitable for threatened species under the Tasmanian *Threatened Species Protection Act 1995* (TSPA) and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA), and to 'declared' weeds under the Tasmanian *Weed Management Act 1999* (WMA)[10].

2.2 Fauna survey

A search was made for sign (e.g. scats, tracks) and presence of potential threatened fauna concurrently with the botanical survey. A search for nests and tree hollows was done from the ground only. The survey was carried out in accordance with DPIPWE's 'Survey guidelines and management advice for development proposals that may impact on the Tasmanian devil (*Sarcophilus harrisii*)'.

2.3 Limitations

Due to various limitations (e.g. variations in species presence and detectability), no biological survey can guarantee that all species will be recorded during a single visit. The field surveys were undertaken in winter and spring, so seasonal and ephemeral species may have been overlooked or are seasonally absent, including summer flowering species. However, we are confident the surveys sufficiently captured community level diversity. We compensate for survey limitations in part by considering all listed threatened species from data from the Tasmanian *Natural Values Atlas* (NVA)[11]. These data include records of all threatened species known to occur, or with the potential to occur, up to 5 km from the study area.

3 Results - Biological values

3.1 Vegetation communities

The following TASVEG communities were recorded in the study area (Figure 2):

- DAD - *Eucalyptus amygdalina* forest and woodland (23.45 ha)
- DVG - *Eucalyptus viminalis* grassy forest and woodland (0.93 ha)
- DOV - *Eucalyptus ovata* forest and woodland (1.19 ha)
- NBA - *Bursaria - Acacia* woodland and scrub (11.38 ha)

[3] Kitchener and Harris 2013
[4] DPIPWE Natural Values Atlas Report, nvr_3_25-Jun-2018
[5] Commonwealth of Australia, EPBC Protected Matters Search Tool Report, 2018 (report PMST_WMVSBO)
[6] DPIPWE 2015
[7] Kitchener and Harris 2013
8 de Salas and Baker 2018
[9] Goff *et al.* 1982
10 Tasmanian State Government 1995; Commonwealth of Australia 1999
11 DPIPWE Natural Values Atlas Report, nvr_3_25-Jun-2018

DAD, DVG and NBA are not listed under any Act. DOV is listed as threatened under the NCA. A decision on the listing of *Eucalyptus ovata* dominated forest under the EPBCA is pending. That listing is specifically attributed to forests dominated by *E. ovata*, and hence will not apply here as the DOV in the study area is dominated by *E. viminalis* (and not classed as DVG due to the absence of a grassy understorey).

Figure 2: map of the vegetation communities, and flora and fauna values in the study area

3.1.1 DAD - *Eucalyptus amygdalina* forest and woodland (23.43 ha, Plate 1)

This is the most prevalent community in the study area. The canopy is dominated by *Eucalyptus amygdalina* with *E. viminalis* occasional. The trees belong to > 1 cohort, and while occasional larger trees (> 100 cm DBH) are present, most trees are in the 40-70 cm DBH range. The canopy is generally in good health. Regular understorey species include *Acacia dealbata* and *Exocarpos cupressiformis*. In large areas the ground cover is dominated by either *Pteridium esculentum* or *Gahnia radula*. Introduced species are common, the most notable of which is blackberry (*Rubus fruticosus*), which has formed infestations in places. In the south east of the study area some areas of this community have been used for dumping, and a few corrugated iron structures remain (Plate 2). The threatened *Brunonia australis* (TSPA rare) occurs in this community.

This community is not listed under any Act.

Plate 1: DAD in the study area

Plate 2: Corrugated iron structures and rubbish in the DAD in the south west of the study area

3.1.2 DVG - *Eucalyptus viminalis* grassy forest and woodland (0.93 ha)

A small patch of this community occurs in the south west of the study area, upslope from the moist areas along the watercourse. *Eucalyptus viminalis* is the canopy dominant, with *E. amygdalina* occasional. Trees are generally in the 50-70 cm DBH range, and in good health. Regular understorey species include *Bursaria spinosa* and *Exocarpos cupressiformis*. The ground cover is dominated by grasses, particularly *Poa labillardierei*; *Lepidosperma laterale* is also common. Blackberry (*Rubus fruticosus*) has formed infestations on the fence line.

This community is not listed under any Act.

3.1.3 DOV - *Eucalyptus ovata* forest and woodland (1.19 ha)

This community occurs in the moist drainage line in the south west of the study area. While *E. viminalis* is the canopy dominant and *E. ovata* is very sparse, this community is mapped as DOV rather than DVG due to the sedge-dominated understorey. On the creek line the understorey is dominated by *Melaleuca ericifolia*, while upslope drier habitat species such as *Bursaria spinosa* and *Acacia dealbata* occur. *Gahnia radula*, and *Lepidosperma* spp. dominate the ground cover layer. Introduced species are sparse.

This is a threatened community under the NCA.

3.1.4 NBA - *Bursaria - Acacia* woodland and scrub (11.38 ha, Plate 3)

This community occurs in drier sites, occupying much of the central part of the study area. The canopy consists largely of A*cacia mearnsii, and A. dealbata*. This community is generally species poor. Large areas of the ground cover are dominated by *Gahnia radula*. Rocky areas with areas of shallow soil, are in poor condition and there is no potential for threatened specialist rockplate species; *Cheilanthes austrotenuifolia* was common in these areas. A range of widespread introduced species are present (e.g. *Hypochaeris radicata, Lysimachia arvensis*) but declared weeds are largely absent.

Plate 3: NBA in the study area

3.2 Plant species

A total of 99 species of vascular plants were recorded in the study area (Appendix A). Fifty plants of the threatened *Brunonia australis* (TSPA rare) occur in four locations (in lots 1, 7 and 8, Plate 4). These records are close to previous records (from 2010). A targeted search effort was carried out in all areas of potential habitat, including previous locations of this species in the study area; in three of the previous locations no plants were located, but two these locations had a location accuracy of > 100 m. Regardless, we are confident that we have assessed the likely current extent of this species in the study area.

Poa mollis, also TSPA rare, has also been previously recorded in two locations the study area (21 plants in 2010). This species was not located in these areas in the current surveys. The similar *Poa labillardierei* was located in these areas and may have displaced this species. Given the survey effort and result, the likelihood of *Poa mollis* occurring on the site is considered low.

No additional threatened species are known within 500 m of the study area. However, several species have been recorded within 5000 m, as well as a number of species that are considered to have potential habitat in the region according to the EPBCA Protected Matters Search Tool. Each of these threatened flora species are presented in Table 1 in context of the suitability of habitat within the study area, and the likelihood of occurrence.

Plate 4: *Brunonia australis* in the study area

Table 1: Flora species of conservation significance known to occur, or which may potentially occur based on range boundaries, within a 5 km radius of the study areas.

Species	Status TSPA / EPBCA	Potential to occur in study area	Observations and preferred habitat[12]
Alternanthera denticulata lesser joyweed	Endangered/ -	LOW	*Alternanthera denticulata* displays a preference for rocky (dolerite) river margins, but has also been recorded from disturbed *Melaleuca ericifolia* swamp forest and damp riparian grasslands. Suitable habitat on site is limited and sub-optimal for this species and it is unlikely to have been overlooked.
Anogramma leptophylla annual fern	Vulnerable/ -	NONE	*Anogramma leptophylla* grows in shallow soil layers over rock, on exposed or semi-exposed outcrops in dry or damp sclerophyll forest. Plants are mostly found on rock ledges, often on, or just inside, the drip line of the overhead rock-face. The substrate is variable, including dolerite, basalt and sandstone. No suitable habitat in the study area.
Aphelia gracilis slender fanwort	Rare/ -	NONE	*Aphelia gracilis* inhabits damp sandy ground and wet places in the Midlands and north-east of the State. It may readily colonise sites after fire or other disturbance. No suitable habitat on site.
Aphelia pumilio dwarf fanwort	Rare/ -	NONE	*Aphelia pumilio* is found growing on damp flats, often with impeded drainage. The main vegetation types are lowland grassland (*Themeda triandra)* and dry sclerophyll forest and woodland dominated by *Eucalyptus viminalis*, *E. amygdalina* or *E. ovata*. No suitable habitat on site.
Barbarea australis riverbed wintercress	endangered/ -	NONE	*Barbarea australis* is a riparian species found near river margins, creek beds and along flood channels adjacent to the river. It tends to favour the slower reaches, and has not been found on steeper sections of rivers. It predominantly occurs in flood deposits of silt and gravel deposited as point bars and at the margins of base flows, or more occasionally or between large cobbles on sites frequently disturbed by fluvial processes. Some of the sites are a considerable distance from the river, in flood channels scoured by previous flood action, exposing river pebbles. Most populations are in the Central Highlands, but other populations occur in the north-east and upland areas in the central north. Not recorded within 5 km. No suitable habitat in the study

[12] Threatened Species Section (2018)

Species	Status TSPA / EPBCA	Potential to occur in study area	Observations and preferred habitat[12]
			area.
Blechnum spinulosum small raspfern	Endangered/ -	NONE	*Blechnum spinulosum* is an erect tufted fern, known from a few rivers in northern Tasmania. The species is strictly riparian in habitat, occurring amongst boulders and along shaded banks of rivers and creeks. In Tasmania, it is known to be extant at three locations: River Leven, Pipers River and the lower reaches of the South Esk River near Launceston. No suitable habitat in the study area.
Bolboschoenus caldwellii sea clubsedge	Rare/ -	NONE	*Bolboschoenus caldwellii* is widespread in shallow, standing, sometimes brackish water, rooted in heavy black mud. No suitable habitat in the study area.
Boronia gunnii river boronia	Vulnerable/ VULNERABLE	NONE	*Boronia gunnii* is strictly riparian in habitat, occurring in the flood zone of the Apsley, St Pauls, and Dukes rivers (where extant) and the Denison Rivulet and South Esk River (where presumed extinct) in rock crevices or in the shelter of boulders. The base substrate is always dolerite. No suitable habitat on site.
Caesia calliantha blue grasslily	Rare/ -	LOW	*Caesia calliantha* is found predominantly in the Midlands in grassland or grassy woodland including wattle and prickly box "scrub" (occasionally extending into forest, then usually dominated by *Eucalyptus viminalis* or *E. amygdalina*). It has also been recorded from grassy roadsides. While some habitat occurs in the study area, all potential areas were searched at the optimum time of year; it is a distinctive species and is unlikely to have been overlooked.
Caladenia caudata tailed spider-orchid	vulnerable/ VULNERABLE	VERY LOW	*Caladenia caudata* has highly variable habitat, which includes the central north: *Eucalyptus obliqua* heathy forest on low undulating hills; the north-east: *E. globulus* grassy/heathy coastal forest, *E. amygdalina* heathy woodland and forest, *Allocasuarina* woodland; and the south-east: *E. amygdalina* forest and woodland on sandstone, coastal *E. viminalis* forest on deep sands. Substrates vary from dolerite to sandstone to granite, with soils ranging from deep windblown sands, sands derived from sandstone and well-developed clay loams developed from dolerite. A high degree of insolation is typical of many sites. Not recorded within 5 km. The habitat on site is sub optimal for this species and it is unlikely to occur. The survey time was during flowering for this species and it is distinctive and unlikely to have been overlooked.
Callitris oblonga	Vulnerable/	NONE	*Callitris oblonga* subsp. *oblonga* occurs predominantly in riparian scrub, woodland and

Species	Status TSPA / EPBCA	Potential to occur in study area	Observations and preferred habitat[12]
subsp. *oblonga* south esk pine	ENDANGERED		forest (where it can extend away from rivers) in areas with low precipitation and usually sandy soil. It is local on the East Coast, particularly on the margins of the Swan, Apsley, South Esk, Cygnet and St Pauls rivers. A small population is also present in Cataract Gorge. This is a large, distinctive species that unlikely to have been overlooked.
Calochilus campestris copper beard-orchid	Endangered/ -	NONE	On mainland Australia, *Calochilus campestris* occurs on ridges and slopes in forest and woodland and can also be found in coastal heath and headlands. The species is known to colonise embankments and road verges. The habitat in Tasmania is poorly understood. There is only a single record of this species for Tasmania and it is highly unlikely that it occurs in the study area.
Calystegia sepium swamp bindweed	Rare/ -	VERY LOW	*Calystegia sepium* has been recorded from riverbanks and the margins of forests in the north of the State around the Tamar region, where it mainly occurs in *Melaleuca ericifolia* swamp forest and amongst *Phragmites australis* swampland. This is a distinctive perennial vine and is highly unlikely to have been overlooked.
Carex gunniana mountain sedge	Rare/ -	LOW	The habitat of *Carex gunniana* is poorly understood and highly variable. It includes wet eucalypt forest, sandy heathlands, margins of streams, littoral sands, shingle with seepage, damp grasslands within dry forest and rough pasture. No sedges that resemble this species were found during the survey, and it unlikely to have to have been overlooked.
Carex longebrachiata drooping sedge	Rare/ -	LOW	*Carex longebrachiata* grows along riverbanks, in rough grassland and pastures, in damp drainage depressions and on moist slopes amongst forest, often dominated by *Eucalyptus viminalis, E. ovata* or *E. rodwayi*. No sedges that resemble this species were found during the survey, and it unlikely to have to have been overlooked.
Centipeda cunninghamii erect sneezeweed	Rare/ -	NONE	*Centipeda cunninghamii* is found in a wide variety of soil types, usually in areas subject to flooding or where water is stagnant. The seasonally dry margins of wetlands and lagoons also have the potential to support this species. No suitable habitat in the study area.
Chiloglottis trapeziformis broadlip bird-orchid	Endangered/ -	VERY LOW	*Chiloglottis trapeziformis* is known from near Wynyard on sandy soil in damp sclerophyll forest. There is a historical record from dry open forest near Legana. It has also been recorded from *Leptospermum* (teatree) and *Allocasuarina* (sheoak) scrub on sandy humus overlying granite on Great Dog Island (Furneaux group). While this species

Species	Status TSPA / EPBCA	Potential to occur in study area	Observations and preferred habitat[12]
			occurs in a range of habitats there are very few records from Tasmania and the chances of this species occurring in the study area are very low.
Dianella amoena grassland flaxlily	Rare/ ENDANGERED	VERY LOW	*Dianella amoena* occurs mainly in the northern and southern Midlands, where it grows in native grasslands and grassy woodlands. Suitable habitat was limited in the study area. This is a distinctive species and it is highly unlikely that it was overlooked.
Discaria pubescens spiky anchorplant	Endangered/ -	NONE	*Discaria pubescens* is found sporadically in the Midlands and more abundantly in drier parts of the Central Highlands. It grows on sandy or gravelly soil, in basalt talus slopes and clefts amongst fractured dolerite rocks and flood channels. Many sites are in rough pasture, and it also grows on roadsides. Recent collections indicate the species is occasionally associated with sandstone outcrops. No suitable habitat in the study area.
Diuris palustris swamp doubletail	Endangered/ -	NONE	*Diuris palustris* occurs in coastal areas in grassy open eucalypt forest, sedgy grassland and heathland with *Leptospermum* (teatree) and *Melaleuca* (paperbark) on poorly- to moderately-drained sandy peat and loams, usually in sites that are wet in winter. No suitable habitat in the study area.
Epacris exserta south esk heath	Endangered/ ENDANGERED	NONE	*Epacris exserta* occurs along the lower reaches of the South Esk, North Esk and Supply rivers. It is a strictly riparian species that grows in areas subject to periodic inundation, mainly on alluvium amongst dolerite boulders within dense riparian scrub, and occasionally in open rocky sites. It has been recorded from 10-310 m above sea level. No suitable habitat in the study area.
Epilobium pallidiflorum showy willowherb	Rare/ -	LOW	*Epilobium pallidiflorum* occurs in wet places (e.g. natural wetlands amongst forest, margins of *Melaleuca ericifolia* swamp forest, scrubby-sedgy *E. ovata* woodland on heavy soils, etc.) mostly in the north and north-west of the State. There is limited habitat in the study area; this is a distinctive species and is unlikely to have been overlooked.
Glycine latrobeana clover glycine	vulnerable/ VULNERABLE	VERY LOW	*Glycine latrobeana* occurs in a range of habitats, geologies and vegetation types. Soils are usually fertile but can be sandy when adjacent to or overlaying fertile soils. The species mainly occurs on flats and undulating terrain over a wide geographical range, including near-coastal environments, the Midlands, and the Central Plateau. It mainly occurs in grassy/heathy forests and woodlands and native grasslands, and favours areas of loose sandy soil. No records within 5 km. The habitat for this species is sub-optimal and it is unlikely to occur.

Species	Status TSPA / EPBCA	Potential to occur in study area	Observations and preferred habitat[12]
Gratiola pubescens hairy brooklime	Vulnerable/ -	NONE	*Gratiola pubescens* is most commonly located in permanently or seasonally damp or swampy ground, including the margins of farm dams. There is no suitable habitat in the study area.
Gyrostemon thesioides broom wheelfruit	Rare/ -	NONE	*Gyrostemon thesioides* occurs predominately on dolerite in *Allocasuarina* (sheoak) forest in the north and east of the State. No suitable habitat in the study area.
Haloragis heterophylla variable raspwort	Rare/ -	NONE	*Haloragis heterophylla* occurs in poorly-drained sites (sometimes only marginally so), which are often associated with grasslands and grassy woodlands with a high component of *Themeda triandra* (kangaroo grass). It also occurs in grassy/sedgy *Eucalyptus ovata* forest and woodland, shrubby creek lines, and broad sedgy/grassy flats, wet pasture and margins of farm dams. No suitable habitat in the study area.
Hovea tasmanica rockfield purplepea	Rare/ -	VERY LOW	*Hovea tasmanica* occurs in central and north-eastern regions. It is usually found on dry, rocky ridges or slopes (mostly dolerite) in forest and riverine scrub. Limited habitat on site. A distinctive species that is highly unlikely to have been overlooked.
Juncus amabilis gentle rush	Rare/ -	VERY LOW	*Juncus amabilis* occurs in a variety of habitats, usually poorly-drained sites such as damp grasslands and grassy woodlands, wet pastures, roadside ditches and edges of still and slow-flowing waterbodies. As presently understood, the species is mainly confined to lowland areas in the eastern half of the State but there are potential higher elevation and more western records that require confirmation. There is limited habitat for this species in the study area. It is also a distinctive *Juncus* and is unlikely to have been overlooked.
Lachnagrostis punicea subsp. *punicea* bristle blowngrass	Rare/ -	NONE	*Lachnagrostis punicea* subsp. *punicea* (both subspecies) occurs in moist depressions in grassy woodlands/forests and grasslands, and on the edges of swamps and saline flats. No suitable habitat in the study area.
Lepidium hyssopifolium soft peppercress	endangered/ ENDANGERED	NONE	The native habitat of *Lepidium hyssopifolium* is the growth suppression zone beneath large trees in grassy woodlands and grasslands (e.g. over-mature black wattles and isolated eucalypts in rough pasture). *Lepidium hyssopifolium* is now found primarily under large exotic trees on roadsides and home yards on farms. It occurs in the eastern part of Tasmania between sea-level to 500 metres above sea level in dry, warm and

Species	Status TSPA / EPBCA	Potential to occur in study area	Observations and preferred habitat[12]
			fertile areas on flat ground on weakly acid to alkaline soils derived from a range of rock types. It can also occur on frequently slashed grassy/weedy roadside verges where shade trees are absent. No records within 5km. The study area is unsuitable for this species.
Lycopus australis australian gypsywort	Endangered/ -	VERY LOW	*Lycopus australis* occurs in moist shaded places including disturbed areas within *Melaleuca ericifolia* swamp forest, *Phragmites australis* reed beds, and rocky (dolerite) riverbeds fringed by riparian scrub. There are however few records of this species in Tasmania; it is a distinctive species and given the small area of suitable habitat it is unlikely that it was overlooked.
Lythrum salicaria purple loosestrife	Vulnerable/ -	VERY LOW	*Lythrum salicaria* inhabits swamps, stream banks and rivers mainly in the north and north-east of the State. It can also occur between gaps in *Melaleuca ericifolia* forest. This species can act as a weed, proliferating along roadsides and other disturbed areas, and, as horticultural strains are in cultivation and birds can disperse seed, some occurrences may not be native. It is a distinctive species and given the small area of suitable habitat it is unlikely that it was overlooked.
Mentha australis river mint	Endangered/ -	NONE	*Mentha australis* is known from riparian habitats along the lower reaches of the South Esk River, Lake Trevallyn and the Rubicon River, where it occurs along the rocky (dolerite) margins of rivers and lakes. There is no suitable habitat in the study area.
Muehlenbeckia axillaris matted lignum	Rare/ -	NONE	*Muehlenbeckia axillaris* is predominantly found in moist gravely or rocky places on the Central Plateau, extending out to the west, north-west and lower reaches of the South Esk River. No suitable habitat in the study area.
Myriophyllum integrifolium tiny watermilfoil	Vulnerable/ -	NONE	*Myriophyllum integrifolium* occurs mostly in the Northern Midlands, with isolated populations in the State's north, north-east and south. It grows at the margins of wetlands and in seasonally wet places, including depressions associated with small ephemeral lakes. It can occur in coastal heathland and in forest in the Midlands, where it is often associated with old muddy tracks. No suitable habitat in the study area.
Parietaria debilis shade pellitory	Rare/ -	NONE	*Parietaria debilis* occurs around muttonbird rookeries, on cliffs/rocks in the salt spray zone, in moist shaded areas in dune scrubs, and under rock overhangs in forested gullies. No suitable habitat in the study area.
Persicaria decipiens	Vulnerable/ -	VERY	*Persicaria decipiens* occurs on the banks of rivers and streams, mostly in the north of the

Species	Status TSPA / EPBCA	Potential to occur in study area	Observations and preferred habitat[12]
slender waterpepper		LOW	State, including King Island. The species may colonise farm dams. It is a distinctive species and given the limited suitable habitat it is unlikely that it was overlooked.
Persicaria subsessilis bristly waterpepper	Endangered/ -	VERY LOW	*Persicaria subsessilis* occurs in Launceston and on the Ringarooma River in rocky (dolerite) river margins, where it co-occurs with the more frequent *Persicaria hydropiper* (green waterpepper); disturbed *Melaleuca ericifolia* (coast paperbark) swamp forest and lagoon margins; *Cyperus lucidus* (leafy flatsedge) sedgeland with the allied *Persicaria praetermissa* (arrow waterpepper) prominent; and within openings in riparian scrub on alluvium. Habitat in the study area was sub optimal and this species is unlikely to have been overlooked.
Phyllangium divergens wiry mitrewort	Vulnerable/ -	NONE	*Pyllangium divergens* occurs in a wide variety of near-coastal habitats on a range of substrates, a common feature usually being bare ground (e.g. tracks) and rock exposures (e.g. outcrops, coastal cliffs, etc.). The site is not near the coast.
Prostanthera rotundifolia roundleaf mintbush	Vulnerable/ -	NONE	*Prostanthera rotundifolia* mainly occurs along flood-prone rocky riverbeds as a component of the dense riparian shrubbery but also extends to adjacent rocky slopes. Habitat in the study area is largely unsuitable – this is also a large and distinctive species that is highly unlikely to have been overlooked.
Pterostylis commutata midlands greenhood	endangered/ CRITICALLY ENDANGERED	NONE	No records within 5 km. *Pterostylis commutata* is restricted to Tasmania's Midlands, where it occurs in native grassland and *Eucalyptus pauciflora* grassy woodland on well-drained sandy soils and basalt loams. No suitable habitat in the study area.
Pterostylis ziegeleri grassland greenhood	vulnerable/ VULNERABLE	NONE	No records within 5 km. *Pterostylis ziegeleri* is restricted to the east and north of Tasmania. In coastal areas, the species occurs on the slopes of low stabilised sand dunes and in grassy dune swales, while in the Midlands it grows in native grassland or grassy woodland on well-drained clay loams derived from basalt. No suitable habitat in the study area.
Ranunculus pumilio var. *pumilio* ferny buttercup	Rare/ -	VERY LOW	*Ranunculus pumilio* var. *pumilio* occurs mostly in wet places (e.g. broad floodplains of permanent creeks, "wet pastures") from sea level to altitudes of 800-900 m above sea level. Limited potential due to the dense sward of sedges in the riparian habitat that reduces the chances of this species occurring.
Rumex bidens mud dock	R (V Pending)/ -	NONE	*Rumex bidens* grows at the margins of lakes, swamps, and slow-moving rivers and streams, and may also occur in drainage channels. No suitable habitat in the study

Species	Status TSPA / EPBCA	Potential to occur in study area	Observations and preferred habitat[12]
			area.
Schoenoplectus tabernaemontani river clubsedge	Rare/ -	NONE	*Schoenoplectus tabernaemontani* inhabits the margins of lagoons on King Island, Flinders Island and on some riverbanks in the Midlands. No suitable habitat in the study area.
Scutellaria humilis dwarf scullcap	Rare/ -	NONE	*Scutellaria humilis* is found in moist, shady places in the north-east and south-east of the State. Recent sites have been associated with rocky slopes and rises. No suitable habitat in the study area.
Senecio campylocarpus bulging fireweed	- (V Pending)/ -	NONE	*Senecio campylocarpus* occurs on grassy margins of permanent rivers in the Midlands and on broad floodplains. No suitable habitat in the study area.
Senecio psilocarpus swamp fireweed	Endangered/ ENDANGERED	NONE	*Senecio psilocarpus* is known from six widely scattered sites in the northern half of the State, including King and Flinders islands. It occurs in swampy habitats including broad valley floors associated with rivers, edges of farm dams amongst low-lying grazing/cropping ground, herb-rich native grassland in a broad swale between stable sand dunes, adjacent to wetlands in native grassland, herbaceous marshland and low-lying lagoon systems. No suitable habitat in the study area.
Siloxerus multiflorus small wrinklewort	Rare/ -	NONE	*Siloxerus multiflorus* occurs in a range of somewhat exposed lowland habitats, including bare soil and rocks amongst dense windswept coastal shrubbery to rock outcrops and bare ground associated with native grassland, grassy woodland and forest. No suitable habitat for this species.
Spyridium eriocephalum var. *eriocephalum* heath dustymiller	Endangered/ -	NONE	In Tasmania, *Spyridium eriocephalum* var. *eriocephalumis* known to be extant at a single subpopulation within East Risdon State Reserve. This is an erroneous record from the 1800's.
Spyridium vexilliferum var. *vexilliferum* helicopter bush	Rare/ -	NONE	*Spyridium vexilliferum* occurs in a range of vegetation types, including sandy heaths, rock plates and dry sclerophyll forest and woodland (mainly dominated by *Eucalyptus amygdalina*). It is found on a range of substrates (e.g. mudstone, granite, laterite gravels) from near-coastal areas in the east, north and west of the State, to the Midlands and lower Derwent Valley. It is most abundant in open or disturbed areas, as it can proliferate from soil-stored seed after disturbance. No suitable habitat in the

Species	Status TSPA / EPBCA	Potential to occur in study area	Observations and preferred habitat[12]
			study area.
Stylidium despectum small triggerplant	Rare/ -	NONE	*Stylidium despectum* has mainly been recorded from wet sandy heaths, moist depressions, soaks and hollows in near-coastal areas. It extends to similar habitat amongst forest and woodland in the Midlands. No suitable habitat in the study area.
Teucrium corymbosum forest germander	Rare/ -	VERY LOW	*Teucrium corymbosum* occurs in a wide range of habitats from rocky steep slopes in dry sclerophyll forest and *Allocasuarina* (sheoak) woodland, riparian flats and forest. Habitat in the study area is sub optimal for this species; it is also a distinctive species that is unlikely to have been overlooked.
Triptilodiscus pygmaeus dwarf sunray	Vulnerable/ -	NONE	*Triptilodiscus pygmaeus* grows within grasslands, grassy woodlands or rockplates, with the underlying substrate being mostly Tertiary basalt or Jurassic dolerite. The elevation range of recorded sites in Tasmania is 30-470 m above sea level, with an annual rainfall of about 450-600 mm. The species occurs within native grassland dominated by *Themeda triandra* (kangaroo grass). No suitable habitat.
Utricularia australis yellow bladderwort	Rare/ -	NONE	*Utricularia australis* has a widespread distribution, ranging from the Gordon River in the south-west to the northern part of Flinders Island in the far north-east (and also reportedly from the Derwent River in the State's south). It grows in stationary or slow-moving water, including natural lakes, farm dams and reservoirs, where it has been reported as forming 'locally dense swards'. No suitable habitat.
Velleia paradoxa spur velleia	Vulnerable/ -	VERY LOW	*Velleia paradoxa* is known from the Hobart and Launceston areas, and the Midlands and the Derwent Valley, where it occurs in grassy woodlands or grasslands on dry sites. It has been recorded up to 550 m above sea level at sites with an annual rainfall range of 450-750 mm. This is the northern extreme of the species in Tasmania with very few records this far north. Highly unlikely to occur.
Veronica plebeia trailing speedwell	Rare/ -	LOW	*Veronica plebeia* typically occurs in dry to damp sclerophyll forest dominated by *Eucalyptus amygdalina* on dolerite or Tertiary sediments, but can also occur in *Eucalyptus ovata* grassy woodland/forest and *Melaleuca ericifolia* swamp forest. Possible, but the dense sward of sedges in the riparian habitat reduces the chances of this species occurring.
Viola caleyana swamp violet	Rare/ -	VERY LOW	The habitat of *Viola caleyana* in Tasmania is poorly understood but includes lowland wet grasslands, possibly wet heathlands and a variety of forest types. There are very

Species	Status TSPA / EPBCA	Potential to occur in study area	Observations and preferred habitat[12]
			few records of this species in Tasmania, and it is unlikely to have been overlooked.
Xerochrysum bicolor eastcoast everlasting	Rare/ -	NONE	Species of *Xerochryrum* are poorly understood in Tasmania, especially the identification of coastal species (*X. bicolor* and *X. bracteatum*). *X. bicolor* may be restricted to stabilised dune systems. No suitable habitat in the study area.

3.3 Declared weeds

Three species of declared weeds occur in the study area: slender thistle (*Carduus pycnocephalus*), blackberry (*Rubus fruticosus,* Plate 5) and gorse (*Ulex europaeus*, Plate 6). Slender thistle occurs as an infestation in one area; blackberry has invaded areas along the southern boundary; and there is a single occurrence of the gorse (Figure 3).

Plate 5: blackberry infestation on the fenceline in the south of the study area

Plate 6: gorse in the study area

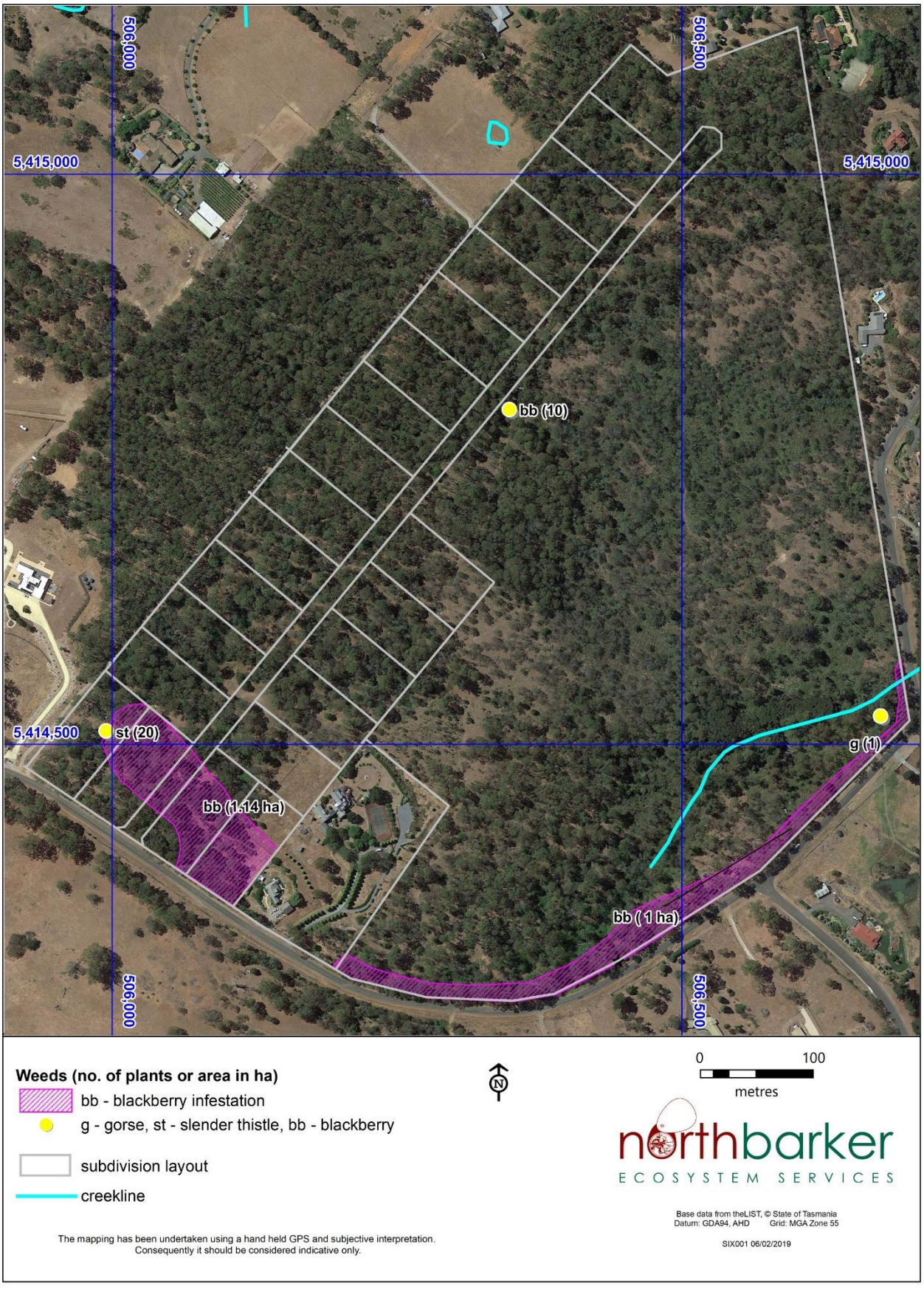

Figure 3: map of the declared weeds in the study area

3.4 Fauna conservation values (incl. habitat trees)

The surveys revealed no sighting or sign (e.g. scats, prints, nests) of any listed threatened fauna.

In the south east of the study area (and outside the impact area), there is a tree hollow in a large *Eucalyptus viminalis* (DBH 170 cm) of suitable potential dimensions for masked owl[13] (Plate 7).

In Table 2, all species known from within a 5 km radius (or considered likely to have potential habitat), as identified in the natural Values Atlas and EPBC Protected Matters Search Tool reports, are discussed[14]. Coastal, marine, cave-dwelling and wetland species (e.g. Australasian Bittern, Eastern Curlew) included in these reports are excluded from the table as they have no chance of occurring in the study area.

Plate 7: tree hollow in *Eucalyptus viminalis* in the study area

[13] Forest Practices Authority 2016
[14] DPIPWE Natural Values Atlas Report, nvr_3_25-Jun-2018, Commonwealth of Australia, EPBC Protected Matters Search Tool Report, 2018 (report PMST_WMVSBO)

Table 1: Fauna species of conservation significance previously recorded, or which may potentially occur, within 5 km of the study area[15]

Species	Status[16] TSPA/EPBCA	Potential to occur	Observations and preferred habitat[17]
BIRDS			
azure kingfisher *Alcedo azurea* ssp. *diemenensis* (*Ceyx azureus* ssp. *diemenensis*)	Endangered/ ENDANGERED	NONE	The Tasmanian subspecies of the azure kingfisher occurs in shady and overhanging forest vegetation along the forested margins of major rivers on the south, west, north and northwest coasts. It catches prey by plunging from perches overhanging the water. It feeds on small fish, freshwater crayfish, aquatic insects, and occasionally frogs. The main threat to the species is clearing and modification of river-side vegetation. No suitable habitat in the study area. Not recorded within 5 km of the study area. The watercourses in the study area are not sufficient to offer foraging or nesting habitat for this species.
grey goshawk *Accipiter novaehollandiae*	Endangered/-	LOW	Recorded within 500m of the study area. Nesting habitat potential in the study area is very low. The species may forage in the area on occasion but the relatively closed nature of the forest across much of the study area is sub-optimal for this species.
wedge-tailed eagle *Aquila audax fleayi*	Endangered/ ENDANGERED	LOW	Recorded within 500 m of the study area. No nests were observed in the study area and the aspect of the site is sub-optimal for nesting trees. The species may forage in the area on occasion but the relatively closed nature of the forest across much of the study area is sub-optimal for this species.
white-bellied sea-eagle *Haliaeetus leucogaster*	Vulnerable/ MIGRATORY	NONE	Occurs in coastal habitats and large inland waterways. No nests were observed in the study area. Forages in coastal and wetland environments.
Swift parrot *Lathamus discolor*	Endangered/ ENDANGERED	VERY LOW	Recorded within 500 m of the study area. However, the study area is not within the core range of this species. Also, this species' preferred foraging habitat tree - blue gum (*Eucalyptus globulus*) - is not present, and black gum (*Eucalyptus ovata*) – another

[15] DPIPWE Natural Values Atlas Report, nvr_3_25-Jun-2018, Commonwealth of Australia, EPBC Protected Matters Search Tool Report, 2018 (report PMST_WMVSBO)
[16] National - Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* including JAMBA, CAMBA and Migratory species; State - Tasmanian *Threatened Species Protection Act, 1995.*
[17] Bryant & Jackson 1999;

Species	Status[16] TSPA/EPBCA	Potential to occur	Observations and preferred habitat[17]
			foraging tree - is very sparse in a small area in the study area. Breeding is not known from the area and based on the lack of observations highly unlikely to occur.
masked owl *Tyto novaehollandiae castanops*	Endangered/ VULNERABLE	LOW - MODERATE	Recorded within 500 m of the study area. Requires a mosaic of forest and open areas for foraging and large old-growth hollow-bearing white gum trees for nesting. One potentially suitable nesting tree present and may hunt over study area.
fork-tailed swift *Apus pacificus*	-/MIGRATORY	VERY LOW	This species is predicted to occur in the area by habitat mapping only. Most records of the Fork-tailed swift are from Bass Strait Islands with fewer on mainland northern Tasmania. Almost exclusively an aerial species, with no likelihood of roosting in the study area.
Hirundapus caudacutus white-throated needletail	-/MIGRATORY	LOW	This species is infrequently recorded in Tasmania and although it may sporadically occur over the area it is an aerial feeder and the impact on this species is considered negligible.
satin flycatcher *Myiagra cyanoleuca*	-/MIGRATORY	LOW	A summer migrant that is widespread in Tasmanian forested habitats. Is sensitive to fragmentation and canopy thinning. Optimal habitat is considered to contain old growth elements and occur along water courses, but the species is not entirely absent from habitats lacking these features. May occur in the general area at low frequency. Highly unlikely to be meaningfully impacted by a proposal of this nature.
Japanese snipe *Gallinago hardwickii*	-/MIGRATORY	NONE	This species is predicted to occur in the area by habitat mapping only. Typical habitat is the low vegetation around wetlands. Habitat in the study area is entirely unsuitable for this species.

Species	Status[16] TSPA/EPBCA	Potential to occur	Observations and preferred habitat[17]
Ardea alba great egret	-/MIGRATORY	NONE	This species is predicted to occur in the area by habitat mapping only. A non-breeding wetland species with no habitat on site.
Ardea ibis cattle egret	-/MIGRATORY	NONE	This species is predicted to occur in the area by habitat mapping only. A cosmopolitan species that self-colonised Tasmania in the 1960's and migrates annually for the non-breeding season. It is infrequent, and often recorded foraging in pasture. No habitat on site.
MAMMALS			
Tasmanian devil *Sarcophilus harrisii*	Vulnerable/ VULNERABLE	MODERATE	Recorded within 500 m of the study area. No suitable den habitat on the site, and no scats or tracks were recorded. It is however quite possible that the species may forage in the area.
Eastern Quoll *Dasyurus viverrinus*	-/ ENDANGERED	MODERATE	No scats or tracks were located but suitable habitat is widespread in study area.
spotted-tailed quoll *Dasyurus maculatus*	Rare/ VULNERABLE	MODERATE	No scats or tracks were located but suitable habitat is widespread in study area.
Eastern barred-bandicoot *Perameles gunnii*	-/VULNERABLE	MODERATE	The study area is within the geographic range of this species. Although not generally a suitable grassy habitat there are localised grassy patches and there is dense undergrowth suitable for cover. If present it is likely to be in relatively low numbers.
REPTILES			
Tussock Skink *Pseudemoia pagenstecheri*	Vulnerable/-	NONE	Inhabits tussock grasslands. No suitable habitat in the study area.
INVERTEBRATES			

Species	Status[16] TSPA/EPBCA	Potential to occur	Observations and preferred habitat[17]
Green-lined ground beetle *Catadromus lacordairei*	Vulnerable/-	NONE	The species occurs in open grassy woodland associated with wetlands at low elevations. No suitable habitat.
Mount Arthur Burrowing Crayfish *Engaeus orramakunna*	Vulnerable/ VULNERABLE	NONE	Not recorded within 5 km of the study area, and the catchment range for this species is not near the study area.
Tasmanian Chaostola Skipper *Antipodia chaostola leucophaea*	Endangered/ ENDANGERED	LOW	*Gahnia radula* is common in places on the site, often forming dense swards. This plant is the larval host plant for this species. There are however no confirmed records of the skipper within 5 km of the site, and this is a relatively common understorey plant that has a broader distribution than the skipper.
snail (Cataract Gorge) *Pasmaditta jungermanniae*	Rare/-	NONE	Known only from the Cataract Gorge and nearby locations.
spider (Cataract Gorge) Migas plomleyi	Rare/-	NONE	Only know from the slopes surrounding Cataract Gorge, near Launceston. Inhabits burrows in moss covering boulders and in crevices in open bushland.
AMPHIBIANS			
Green and Golden Frog *Litoria raniformis*	Vulnerable/ VULNERABLE	NONE	Recorded within 500 m of the study area. Requires shallow standing water. No suitable habitat in the study area.
Striped Marsh Frog *Limnodynastes peroni*	Endangered / VULNERABLE	NONE	No suitable habitat in the study area.
FISH			

Species	Status[16] TSPA/EPBCA	Potential to occur	Observations and preferred habitat[17]
Galaxiella pusilla eastern dwarf galaxias	Vulnerable/ VULNERABLE	NONE	Lives in still or slow-flowing waters such as ponds, swamps, drains and backwaters of streams, often containing dense aquatic or emergent plants. No suitable habitat present.
Swan Galaxias *Galaxias fontanus*	Endangered /ENDANGERED	NONE	Found only in the Swan River and Macquarie River catchments of eastern Tasmania.
Prototroctes maraena australian grayling	Vulnerable/ VULNERABLE	NONE	Occurs in unpolluted streams with large pools and major rivers. No suitable habitat.

4 Assessment of impact and mitigation

While the entire property was surveyed, only the western side is planned for this 22-lot subdivision development; it is understood the eastern half may be developed at a later stage. The area occupied by the 22 lots and the internal road is ~12.58 ha, yielding a balance of ~24.37 ha that will not be included in this development.

4.1 Vegetation communities

The DAD and the NBA communities in the study area will be impacted by this development (12.47 and 0.11 ha, respectively). Neither of these communities are protected under any Act.

To mitigate the impact of vegetation clearance efforts should be made to reduce the risk of the spread of weeds and pathogens during construction. Accordingly, the implementation of the proposal would benefit from a weed management plan.

- It is recommended that all occurrences of declared weeds are treated prior to works.
- Best practice construction hygiene[18] should be practiced to prevent the spread of weed propagules in contaminated soil. This should involve cleaning all machinery before leaving the works area, as well as not bringing dirty machinery into the site.
- Follow-up weed control implemented 6-12 months after works to treat any individuals that have colonised the disturbance area.

Furthermore, indirect impacts on vegetation outside the build areas should be minimised by clearly defining the extent of clearance required for the project and avoiding impact outside of these areas.

4.2 Plant species

The proposed development will impact on 50 *Brunonia australis* (TSPA rare); these are in lots 1, 7 and 8.

4.3 Threatened fauna habitat (incl. habitat trees)

Although no presence or sign (e.g. scats, nests) of threatened fauna species listed on the EPBCA or TSPA were observed within the study area, it is possible that quolls, Tasmanian devil, eastern-barred bandicoot, masked owl and Tasmanian wedge-tailed eagle occur in the study area.

4.3.1 Spotted-tailed quoll

The habitat loss of potential habitat by the current proposal could conceivably reduce the carrying capacity of the habitat in the area for this species. It is unknown exactly how many quolls could be displaced by the expected loss of habitat, but a rough estimate of density in non-core habitat is approximately 1 animal per 300 ha. A viable population of about 50 quolls is thought to require about 15,000 ha of continuous habitat. The clearance area is small (<13 ha) and is therefore not expected to have a significant impact on this species.

4.3.2 Eastern quoll

The impact may result in little more than a contraction in home range, or potential displacement to a neighbouring home range. There is no indication that the site is important for dispersal or connectivity and the proposal has no potential for significant impacts to this species.

[18] DPIPWE 2015

4.3.3 Tasmanian devil

While devils may forage in the area, the extent of the impact area (< 13 ha) is considerably less than a typical home range for this species. While density may exceed this in optimum habitat, the impact to this wide-ranging species by the current development is not significant.

4.3.4 Eastern barred bandicoot

The mosaic of habitat on the site may support this species. The scale of the development does not however represent a significant impact to this wide-ranging species.

4.3.5 Tasmanian wedge-tailed eagle

No eagle nests were located during the survey, but this species may forage in the area; this is a wide-ranging species and the proposed development is not expected to have a significant impact on this species.

4.3.6 Tasmanian masked owl

This species may forage in the area, and a single tree hollow, potentially suitable for this species was located in a *Eucalyptus viminalis* in the east of the study area; this is however outside the planned impact area for this development. There is no indication that the site is important for dispersal or connectivity and the proposal has no potential for significant impacts to this species.

5 Legislative Requirements

5.1 Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

The EPBCA is structured for self-assessment; the proponent must indicate whether or not the project is considered a 'controlled action' which if confirmed would require approval from the Commonwealth Minister.

The development of the subdivision will not have a "significant impact" on any of the nationally listed species with the potential to occur in the study area.

The current impact footprint does not affect any vegetation communities listed under this Act.

5.2 Tasmanian *Threatened Species Protection Act 1995*

The impact to the 50 *Brunonia australis* will require a 'permit to take' from the Policy and Conservation Advice Branch (PCAB) at the Department of Primary Industries, Parks, Wildlife and the Environment (DPIPWE).

5.3 Tasmanian *Nature Conservation Act 2002*

Of the four vegetation communities on site, *Eucalyptus ovata* forest and woodland (DOV), is listed under the Act. No impact to this community is expected by the current subdivision proposal.

5.4 Tasmanian *Weed Management Act 1999*

West Tamar is a Zone B municipality for the species of declared weed observed on site (blackberry, slender thistle and gorse). According to the provisions of the *Weed Management Act 1999,* Zone B municipalities are those which host widespread infestations where control and prevention of spread is the principle aim. The containment principles of

this Act should be sufficiently met with best practice construction hygiene that prevents the transport of contaminated material off site.

5.5 West Tamar Interim Planning Scheme 2013

The clearance of native vegetation triggers the Biodiversity Code (E8) of the Scheme. The purpose of the code (E.8.1.1) is to:

a) protect, conserve and enhance the region's biodiversity in consideration of the extent, condition and connectivity of critical habitats and priority vegetation communities, and the number and status of vulnerable and threatened species; and

b) ensure that development is carried out in a manner that assists the protection of biodiversity by:

i) minimising vegetation and habitat loss or degradation; and

ii) appropriately locating buildings and works; and

iii) offsetting the loss of vegetation through protection of other areas where appropriate.

The objective of the Development Standards of the Scheme (E.8.6.1) are to ensure that:

a) vegetation identified as having conservation value as habitat has priority for protection and is appropriately managed to protect those values; and

b) the representation and connectivity of vegetation communities is given appropriate protection when considering the impacts of use and development.

Acceptable Solution A1 to the Standards is:

A1.1 Clearance or disturbance of priority habitat is in accordance with a certified Forest Practices Plan or;

A1.2 Development does not clear or disturb native vegetation within areas identified as priority habitat.

There is no Priority Vegetation overlay in the study area, so the development can meet Acceptable Solution A1.

Acceptable Solution A2 to the Standards is:

A2 Clearance or disturbance of native vegetation is in accordance with a certified Forest Practices Plan.

The development will require the clearance of native vegetation and does not accord with a certified Forest Practices Plan so will therefore be required to meet Performance Criteria P2.1.

P2.1 Clearance or disturbance of native vegetation must be consistent with the purpose of this Code and not unduly compromise the representation of species or vegetation communities of significance in the bioregion having regard to the:

a) quality and extent of the vegetation or habitat affected by the proposal, including the maintenance of species diversity and its value as a wildlife corridor; and

The quality of the vegetation likely to be impacted (mostly DAD and a small area of NBA) is in moderate condition: there are infestations of blackberry on the southern and eastern boundaries, and there is evidence of selective harvesting of wood throughout. Several roads and tracks are also evident, permitting access for the dumping of waste; this is especially

evident in the south-west. While there are occasional large trees (>100 cm DBH) in the impact area, most trees are < 80 cm DBH.

The property is surrounded by modified land that has been partially or wholly cleared of native vegetation. The nearest block of native vegetation lies to ~1 km to the north west. Hence, the vegetation in the study area cannot be considered an important corridor.

The impact of the development is not expected to reduce species diversity in the bioregion.

Accordingly, the development can meet this criterion.

b) means of removal; and

This is unknown at this stage.

c) value of riparian vegetation in protecting habitat values; and

The riparian vegetation is in the south-east corner of the property, and this vegetation will not be impacted by this development. The development can therefore meet this criterion.

d) impacts of siting of development (including effluent disposal) and vegetation clearance or excavations, in proximity to habitat or vegetation; and

Within the context of this development there are no alternatives regarding siting as the entire property is entirely native vegetation; the siting of the development will therefore unavoidably impact native vegetation. This native vegetation community (DAD and NBA) is however well-represented in the bioregion, and the development will not meaningfully compromise the representation of these communities or their species in the bioregion. The development can therefore meet this criterion.

e) need for and adequacy of proposed vegetation or habitat management; and

Given the scale of this development it is not expected that a vegetation or habitat management plan is required. The development can therefore meet this criterion.

f) conservation outcomes and long-term security of any offset in accordance with the General Offset Principles for the RMPS, Department of Primary Industries, Parks, Water and Environment.

It is not known if any the impact due to this development will require offset under these principles.

6 Conclusion and recommendations

A 22-lot subdivision is planned for Ecclestone Road in Riverside, in northern Tasmania. This will involve the clearing of native vegetation and impact a threatened flora species (*Brunonia australis* – TSPA rare). A summary of the impact and recommendations is as follows:

<u>Vegetation communities</u>

The planned development will impact 12.47 and 0.11 ha of DAD and NBA communities, respectively. Neither of these communities are protected under any Act. To minimise the impact to the communities that remain in the area, and to reduce the spread of weeds and pathogens in general it is recommended that:

- All occurrences of declared weeds are treated prior to works.

- Best practice construction hygiene[19] should be practiced to prevent the spread of weed propagules in contaminated soil.
- Follow-up weed control implemented 6-12 months after works to treat any individuals that have colonised the disturbance area.

Threatened flora

Brunonia australis (TSPA rare) occurs in three of the 22 lots – a total of 50 plants in 4 locations. A 'permit to take' will be required for impact to thee plants. No flora listed under the EPBCA are likely to be impacted by this development.

Threatened fauna

Although no presence or sign (e.g. scats, nests) of threatened fauna species listed on the EPBCA or TSPA were observed within the study area, it is possible that quolls, Tasmanian devil, eastern-barred bandicoot, masked owl and Tasmanian wedge-tailed eagle occur in the study area. The clearance of < 13 ha of vegetation is not expected to have a significant impact on any EPBCA or TSPA listed species. A single tree hollow, potentially suitable for masked owl, was located in the study area but is outside the impact area.

[19] DPIPWE 2015

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8 Appendix A: Plant species recorded in the study area

Status codes:

ORIGIN	NATIONAL SCHEDULE	STATE SCHEDULE
i - introduced	EPBC Act 1999	TSP Act 1995
d - declared weed WM Act	CR - critically endangered	e - endangered
en - endemic to Tasmania	EN - endangered	v - vulnerable
t - within Australia, occurs only in Tas.	VU - vulnerable	r - rare

Sites:

1	DAD - E506048, N5414409	26/06/2018	Richard	White
2	NBA - E506407, N5414836	26/06/2018	Richard	White
3	DOV - E506539, N5414470	26/06/2018	Richard	White
4	DVG - E506563, N5414426	26/06/2018	Richard	White

Site	Name	Common name	Status
	DICOTYLEDONAE		
	APIACEAE		
1	*Hydrocotyle hirta*	hairy pennywort	
	ASTERACEAE		
1	*Carduus pycnocephalus*	slender thistle	d
1 4	*Cassinia aculeata subsp. aculeata*	dollybush	
1 2	*Cirsium vulgare*	spear thistle	i
1 2	*Euchiton japonicus*	common cottonleaf	
1	*Hypochaeris radicata*	rough catsear	i
1	*Lagenophora stipitata*	blue bottledaisy	
1	*Senecio sp.*	groundsel	
	BORAGINACEAE		
1	*Cynoglossum suaveolens*	sweet houndstongue	
	BRUNONIACEAE		
1	*Brunonia australis*	blue pincushion	r
	CAMPANULACEAE		
1	*Wahlenbergia sp.*	bluebell	
	CASUARINACEAE		
1	*Allocasuarina littoralis*	black sheoak	
	CONVOLVULACEAE		
1 2	*Dichondra repens*	kidneyweed	
	DROSERACEAE		
1	*Drosera hookeri*	grassland sundew	en
1	*Drosera peltata subsp. auriculata*	tall sundew	
	EPACRIDACEAE		
1	*Acrotriche serrulata*	ants delight	
1	*Epacris impressa*	common heath	
1	*Lissanthe strigosa subsp. subulata*	peachberry heath	
	EUPHORBIACEAE		
1	*Poranthera microphylla*	small poranthera	
	FABACEAE		
1	*Bossiaea prostrata*	creeping bossiaea	
1	*Daviesia latifolia*	hop bitterpea	
3	*Ulex europaeus*	gorse	d
	FUMARIACEAE		
1	*Fumaria sp.*	fumitory	i
	GENTIANACEAE		
1 2 4	*Centaurium erythraea*	common centaury	i
1	*Centaurium tenuiflorum*	slender centaury	i
1	*Cicendia filiformis*	slender cicendia	i

	GERANIACEAE		
1	*Geranium sp.*	native geranium	
	GOODENIACEAE		
1	*Goodenia lanata*	trailing native-primrose	
	HALORAGACEAE		
1 2	*Gonocarpus tetragynus*	common raspwort	
	LAURACEAE		
1 3 4	*Cassytha melantha*	large dodderlaurel	
	MIMOSACEAE		
1 2 3 4	*Acacia dealbata subsp. dealbata*	silver wattle	
1	*Acacia floribunda*	gossamer wattle	i
2 4	*Acacia mearnsii*	black wattle	
1 2	*Acacia melanoxylon*	blackwood	
1	*Acacia verticillata*	prickly moses	
	MYRTACEAE		
1 2 3 4	*Eucalyptus amygdalina*	black peppermint	en
3	*Eucalyptus ovata var. ovata*	black gum	
1 3 4	*Eucalyptus viminalis subsp. viminalis*	white gum	
1 3	*Melaleuca ericifolia*	coast paperbark	
	OLEACEAE		
1	*Ligustrum vulgare*	privet	i
	OXALIDACEAE		
1 2 4	*Oxalis perennans*	grassland woodsorrel	
	PITTOSPORACEAE		
1	*Billardiera mutabilis*	green appleberry	
1 2 4	*Bursaria spinosa subsp. spinosa*	prickly box	
1	*Pittosporum undulatum*	sweet pittosporum	i
	PLANTAGINACEAE		
1	*Plantago lanceolata*	ribwort plantain	i
	POLYGALACEAE		
1	*Comesperma volubile*	blue lovecreeper	
	PRIMULACEAE		
1	*Lysimachia arvensis*	scarlet pimpernel	i
	RANUNCULACEAE		
1	*Clematis aristata*	mountain clematis	
1 2 3 4	*Clematis sp.*	clematis	
	ROSACEAE		
1 2	*Acaena novae-zelandiae*	common buzzy	
4	*Cotoneaster sp.*	cotoneaster	i
2	*Rosa rubiginosa*	sweet briar	i
1 3 4	*Rubus fruticosus*	blackberry	d
	RUBIACEAE		
1 2	*Coprosma quadrifida*	native currant	
1	*Galium sp.*	bedstraw	
	SANTALACEAE		
1 2 4	*Exocarpos cupressiformis*	common native-cherry	
	SCROPHULARIACEAE		
1	*Veronica calycina*	hairy speedwell	
	SOLANACEAE		
1	*Solanum laciniatum*	kangaroo apple	
	THYMELAEACEAE		

1	*Pimelea humilis*	dwarf riceflower	
	VIOLACEAE		
1	*Viola hederacea*	ivyleaf violet	
	MONOCOTYLEDONAE		
	ARACEAE		
1	*Zantedeschia aethiopica*	arum lily	i
	CYPERACEAE		
1	*Carex breviculmis*	shortstem sedge	
1 2 3 4	*Gahnia radula*	thatch sawsedge	
1 2 3	*Lepidosperma ensiforme*	arching swordsedge	
1 2 3 4	*Lepidosperma laterale*	variable swordsedge	
	IRIDACEAE		
1	*Diplarrena moraea*	white flag-iris	
	JUNCACEAE		
1	*Juncus procerus*	tall rush	
1	*Juncus sarophorus*	broom rush	
	LILIACEAE		
1	*Arthropodium strictum*	chocolate lily	
1	*Bulbine bulbosa*	golden bulbine-lily	
1	*Burchardia umbellata*	milkmaids	
1	*Dianella revoluta*	spreading flaxlily	
1	*Thysanotus patersonii*	twining fringelily	
1	*Wurmbea uniflora*	oneflower early nancy	
	ORCHIDACEAE		
1	*Chiloglottis triceratops*	threehorned bird-orchid	
1	*Pterostylis sp.*	greenhood	
1	*Thelymitra nuda*	plain sun-orchid	
	POACEAE		
1	*Agrostis capillaris*	brown top bent grass	i
1	*Aira caryophyllea*	silvery hairgrass	i
1	*Anthoxanthum odoratum*	sweet vernalgrass	i
1	*Austrostipa semibarbata*	fibrous speargrass	
1 2 4	*Austrostipa sp.*	speargrass	
1 4	*Briza minor*	lesser quaking-grass	i
1	*Cynosurus echinatus*	rough dogstail	i
1 4	*Dactylis glomerata*	cocksfoot	i
1	*Ehrharta distichophylla*	hairy ricegrass	
1	*Ehrharta stipoides*	weeping grass	
1 4	*Poa labillardierei*	silver tussockgrass	
1	*Poa rodwayi*	velvet tussockgrass	
1 4	*Poa sp.*	poa	
1 2	*Rytidosperma sp.*	wallabygrass	
1 2 4	*Themeda triandra*	kangaroo grass	
	XANTHORRHOEACEAE		
1 2 3	*Lomandra longifolia*	sagg	
	PTERIDOPHYTA		
	ASPIDIACEAE		
2 3	*Polystichum proliferum*	mother shieldfern	
	BLECHNACEAE		
3	*Blechnum nudum*	fishbone waterfern	
	DENNSTAEDTIACEAE		
1 3	*Pteridium esculentum subsp. esculentum*	bracken	
	DICKSONIACEAE		
1 3	*Dicksonia antarctica* soft treefern	soft treefern	