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Construction Environmental Management Plan

Proposed UTAS Pedestrian Bridge, Invermay

Prepared for
University of Tasmania

Client representative
Sam Tucker

Date
14 August 2019

Rev 01



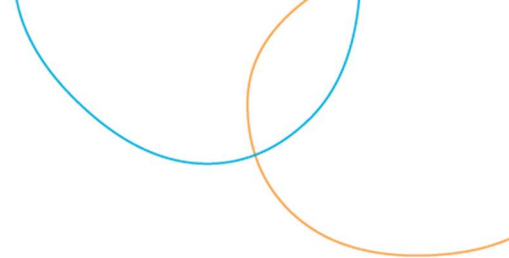


Table of Contents

| | |
|---|----------|
| 1. Background | 3 |
| 2. Project Description | 4 |
| 2.1 Construction Expected Timeframes | 4 |
| 2.2 Construction Methodology | 5 |
| 2.3 Operating Hours | 5 |
| 3. Legislative requirements | 5 |
| 4. Surrounding land uses | 5 |
| 5. Water | 6 |
| 6. Flora and Fauna Protection | 6 |
| 7. Weed Management | 7 |
| 8. Soil Management | 8 |
| 8.1 Acid Sulfate Soils (ASS) | 8 |
| 8.2 Potentially Contaminated Soils | 8 |
| 9. Operational Requirements | 9 |
| 10. Summary of Mitigation Measures | 9 |
| 11. Unexpected Finds Protocol | 10 |

List of Figures

| | |
|------------------------------------|---|
| Figure 1- Site location plan | 4 |
|------------------------------------|---|

List of tables

| | |
|--|----|
| Table 1 Summary of mitigation measures | 10 |
|--|----|

Appendices

- Appendix A** — Proposed design
- Appendix B** — Flora and Fauna Report

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|-------------------------------------|---|---------------------|
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Revision History

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| 00 | CEMP | SLR | LK | BH | 27/06/2019 |
| 01 | Updated to incorporate unexpected finds protocol. | DL | SLR | SLR | 14/08/2019 |

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1. Background

The University of Tasmania (UTAS) is developing a pedestrian-cycle bridge at the UTAS Invermay Campus. **pitt&sherry** were engaged by the University of Tasmania (UTAS) to prepare a Construction Environmental Management Plan (CEMP) for the construction and works associated with the pedestrian-cycle bridge development.

The proposed bridge will occupy small areas on the northern (approximately 150 m²) and southern side (approximately 190 m²) of the North Esk River located in Launceston Tasmania (herein referred to as the 'the site'). The site occupies the river bank and nature strip on either side of the river and part of 21 Boland Street on the southern side and 6 Barnards Way Inveresk, Invermay on the northern side. The construction of the bridge will also involve the advancement of supporting piles at two locations in the river channel. The majority of the site is Department of Primary Industries, Water and Environment (DPIPWE) Crown Land and consists of a nature strip on either side of the North Esk River. The site has been disturbed in the past and hosts a number of declared and environmental weeds. No mature trees are present on site. The site also occupies part of title references 174633/2 on the north shore and title reference 144355/1 and 31568/2 on the southern shore. A Site Location Plan which indicates the land parcels and areas of soil disturbance is provided in Figure 1.

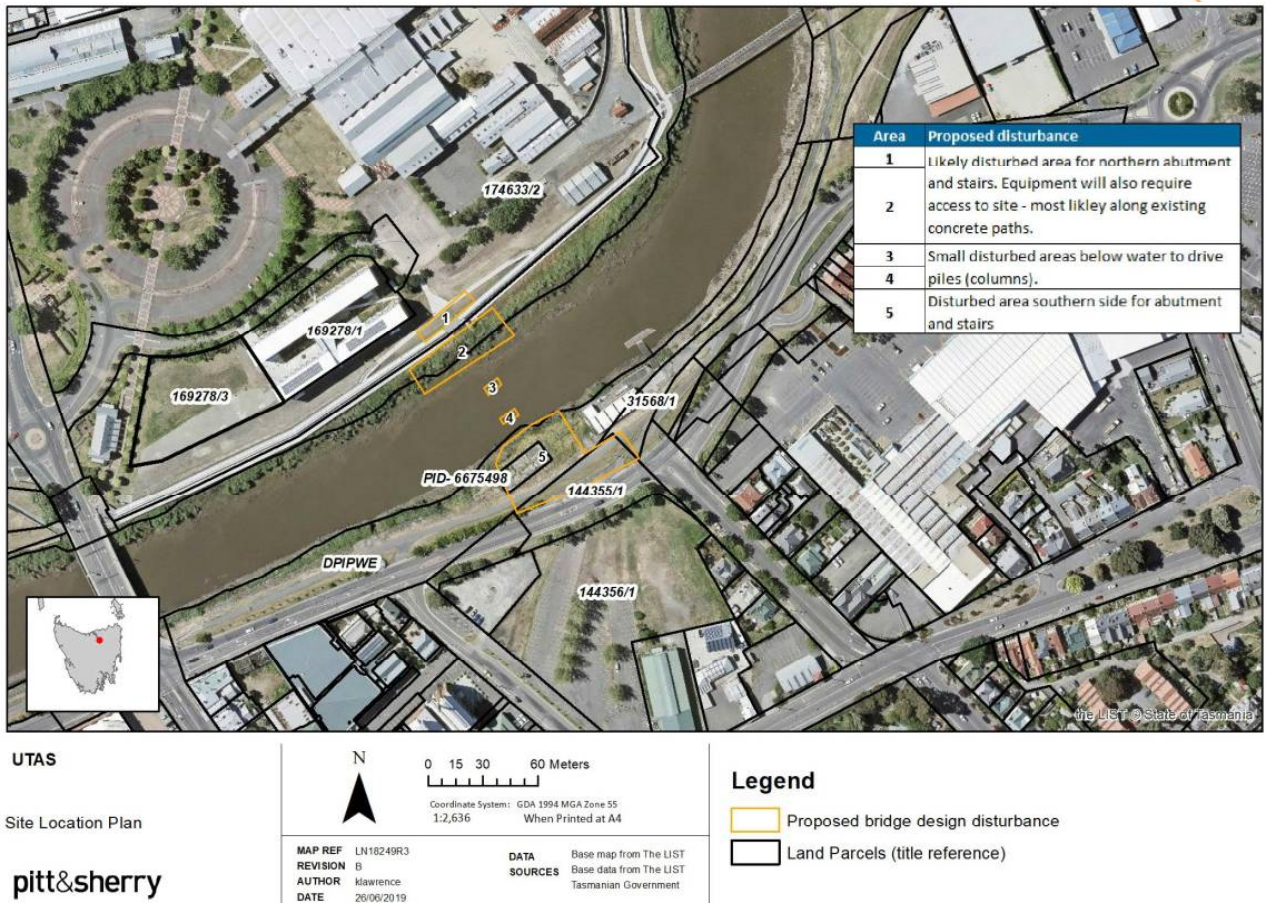


Figure 1- Site location plan

pitt&sherry was engaged by Council to prepare an Environmental Site Assessment (ESA)¹ to support a development application for the bridge development. The ESA included a review of historical land uses and determined that a number of potential sources of contamination existed on site. Preliminary testing identified a localized area of soil contamination (lead and benzo(a)pyrene).

This Construction Environmental Management Plan (CEMP) has been prepared to align with the findings of the ESA to identify potential risks associated with earthworks required during construction, and to outline measures to avoid or mitigate potential impacts.

2. Project Description

It is proposed to construct a pedestrian-cycle bridge over the North-Esk River. Drawings showing the bridge design are attached in Appendix A. The proposed bridge will be constructed in a two-stage process. Stage one will entail construction from the north landing bank/platform spanning to the northern side of Boland Street. Stage one will also include pedestrian connections to the existing shared pathways. Stage two will complete the bridge link over Boland Street and connect to a mid-level floor on the proposed Willis Street Campus building.

2.1 Construction Expected Timeframes

Works will occur over a relatively short timeframe and are expected to be completed by the end of 2020.

¹ Phase 1 Environmental Site Assessment – Proposed UTAS Pedestrian Bridge Invermay, pitt&sherry (May 2019)

2.2 Construction Methodology

The bridge is to be built under a design and construct contract under which the final construction methodology and materials will be finalized. The proposed design has been included in Appendix A.

It is expected that no excavation will occur on the northern side of the bridge. Minimal excavation will be required on the southern side at each landing. It is not expected that excavation will extend beyond 1 m in depth.

2.3 Operating Hours

Works will generally be undertaken during the following hours:

Monday to Friday: 7am to 6pm

3. Legislative requirements

A development application is to be submitted for Council approval and works will be required to be conducted in accordance with the planning permit issued and the DA documentation. No approvals under the *Environmental Management and Pollution Control Act 1994* are considered necessary as no significant environmental impacts are likely to result from the proposed works. The following additional legislative requirements may apply:

- a permit to take may be required under the *Threatened Species Protection Act 1995* if threatened plants are to be disturbed by the proposed works
- declared weeds are required to be managed in accordance with the *Weed Management Act 1999*.

Control measures must be put in place by the contractor to prevent the following:

- destruction of native vegetation and threatened species
- discharge of pollutants to the North Esk River
- river bank erosion or collapse
- excessive noise emissions
- excessive dust and air emissions
- release of hazardous chemicals.

4. Surrounding land uses

The proposed works are located on both sides of the North Esk River. The site is surrounded by a mix of light commercial, residential and open parkland uses:

- East: North Esk River with the row club building, Boland Street and Becks Home Timber and Hardware and residential properties approximately 200 m beyond.
- West: North Esk River with UTAS student accommodation, an open storage area, education building and carparking. Invermay Road, retail shops and residential properties are located approximately 250 m beyond.
- North: Queen Victoria Museum with the University of Tasmania Inveresk Campus beyond
- South: Boland Street with open space, parking, with the National Automobile Museum of Tasmania, Crystal Cleaning approximately 100 m beyond.

There are currently no sensitive uses adjoining the site however there are sites either side where workers, residents and students are present on a daily basis. The UTAS student accommodation is adjacent to the site and the university campus extends from the site. These uses should be considered, with access managed through adequate fencing and signage.

The noise generated from the works will be managed by limiting working times between 7am and 6pm. Work will not be undertaken on Sundays. No special control or mitigation measures are considered necessary for noise other than adherence to hours of operation. A complaints protocol is to be developed for the proposed works

Traffic to and from the site associated with the trenching will be limited and is not expected to impact the safety or efficiency of the road network. No special traffic management arrangements are considered necessary.

5. Water

The site is located on either side of the North Esk River. A small concrete slab is located on the southern shore and the river foreshore vegetated. Levees on either side of the river direct any surface runoff adjacent to the channel towards river.

There is no public stormwater infrastructure shown within this the site on The LIST and those services in Boland St are identified as gravity mains.² These are higher than the site and are unlikely to offer any service to the development.

All soils excavated on the southern side of the river are proposed to be contained as described in section 8.2 due to potential contamination. As a result, no leachate or run-off from excavated soils will be generated. If soils are very wet at the time of excavation, some leachate may run from excavated material but the volume of this material is proposed to be low.

Excavation pits are unlikely to stay open long enough to fill with sufficient water to warrant pumping out. However, if significant water was encountered during trenching, pumping may be required followed by adequate disposal due to the close vicinity of the site to the river.

Installation of the piles within the river is likely to increase turbidity and sedimentation during works. The duration of works within the river should thus be reduced where possible. As the works will not be ongoing, any increase in suspended sediments within the river are likely to subside following cessation of works.

Given the relatively limited duration of the excavation works and the limited excavation depth proposed, no significant, long term impacts on water sources is anticipated.

Temporary sediment run-off may be generated following weed removal and site preparation works on the northern side of the river. However, no contamination was identified in soils on that side of the river.

Implementation of standard erosion and sediment control measures, including silt mesh and diversion bunds, will ensure any mobilized sediments do not cause any environmental nuisance.

No refueling will be occurring on site and the activities proposed are not considered to have the potential for the release of fuels or other pollutants. No special precautions are considered necessary.

6. Flora and Fauna Protection

According to TASVEG 3.0 mapping, the vegetation community on the northern river foreshore would be classified as 'agricultural, urban and exotic vegetation' (FWU), with a vegetation community description of 'weed infestation'. Vegetation beyond the river foreshore on the northern bank and the southern side of the river within the site is classified as 'agricultural, urban and exotic' species (FUR) with a vegetation community description of 'urban areas'. The site does not support and vegetation larger than low growing grasses and shrubs, consistent with earthworks which would have occurred during the construction of the levees.

A flora and fauna assessment³ was undertaken at the site of the proposed development. The flora and fauna assessment confirmed that vegetation along the banks of the North Esk River consists of highly disturbed riparian

² LIST Map www.thelist.tas.gov.au. Website accessed January 2019.

³ *University of Tasmania Proposed Footbridge – Flora and Fauna Assessment Report (R01)*. Prepared by Umwelt (Australia) Pty Ltd on behalf of Pitt&Sherry, February 2019

vegetation. The findings of the survey were as follows:

- No Threatened Ecological Communities identified under either the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or the *Tasmanian Nature Conservation Act 2002* (NC Act) was recorded in the Study Area.
- No threatened flora as listed under either the Commonwealth EPBC Act or the Tasmanian Threatened Species Protection Act 1995 (TSP Act) were recorded within the Study Area. Assessment of available habitats using the results of the field survey indicates that due to historic disturbance associated with urban development in the Study Area, threatened flora species are considered unlikely to occur.
- No threatened fauna was recorded within the Study Area, during the field survey. The proposed development will not impact any critical habitat elements for any threatened species identified with potential to occur including Tasmanian wedge-tailed eagle, grey goshawk, white-bellied sea-eagle, Australasian bittern or the fish species Australian grayling.
- Implementation of the various mitigation measures proposed under sections 5 and 8 will ensure that impact of sedimentation; siltation and erosion upon the riparian habitats adjacent to the construction area are minimized.

7. Weed Management

Three declared weeds, as listed under the *Weed Management Act 1999* (WM Act), were identified during the flora and fauna assessment²: crack willow, blackberry and Paterson's curse. These weeds must be managed, controlled or eradicated in-line with the WM Act and the Tamar Valley Weed Strategy.⁴ Any clearing for trenching should ensure any other weeds disturbed are disposed of appropriately and not placed in any mulching facilities.

Weed management controls implemented by the construction contractor shall also aim to prevent the spread of weeds on the site and off site and the introduction of the weeds particularly in disturbed areas.

The following weed management controls shall be implemented:

- Prior to works commencing, declared and environmental weeds within the construction area will be controlled by a licensed contractor;
- Prior to entering the construction area all personnel will complete a weed management induction;
- A wash down area will be established on site, and will be maintained to prevent the further spread of declared and environmental weeds. Prior to leaving site, vehicles and/or machinery must be adequately clean to prevent the spread of weeds;
- Soil and vegetative matter from the clean down area is to be removed regularly and stockpiled and/or disposed of to an appropriate site;
- Signage will be established at clean and wash-down points, directing machinery/ vehicle operators to use these facilities;
- Weeds have the potential to germinate in the project area during construction within areas such as around infrastructure, fencing, soil stockpiles, disturbed areas, etc. As such, on-going weed control works will be maintained during construction;
- Any topsoil/bedding that is imported to site is required to be certified weed free (where practicable);
- Any excess soil/fill cannot be used onsite, will be disposed of at a licensed receiving facility or other property with an

⁴ Tamar Valley Weed Strategy Working Group,

<http://www.weeds.asn.au/>. Website accessed January 2019.

approved planning permit to receive such material;

- Weed-infested stockpiles as well as topsoil which are to be transported away must be covered to protect against further spread and contamination
- Disturbed areas must be re-sown as soon as practicable to minimize the area of exposed soil for weed establishment and spread; and
- Post work monitoring of weeds and any new infestations controlled.

8. Soil Management

The history of development and use across the site means that soils are unlikely to be reflective of original sediments. The area is alluvial in nature and is comprised of estuarine deposits. Some fill material has been imported to the site and various surrounding land uses have resulted in contamination of soils on site. In the site on the southern bank of the of North Esk River, construction and demolition waste was identified. Some litter has also been dumped on the bank. On the northern side of the river, the soil was identified as clay, whilst on the southern side, the soil was a combination of gravel, loam and silt.

8.1 Acid Sulfate Soils (ASS)

The Tasmanian Acid Sulfate Soils Information (TASSI) database accessed via the LIST, identified coastal acid sulfate soil ASS (0-20 m AHD zone) on the site. The northern river shore, and a strip on the southern shore close to the river, had a high probability of costal ASS occurrence. This equates to a >70% chance of occurrence with ASS generally within upper 1 m. No excavation will occur in these areas.

The remainder of the site on the southern side of the river had a low probability of costal ASS occurrence, which corresponds to a 6-70% chance of occurrence. Minimal soil excavation is proposed in these areas and no ASS management plan is considered necessary. However regular visual monitoring of the works area should be undertaken to identify signs of ASS oxidation, such as:

- Unexplained scalding, degradation or death of vegetation
- Unexplained death of aquatic biota
- Formation of the mineral jarosite and other acidic salts in exposed or excavated soils
- Areas of blue-green water or extremely clear water indicating high concentrations of aluminium
- Rust-coloured deposits on plants, banks of drains, waterbodies and watercourses indicating iron precipitates
- Excessive corrosion of concrete and/or steel structures in contact with soil or water
- Black waters indicating deoxygenation
- Sulfurous smells (eg hydrogen sulphide or rotten egg gas).

Sediment under the water will be displaced during pile driving but not removed from the river.

8.2 Potentially Contaminated Soils

Sampling and testing of soils was undertaken by **pitt&sherry** in November 2018 at the location of the proposed soil

excavations.⁵ The results showed a localized area of soil contamination (benzo(a)pyrene and lead) on the southern side of the bridge near the rowing club.

The risk assessment undertaken as part of the environmental site assessment (**pitt&sherry**, 2019) determined that the risk to workers from exposure to the identified contamination was likely to be low. However, the risk can be further reduced by the implementation of standard dust reduction measures and through the use of appropriate personal protective equipment (PPE) during works such as protective clothing, gloves, eye wear and dust masks when conditions require. An operational Workplace Health and Safety (WHS) Plan is to be prepared and implemented. The WHS Plan should include the potential presence of asbestos in soils (although no asbestos was visually identified during the site assessment).

All excavated soils should be treated as potentially contaminated. Excavated soil shall be placed in a water tight skip bin with a lid to prevent the ingress of water or wrapped in plastic and contained within an earth bund. The materials should be inspected and sampled by an appropriately qualified person for waste classification purposes. The soil analytical results should be compared against the EPA Tasmania *Information Bulletin No.105, Classification and Management of Contaminated Soil for Disposal* (Version 3, 2018) and managed accordingly. Soils found to be contaminated will be disposed of off-site at an appropriately authorized waste facility (based on the contamination levels). Management and transport of the soil would have to be subject to EPA approvals.

The Unexpected Finds Protocol outlined in Section 11 should be implemented where suspected contaminated or hazardous materials are encountered during excavation works.

River Sediment

It is expected that sediments will not be removed during pile driving (under the water). Sediment will be displaced but will not be extracted from the river. Pile driving shall be completed in a way that minimises sediment disturbance where possible. However, it is expected that sediment will be displaced and an increase in turbidity may also occur temporarily. The installation of piles within the river and will not increase workers exposure.

9. Operational Requirements

Dust minimisation measures should be implemented to mitigate potential impacts on construction workers and pedestrians. Public access should be restricted around the work area and excavations to minimise the potential for exposure to dust borne contaminants and to prevent injury.

Staff and visitors are to be inducted into the WHS Plan and the required protective measures required relating to potential soil contamination on site.

A complaints and communications strategy is to be developed with all complaints being referred to the project manager for immediate action.

An incident reporting procedure will be implemented to record, investigate and report any spills or unscheduled discharges. In the event that an incident occurs, the project manager is to co-ordinate corrective actions. Contingency measures will be developed based on the incident requirements (for example erecting bunds around excavation areas, lining for drainage systems).

10. Summary of Mitigation Measures

Measures to be implemented to avoid or mitigate impacts potentially occurring from the works are summarised in Table 1.

⁵ Phase 1 Environmental Site Assessment – Proposed UTAS Pedestrian Bridge Invermay, **pitt&sherry** (May 2019)

Table 1 Summary of mitigation measures

| Potential Impact | Mitigation Measure |
|------------------------|--|
| Water | <ul style="list-style-type: none"> • Appropriate erosion and sediment control measures • Silt mesh barriers if sediments are saturated • Diversion bunds if trenches are to remain open for extended periods |
| Vegetation Management | <ul style="list-style-type: none"> • Implementation of weed management control measures (refer to Section 7) |
| Contaminated soil | <ul style="list-style-type: none"> • Prepare and implement WHS Plan and task specific Safe Work Method Statements • Use of appropriate PPE by all personnel on site when required, to prevent direct contact with soil and dust inhalation • Excavated soil to be treated as potentially contaminated, placed in a water tight skip bin with a lid, or wrapped in plastic and contained within an earth bund • Excavated soil to be inspected and tested by an appropriately qualified person for waste classification purposes • Soils to be classified in accordance with EPA Information Bulletin No.105 and managed and disposed according to the classification level. Remove contaminated material to an approved disposal facility (pending results and EPA approval). |
| Dust and Air Emissions | <ul style="list-style-type: none"> • Implement dust minimisation measures • Public access to be restricted • Preparation and implementation of WHS Plan • Site inductions for personnel and visitors • Use of appropriate PPE by all personnel on site when required • Return excavated fill to trenches as soon as practical (if no contamination identified) |
| Soil Management | <ul style="list-style-type: none"> • Standard erosion and sediment control measures • Visual monitoring of the works area should be undertaken to identify signs of acid sulfate soil oxidation (refer to section 8.1) • Implement Unexpected Finds Protocol. |
| Noise Impacts | <ul style="list-style-type: none"> • Adherence to hours of operation • All machinery to be in good working order with appropriate noise attenuation devices fitted • Follow up on any complaints received in accordance with complaints procedure |

11. Unexpected Finds Protocol

Purpose

This protocol has been provided in response to the potential to unexpectedly encounter contaminated soil or hazardous materials during excavation activities. This protocol applies to all site works undertaken during the construction period.

All personnel onsite should be aware of this protocol and receive the appropriate level of training for the tasks being undertaken.

Contaminated Soils

Unexpected finds associated with contaminated soils can include many different types of material, which can be encountered during excavation. The following are signs of contaminated material (but not limited to):

- Odours
- Discolouration or staining
- Minimal or stressed vegetation
- Fragments of metal, glass, wood or other foreign material
- Fibrous or corrugated sheeting which potentially contain asbestos
- Presence of underground tanks or infrastructure.

What to do if an unexpected find is encountered?

In the event that any unusual soil conditions are encountered or any of the above, the following steps should be implemented:

- Immediately STOP WORK and secure the work area with tape/bunting or temporary fencing.
- Notify the Environmental Manager

The environmental manager will determine what response is necessary, which may involve undertaking an environmental investigation or a review of the Safe Work method Statement / Job Safety Assessment to determine if the associated risks are adequately controlled.

Recommencement of work in the excluded work area can only occur following approval to proceed from the Environmental Manager.

Plans of the proposed bridge

Appendix A

PLANNING EXHIBITED DOCUMENTS
Ref. No: DA 0312/2019
Date advertised: 21/09/2019
Planning Administrator: *[Signature]*

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Document Set ID: 4139463
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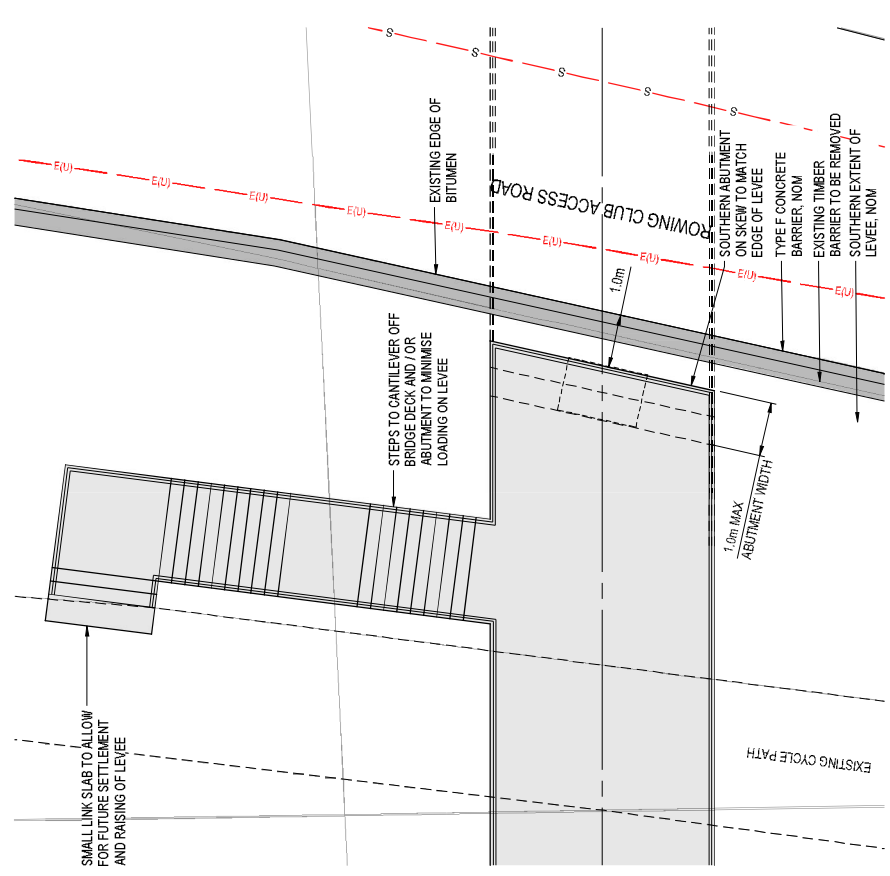
 **PLANNING EXHIBITED
DOCUMENTS**

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Planning Administration
Document Set ID: 4139463

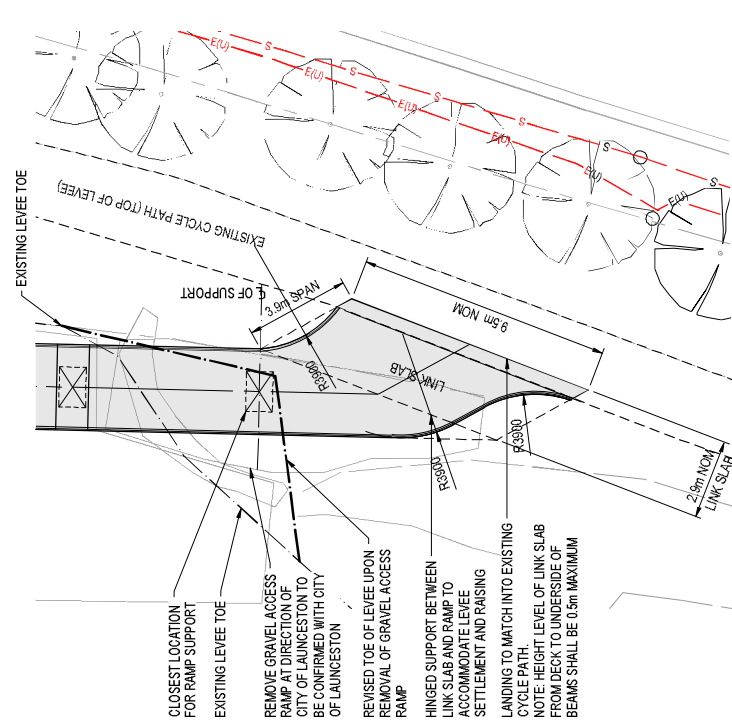
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DETAIL A
1:100
P.100

NOTE:
1. APPROPRIATE SCOUR PROTECTION SHALL BE DESIGNED BELOW BOTH LINK SLABS AND BELOW THE LOWER STAIRS, WHERE VEGETATION IS UNLIKELY TO ESTABLISH.



DETAIL B
1:200
P.100

KEY:
 -S- SEWER
 -SW- STORMWATER
 -E(U)- ELECTRICAL (UNDERGROUND)
 -T- TELSTRA

REFERENCE FILES ATTACHED: Layout Link Crossings; LN18249-X1800; LN18249-X100

| No. | DESCRIPTION | DRAWN | DESIGNED | REVIEWED | DATE |
|-----|--------------------------|-------|----------|----------|------------|
| 1 | ISSUED FOR TENDER PERIOD | MP | B.H. | B.H. | 20/09/2019 |
| 2 | ISSUED FOR TENDER PERIOD | MP | B.H. | B.H. | 18/09/2019 |
| 3 | ISSUED FOR TENDER PERIOD | MP | B.H. | B.H. | 18/09/2019 |
| 4 | ISSUED FOR TENDER PERIOD | MP | B.H. | B.H. | 18/09/2019 |
| 5 | ISSUED FOR TENDER PERIOD | MP | B.H. | B.H. | 18/09/2019 |

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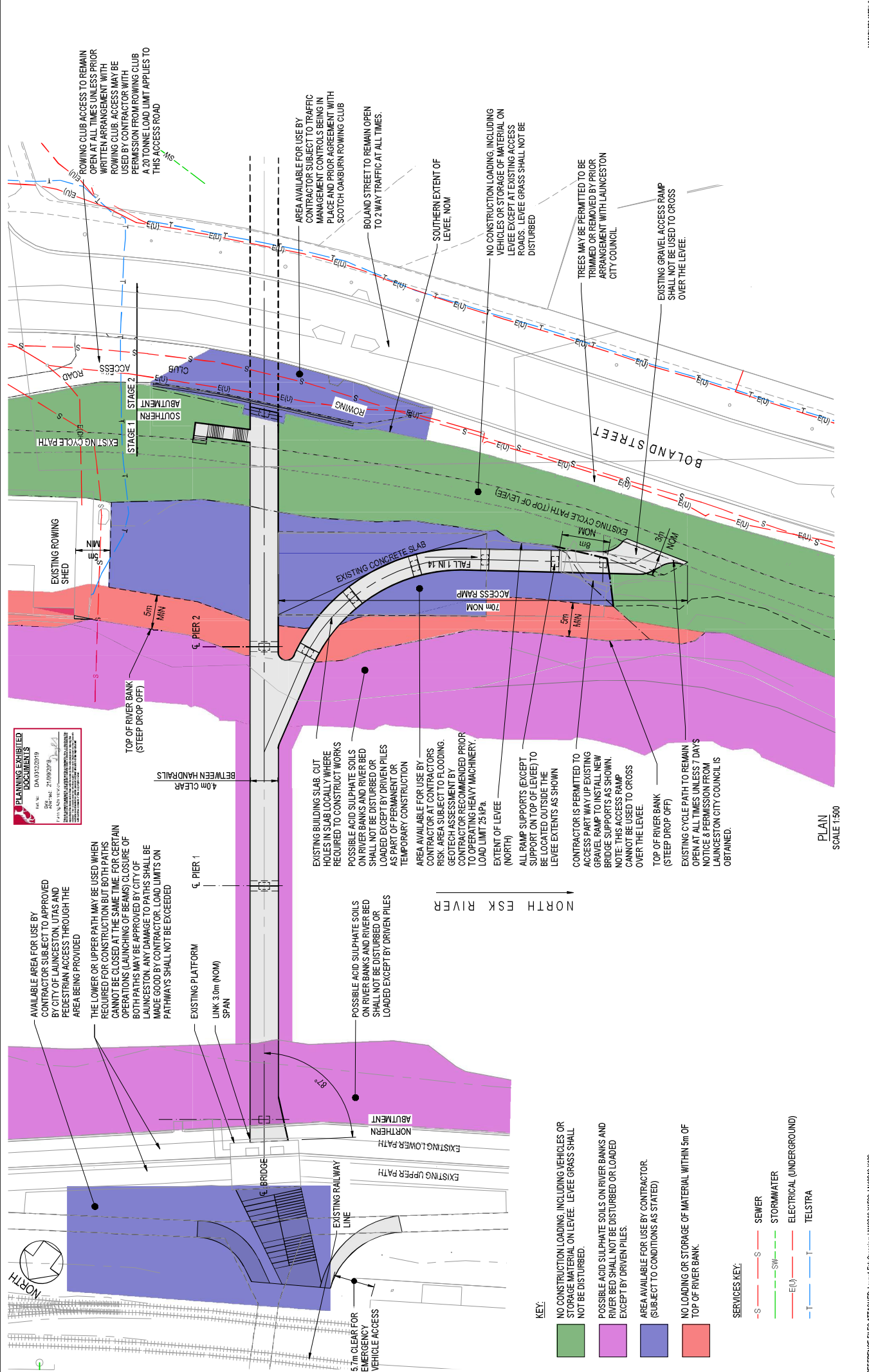
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UNIVERSITY OF TASMANIA
 INVERESK PEDESTRIAN CYCLE BRIDGE
 INVERESK LAUNCESTON

CLIENT: UNIVERSITY OF TASMANIA
 PROJECT: INVERESK PEDESTRIAN CYCLE BRIDGE
 STATUS: PRELIMINARY

| DRAWING TITLE | CLIENT | DATE |
|---|------------------------|------------|
| GENERAL ARRANGEMENT - STAGE 1 DETAIL PLANS | UNIVERSITY OF TASMANIA | 20/09/2019 |

DATE: 20/09/2019
 DRAWING NO: LN18249-P102
 REVISION: C



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 INVERESK PEDESTRIAN CYCLE BRIDGE
 INVERESK, LAUNCESTON

CLIENT: UNIVERSITY OF TASMANIA
 PROJECT: INVERESK PEDESTRIAN CYCLE BRIDGE
 STATUS: PRELIMINARY

DATE: AHD/JMCA
 DRAWING NO: LN18249-P111
 REVISION: E

SCALE (AS SHOWN) (A3)
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 SCALE IN MILLIMETRES - 1:500

| NO. | DESCRIPTION | DRAWN | DESIGNED | REVIEWED | DATE |
|-----|--------------------------------|-----------|----------|----------|----------|
| 1 | APPROVED FOR PLANNING APPROVAL | MP | B.H. | B.H. | 17/02/19 |
| 2 | FORWARD PREPARED | E.FANNING | B.HART | B.HART | 12/02/19 |
| 3 | ISSUED FOR PLANNING APPROVAL | MP | B.H. | B.H. | 16/02/19 |
| 4 | ISSUED FOR PLANNING APPROVAL | E.FANNING | B.HART | B.HART | 22/02/19 |
| 5 | ISSUED FOR PLANNING APPROVAL | E.FANNING | B.HART | B.HART | 22/02/19 |

APPROVED ORIGINAL COPY ON FILE & SIGNED BY: [Signature]

REFERENCE FILES ATTACHED: Inveresk Crossing LN18249-X1500 LN18249-X1000

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 INVERESK PEDESTRIAN CYCLE BRIDGE
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DRAWING TITLE: SITE PLAN - STAGE 1

DATE: AHD/JMCA
 DRAWING NO: LN18249-P111
 REVISION: E

SCALE (AS SHOWN) (A3)
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 SCALE IN MILLIMETRES - 1:500

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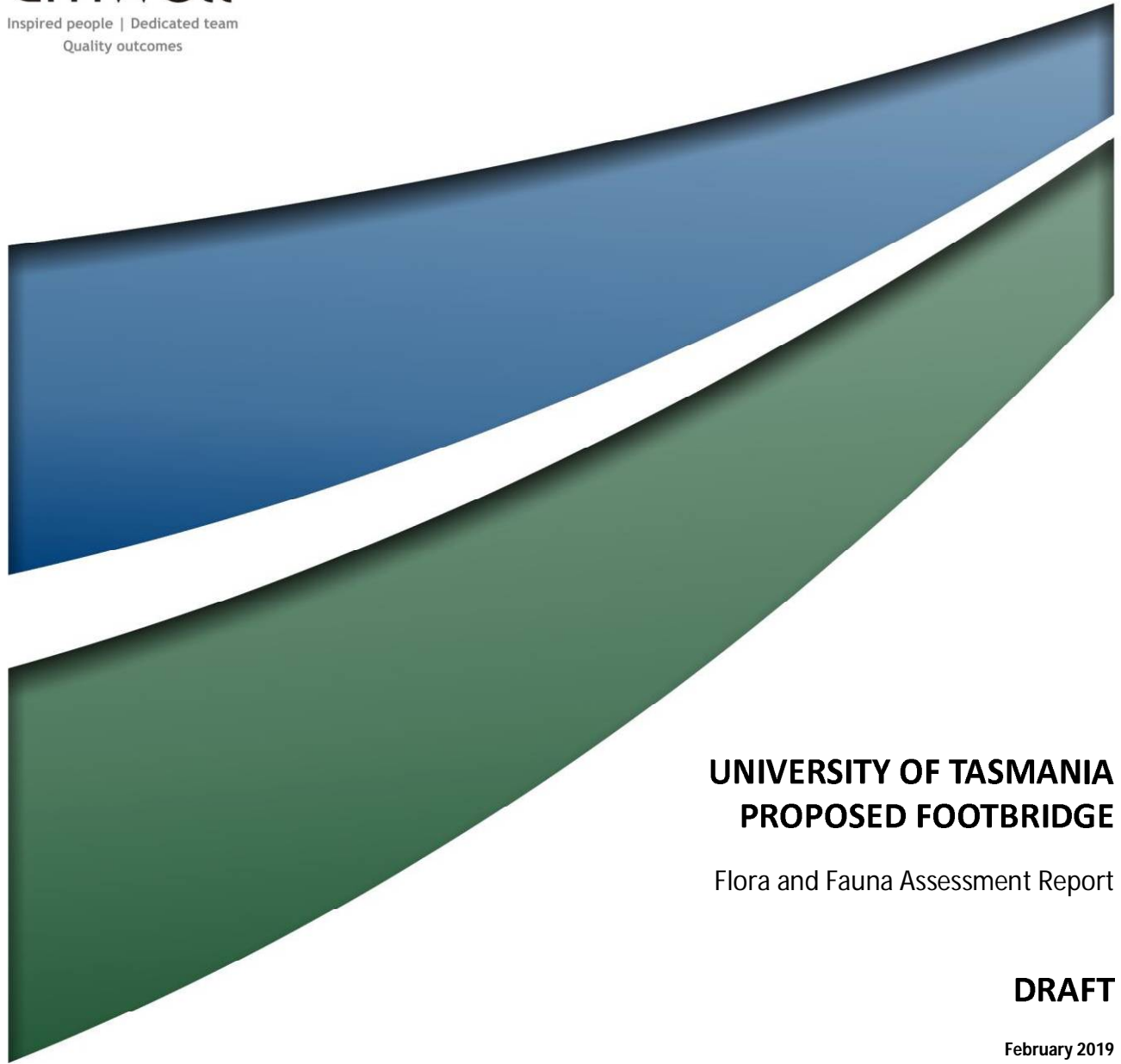
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DRAWING TITLE: SITE PLAN - STAGE 1

DATE: AHD/JMCA
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Flora and Fauna Report

Appendix B



**UNIVERSITY OF TASMANIA
PROPOSED FOOTBRIDGE**
Flora and Fauna Assessment Report

DRAFT

February 2019

UNIVERSITY OF TASMANIA PROPOSED FOOTBRIDGE

Flora and Fauna Assessment Report

DRAFT

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Pitt and Sherry Pty Ltd

Project Director: Travis Peake
Project Manager: Richard Floyd
Report No. R01
Date: February 2019



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|---------|----------------|------------|--------------------|------------|
| | Name | Date | Name | Date |
| V01 | Naomi Buchhorn | 30/01/2019 | Richard Floyd | 25/02/2019 |
| | | | | |
| | | | | |



Executive Summary

The University of Tasmania (UTAS) is proposing the construction of a pedestrian-cycle bridge from the existing pedestrian landing on the northern bank of the North Esk River, across the river to the southern bank of the North Esk River to link to a future UTAS facility.

This flora and fauna assessment investigates the natural values of the banks of the North Esk River adjacent to the existing and proposed UTAS campus buildings where bridge structures and associated construction components will be located.

Vegetation

The vegetation along the banks of the North Esk River consists of highly disturbed riparian vegetation. No Threatened Ecological Communities identified under either the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or the Tasmanian *Nature Conservation Act 2002* (NC Act) was recorded in the Study Area.

Threatened Flora

No threatened flora as listed under either the Commonwealth EPBC Act or the Tasmanian *Threatened Species Protection Act 1995* (TSP Act) were recorded within the Study Area. Assessment of available habitats using the results of the field survey indicates that due to historic disturbance associated with urban development in the Study Area, threatened flora species are considered unlikely to occur.

Threatened Fauna

No threatened fauna were recorded within the Study Area, during the field survey. The proposed development will not impact any critical habitat

elements for any threatened species identified with potential to occur including Tasmanian wedge-tailed eagle, grey goshawk, white-bellied sea-eagle, Australasian bittern or the fish species Australian grayling. Various mitigation measures are proposed to minimise impact of sedimentation; siltation and erosion upon the riparian habitats adjacent to the construction area. These mitigation measures are proposed to be detailed within a Construction Environmental Management Plan (CEMP) for the project.

Weeds

Three declared weeds as listed under the *Weed Management Act 1999* (WM Act) (crack willow,) were identified within the Study Area. It is recommended that a weed management plan be included in the CEMP. The weed management plan should include measures to treat weeds prior to construction activities to minimise spread of weeds during construction, and appropriate monitoring and control measures are implemented following construction to ensure the site is sustainably rehabilitated.

Implications and Requirements

Provided the recommended mitigation measures are implemented, the proposed development is unlikely to result in any significant impacts to any matters of National Environmental Significance identified under the EPBC Act. Further to this, no significant impacts are expected to result on any Tasmanian species listed under the TSP Act.

Table of Contents

| | |
|--|----------|
| Executive Summary | i |
| 1.0 Introduction | 1 |
| 1.1 Study Aims and Objectives | 1 |
| 1.2 The Proposed Development | 3 |
| 1.3 Study Area | 3 |
| 1.4 Topography | 4 |
| 2.0 Regulatory Framework | 5 |
| 2.1 Commonwealth | 5 |
| 2.2 Tasmanian | 5 |
| 2.2.1 Threatened Species Protection Act 1995 | 5 |
| 2.2.2 Nature Conservation Act 2002 | 5 |
| 2.2.3 Weed Management Act 1999 | 5 |
| 2.2.4 Launceston Interim Planning Scheme 2015 | 5 |
| 3.0 Methodology | 7 |
| 3.1 Literature Review | 7 |
| 3.1.1 Data Sources | 7 |
| 3.1.2 Search Area | 7 |
| 3.2 Field Assessments | 7 |
| 3.2.1 Vegetation Assessment | 7 |
| 3.2.2 Flora Survey | 7 |
| 3.2.3 Fauna Survey | 8 |
| 4.0 Results | 9 |
| 4.1 Literature Review Results | 9 |
| 4.1.1 Bio-Regional Context | 9 |
| 4.1.2 Soils | 9 |
| 4.1.3 Conservation Significant Communities | 9 |
| 4.1.4 Conservation Significant Flora Species | 10 |
| 4.1.5 Conservation Significant Fauna Species | 11 |
| 4.2 Field Survey Results | 11 |
| 4.2.1 Survey Timing and Climatic Conditions | 11 |
| 4.2.2 Study Area Characteristics | 12 |
| 4.2.3 Vegetation Associations | 14 |
| 4.2.4 Conservation Significant Vegetation Associations | 15 |
| 4.2.5 Habitats | 15 |
| 4.2.6 Species Diversity | 15 |
| 4.2.7 Weeds of Concern | 17 |

| | | |
|------------|-------------------------------------|-----------|
| 5.0 | Potential Impacts | 18 |
| 5.1 | Vegetation Clearing | 18 |
| 5.2 | Threatened Flora | 18 |
| 5.3 | Terrestrial Threatened Fauna | 18 |
| 5.4 | Aquatic Threatened Fauna | 19 |
| 5.5 | Weed Control | 19 |
| 6.0 | Planning Scheme Requirements | 20 |
| 6.1 | Environmental Management Zone | 20 |
| 6.2 | Biodiversity Code | 20 |
| 6.3 | Water Quality Code | 23 |
| 7.0 | Management and Mitigation | 25 |
| 7.1 | Erosion and Sedimentation Control | 25 |
| 7.2 | Weed Management | 25 |
| 8.0 | Conclusions | 27 |
| 8.1 | Vegetation | 27 |
| 8.2 | Threatened Flora | 27 |
| 8.3 | Threatened Fauna | 27 |
| 8.4 | Weeds | 27 |
| 8.5 | Implications | 27 |
| 9.0 | References | 28 |

Figures

| | | |
|------------|--|----|
| Figure 1.1 | Location of the Study Area | 2 |
| Figure 1.2 | Conceptual Representation of Proposed UTAS Pedestrian-Cycle Bridge | 3 |
| Figure 4.1 | TASVEG 3.0 Mapping of Vegetation Associations | 10 |

Plates

| | | |
|---------|--|----|
| Plate 1 | Looking west towards the rowing club and pontoon from eastern end of Study Area on the southern bank of the North Esk River | 12 |
| Plate 2 | View from southern bank of North Esk River overlooking old rowing club house foundations. | 13 |
| Plate 3 | View from central section of Study Area from the southern bank of the North Esk River looking across to the UTAS Campus and the existing foreshore pedestrian/cycleway | 13 |
| Plate 4 | View west along the north bank of the North Esk River from the existing pedestrian access over the foreshore pedestrian-cycleway fronting the UTAS Campus | 14 |

Tables

| | | |
|-----------|---|----|
| Table 1.1 | Proposed Construction Activities Identified within Figure 1.2 for Proposed Bridge | 3 |
| Table 4.1 | Descriptions of Vegetation Associations Mapped within 1 km of the Study Area | 10 |
| Table 4.2 | Threatened Flora Species Identified with Potential to Occur within the Study Area | 11 |
| Table 4.3 | Threatened Flora Species Identified with Potential to Occur within the Study Area | 11 |
| Table 4.4 | Flora Identified within the Study Area | 15 |
| Table 4.5 | Fauna Species Recorded During Field Survey | 17 |

Appendices

| | |
|------------|------------------------------------|
| Appendix A | Protected Matters Tool Report |
| Appendix B | Natural Values Atlas Report |
| Appendix C | Flora of Conservation Significance |
| Appendix D | Fauna of Conservation Significance |
| Appendix E | Commonwealth Impact Assessment |

1.0 Introduction

Umwelt (Australia) Pty Ltd was commissioned by Pitt and Sherry Pty Ltd on behalf of the University of Tasmania (UTAS) to undertake a terrestrial flora and fauna assessment for the proposed installation of a pedestrian/cycle bridge at UTAS, Launceston Tasmania. The bridge will provide a link between the campus located on the bank of the North Esk River in Inveresk to proposed new campus facilities to be located on the southern side of the river, adjacent to Boland Street, near the city of Launceston (**Figure 1.1**).

The terrestrial flora and fauna assessment consists of a two stage process involving literature review followed by a field assessment, undertaken in December 2018. The literature review analysed existing ecological data to identify conservation significant flora and fauna species as well as conservation significant vegetation communities present within the areas proposed for construction of the cycle-way bridge. This review formed the basis of the field survey, in which potentially occurring conservation significant flora, fauna or vegetation communities were targeted and ecological values documented.

For the purposes of this report, the 'Study Area' refers to an area 100 metres (m) either side of the location of the proposed bridge as shown in **Figure 1.1**. Noting that, the assessment was restricted to the banks and fringing vegetation of the river and did not extend into the open channel of the river.

1.1 Study Aims and Objectives

The aims of this assessment were to document terrestrial flora, terrestrial fauna and vegetation communities within and adjacent to the Study Area, with particular reference to the occurrence of conservation significant species and vegetation communities. In meeting this aim, the objectives of the study was to:

- Review existing terrestrial flora and fauna data for the Study Area and surrounding areas;
- Provide baseline data on vegetation associations and any Threatened Ecological Communities (TECs) occurring in the Study Area;
- Describe the diversity of the terrestrial flora found within the Study Area;
- Describe the diversity of the terrestrial fauna found within the Study Area;
- Identify the occurrence or expected occurrence of conservation significant flora and fauna species;
- Identify the occurrence of weed species and their distribution across the Study Area;
- Assess the potential significance of impacts from the proposed development on terrestrial flora and fauna values in the context of relevant legislation, in particular the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the Tasmanian *Nature Conservation Act 2002* (NC Act), *Threatened Species Protection Act 1995* (TSP Act), and the *Weed Management Act 1999* (WM Act); and
- Provide measures to avoid or mitigate adverse impacts on significant terrestrial species and communities at the design, construction and operational phases of the project.

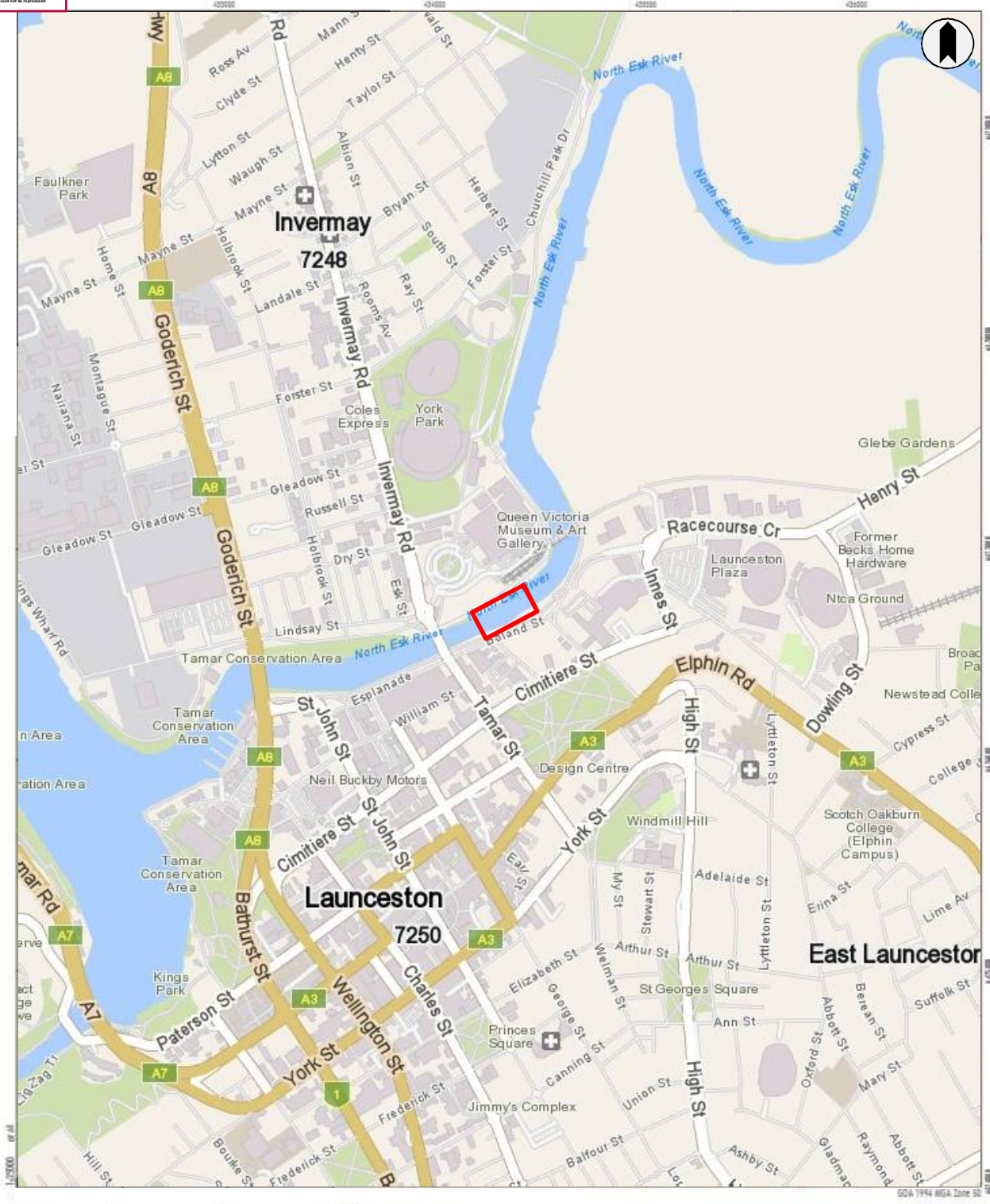


FIGURE 1
Location Map

Image Source: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeBCo, IGN, Kabzonar NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, © OpenStreetMap contributors, and the GIS User Community
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1.2 The Proposed Development

As shown in **Figure 1.2**, the proposed development will consist of the construction of a bridge for use by pedestrians and bicycles across the North Esk River linking Invermay to Launceston. In summary, five construction areas have been identified and these are shown in **Figure 1.2** and potential impact identified in **Table 1.1**.

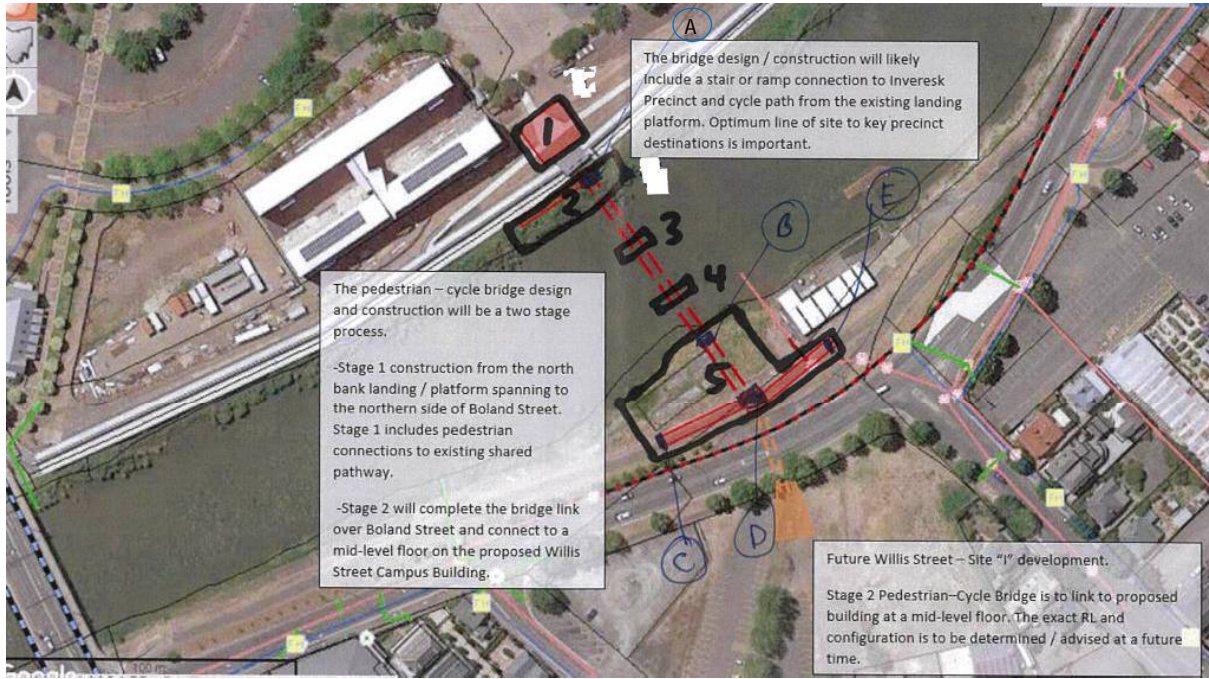


Figure 1.2 Conceptual Representation of Proposed UTAS Pedestrian-Cycle Bridge

Table 1.1 Proposed Construction Activities Identified within Figure 1.2 for Proposed Bridge

| Area | Proposed Construction Activities |
|----------------------|---|
| Area 1 | This area to be mainly used as hard stand area for cranes to lift bridge components into position. Existing disturbed area. Unlikely to be any significant disturbance and excavation is not expected. |
| Area 2 | Stair or ramp connection to Inveresk Precinct. Excavation up to 1.0 m in depth in the immediate bridge abutment location (see Area A) and also driving piles into the ground. Remainder of area used for access/storage and no excavation expected. |
| Areas 3 and 4 | Driving piles below water. No excavation proposed. |
| Area 5 | Excavations up to 1 m deep in areas B, C, D and E. The remaining area to be used for site sheds, machinery movements, storing equipment etc. |

1.3 Study Area

The Study Area consists of a 250 m wide strip along the foreshore of both the northern and southern banks of the North Esk River, centred on the identified location for the proposed cycle-way bridge. This area has been investigated to allow for any modifications to the site layout that may become necessary as the project progresses.

1.4 Topography

The Study Area occurs on the North Esk River flood plain. This area has been extensively modified through the construction of an earthen levee on the southern bank and a concrete levee on the northern bank, both of which protect Launceston urban areas.

Expansion of the UTAS campus is expected to occur to the south of the Study Area between Boland Street, Willis Street and Cimitiere Street.

2.0 Regulatory Framework

2.1 Commonwealth

The Commonwealth of Australia under the EPBC Act provides for listing of and protection to matters of national environment significance (MNES) including, but not limited to, threatened species, threatened ecological communities (TEC) and migratory species. Should a listed matter be significantly impacted, the Minister of the Environment must approve the activity causing the impact.

2.2 Tasmanian

2.2.1 Threatened Species Protection Act 1995

Any impacts on threatened plant species listed under the TSP Act would require a 'Permit to Take' from the Policy and Conservation Assessment Branch (PCAB) at the Department of Primary Industries, Parks, Wildlife and the Environment (DPIPWE).

2.2.2 Nature Conservation Act 2002

Schedule 3A of the NC Act lists native vegetation communities in Tasmania considered to be threatened. Provisions under Local Government Planning Schemes call upon this list to regulate clearing of these communities where they occur.

2.2.3 Weed Management Act 1999

The WM Act is the principal legislation concerned with the management of "declared weeds" in Tasmania. Under the WM Act, the State Government may:

- 1. Prohibit the introduction of declared weeds into Tasmania.*
- 2. Undertake the eradication of declared weed species.*
- 3. Take action aimed at preventing the spread of declared weeds within Tasmania.*
- 4. Require that action be taken against declared weed species where this is necessary to alleviate or prevent a particular problem.*

Declared weeds will need to be managed during construction to ensure that these species are not spread beyond their current distribution.

2.2.4 Launceston Interim Planning Scheme 2015

Review of the *Launceston Interim Planning Scheme 2015* (the Planning Scheme) indicates that the land on the southern bank of the Study Area consists of Open Space zoned land encompassing the levee and former rowing shed, and Urban Mixed Use zoned land which includes the site of the future university building. The northern bank of the North Esk River is zoned Particular Purpose for the Inveresk Cultural Precinct and is dominated by the Launceston Museum, the UTAS campus site, a large car park and UTAS stadium further to the north. The North Esk River itself is zoned Environmental Management.

The proposed bridge will cross an area mapped on the Priority Habitat Overlay (as a Conservation Area). This area extends from near the bottom of the river bank on both banks and includes the river proper. The proposal also involves works within the water course or within 30 m and as such requires assessment against the Water Quality Code. An assessment against the Planning Scheme requirements is presented in **Section 6** of this report.

3.0 Methodology

3.1 Literature Review

The objective of the database searches and literature review is to assist in identifying additional threatened and migratory species, TECs or their habitats that could potentially be impacted by the proposed works.

3.1.1 Data Sources

Databases reviewed as a component of this assessment included:

- Department of Primary Industries, Parks, Water and Environment (DPIPWE) Threatened Species and Communities Database;
- Commonwealth Department of the Environment and Energy (DoEE) online Protected Matters Search Tool (PMST);
- Tasmanian Government Natural Values Atlas (Version 3.7.0); and
- DPIPWE TASVEG 3.0 consisting of mapped vegetation to determine the likely vegetation communities present.

3.1.2 Search Area

Database searches involved two distinct areas for flora and fauna respectively. For threatened flora, a 1 kilometre (km) radius was reviewed using the centre of the proposed bridge location to define the search area. With respect to more highly mobile fauna species, a 5 km search radius was utilised, also using the centre of the proposed bridge to define the search area.

3.2 Field Assessments

A targeted site inspection on 4 December 2018 over 6 hours by a suitably qualified ecologist was undertaken primarily to confirm the presence of threatened and migratory species, endangered populations, TECs or their habitats and any other key ecological features required for assessment as part of this ecological assessment to address Commonwealth, State and Launceston City Council regulatory requirements. Plant nomenclature was based upon Tasmanian Plant Census (de Salas and Baker 2017).

3.2.1 Vegetation Assessment

The field survey was undertaken to verify the TASVEG 3.0 vegetation mapping and type descriptions.

3.2.2 Flora Survey

The site inspection included the following aspects in relation to areas subject to potential impacts:

- ground-truthing vegetation community mapping, including the location and extent of any TECs; and
- identification and recording of the location of threatened flora species.

Particular attention was paid to threatened species records (identified through database searches) that were proximate to the proposed bridge location as well as any TECs previously mapped as potentially occurring with the locality.

Floristic sampling was completed to a level sufficient to describe the composition and condition of any mapped vegetation.

3.2.3 Fauna Survey

Fauna survey was restricted to a habitat assessment, and opportunistic observations. Notes were collected on the presence of tree hollows, logs, and other structures which may provide habitat for fauna species. All fauna species encountered during the field survey were also recorded.

4.0 Results

4.1 Literature Review Results

The following sections provide the results of the literature review components of the assessment. These results are used latter in this report to identify those ecological issues requiring field verified including vegetation units present, available habitats, and potential occurrence for threatened flora, fauna and ecological communities.

4.1.1 Bio-Regional Context

The Study Area occurs within the Tasmanian Northern Midlands IBRA bioregion (Thackway *et al*, 1995).

4.1.2 Soils

The geology of the study area consists of quaternary alluvium deposits. The resulting soils are hydrosols, with potential for acid generation (Forsyth *et al*, 2005).

4.1.3 Conservation Significant Communities

4.1.3.1 Commonwealth

The PMST (**Appendix A**) identified two TECs that are “likely” to occur within the Study Area consisting of:

- *Eucalyptus ovata* – *Callitris oblonga* Forest (Vulnerable); and
- Lowland Native Grasslands of Tasmania (Critically Endangered).

4.1.3.2 State

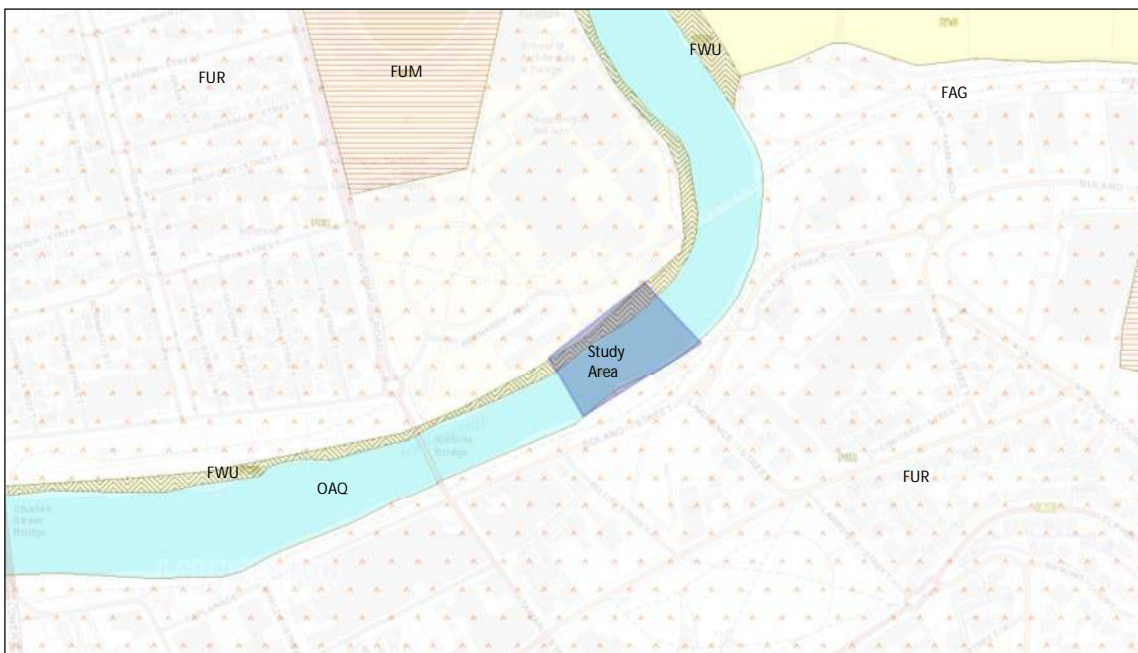
Review of TASVEG 3.0 mapping identified that no native vegetation communities have been mapped within 1 km of the Study Area. No areas of remnant native vegetation are mapped within 5 km of the Study Area.

The mapped communities under TASVEG 3.0 are described in **Table 4.1** and shown in **Figure 4.1**.

Table 4.1 Descriptions of Vegetation Associations Mapped within 1 km of the Study Area

| Label | Title | Description |
|-------|---|---|
| FWU | Agricultural, Urban and exotic vegetation | Urban areas include urban and suburban landscapes. These areas are largely or wholly devoid of vegetation apart from areas such as suburban gardens, street trees and parks. Where vegetation occurs, it is highly variable in composition and is predominantly composed of non-native species. |
| FUM | Extra-urban miscellaneous | Extra-urban miscellaneous (FUM) represents areas where native vegetation has been replaced with human infrastructure in rural and remote areas. |
| FUR | Urban Areas | Densely settled urban areas; largely un-vegetated, but including vegetation associated with infrastructure that is within the bounds or closely associated with cities or towns |
| OAQ | Water, sea | Consists of areas of open water and the ocean. |

Source: Kitchener and Harris (2013)



Note Key for Vegetation Mapping is provided in **Table 4.1**. Source: DPIPWE (2018).

Figure 4.1 TASVEG 3.0 Mapping of Vegetation Associations

4.1.4 Conservation Significant Flora Species

Review of available vegetation and soils mapping and location of those threatened flora species identified from both the results of the PMST (**Appendix A**) and the results obtained from the Natural Values Atlas Report (2018) (**Appendix B**), has allowed an assessment to be made of those species with potential to occur within the Study Area. Commonwealth flora species which are likely or which may occur as identified within the PMST but that have not been recorded within 5 km of the Study Area have been excluded from further assessment as they are not expected to occur within the Study Area. The assessment of occurrence is contained in **Appendix C** of this report.

Of the 22 threatened flora species known to occur within 1 km of the Study Area, five have been identified as having potential to occur within the Study Area. No species listed under the EPBC Act were identified as having potential to occur within the Study Area. State listed threatened species, with potential to occur in the Study Area are identified in **Table 4.2**.

Table 4.2 Threatened Flora Species Identified with Potential to Occur within the Study Area

| Scientific Name | Common Name | State Status |
|---------------------------------------|------------------|--------------|
| <i>Schoenoplectus tabernaemontani</i> | river clubsedge | Rare |
| <i>Hypolepis muelleri</i> | harsh groundfern | Rare |
| <i>Calystegia sepium</i> | swamp bindweed | Rare |
| <i>Bolboschoenus caldwellii</i> | sea clubsedge | Rare |

4.1.5 Conservation Significant Fauna Species

Review of available vegetation and soils mapping and those threatened fauna species identified from both the results from the PMST Report and the results obtained from the Natural Values Atlas Report, has allowed an assessment to be made of those threatened fauna species with potential to occur within the Study Area. Commonwealth Oceanic species and other threatened species not recorded within 5 km of the Study Area have been excluded from further assessment as they are not expected to occur within the Study Area. Those species previously recorded form the basis of the assessment of potential occurrence, which is contained in **Appendix D** of this report.

Of the 20 threatened fauna species known to occur within 5 km of the Study Area, five have been identified as having potential to occur within the habitats occurring in the Study Area. Three species listed under the EPBC Act were identified as having potential to occur within the Study Area and four species listed under the Tasmanian TSP Act. Those species with potential to occur in the Study Area are identified in **Table 4.3**.

Table 4.3 Threatened Flora Species Identified with Potential to Occur within the Study Area

| Scientific Name | Common Name | Commonwealth Status | State Status |
|-----------------------------------|------------------------------|---------------------|--------------|
| <i>Aquila audax subsp. fleayi</i> | Tasmanian wedge-tailed eagle | Endangered | Endangered |
| <i>Accipiter novaehollandiae</i> | grey goshawk | - | Endangered |
| <i>Prototroctes maraena</i> | Australian grayling | Vulnerable | Vulnerable |
| <i>Haliaeetus leucogaster</i> | white-bellied sea-eagle | - | Vulnerable |
| <i>Botaurus poiciloptilus</i> | Australasian bittern | Endangered | - |

4.2 Field Survey Results

4.2.1 Survey Timing and Climatic Conditions

Field surveys were undertaken on the 4th of December 2018. At the time of survey, weather conditions were fine and warm, with Day time temperature of 26°C, and preceding night temperatures of 11°C, which are optimal early summer survey conditions.

4.2.2 Study Area Characteristics

The Study Area occurs in a highly modified landscape. On the southern bank of the North Esk River, a flood levee has been constructed to protect the Launceston urban areas during flood events. On the riverside of the levee, the Launceston Rowing Club has been constructed and includes a boat launching jetty on the northern side of the proposed cycle-way bridge (**Plate 1**). To the west of the proposed cycle-way bridge, the concrete floor/ footings of the old Launceston rowing club house occurs (**Plate 2**).

On the northern bank of the North Esk River, the U TAS Campus has been constructed (**Plate 3**) within the more extensive Inveresk Development Precinct. Between the main campus building and the river, an elevated concrete cycle way/footpath situated on top of a concrete levee follows the bank of the North Esk River (**Plate 3 and 4**).

The site inspection identified the presence of hydrosols within the Study Area. These soils are grey in colour. This confirms the presence of the mapped information, and the potential for disturbance of these soils to generate acid should they be excavated and the excavated material allowed to dry.



Plate 1 Looking west towards the rowing club and pontoon from eastern end of Study Area on the southern bank of the North Esk River



Plate 2 View from southern bank of North Esk River overlooking old rowing club house foundations.



Plate 3 View from central section of Study Area from the southern bank of the North Esk River looking across to the UTAS Campus and the existing foreshore pedestrian/cycleway



Plate 4 View west along the north bank of the North Esk River from the existing pedestrian access over the foreshore pedestrian-cycleway fronting the UTAS Campus

4.2.3 Vegetation Associations

The vegetation on both banks of the North Esk River within the Study Area consists of disturbed, weed infested riparian vegetation. Historic clearing associated with construction of the Launceston Flood Levee on the southern bank of the river and disturbance associated with the land development of the Inveresk Precinct containing the adjacent UTAS campus on the northern bank together with historic urban development in these areas has resulted in the highly disturbed riparian vegetation.

This disturbed riparian vegetation is described below.

Trees: Community dominated by the presence of the introduced scattered occurrences of Crack Willow (*Salix alba X fragilis*) occurring as a low tree to 3 m in height.

Shrubs: Shrub species dominated by introduced New Zealand flax (*Phormium tenax*), wild radish (*Raphanus raphanistrum*), and a dense lower cover of the native common reed (*Phragmites australis*) to a height of 1.5 m.

Groundcovers: Various ground covers and twining plants were identified throughout the Study Area. This layer is dominated by introduced species including morning glory (*Calystegia silvatica*), bindweed (*Convolvulus arvensis*), and blackberry (*Rubus fruticosus*) and occasional grass species including rough poa tussock (*Poa labillardieri*) and slender oat (*Avena barbata*) and herbs such as dandelion (*Taraxacum officinale*) to a height of 0.5 m.

The vegetation described above from the data collected during the field survey, confirms the mapping prepared under TASVEG 3.0 prepared by DPIPW (2018).

4.2.4 Conservation Significant Vegetation Associations

No Commonwealth TECs as identified within the EPBC Act were found to occur within the Study Area. Further to this, no State listed TECs were identified during the field survey of the Study Area.

4.2.5 Habitats

The high levels of disturbance associated with the Study Area have reduced available habitats to weed infested vegetation fringing the North Esk River and man-made structures used for perching of estuarine bird species. No habitat trees, logs, natural caves or crevices were identified during the field survey.

4.2.6 Species Diversity

4.2.6.1 Flora Species

In total, 29 flora species from 18 flora families and 18 genera were detected within the Study Area. The dominant number of species was from Poaceae with eight species detected, and the next dominant was four species from Asteraceae.

It is of note that 24 species of introduced flora were identified within the Study Area. This is indicative of the high levels of historic and on-going disturbance associated with adjoining urban land uses present both within and adjacent to the Study Area.

The species identified during the field survey of the Study Area are presented in **Table 4.4**.

Table 4.4 Flora Identified within the Study Area

| Family | Scientific Name | Common Name |
|----------------|-------------------------------|-----------------------|
| Poaceae | <i>Phragmites australis</i> | southern reed |
| Convolvulaceae | <i>Calystegia silvatica</i> * | great bindweed |
| Rosaceae | <i>Rubus fruticosus</i> * | blackberry |
| Verbenaceae | <i>Verbena officinalis</i> * | common verbena |
| Araliaceae | <i>Hedera helix</i> * | ivy |
| Salicaceae | <i>Salix alba X fragile</i> * | crack willow |
| Boraginaceae | <i>Echium plantagineum</i> * | Paterson's curse |
| Asphodelaceae | <i>Phormium tenax</i> * | New Zealand flax |
| Juncaginaceae | <i>Triglochin procerum</i> | greater water ribbons |
| Asteraceae | <i>Taraxacum officinale</i> * | dandelion |
| Convolvulaceae | <i>Convolvulus arvensis</i> * | field bindweed |
| Poaceae | <i>Spartina anglica</i> * | common cordgrass |

| Family | Scientific Name | Common Name |
|-------------------|--|-----------------------|
| Polygonaceae | <i>Persicaria hydropiper</i> | green water-pepper |
| Juncaceae | <i>Juncus pauciflorus</i> | common sedge |
| Euphorbiaceae | <i>Euphorbia helioscopia</i> * | sun spurge |
| Plantaginaceae | <i>Plantago lanceolate</i> * | ribwort plantain |
| Brassicaceae | <i>Raphanus raphanistrum</i> * | wild radish |
| Poaceae | <i>Poa labillardierei</i> | blue tussockgrass |
| Poaceae | <i>Avena barbata</i> * | bearded oat |
| Poaceae | <i>Cynodon dactylon</i> var. <i>dactylon</i> * | couchgrass |
| Poaceae | <i>Paspalum dilatatum</i> * | paspalum |
| Poaceae | <i>Pennisetum clandestinum</i> * | kikuyu grass |
| Poaceae | <i>Setaria verticillata</i> * | whorled pigeongrass |
| Asteraceae | <i>Hypochoeris radicata</i> * | rough catsear |
| Asteraceae | <i>Lactuca saligna</i> * | willow lettuce |
| Solanaceae | <i>Solanum nigrum</i> * | blackberry nightshade |
| Primulaceae | <i>Lysimachia arvensis</i> * | scarlet pimpernel |
| <u>Asteraceae</u> | <i>Erigeron bonariense</i> * | flaxleaf fleabane |
| Araceae | <i>Zantedeschia aethiopica</i> * | arum lily |

* Introduced species

4.2.6.2 Fauna

In total, 8 fauna species were detected within the Study Area at the time of survey. The dominant fauna group consisted of bird species with a total of 7 species detected. One reptile species was observed within the rocky areas adjacent to the old rowing club foundations.

Due to the absence of suitable habitats, no other faunal groups are anticipated to occur within the Study Area. Those species found during the field survey are presented in **Table 4.5**.

Table 4.5 Fauna Species Recorded During Field Survey

| Faunal Group | Scientific Name | Common Name |
|--------------|--------------------------------|-------------------------|
| Birds | <i>Anas platyrhynchos</i> | Mallard |
| | <i>Anas castanea</i> | Chestnut Teal |
| | <i>Anas superciliosa</i> | Pacific Black Duck |
| | <i>Porphyrio porphyrio</i> | Purple Swamphen |
| | <i>Acrocephalus australis</i> | Australian reed warbler |
| | <i>Anhinga melanogaster</i> | Australian Darter |
| | <i>Aythya australis</i> | Hardhead |
| Reptiles | <i>Niveoscincus metallicus</i> | Metallic Cool-Skink |

None of these species are listed as threatened or migratory. While the Australian reed warbler is listed as a marine species under the EPBC Act, this listing only applies within Commonwealth marine areas and the Study Area does not occur within a Commonwealth marine area.

4.2.7 Weeds of Concern

Paterson's Curse (*Echium plantagineum*), Blackberry (*Rubus fruticosus*) and Crack Willow (*Salix alba X fragilis*) were identified as occurring within the Study Area. These species are identified as Declared Weeds under the WM Act and are also identified as Weeds of National Significance (WoNS) and as a consequence a site specific Weed Management Plan should be developed to ensure these weeds are controlled within the Study Area, and that they are not spread from the Study Area once construction equipment is no longer required.

Review of the Tamar Valley Weed Strategy (Weed Strategy Working Group, 2019)¹, should be undertaken to ensure appropriate control measures are implemented.

¹ <http://www.weeds.asn.au/>

5.0 Potential Impacts

5.1 Vegetation Clearing

No TEC's identified under the Commonwealth EPBC Act or under the Tasmanian NC Act were identified in the Study Area. Weed Infested fringing riparian vegetation was found to be present along both banks of the Study Area.

5.2 Threatened Flora

No threatened flora species listed under either the EPBC Act or the Tasmanian TSP Act were identified as occurring within the Study Area. Due to the localised nature of the disturbance proposed, and the proposed mitigation measures to be implemented to reduce sedimentation and erosion from the construction area, no impacts on any threatened flora species occurring in the wider receiving environment are anticipated to occur.

5.3 Terrestrial Threatened Fauna

Four threatened fauna species were identified as having potential to occur within the Study Area as part of a broader home range (**Appendix D**). These are:

- Tasmanian wedge-tailed eagle (*Aquila audax fleayi*)
- grey goshawk (*Accipiter novaehollandiae*)
- white-bellied sea-eagle (*Haliaeetus leucogaster*)
- Australasian bittern (*Botaurus poiciloptilus*).

No trees suitable for nesting or roosting purposes were identified within the Study Area for the Tasmanian wedge-tailed eagle, grey goshawk or white-bellied sea-eagle. While these species have potential to forage over the locality, due to the highly disturbed habitats present in the Study Area, together with the high levels of disturbance surrounding the Study Area, it is unlikely that these three species would be dependent upon the available habitats in the Study Area.

The Australasian Bittern is a large, heron-like bird found in shallow and vegetated freshwater or brackish swamps. According to the Threatened Species Section (2019b), the bird can be very difficult to detect due to its camouflage-coloured plumage (it's streaked and scalloped feathers blend in perfectly with background reedy vegetation); birds are also known to freeze if approached, and on windy days may even sway to match the movement of the vegetation. Due to the high levels of disturbance associated with the adjacent commercial activities in Launceston and the UTAS campus site there is a low likelihood that this species would occur in the narrow bands of habitat along the banks of the river. The proposed development is not anticipated to result in any significant impact upon this species. Short-term impacts associated with construction will be restricted to an area of approximately 0.25 ha consisting of highly disturbed marginal habitat for this species. Large areas of adjacent riparian habitat will be available for this species during the construction period. Due to its high mobility, the proposed development is not considered likely to represent any form of barrier to the movement of this species.

An assessment of significance, prepared in accordance with the Commonwealth's Impact Assessment Guidelines Version 1.1 (Department of Environment, 2013) has been prepared for the Tasmanian Wedge-tailed Eagle and the Australasian Bittern and is provided in **Appendix E**.

5.4 Aquatic Threatened Fauna

One threatened fish species, the Australian Grayling (*Prototroctes maraena*), has been recorded in the upper freshwater sections of the North Esk River. This species is known to migrate between fresh and marine waters. Adults live and breed in freshwater rivers, and the larvae are swept downstream into coastal waters. Juveniles then remain in marine waters for approximately six months before returning to the freshwater adult habitat (Threatened Species Section, 2019).

Little is known of the population size of the species in Tasmania, but it is believed that the species' range has contracted substantially in recent years (Bryant *et al*, 1999). The major threat to this species is the construction of barriers to fish movement which prevent adults migrating upstream and larvae moving downstream.

The proposed construction of a pedestrian-cycleway bridge is considered unlikely to result in any impacts upon this species. It is proposed to utilise sediment curtains around each pylon location during construction works within the North Esk River channel, together with the use of sedimentation and erosion control measures on each bank of the North Esk River where construction activities will be undertaken. Should fish migrate during construction activities, no barriers are proposed to block the North Esk River, ensuring free passage of fish.

An assessment of significance, prepared in accordance with the *Commonwealth's Impact Assessment Guidelines Version 1.1* (Department of Environment 2013) has been prepared for the Australian Grayling and is provided in **Appendix E**.

5.5 Weed Control

Due to the occurrence of Declared Weed species within the Study Area, a Weed Management Plan should be developed in accordance with the Tamar Valley Weed Strategy (to ensure these species are not dispersed as a result of the proposed development. It is recommended that provisions within the Weed Management Plan be developed to control declared weeds prior to construction activities commencing. Further to this, construction vehicles should be inspected washed down if required prior to leaving the site, to ensure soil material potentially containing seeds of these species does not leave the site. The weed management plan should also contain provisions following construction activities to monitor and control and declared weed species that respond to the disturbed conditions.

6.0 Planning Scheme Requirements

6.1 Environmental Management Zone

The banks of the North Esk River are Public Reserve under the *Crown Lands Act 1976*. The bed of the river is designated as the 'Tamar Conservation Area' under the NC Act. It is unknown whether a Reserve Activities Assessment is being prepared or if the relevant Minister has granted approval to satisfy the Acceptable Solution. In order to allow assessment against the Performance Criteria, if required, the following criteria from P1 are addressed in **Table 6.1**.

Table 6.1 Consideration of P1 Performance Criteria

| Performance Criteria | Comment |
|--|---|
| P1 Use is consistent with the ecological, scientific, cultural or aesthetic values of the land, having regard to: | |
| (a) the significance of the ecological, scientific, cultural or aesthetic values; | Due to the high level of disturbance observed in the Study Area, and the low level of impact proposed (provided mitigation measures including sedimentation and erosion management are implemented), the proposed development will have a negligible negative impact on the ecological values of the Study Area. |
| (b) the protection, conservation, and management of the values; | The proposed development will be limited to disturbance of approximately 0.25 ha of low quality vegetation on modified banks of the North Esk River. Management plans to mitigate risks associated with erosion, siltation and sedimentation are recommended to be prepared and implemented prior to construction activities commencing. A weed management plan is also recommended to prevent the propagation of 'Declared' and environmental weeds on and adjacent to the Study Area. |
| (i) the measures to minimise or mitigate impacts; | It is recommended that an Erosion and Sedimentation Control Plan be developed for the project to mitigate sedimentation issues or siltation impacts associated with the proposed development. Due to the presence of declared and environmental weeds, a weed management plan is also recommended to mitigate the potential spread of these weeds species from the Study Area. |

6.2 Biodiversity Code

The Biodiversity Codes applies to use or development of land:

- (a) *shown as priority habitat on the planning scheme overlay maps; or*
- (b) *identified in a flora and fauna report prepared by a suitably qualified person, that is lodged with an application for a permit or required in response to a request under section 54 of the Act, which*

identifies that the removal of native vegetation will have a significant impact on priority vegetation communities.

Priority vegetation communities are defined in the code as “threatened vegetation and important habitat for threatened species that are listed under the Threatened Species Protection Act 1995 or the Environment Protection and Biodiversity Conservation Act (Commonwealth)”.

The site was not found to contain any threatened vegetation or important habitat. It does however include some areas mapped as Priority Habitat and as such this code is applicable.

Clause E8.6.1 Habitat and vegetation management applies to development within areas mapped as Priority Habitat. The objective of the clause is “To appropriately protect or manage vegetation identified as priority habitat and priority vegetation communities”. The Acceptable Solution for achievement of this objective is that clearance or disturbance of Priority Habitat is in accordance with a certified Forest Practices Plan. There is no Forest Practices Plan for the proposed development and as such the proposal relies upon Performance Criteria. These are addressed in the **Table 6.2**.

Table 6.2 Consideration of Performance Criteria

| Performance Criteria | Comment |
|---|---|
| P1 Clearance or disturbance of native vegetation within priority habitat or areas identified as priority vegetation communities does not compromise the adequacy of representation of species or vegetation communities, having regard to: | |
| (a) the quality of the site to provide habitat of significance to the maintenance or protection of biodiversity in the planning scheme area; | The banks of the North Esk River in the area proposed for the pedestrian-cycleway consists of degraded weed infested riparian vegetation. This area is not considered significant with respect to the maintenance or protection of biodiversity in the planning scheme area. |
| (b) the need for the clearance or disturbance of the vegetation; | Vegetation clearing will be restricted to predominantly weed infested river bank areas. Clearing of this area will not impact upon any native vegetation communities. |
| (c) the method of clearance or disturbance of the vegetation; | Vegetation will be cleared using an excavator. The extent of clearance will be defined prior to work to minimise disturbance. |
| (d) the extent and quality of the vegetation or habitats affected by the proposal; | The proposal development will impact predominantly weed infested disturbed areas on the banks of the North Esk River. It is anticipated that only 0.25 ha of disturbance will occur as a result of the proposed development. |
| (e) the value of the vegetation as a wildlife corridor; | Based upon the assessment undertaken within the Flora and Fauna report, the riparian habitats associated with the North Esk River within the Study Area represent habitat for primarily common waterbird species. This group of species is highly mobile and as a consequence, habitat disturbance will be short term, and is unlikely to impact avian species that utilise this area. Due to the high levels of disturbance present in the Study Area, no other terrestrial faunal groups are anticipated to be |

| Performance Criteria | Comment |
|--|--|
| | <p>potentially impacted.</p> <p>As disturbance to the water way will involve the installation pylons within the channel, these works are not anticipated to impact upon the Australian Grayling and its potential movement along this waterway.</p> |
| (f) the value of riparian vegetation to the protection of habitats and wildlife corridors; | <p>As the proposed development consists of a pedestrian-cycleway bridge, clearing will be restricted to the piers and access points of the bridge. The vegetation present within the Study Area is highly disturbed, and dominated by various introduced weed species. As a consequence, it is considered that the riparian vegetation represents low value with respect to protection of habitats and wildlife corridors.</p> |
| (g) any rehabilitation and maintenance measures; | <p>The development will be managed in accordance with a CEMP which will ensure disturbed areas are rehabilitated and maintained to ensure the long term stability of the development area.</p> |
| (h) the impacts of development and vegetation clearance, in proximity to the priority habitat or priority vegetation communities; | <p>The North Esk River has been identified as a Priority Habitat Area. It is anticipated that the impacts of the proposed pedestrian-cycleway bridge construction will predominantly be restricted to the historically cleared/disturbed areas. Sediment curtains are proposed to be used around the location of each proposed in-river pylon to be constructed in the waterway, and sedimentation and erosion control measures will be implemented during construction associated with the bridge ends. These measures will be implemented prior to and during construction to minimise any detrimental impacts upon the Priority Habitat Area.</p> |
| (i) any conservation outcomes achieved and the long term security of any offset for the loss of the vegetation, provided in accordance with the General Offset Principles document published by the Department of Primary Industries, Parks, Water and Environment, available at http://dpiwpe.tas.gov.au/Documents/General-Offset-Principles.pdf ; | <p>Limited clearing of highly disturbed vegetation will be undertaken as a result of the proposed development. No TEC's or threatened species will be impacted by the proposed development.</p> |
| (j) any agreement under section 71 of the Act relating to vegetation management; | <p>No agreements have been made relating to vegetation management.</p> |
| (k) any conservation covenant made under the <u>Nature Conservation Act 2002</u> , that exists on or adjacent to the site of the proposed development; and | <p>No conservation covenants have been made under the NC Act that exists on or adjacent to the site of the proposed development.</p> |

| Performance Criteria | Comment |
|--|--|
| (l) any recommendations or advice contained in a flora and fauna report. | <p>Silt curtains to reduce silt impacts from construction of piles for the bridge.</p> <p>Bank sedimentation and erosion control devices to be implemented on the banks of the North Esk River in accordance with the Wetlands and Waterway Works Manual.</p> <p>Weed management should be undertaken in accordance with a site specific Weed Management Plan to prevent the spread or propagation of weeds on and adjacent to the Study Area.</p> |

6.3 Water Quality Code

The Water Quality Code applies to use or development of land:

- (a) within a wetland or watercourse; or
- (b) located within 30 m of a wetland or watercourse; or
- (c) which discharges stormwater or wastewater to land within 30 m of a watercourse or wetland.

Performance Criteria: To protect watercourses and wetlands from the effects of development and minimise the potential for water quality degradation.

| Performance Criteria | Comment |
|---|--|
| P1 Development must not unreasonably impact the water quality of watercourses or wetlands, having regard to: | |
| (a) the topography of the site; | The Study Area occurs on the floodplain of the North Esk River. A man made flood levee occurs on the southern and northern banks of the North Esk River, representing an approximate 2 m rise in the topography in this location. The proposed construction of a pedestrian-cycleway bridge is considered unlikely to impact the water quality having regard to the disturbed nature of the topography in this location. |
| (b) the potential for erosion | Hydrosol soils are considered to have low potential for erosion. Construction is expected to be restricted to small areas, will have sedimentation control devices installed prior to construction activities commencing, and any disturbed areas will be rehabilitated following construction, and managed until stabilisation has been achieved to eliminate the potential for erosion to impact the North Esk River. Further or refined mitigation measures should be implemented in accordance with a project specific geotechnical investigation to be prepared by Pitt and Sherry Pty Ltd. |
| (c) the potential for siltation and sedimentation; | Sedimentation and erosion control measures will be implemented prior to construction. Measures proposed for implementation include installation of sediment fencing between construction areas and the high water mark of the North Esk River. During construction of the pylons, siltation curtains will be installed around the location of each pylon to eliminate sediment disturbance, and adjacent upstream or downstream siltation. Provide the recommended |

| Performance Criteria | Comment |
|---|--|
| | measures are implemented, there is considered low potential for siltation and sedimentation to impact the North Esk River. |
| (d) the risk of flood; | Pitt and Sherry Pty Ltd to address this criteria. |
| (e) the impact of the removal of vegetation on hydrology; | Pitt and Sherry Pty Ltd to address this criteria. |
| (f) the natural values of the vegetation and the land; | The land within the Study Area consists of historically disturbed vegetation communities associated with the construction of the Inveresk Precinct and the works associated with the Launceston Rowing Club and the flood levee. These high levels of disturbance have also decreased the resultant fauna habitat values of the Study Area. |
| (g) the scale of the development; | The scale of development is expected to be minimal with respect to ground disturbance. Concept plans indicate that excavations to an approximate depths of 1 m will occur on the southern bank of the North Esk River over an area of 50 m ² , representing the entry to the south end of the proposed bridge. Two pylons will be installed within the river channel, to provide structural support for the proposed bridge. |
| (h) the method of works, including vegetation removal, and the machinery used; | It is anticipated that work areas will consist of excavation areas for the southern entry to the proposed bridge, and proposed construction material laydown areas and vehicle parking. It is anticipated that excavations will be undertaken using a backhoe, within the identified areas specified in Section 1.2 of this report. A barge will be used for the installation/construction of the in stream pylons. |
| (i) any measures to mitigate impacts; | Sedimentation and erosion control measures will be implemented in accordance with the Department of Primary Industries, Parks, Water and Environment Wetlands and Waterways Works Manual. |
| (j) any remediation measures proposed; | Weed management will be undertaken prior to construction and will involve on-going monitoring until the site has been successfully rehabilitated. Remediation of construction areas will involve the stabilisation of disturbed areas following construction through armouring which may include rock revetment or appropriate vegetative cover. These remediation measures will be addressed in detail within the Construction Environmental Management Plan to be prepared for the site. |
| (k) any soil and water management plan; and | Control measures will be implemented via a Construction Environmental Management Plan. This Plan will be prepared in accordance with the Department of Primary Industries, Parks, Water and Environment Wetlands and Waterways Works Manual. |
| (l) the requirements of the Department of Primary Industries, Parks, Water and Environment Wetlands and Waterways Works Manual. | The requirements as stated within the Department of Primary Industries, Parks, Water and Environment Wetlands and Waterways Works Manual will be implemented within the proposed Construction Environmental Management Plan for the site, specifically with respect to erosion, sedimentation and works within a watercourse. |

7.0 Management and Mitigation

No direct impacts are anticipated on threatened flora, fauna or ecological communities. However, there is potential for indirect impacts to occur as a result of this proposed development includes the following:

- clearance of existing disturbed fringing vegetation resulting in potential erosion and sedimentation associated with bank earth works and potential siltation as a result of construction on in channel pylons; and
- potential for 'Declared' weeds present within the Study Area being spread or allowed to increase in density due to their propensity to exploit disturbed areas.

It is anticipated that these two impacts will be mitigated through the development of a project specific CEMP. Recommendations for information to be included within the CEMP to address the identified impacts are detailed in the following sections.

7.1 Erosion and Sedimentation Control

In accordance with the Wetland and Waterway Works Manual (DPIPWE 2019c), the following aspects will need to be addressed within a project specific Erosion and Sedimentation Control Plan:

- Prior to works commencing, it is recommended that erosion and sedimentation measures be installed between proposed construction areas and the North Esk River;
- Maintain the natural flow regime of the river by avoiding or minimising changes to the channel form and flow volume;
- Minimise disturbance to streambank soil and vegetation; and
- Monitor effectiveness of erosion and sedimentation controls during construction and following site remediation for a period of five years.

It is recommended that siltation curtains be utilised during construction of in channel pylons for the proposed bridge. This will mitigate impacts associated with siltation impacting water quality in proximity to the proposed bridge. Silt curtains should be left in place following construction until sediment levels have dropped to ambient levels in the wider North Esk River.

7.2 Weed Management

A Weed Management Plan should be developed to control 'declared' and environmental weeds throughout the works area, in accordance with the Tamar Valley Weed Strategy (Weed Strategy Working Group, 2018).

Specifically this plan should:

- Plan for targeted pre-works control to reduce propagule pressure during works
- Ensure excavated soil from weed affected areas is not spread to weed free areas and preferably buried beneath 500 mm of fill
- Include prescriptions for weed hygiene during construction activities

Allow for targeted weed treatment on completion of works and during follow-up monitoring. This should include an annual weed control audit of the site for up to five years following construction completion, to specifically target weeds that have exploited the disturbance associated with the construction activities.

8.0 Conclusions

8.1 Vegetation

The vegetation along the banks of the North Esk River consists of highly disturbed fringing vegetation. No Threatened Ecological Communities identified under either the Commonwealths EPBC Act, or the Tasmanian NC Act was recorded in the Study Area.

8.2 Threatened Flora

No threatened flora species as listed under either the Commonwealth's EPBC Act or the Tasmanian TSP Act were recorded within the Study Area. Assessment of available habitats as determined during the field survey indicates that due to historic disturbance associated with the existing urban landscape of the Study Area, threatened flora species are considered unlikely to occur.

8.3 Threatened Fauna

No threatened fauna were recorded within the Study Area, following targeted field surveys. The proposed development will not impact any critical habitat elements for any threatened species identified as having potential to occur including the Tasmanian Wedge-tailed Eagle, Grey Goshawk, White Bellied Sea-eagle, Australasian Bittern or the fish species Australian Grayling, to the point that proposed development will impact the persistence of these threatened species within the locality.

Various mitigation measures are proposed within **Section 7** of this report to minimise erosion; sedimentation and siltation do not impact upon the fringing habitats or aquatic habitats adjacent to the construction area associated with the North Esk River. These mitigation measures are proposed to be detailed within a project specific Construction Environmental Management Plan and will protect habitats for native species with known to occur in this area.

8.4 Weeds

Three declared weeds were identified within the Study Area (crack willow, Paterson's curse and blackberry). It is recommended that a weed management plan be developed in accordance with the Tamar Valley Weed Strategy (Weed Strategy Working Group, 2018) to treat these weed species prior to construction activities commencing. Further to this, measures should be implemented to ensure weeds are not spread from the site during construction, and that appropriate monitoring and control measures are implemented following construction to ensure the site is sustainably rehabilitated.

8.5 Implications

Provided the recommended mitigation measures are implemented, the proposed development will not result in any significant impacts to any Commonwealth listed flora, fauna or ecological community identified under the EPBC Act. Further to this, no significant impacts are expected to result on any Tasmanian species listed under the TSP Act requiring a permit under this Act.

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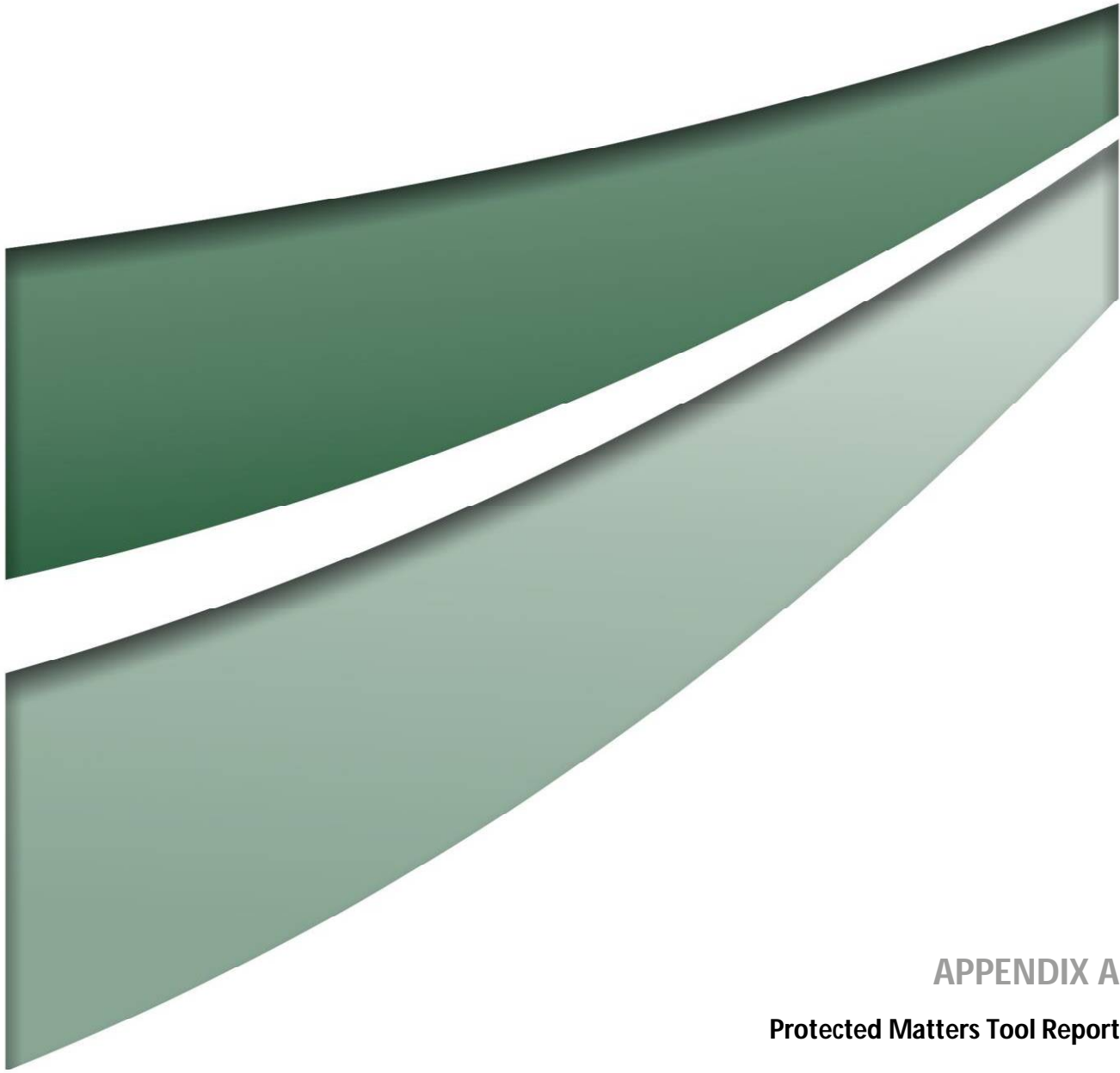
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APPENDIX A
Protected Matters Tool Report



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 17/01/19 16:13:40

[Summary](#)

[Details](#)

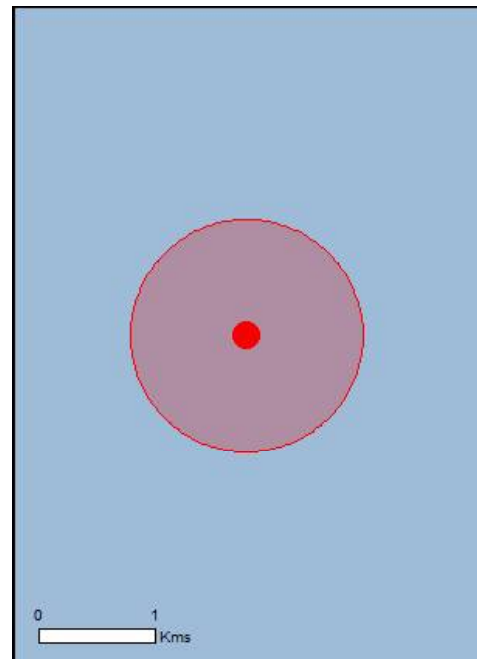
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



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Buffer: 1.0Km



Summary



Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

| | |
|---|------|
| World Heritage Properties: | None |
| National Heritage Places: | None |
| Wetlands of International Importance: | None |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Area: | None |
| Listed Threatened Ecological Communities: | None |
| Listed Threatened Species: | 42 |
| Listed Migratory Species: | 26 |

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

| | |
|--|------|
| Commonwealth Land: | 1 |
| Commonwealth Heritage Places: | 2 |
| Listed Marine Species: | 32 |
| Whales and Other Cetaceans: | None |
| Critical Habitats: | None |
| Commonwealth Reserves Terrestrial: | None |
| Australian Marine Parks: | None |

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

| | |
|--|------|
| State and Territory Reserves: | 1 |
| Regional Forest Agreements: | 1 |
| Invasive Species: | 26 |
| Nationally Important Wetlands: | None |
| Key Ecological Features (Marine) | None |

Details



Matters of National Environmental Significance

| Listed Threatened Species | | [Resource Information] |
|--|-----------------------|--|
| Name | Status | Type of Presence |
| Birds | | |
| Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435] | Endangered | Species or species habitat likely to occur within area |
| Botaurus poiciloptilus Australasian Bittern [1001] | Endangered | Species or species habitat known to occur within area |
| Calidris ferruginea Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977] | Endangered | Species or species habitat may occur within area |
| Diomedea antipodensis Antipodean Albatross [64458] | Vulnerable | Species or species habitat likely to occur within area |
| Diomedea antipodensis gibsoni Gibson's Albatross [82270] | Vulnerable | Species or species habitat likely to occur within area |
| Diomedea epomophora Southern Royal Albatross [89221] | Vulnerable | Species or species habitat likely to occur within area |
| Diomedea exulans Wandering Albatross [89223] | Vulnerable | Species or species habitat likely to occur within area |
| Diomedea sanfordi Northern Royal Albatross [64456] | Endangered | Species or species habitat likely to occur within area |
| Lathamus discolor Swift Parrot [744] | Critically Endangered | Species or species habitat known to occur within area |
| Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380] | Vulnerable | Species or species habitat may occur within area |
| Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432] | Critically Endangered | Species or species habitat may occur within area |
| Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel | Endangered | Species or species |

| Name | Status | Type of Presence |
|--|-----------------------|--|
| [1060] | | habitat likely to occur within area |
| Macronectes halli | | |
| Northern Giant Petrel [1061] | Vulnerable | Species or species habitat may occur within area |
| Numenius madagascariensis | | |
| Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area |
| Pachyptila turtur subantarctica | | |
| Fairy Prion (southern) [64445] | Vulnerable | Species or species habitat likely to occur within area |
| Pterodroma leucoptera leucoptera | | |
| Gould's Petrel, Australian Gould's Petrel [26033] | Endangered | Species or species habitat may occur within area |
| Thalassarche bulleri | | |
| Buller's Albatross, Pacific Albatross [64460] | Vulnerable | Species or species habitat may occur within area |
| Thalassarche bulleri platei | | |
| Northern Buller's Albatross, Pacific Albatross [82273] | Vulnerable | Species or species habitat may occur within area |
| Thalassarche cauta cauta | | |
| Shy Albatross, Tasmanian Shy Albatross [82345] | Vulnerable | Species or species habitat likely to occur within area |
| Thalassarche cauta steadi | | |
| White-capped Albatross [82344] | Vulnerable | Species or species habitat likely to occur within area |
| Thalassarche chrysostoma | | |
| Grey-headed Albatross [66491] | Endangered | Species or species habitat may occur within area |
| Thalassarche impavida | | |
| Campbell Albatross, Campbell Black-browed Albatross [64459] | Vulnerable | Species or species habitat likely to occur within area |
| Thalassarche melanophris | | |
| Black-browed Albatross [66472] | Vulnerable | Species or species habitat likely to occur within area |
| Thalassarche salvini | | |
| Salvin's Albatross [64463] | Vulnerable | Species or species habitat likely to occur within area |
| Tyto novaehollandiae castanops (Tasmanian population) | | |
| Masked Owl (Tasmanian) [67051] | Vulnerable | Breeding known to occur within area |
| Crustaceans | | |
| Engaeus orramakunna | | |
| Mount Arthur Burrowing Crayfish [66778] | Vulnerable | Species or species habitat may occur within area |
| Fish | | |
| Prototroctes maraena | | |
| Australian Grayling [26179] | Vulnerable | Species or species habitat known to occur within area |
| Frogs | | |
| Litoria raniformis | | |
| Growing Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog [1828] | Vulnerable | Species or species habitat known to occur within area |
| Mammals | | |
| Dasyurus maculatus maculatus (Tasmanian population) | | |
| Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183] | Vulnerable | Species or species habitat known to occur within area |



| Name | Status | Type of Presence |
|--|------------|--|
| Dasyurus viverrinus Eastern Quoll, Luaner [333] | Endangered | Species or species habitat known to occur within area |
| Perameles gunnii gunnii Eastern Barred Bandicoot (Tasmania) [66651] | Vulnerable | Species or species habitat likely to occur within area |
| Sarcophilus harrisii Tasmanian Devil [299] | Endangered | Species or species habitat likely to occur within area |



Plants

| | | |
|---|-----------------------|--|
| Barbarea australis Native Wintercress, Riverbed Wintercress [12540] | Endangered | Species or species habitat likely to occur within area |
| Caladenia caudata Tailed Spider-orchid [17067] | Vulnerable | Species or species habitat known to occur within area |
| Dianella amoena Matted Flax-lily [64886] | Endangered | Species or species habitat likely to occur within area |
| Epacris exserta South Esk Heath [19879] | Endangered | Species or species habitat known to occur within area |
| Glycine latrobeana Clover Glycine, Purple Clover [13910] | Vulnerable | Species or species habitat may occur within area |
| Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542] | Endangered | Species or species habitat may occur within area |
| Pterostylis commutata Midland Greenhood [64535] | Critically Endangered | Species or species habitat may occur within area |
| Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215] | Vulnerable | Species or species habitat likely to occur within area |

Reptiles

| | | |
|---|------------|--|
| Chelonia mydas Green Turtle [1765] | Vulnerable | Species or species habitat may occur within area |
|---|------------|--|

Listed Migratory Species


[[Resource Information](#)]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

| Name | Threatened | Type of Presence |
|---|------------|--|
| Migratory Marine Birds | | |
| Apus pacificus Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
| Diomedea antipodensis Antipodean Albatross [64458] | Vulnerable | Species or species habitat likely to occur within area |
| Diomedea epomophora Southern Royal Albatross [89221] | Vulnerable | Species or species habitat likely to occur within area |
| Diomedea exulans Wandering Albatross [89223] | Vulnerable | Species or species habitat likely to occur within area |

| Name | Threatened | Type of Presence |
|--|-----------------------|--|
| Diomedea sanfordi Northern Royal Albatross [64456] | Endangered | Species or species habitat likely to occur within area |
| Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060] | Endangered | Species or species habitat likely to occur within area |
| Macronectes halli Northern Giant Petrel [1061] | Vulnerable | Species or species habitat may occur within area |
| Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460] | Vulnerable | Species or species habitat may occur within area |
| Thalassarche cauta Tasmanian Shy Albatross [89224] | Vulnerable* | Species or species habitat likely to occur within area |
| Thalassarche chrysostoma Grey-headed Albatross [66491] | Endangered | Species or species habitat may occur within area |
| Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459] | Vulnerable | Species or species habitat likely to occur within area |
| Thalassarche melanophris Black-browed Albatross [66472] | Vulnerable | Species or species habitat likely to occur within area |
| Thalassarche salvini Salvin's Albatross [64463] | Vulnerable | Species or species habitat likely to occur within area |
| Thalassarche steadi White-capped Albatross [64462] | Vulnerable* | Species or species habitat likely to occur within area |
| Migratory Marine Species | | |
| Chelonia mydas Green Turtle [1765] | Vulnerable | Species or species habitat may occur within area |
| Lamna nasus Porbeagle, Mackerel Shark [83288] | | Species or species habitat likely to occur within area |
| Migratory Terrestrial Species | | |
| Hirundapus caudacutus White-throated Needletail [682] | | Species or species habitat known to occur within area |
| Myiagra cyanoleuca Satin Flycatcher [612] | | Species or species habitat known to occur within area |
| Migratory Wetlands Species | | |
| Actitis hypoleucos Common Sandpiper [59309] | | Species or species habitat known to occur within area |
| Calidris acuminata Sharp-tailed Sandpiper [874] | | Species or species habitat known to occur within area |
| Calidris ferruginea Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Calidris melanotos Pectoral Sandpiper [858] | | Species or species |



| Name | Threatened | Type of Presence |
|---|--|---|
| Gallinago hardwickii Latham's Snipe, Japanese Snipe [863] |  | habitat may occur within area Species or species habitat may occur within area |
| Limosa lapponica Bar-tailed Godwit [844] | | Species or species habitat may occur within area |
| Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area |
| Tringa nebularia Common Greenshank, Greenshank [832] | | Species or species habitat may occur within area |

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

| Name |
|--|
| Defence - PATERSON BARRACKS - LAUNCESTON |

Commonwealth Heritage Places [\[Resource Information \]](#)

| Name | State | Status |
|--|-------|--------------|
| Historic | | |
| Launceston General Post Office | TAS | Listed place |
| Paterson Barracks Commissariat Store | TAS | Listed place |

Listed Marine Species [\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

| Name | Threatened | Type of Presence |
|---|-----------------------|--|
| Birds | | |
| Actitis hypoleucos Common Sandpiper [59309] | | Species or species habitat known to occur within area |
| Apus pacificus Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
| Ardea alba Great Egret, White Egret [59541] | | Species or species habitat likely to occur within area |
| Ardea ibis Cattle Egret [59542] | | Species or species habitat may occur within area |
| Calidris acuminata Sharp-tailed Sandpiper [874] | | Species or species habitat known to occur within area |
| Calidris ferruginea Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Calidris melanotos Pectoral Sandpiper [858] | | Species or species habitat may occur within area |
| Diomedea antipodensis Antipodean Albatross [64458] | Vulnerable | Species or species |

| Name | Threatened | Type of Presence |
|--|-----------------------|--|
| Diomedea epomophora Southern Royal Albatross [89221] | Vulnerable | habitat likely to occur within area |
| Diomedea exulans Wandering Albatross [89223] | Vulnerable | Species or species habitat likely to occur within area |
| Diomedea gibsoni Gibson's Albatross [64466] | Vulnerable* | Species or species habitat likely to occur within area |
| Diomedea sanfordi Northern Royal Albatross [64456] | Endangered | Species or species habitat likely to occur within area |
| Gallinago hardwickii Latham's Snipe, Japanese Snipe [863] | | Species or species habitat may occur within area |
| Haliaeetus leucogaster White-bellied Sea-Eagle [943] | | Species or species habitat known to occur within area |
| Hirundapus caudacutus White-throated Needletail [682] | | Species or species habitat known to occur within area |
| Lathamus discolor Swift Parrot [744] | Critically Endangered | Species or species habitat known to occur within area |
| Limosa lapponica Bar-tailed Godwit [844] | | Species or species habitat may occur within area |
| Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060] | Endangered | Species or species habitat likely to occur within area |
| Macronectes halli Northern Giant Petrel [1061] | Vulnerable | Species or species habitat may occur within area |
| Myiagra cyanoleuca Satin Flycatcher [612] | | Species or species habitat known to occur within area |
| Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847] | Critically Endangered | Species or species habitat may occur within area |
| Pachyptila turtur Fairy Prion [1066] | | Species or species habitat likely to occur within area |
| Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460] | Vulnerable | Species or species habitat may occur within area |
| Thalassarche cauta Tasmanian Shy Albatross [89224] | Vulnerable* | Species or species habitat likely to occur within area |
| Thalassarche chrysostoma Grey-headed Albatross [66491] | Endangered | Species or species habitat may occur within area |
| Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459] | Vulnerable | Species or species habitat likely to occur |



| Name | Threatened | Type of Presence |
|--|-------------|--|
| Thalassarche melanophris Black-browed Albatross [66472] | Vulnerable | Species or species habitat likely to occur within area |
| Thalassarche salvini Salvin's Albatross [64463] | Vulnerable | Species or species habitat likely to occur within area |
| Thalassarche sp. nov. Pacific Albatross [66511] | Vulnerable* | Species or species habitat may occur within area |
| Thalassarche steadi White-capped Albatross [64462] | Vulnerable* | Species or species habitat likely to occur within area |
| Tringa nebularia Common Greenshank, Greenshank [832] | | Species or species habitat may occur within area |



Reptiles

| | | |
|---|------------|--|
| Chelonia mydas Green Turtle [1765] | Vulnerable | Species or species habitat may occur within area |
|---|------------|--|

Extra Information

| State and Territory Reserves | [Resource Information] |
|------------------------------|--|
| Name | State |
| Tamar | TAS |

| Regional Forest Agreements | [Resource Information] |
|----------------------------|--|
|----------------------------|--|

Note that all areas with completed RFAs have been included.


| | |
|------------------------------|----------|
| Name | State |
| Tasmania RFA | Tasmania |

| Invasive Species | [Resource Information] |
|------------------|--|
|------------------|--|

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

| Name | Status | Type of Presence |
|---|--------|--|
| Birds | | |
| Alauda arvensis Skylark [656] | | Species or species habitat likely to occur within area |
| Anas platyrhynchos Mallard [974] | | Species or species habitat likely to occur within area |
| Carduelis carduelis European Goldfinch [403] | | Species or species habitat likely to occur within area |
| Carduelis chloris European Greenfinch [404] | | Species or species habitat likely to occur within area |

| Name | Status | Type of Presence |
|---|--|--|
| Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803] |  | Species or species habitat likely to occur within area |
| Passer domesticus House Sparrow [405] | | Species or species habitat likely to occur within area |
| Streptopelia chinensis Spotted Turtle-Dove [780] | | Species or species habitat likely to occur within area |
| Sturnus vulgaris Common Starling [389] | | Species or species habitat likely to occur within area |
| Turdus merula Common Blackbird, Eurasian Blackbird [596] | | Species or species habitat likely to occur within area |
| Mammals | | |
| Bos taurus Domestic Cattle [16] | | Species or species habitat likely to occur within area |
| Canis lupus familiaris Domestic Dog [82654] | | Species or species habitat likely to occur within area |
| Capra hircus Goat [2] | | Species or species habitat likely to occur within area |
| Felis catus Cat, House Cat, Domestic Cat [19] | | Species or species habitat likely to occur within area |
| Lepus capensis Brown Hare [127] | | Species or species habitat likely to occur within area |
| Mus musculus House Mouse [120] | | Species or species habitat likely to occur within area |
| Oryctolagus cuniculus Rabbit, European Rabbit [128] | | Species or species habitat likely to occur within area |
| Rattus norvegicus Brown Rat, Norway Rat [83] | | Species or species habitat likely to occur within area |
| Rattus rattus Black Rat, Ship Rat [84] | | Species or species habitat likely to occur within area |
| Plants | | |
| Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643] | | Species or species habitat likely to occur within area |
| Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473] | | Species or species habitat likely to occur within area |
| Chrysanthemoides monilifera subsp. monilifera Boneseed [16905] | | Species or species habitat likely to occur within area |
| Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934] | | Species or species habitat likely to occur |

| Name | Status | Type of Presence |
|---|--|---|
| <p>Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]</p> |  | <p>within area</p> |
| <p>Rubus fruticosus aggregate Blackberry, European Blackberry [68406]</p> | | <p>Species or species habitat likely to occur within area</p> |
| <p>Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]</p> | | <p>Species or species habitat likely to occur within area</p> |
| <p>Ulex europaeus Gorse, Furze [7693]</p> | | <p>Species or species habitat likely to occur within area</p> |

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.



This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-41.42972 147.14167

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

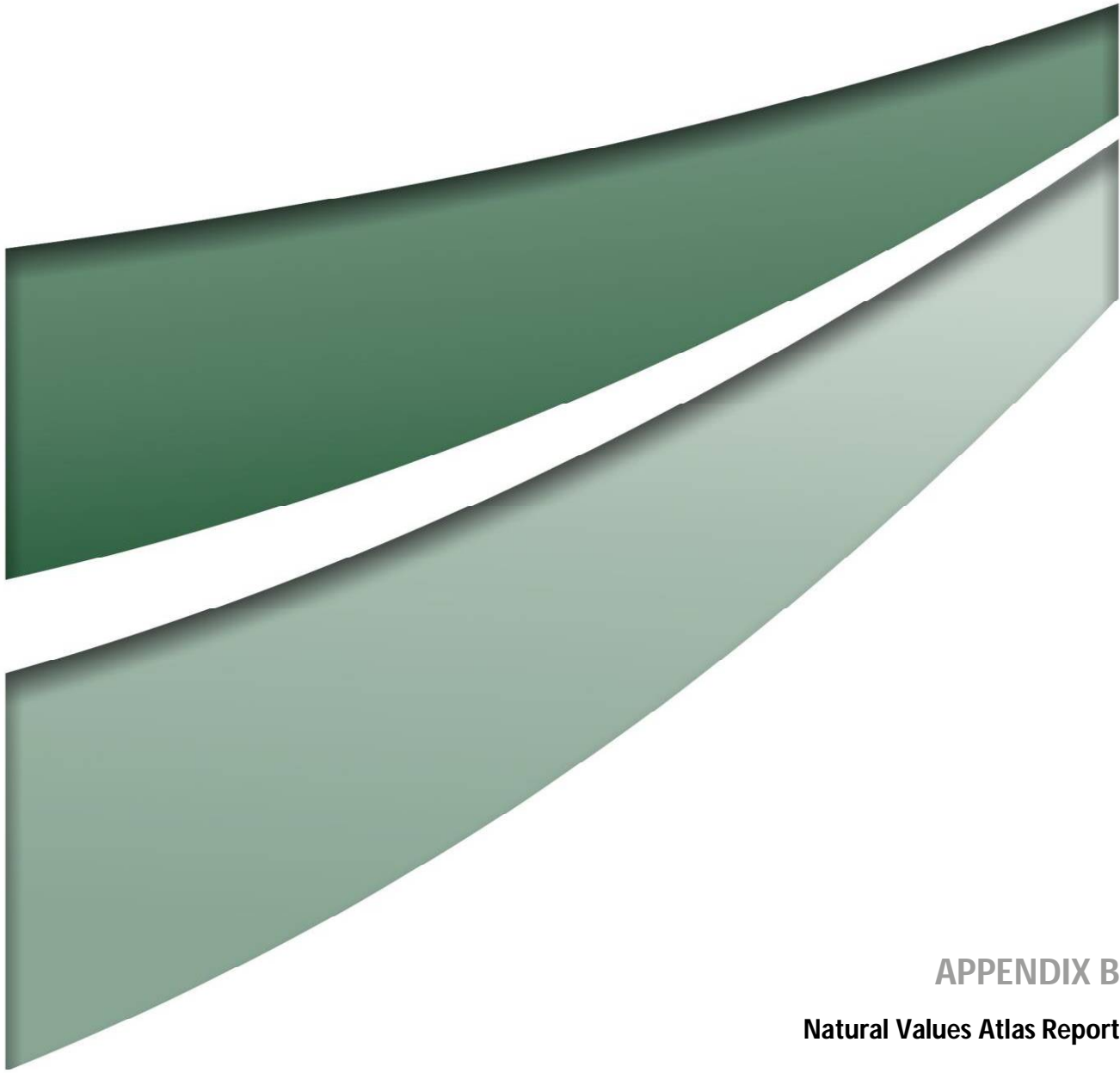


- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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APPENDIX B
Natural Values Atlas Report

Natural Values Atlas Report

Authoritative, comprehensive information on Tasmania's natural values.

Reference: bridge

Requested For: Invermay

Report Type: Summary Report

Timestamp: 03:39:08 PM Tuesday 11 December 2018

Threatened Flora: buffers Min: 500m Max: 5000m

Threatened Fauna: buffers Min: 500m Max: 5000m

Raptors: buffers Min: 500m Max: 5000m

Tasmanian Weed Management Act Weeds: buffers Min: 500m Max: 5000m

Priority Weeds: buffers Min: 500m Max: 5000m

Geoconservation: buffer 1000m

Acid Sulfate Soils: buffer 1000m

TASVEG: buffer 1000m

Threatened Communities: buffer 1000m

Fire History: buffer 1000m

Tasmanian Reserve Estate: buffer 1000m

Biosecurity Risks: buffer 1000m

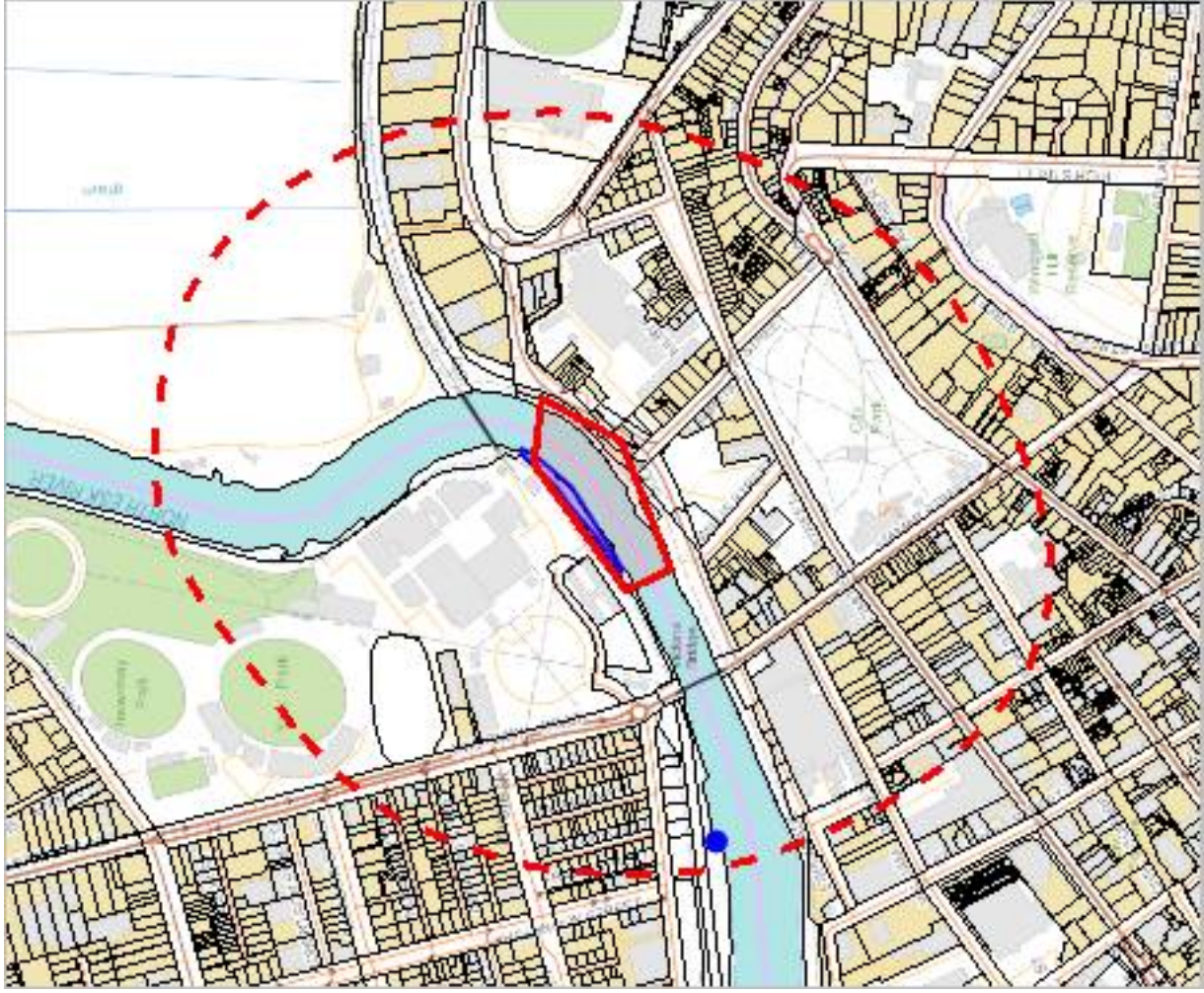


The centroid for this query GDA94: **511873.0, 5413534.0** falls within:

Property: 0

Threatened flora within 500 metres

512527, 5414320



511217, 5412741

Please note that some layers may not display at all requested map scales

Threatened flora within 500 metres

Verified Records

| Species | Common Name | SS | NS | Bio | Observation Count | Last Recorded |
|---------------------------------------|-----------------|----|----|-----|-------------------|---------------|
| <i>Calystegia sepium</i> | swamp bindweed | r | | n | 1 | 10-Jan-2017 |
| <i>Schoenoplectus tabernaemontani</i> | river clubsedge | r | | n | 1 | 30-Mar-2000 |

Unverified Records

No unverified records were found!

For more information about threatened species, please contact Threatened Species Enquiries.

Telephone: 1300 368 550

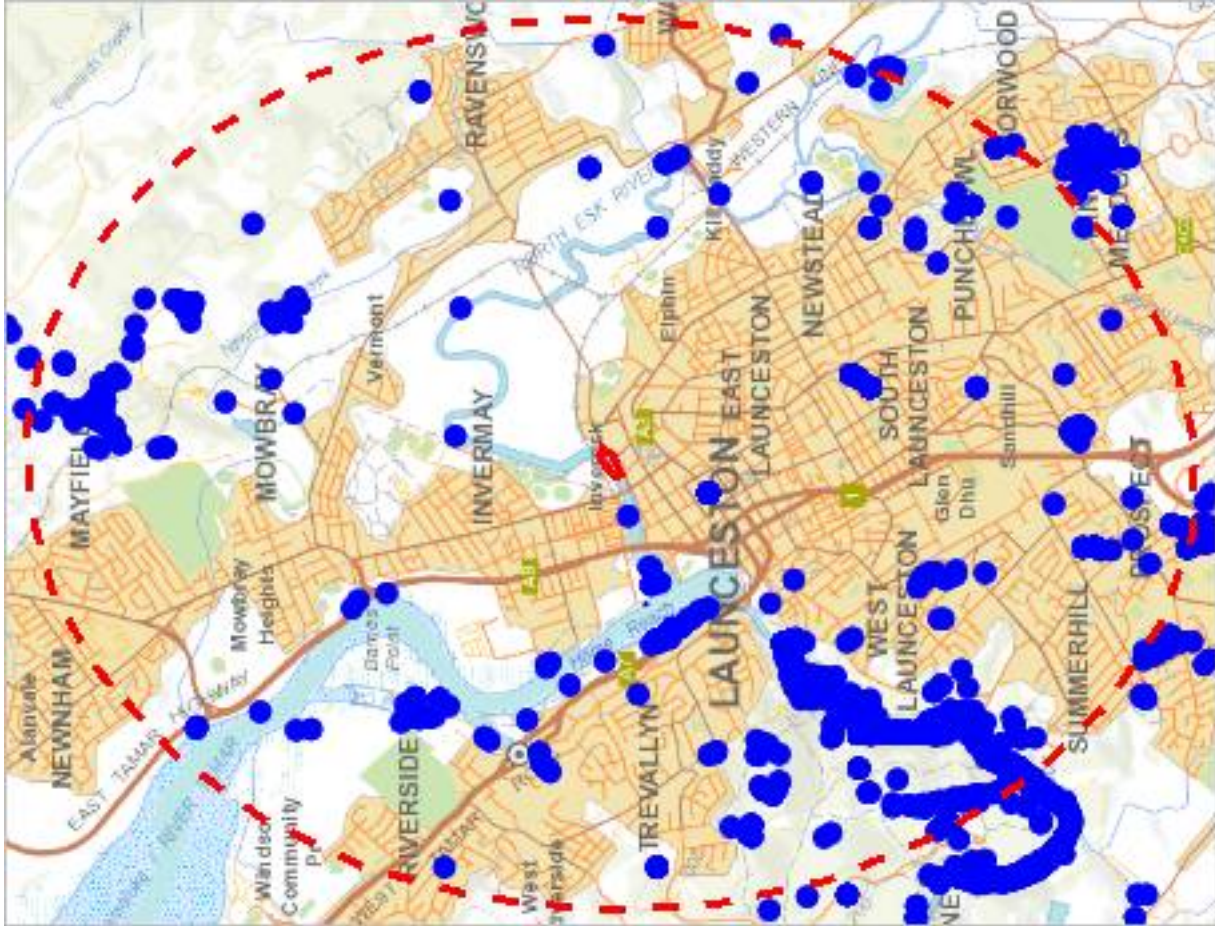
Email: ThreatenedSpecies.Enquiries@dipwe.tas.gov.au

Address: GPO Box 44, Hobart, Tasmania, Australia, 7000



Threatened flora within 5000 metres

515921, 5418813



507829, 5408247

Please note that some layers may not display at all requested map scales

Threatened flora within 5000 metres

Legend: Verified and Unverified observations

● Point Verified

● Point Unverified

— Line Verified

— Line Unverified

■ Polygon Verified

■ Polygon Unverified

Legend: Cadastral Parcels



Threatened flora within 5000 metres



Verified Records

| Species | Common Name | SS | NS | Bio | Observation Count | Last Recorded |
|---|--------------------------|-----|-----|-----|-------------------|---------------|
| <i>Alternanthera denticulata</i> | lesser joyweed | e | | n | 434 | 15-Feb-2015 |
| <i>Anogramma leptophylla</i> | annual fern | v | | n | 5 | 19-Oct-1984 |
| <i>Aphelia gracilis</i> | slender fanwort | r | | n | 20 | 25-Oct-2017 |
| <i>Aphelia pumilio</i> | dwarf fanwort | r | | n | 32 | 14-Nov-2018 |
| <i>Asperula subsimplex</i> | water woodruff | r | | n | 1 | 30-Mar-2000 |
| <i>Austrostipa bigeniculata</i> | doublejointed speargrass | r | | n | 1 | 17-Jun-1996 |
| <i>Blechnum spinulosum</i> | small raspfern | e | | n | 24 | 26-Feb-2018 |
| <i>Bolboschoenus caldwellii</i> | sea clubsedge | r | | n | 20 | 20-Jan-2010 |
| <i>Boronia gunnii</i> | river boronia | v | VU | e | 17 | 25-Oct-1961 |
| <i>Brunonia australis</i> | blue pincushion | r | | n | 162 | 28-Nov-2018 |
| <i>Caesia calliantha</i> | blue grasslily | r | | n | 54 | 22-Dec-2017 |
| <i>Caladenia filamentosa</i> | daddy longlegs | r | | n | 3 | 29-Oct-1893 |
| <i>Caladenia patersonii</i> | patersons spider-orchid | v | | n | 3 | 11-Oct-1991 |
| <i>Callitris oblonga</i> subsp. <i>oblonga</i> | south esk pine | v | EN | e | 17 | 19-Mar-2010 |
| <i>Calocephalus lacteus</i> | milky beautyheads | r | | n | 1 | 24-Dec-1844 |
| <i>Calochilus campestris</i> | copper beard-orchid | e | | n | 1 | 12-Nov-2012 |
| <i>Calystegia sepium</i> | swamp bindweed | r | | n | 46 | 17-Feb-2017 |
| <i>Carex gunniana</i> | mountain sedge | r | | n | 2 | 15-Dec-2009 |
| <i>Carex longebrachiata</i> | drooping sedge | r | | n | 3 | 01-Sep-1992 |
| <i>Centipeda cunninghamii</i> | erect sneezeweed | r | | n | 6 | 14-Feb-2018 |
| <i>Damasonium minus</i> | starfruit | r | | n | 1 | 10-Apr-2000 |
| <i>Deyeuxia lawrencei</i> | lawrences bentgrass | x | EX | ex | 1 | 01-Jan-1831 |
| <i>Dianella amoena</i> | grassland flaxlily | r | EN | n | 6 | 16-Feb-2010 |
| <i>Discaria pubescens</i> | spiky anchorplant | e | | n | 1 | 01-Jan-1912 |
| <i>Diuris palustris</i> | swamp doubletail | e | | n | 3 | 01-Oct-1942 |
| <i>Epacris exserta</i> | south esk heath | e | PEN | e | 36 | 18-Mar-2010 |
| <i>Epilobium pallidiflorum</i> | showy willowherb | r | | n | 3 | 12-Dec-2009 |
| <i>Euphrasia collina</i> subsp. <i>deflexifolia</i> | eastern eyebright | r | | e | 1 | 31-Aug-1892 |
| <i>Euphrasia scabra</i> | yellow eyebright | e | | n | 1 | 21-Nov-1887 |
| <i>Gratiola pubescens</i> | hairy brooklime | v?r | | n | 2 | 11-Feb-2011 |
| <i>Gynatrix pulchella</i> | fragrant hempbush | r | | n | 1 | 01-Oct-1994 |
| <i>Gyrostemon thesioides</i> | broom wheelfruit | r | | n | 13 | 18-Nov-2011 |
| <i>Haloragis heterophylla</i> | variable raspwort | r | | n | 22 | 14-Nov-2012 |
| <i>Hovea tasmanica</i> | rockfield purplepea | r | | e | 7 | 07-Oct-2009 |
| <i>Hypolepis muelleri</i> | harsh groundfern | r | | n | 1 | 10-Mar-1981 |
| <i>Isoetes elatior</i> | tall quillwort | r | | e | 1 | 15-Mar-1842 |
| <i>Juncus amabilis</i> | gentle rush | r? | | n | 18 | 18-Nov-2011 |
| <i>Leucopogon virgatus</i> var. <i>brevifolius</i> | shortleaf beardheath | r | | n | 1 | 14-Oct-2013 |
| <i>Lycopus australis</i> | australian gypsywort | e | | n | 16 | 15-Feb-2015 |
| <i>Lythrum salicaria</i> | purple loosestrife | v | | n | 93 | 15-Feb-2015 |
| <i>Mentha australis</i> | river mint | e | | n | 54 | 21-Feb-2013 |
| <i>Muehlenbeckia axillaris</i> | matted lignum | r | | n | 1 | 02-Apr-1980 |
| <i>Myriophyllum integrifolium</i> | tiny watermilfoil | v | | n | 1 | 18-Nov-1991 |
| <i>Parietaria debilis</i> | shade pellitory | r | | n | 3 | 03-Nov-1992 |
| <i>Persicaria decipiens</i> | slender waterpepper | v | | n | 66 | 30-Apr-2010 |
| <i>Persicaria subsessilis</i> | bristly waterpepper | e | | n | 200 | 09-Mar-2017 |
| <i>Phyllangium divergens</i> | wiry mitrewort | v | | n | 1 | 07-Nov-1949 |
| <i>Pilularia novae-hollandiae</i> | australian pillwort | r | | n | 1 | 01-Jan-1990 |
| <i>Pimelea flava</i> subsp. <i>flava</i> | yellow riceflower | r | | n | 1 | 01-Nov-1946 |
| <i>Poa mollis</i> | soft tussockgrass | r | | e | 20 | 23-Jan-2017 |
| <i>Prostanthera cuneata</i> | alpine mintbush | x | | x | 2 | 03-Feb-1840 |
| <i>Prostanthera rotundifolia</i> | roundleaf mintbush | v | | n | 28 | 08-Oct-2009 |
| <i>Pterostylis grandiflora</i> | superb greenhood | r | | n | 1 | 01-Jun-1951 |
| <i>Pterostylis ziegeleri</i> | grassland greenhood | v | VU | e | 3 | 01-Jan-1889 |
| <i>Pultenaea prostrata</i> | silky bushpea | v | | n | 2 | 01-Nov-1921 |
| <i>Ranunculus pumilio</i> var. <i>pumilio</i> | ferny buttercup | r | | n | 2 | 01-Jan-2000 |
| <i>Rumex bidens</i> | mud dock | v | | n | 2 | 18-Jan-2009 |
| <i>Rytidosperma indutum</i> | tall wallabygrass | r? | | n | 1 | 01-Nov-1984 |
| <i>Schenkia australis</i> | spike centaury | r | | n | 1 | 01-Nov-1943 |
| <i>Schoenoplectus tabernaemontani</i> | river clubsedge | r | | n | 6 | 14-Feb-2018 |
| <i>Scleranthus fasciculatus</i> | spreading knawel | v | | n | 2 | 11-Sep-2017 |
| <i>Scutellaria humilis</i> | dwarf skullcap | r | | n | 13 | 10-Dec-2010 |

Threatened flora within 5000 metres

| Species | Common Name | SS | NS | Bio | Observation Count | Last Recorded |
|--|--------------------------|----|----|-----|-------------------|---------------|
| <i>Senecio campylocarpus</i> | bulging fireweed | v | | n | 23 | 26-Feb-2018 |
| <i>Senecio squarrosus</i> | leafy fireweed | r | | n | 19 | 30-Oct-2009 |
| <i>Siloxerus multiflorus</i> | small wrinklewort | r | | n | 27 | 23-Oct-2012 |
| <i>Spyridium eriocephalum</i> var. <i>eriocephalum</i> | heath dustymiller | e | | n | 4 | 20-Oct-1880 |
| <i>Spyridium vexilliferum</i> var. <i>vexilliferum</i> | helicopter bush | r | | n | 12 | 07-Oct-2009 |
| <i>Stylidium despectum</i> | small triggerplant | r | | n | 3 | 12-Oct-2015 |
| <i>Tetradlea ciliata</i> | northern pinkbells | r | | n | 1 | 01-Jan-1896 |
| <i>Teucrium corymbosum</i> | forest germander | r | | n | 19 | 08-Dec-2011 |
| <i>Triptilodiscus pygmaeus</i> | dwarf sunray | v | | n | 3 | 08-Oct-2015 |
| <i>Utricularia australis</i> | yellow bladderwort | r | | n | 7 | 05-Mar-2014 |
| <i>Velleia paradoxa</i> | spur velleia | v | | n | 4 | 01-Sep-1992 |
| <i>Veronica plebeia</i> | trailing speedwell | r | | n | 22 | 14-Nov-2018 |
| <i>Viola caleyana</i> | swamp violet | r | | n | 1 | 18-Jan-1993 |
| <i>Vittadinia gracilis</i> | woolly new-holland-daisy | r | | n | 2 | 01-Jan-1868 |
| <i>Westringia angustifolia</i> | narrowleaf westringia | r | | e | 1 | 20-Nov-2003 |
| <i>Xerochrysum bicolor</i> | eastcoast paperdaisy | r | | n | 8 | 25-Oct-1992 |

Unverified Records

No unverified records were found!

For more information about threatened species, please contact Threatened Species Enquiries.

Telephone: 1300 368 550

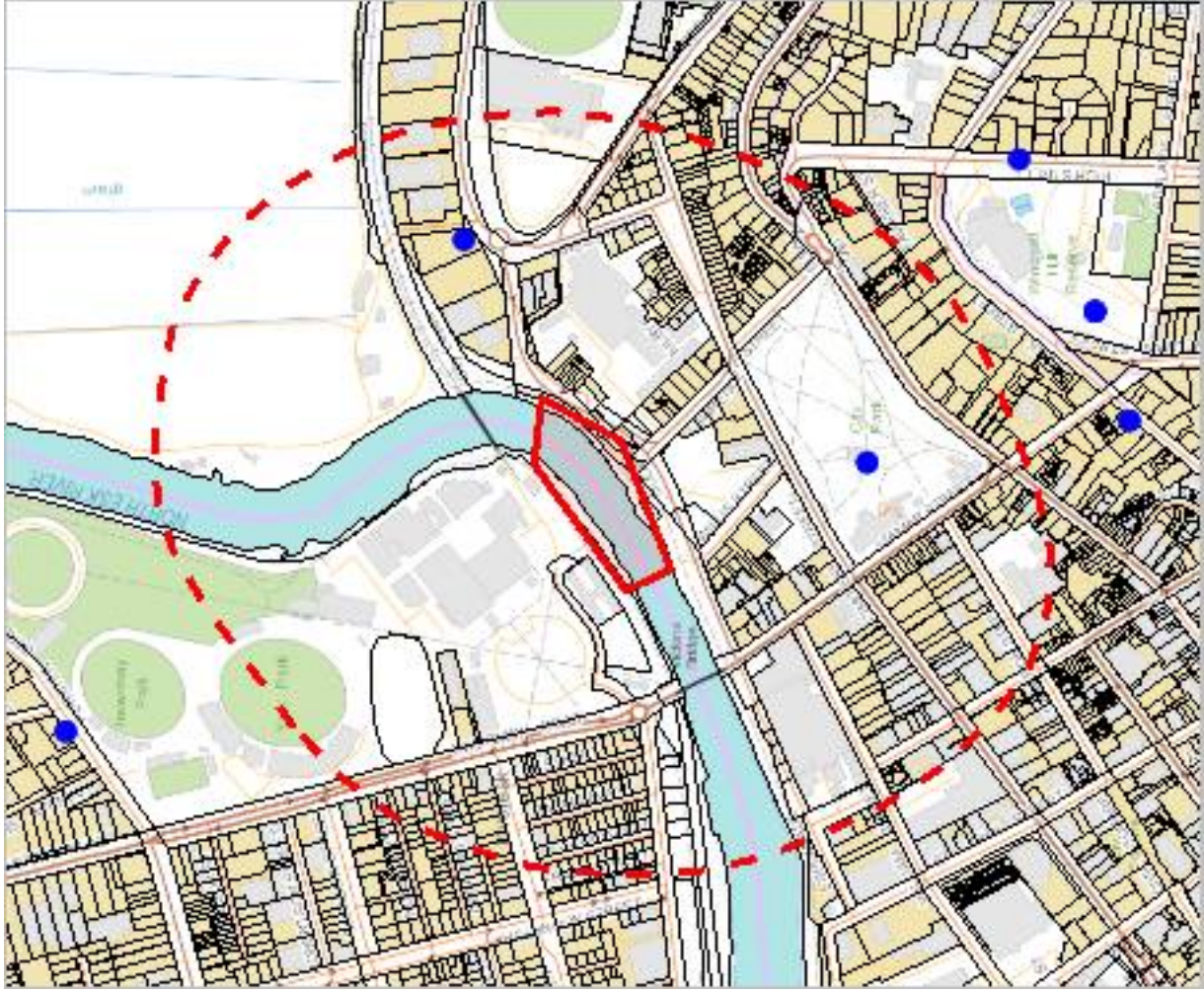
Email: ThreatenedSpecies.Enquiries@dpipwe.tas.gov.au

Address: GPO Box 44, Hobart, Tasmania, Australia, 7000



Threatened fauna within 500 metres

512527, 5414320



511217, 5412741

Please note that some layers may not display at all requested map scales

Threatened fauna within 500 metres

Legend: Verified and Unverified observations

● Point Verified

● Point Unverified

— Line Verified

— Line Unverified

■ Polygon Verified

■ Polygon Unverified

Legend: Cadastral Parcels



Threatened fauna within 500 metres

Verified Records

| Species | Common Name | SS | NS | Bio | Observation Count | Last Recorded |
|-------------------------------|----------------------|----|----|-----|-------------------|---------------|
| <i>Botaurus poiciloptilus</i> | australasian bittern | | EN | n | 1 | 30-Apr-1999 |
| <i>Lathamus discolor</i> | swift parrot | e | CR | mbe | 1 | 23-Oct-1994 |

Unverified Records

No unverified records were found!

Threatened fauna within 500 metres

(based on Range Boundaries)

| Species | Common Name | SS | NS | BO | Potential | Known | Core |
|-----------------------------------|--|----|-----|----|-----------|-------|------|
| <i>Litoria raniformis</i> | green and gold frog | v | VU | n | 1 | 0 | 1 |
| <i>Pseudemoia pagenstecheri</i> | tussock skink | v | | n | 1 | 0 | 0 |
| <i>Aquila audax subsp. fleayi</i> | tasmanian wedge-tailed eagle | e | EN | e | 1 | 0 | 0 |
| <i>Limnodynastes peroni</i> | striped marsh frog | e | | n | 1 | 0 | 0 |
| <i>Aquila audax</i> | wedge-tailed eagle | pe | PEN | n | 1 | 0 | 0 |
| <i>Tyto novaehollandiae</i> | masked owl | pe | PVU | n | 1 | 0 | 1 |
| <i>Perameles gunnii</i> | eastern barred bandicoot | | VU | n | 1 | 0 | 1 |
| <i>Dasyurus maculatus</i> | spotted-tail quoll | r | VU | n | 1 | 0 | 0 |
| <i>Dasyurus viverrinus</i> | eastern quoll | | EN | n | 0 | 0 | 1 |
| <i>Sarcophilus harrisi</i> | tasmanian devil | e | EN | e | 1 | 0 | 0 |
| <i>Accipiter novaehollandiae</i> | grey goshawk | e | | n | 1 | 0 | 0 |
| <i>Prototroctes maraena</i> | australian grayling | v | VU | ae | 1 | 0 | 0 |
| <i>Haliaeetus leucogaster</i> | white-bellied sea-eagle | v | | n | 2 | 0 | 0 |
| <i>Pasmaditta jungermanniae</i> | Cataract Gorge Pinhead Snail or snail (cataract gorge) | v | | e | 1 | 0 | 0 |

For more information about threatened species, please contact Threatened Species Enquiries.

Telephone: 1300 368 550

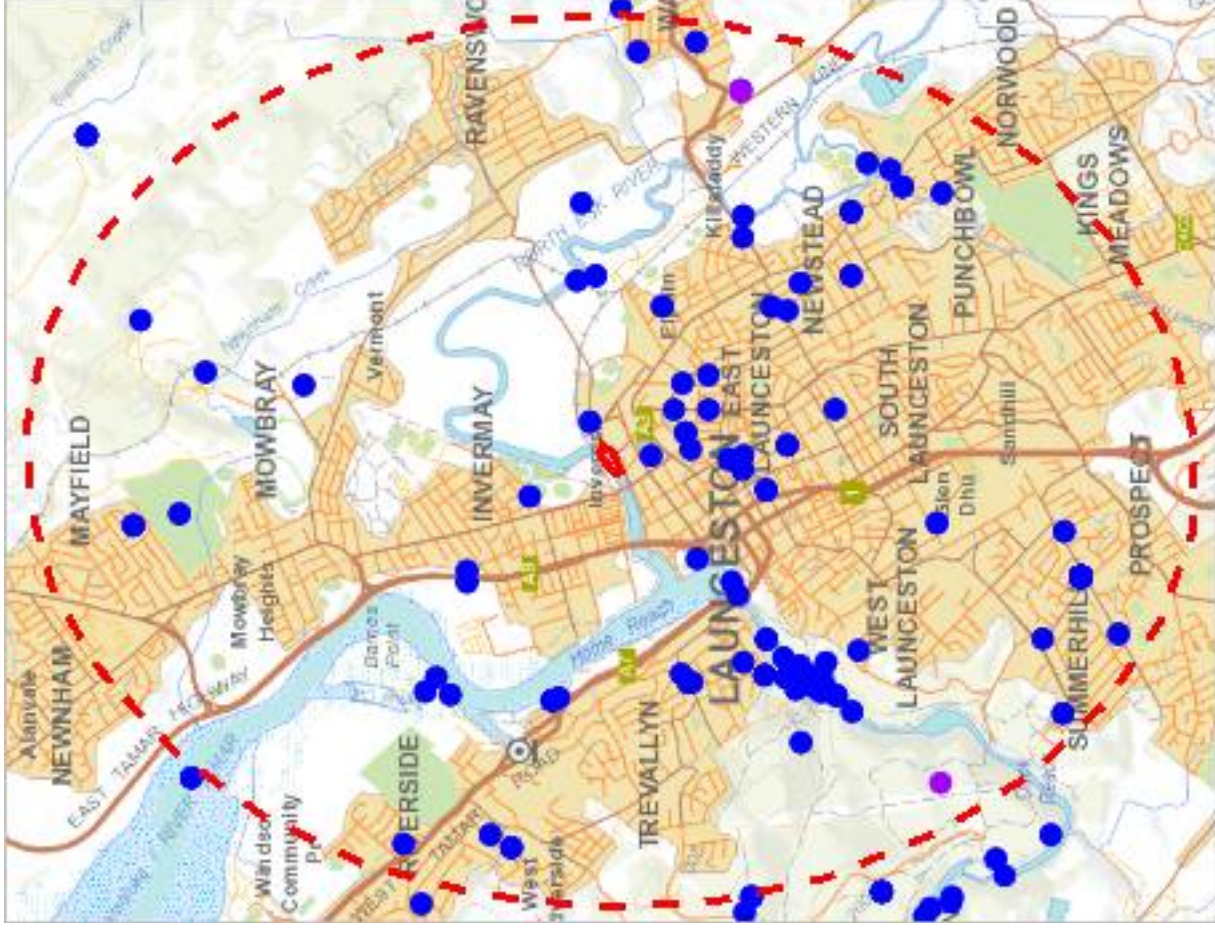
Email: ThreatenedSpecies.Enquiries@dpiwve.tas.gov.au

Address: GPO Box 44, Hobart, Tasmania, Australia, 7000



Threatened fauna within 5000 metres

515921, 5418813



507829, 5408247

Please note that some layers may not display at all requested map scales

Threatened fauna within 5000 metres

Verified Records

| Species | Common Name | SS | NS | Bio | Observation Count | Last Recorded |
|---|--|----|-----|-----|-------------------|---------------|
| Accipiter novaehollandiae | grey goshawk | e | | n | 11 | 04-Aug-2018 |
| Aquila audax | wedge-tailed eagle | pe | PEN | n | 2 | 26-Jun-2015 |
| Aquila audax subsp. fleayi | tasmanian wedge-tailed eagle | e | EN | e | 11 | 28-Nov-2018 |
| Beddomeia launcestonensis | hydrobiid snail (cataract gorge) | e | | eH | 10 | 01-Jan-2001 |
| Botaurus poiciloptilus | australasian bittern | | EN | n | 12 | 30-Apr-2010 |
| Dasyurus maculatus | spotted-tail quoll | r | VU | n | 5 | 12-Jul-2018 |
| Dasyurus maculatus subsp. maculatus | spotted-tail quoll | r | VU | n | 4 | 06-Feb-2017 |
| Dasyurus viverrinus | eastern quoll | | EN | n | 7 | 07-Apr-2017 |
| Haliaeetus leucogaster | white-bellied sea-eagle | v | | n | 20 | 10-Sep-2018 |
| Lathamus discolor | swift parrot | e | CR | mbe | 34 | 10-Sep-2011 |
| Litoria raniformis | green and gold frog | v | VU | n | 10 | 08-Sep-2018 |
| Migas plomleyi | Plomley's trapdoor spider or spider (cataract gorge) | e | | e | 5 | 08-May-2001 |
| Pasmaditta jungermanniae | Cataract Gorge Pinhead Snail or snail (cataract gorge) | v | | e | 10 | 27-Mar-2016 |
| Perameles gunnii | eastern barred bandicoot | | VU | n | 7 | 15-Oct-2015 |
| Perameles gunnii subsp. gunnii | eastern barred bandicoot | | VU | | 2 | 01-Jun-2013 |
| Poliiocephalus cristatus subsp. australis | great crested grebe | pv | | | 8 | 31-Aug-1980 |
| Prototroctes maraena | australian grayling | v | VU | ae | 7 | 09-Feb-2016 |
| Pseudemoia pagenstecheri | tussock skink | v | | n | 1 | 20-Jun-2018 |
| Pseudemoia rawlinsoni | glossy grass skink | r | | n | 1 | 19-Dec-1988 |
| Pteropus poliocephalus | grey-headed flying-fox | | VU | n | 2 | 05-May-2010 |
| Sarcophilus harrisi | tasmanian devil | e | EN | e | 24 | 31-Jan-2012 |
| Thylacinus cynocephalus | thylacine | x | EX | ex | 1 | 02-Jun-1972 |
| Tyto novaehollandiae | masked owl | pe | PVU | n | 9 | 01-Dec-1999 |
| Tyto novaehollandiae subsp. castanops | masked owl (tasmanian) | e | VU | e | 1 | 06-Sep-2012 |

Unverified Records

| Species | Common Name | SS | NS | Bio | Observation Count |
|-------------------------------------|------------------------------|----|----|-----|-------------------|
| Aquila audax subsp. fleayi | tasmanian wedge-tailed eagle | e | EN | e | 1 |
| Dasyurus maculatus subsp. maculatus | spotted-tail quoll | r | VU | n | 1 |



Threatened fauna within 5000 metres (based on Range Boundaries)

| Species | Common Name | SS | NS | BO | Potential | Known | Core |
|----------------------------|--|----|-----|----|-----------|-------|------|
| Litoria raniformis | green and gold frog | v | VU | n | 1 | 0 | 1 |
| Pseudemoia pagenstecheri | tussock skink | v | | n | 1 | 0 | 0 |
| Aquila audax subsp. fleayi | tasmanian wedge-tailed eagle | e | EN | e | 1 | 0 | 0 |
| Limnodynastes peroni | striped marsh frog | e | | n | 1 | 0 | 0 |
| Aquila audax | wedge-tailed eagle | pe | PEN | n | 2 | 0 | 0 |
| Galaxiella pusilla | eastern dwarf galaxias | v | VU | n | 1 | 0 | 0 |
| Migas plomleyi | Plomley's trapdoor spider or spider (cataract gorge) | e | | e | 2 | 0 | 0 |
| Galaxias fontanus | swan galaxias | e | EN | e | 1 | 0 | 0 |
| Tyto novaehollandiae | masked owl | pe | PVU | n | 1 | 0 | 1 |
| Perameles gunnii | eastern barred bandicoot | | VU | n | 1 | 0 | 1 |
| Dasyurus maculatus | spotted-tail quoll | r | VU | n | 1 | 0 | 0 |
| Dasyurus viverrinus | eastern quoll | | EN | n | 0 | 0 | 1 |
| Pseudemoia rawlinsoni | glossy grass skink | r | | n | 0 | 0 | 1 |
| Beddomeia launcestonensis | hydrobiid snail (cataract gorge) | e | | eH | 0 | 1 | 0 |
| Prototroctes maraena | australian grayling | v | VU | ae | 2 | 0 | 0 |
| Sarcophilus harrisi | tasmanian devil | e | EN | e | 1 | 0 | 0 |
| Accipiter novaehollandiae | grey goshawk | e | | n | 1 | 0 | 0 |
| Haliaeetus leucogaster | white-bellied sea-eagle | v | | n | 2 | 0 | 0 |
| Catadromus lacordairei | Green-lined ground beetle | v | | n | 1 | 0 | 0 |
| Pasmaditta jungermanniae | Cataract Gorge Pinhead Snail or snail (cataract gorge) | v | | e | 1 | 1 | 0 |

For more information about threatened species, please contact Threatened Species Enquiries.

Telephone: 1300 368 550

Email: ThreatenedSpecies.Enquiries@dpipwe.tas.gov.au

Threatened fauna within 5000 metres

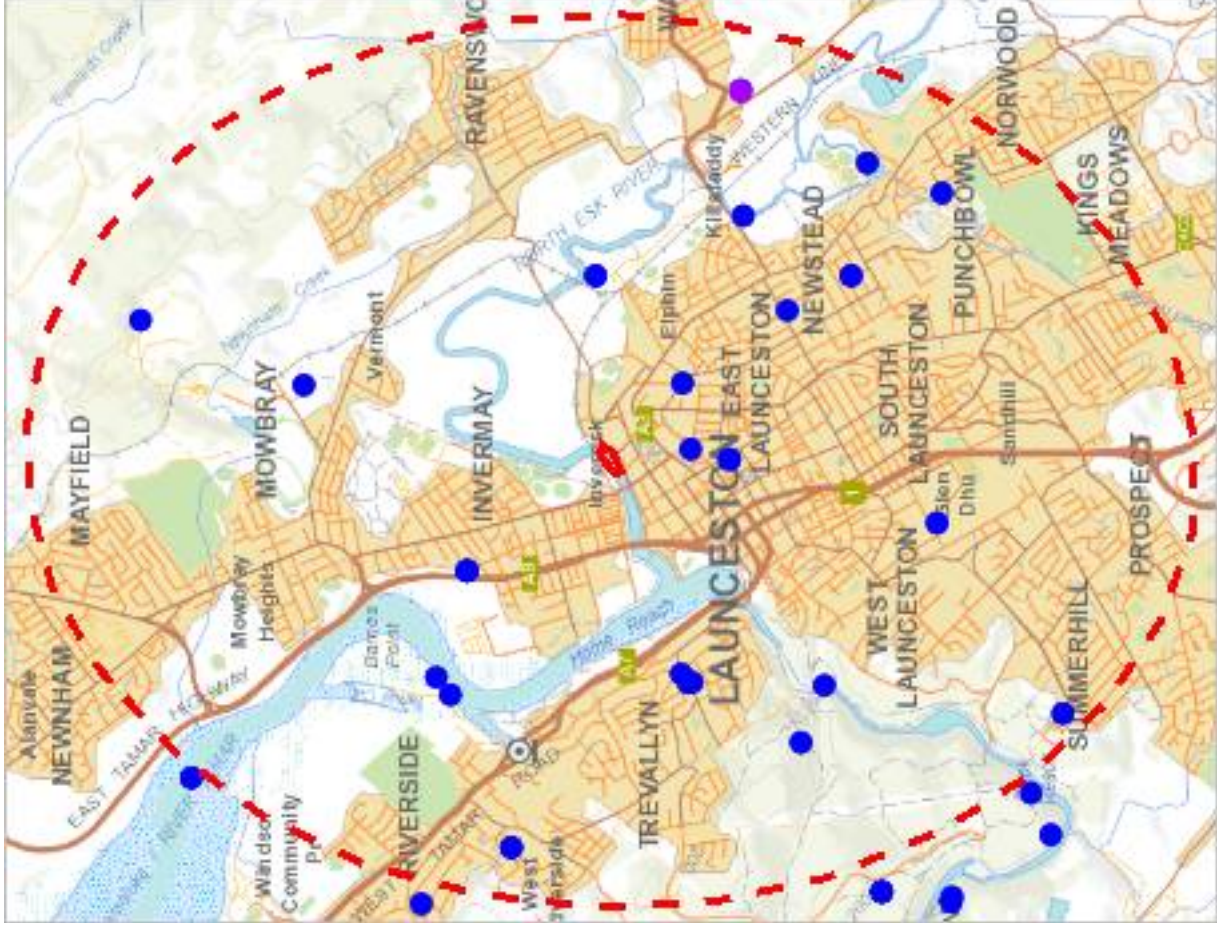
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

***** No Raptor nests or sightings found within 500 metres. *****



Raptor nests and sightings within 5000 metres

515921, 5418813



507829, 5408247

Please note that some layers may not display at all requested map scales

Raptor nests and sightings within 5000 metres

Legend: Verified and Unverified observations

● Point Verified

● Point Unverified

— Line Verified

— Line Unverified

■ Polygon Verified

■ Polygon Unverified

Legend: Cadastral Parcels



Raptor nests and sightings within 5000 metres

Verified Records

| Nest Id/Location Foreign Id | Species | Common Name | Obs Type | Observation Count | Last Recorded |
|-----------------------------|----------------------------|------------------------------|----------|-------------------|---------------|
| 114 | Falco peregrinus | peregrine falcon | Nest | 1 | 01-Jan-1985 |
| 1913 | Aquila audax subsp. fleayi | tasmanian wedge-tailed eagle | Nest | 2 | 12-Nov-2010 |
| 2150 | Haliaeetus leucogaster | white-bellied sea-eagle | Nest | 1 | 15-Jun-2014 |
| 2219 | Aquila audax | wedge-tailed eagle | Nest | 1 | 26-Jun-2015 |
| 2329 | Aquila audax subsp. fleayi | tasmanian wedge-tailed eagle | Nest | 1 | 09-Nov-2016 |
| | Accipiter novaehollandiae | grey goshawk | Carcass | 1 | 15-Nov-2015 |
| | Accipiter novaehollandiae | grey goshawk | Sighting | 10 | 04-Aug-2018 |
| | Aquila audax | wedge-tailed eagle | Sighting | 1 | 11-Sep-1982 |
| | Aquila audax subsp. fleayi | tasmanian wedge-tailed eagle | Sighting | 8 | 28-Nov-2018 |
| | Falco longipennis | australian hobby | Sighting | 5 | 02-Nov-1995 |
| | Falco peregrinus | peregrine falcon | Sighting | 2 | 28-Feb-1981 |
| | Haliaeetus leucogaster | white-bellied sea-eagle | Sighting | 19 | 10-Sep-2018 |
| | Tyto novaehollandiae | masked owl | Sighting | 9 | 01-Dec-1999 |

Unverified Records

| Nest Id/Location Foreign Id | Species | Common Name | Obs Type | Observation Count |
|-----------------------------|----------------------------|------------------------------|----------|-------------------|
| | Aquila audax subsp. fleayi | tasmanian wedge-tailed eagle | Sighting | 1 |

Raptor nests and sightings within 5000 metres (based on Range Boundaries)

| Species | Common Name | SS | NS | Potential | Known | Core |
|----------------------------|------------------------------|----|-----|-----------|-------|------|
| Aquila audax | wedge-tailed eagle | pe | PEN | 2 | 0 | 0 |
| Aquila audax subsp. fleayi | tasmanian wedge-tailed eagle | e | EN | 1 | 0 | 0 |
| Tyto novaehollandiae | masked owl | pe | PVU | 1 | 0 | 1 |
| Haliaeetus leucogaster | white-bellied sea-eagle | v | | 2 | 0 | 0 |
| Accipiter novaehollandiae | grey goshawk | e | | 1 | 0 | 0 |

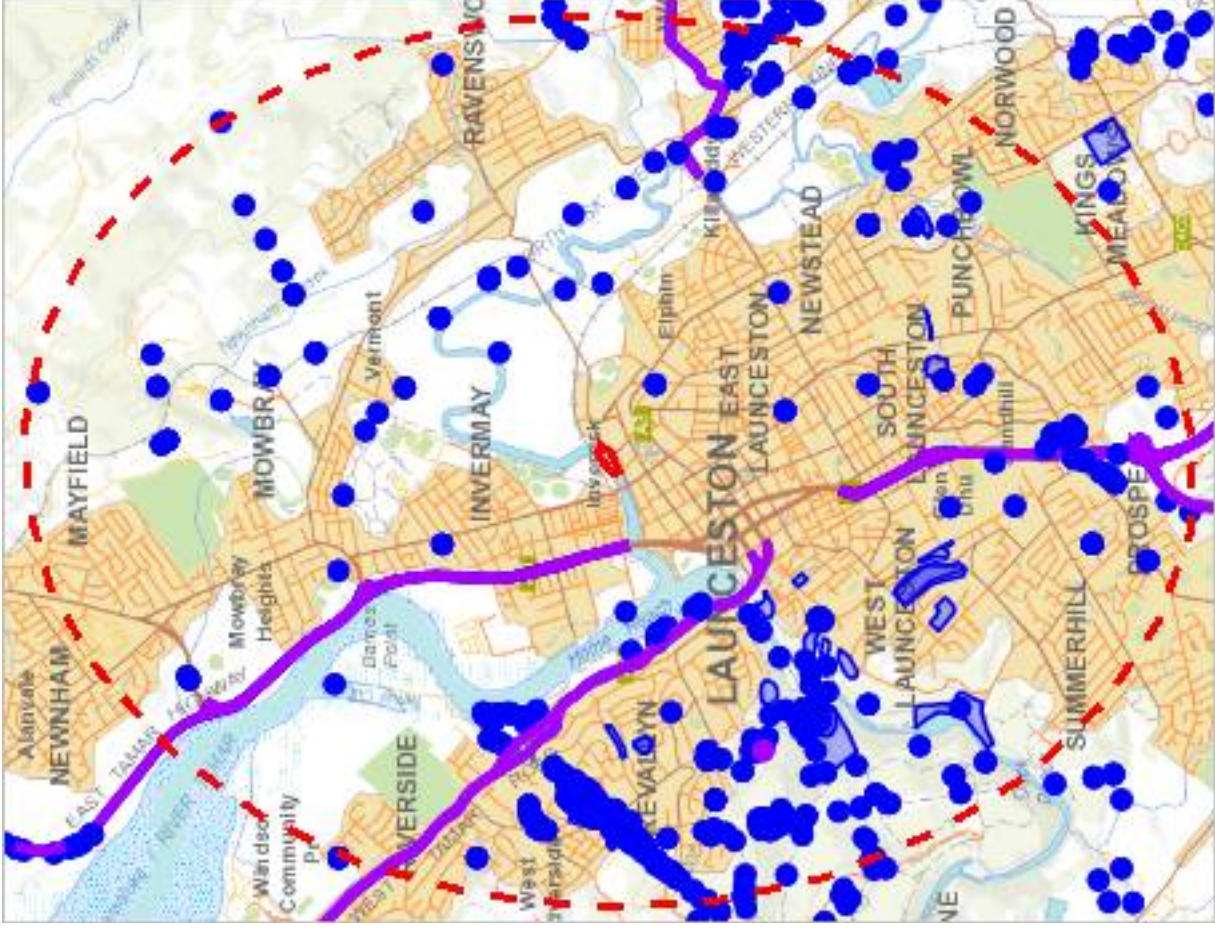
For more information about raptor nests, please contact Threatened Species Enquiries.
 Telephone: 1300 368 550
 Email: ThreatenedSpecies.Enquiries@dpipwe.tas.gov.au
 Address: GPO Box 44, Hobart, Tasmania, Australia, 7000



*** No Tas Management Act Weeds found within 500 metres ***

Tas Management Act Weeds within 5000 m

515921, 5418813



507829, 5408247

Please note that some layers may not display at all requested map scales

Tas Management Act Weeds within 5000 m

Legend: Verified and Unverified observations

● Point Verified

● Point Unverified

— Line Verified

— Line Unverified

■ Polygon Verified

■ Polygon Unverified

Legend: Cadastral Parcels



Tas Management Act Weeds within 5000 m

Verified Records

| Species | Common Name | Observation Count | Last Recorded |
|---|--------------------------|-------------------|---------------|
| Anthemis cotula | stinking chamomile | 2 | 30-Apr-2010 |
| Asparagus asparagoides | bridal creeper | 24 | 14-Oct-2018 |
| Asphodelus fistulosus | onion weed | 1 | 20-Jun-2001 |
| Calluna vulgaris | heather | 1 | 23-Dec-1947 |
| Carduus pycnocephalus | slender thistle | 29 | 15-Dec-2013 |
| Carduus tenuiflorus | winged thistle | 5 | 05-Nov-2009 |
| Cenchrus longisetus | feathertop | 1 | 13-Feb-2009 |
| Centaurea calcitrapa | star thistle | 1 | 24-Mar-1981 |
| Chrysanthemoides monilifera subsp. monilifera | boneseed | 97 | 25-Apr-2018 |
| Cirsium arvense var. arvense | creeping thistle | 1 | 23-Oct-2012 |
| Cortaderia jubata | pink pampasgrass | 2 | 08-Jan-1995 |
| Cortaderia selloana | silver pampasgrass | 5 | 12-Jul-2011 |
| Cortaderia sp. | pampas grass | 27 | 24-Oct-2016 |
| Cytisus scoparius | english broom | 8 | 15-Dec-2013 |
| Datura ferox | longspine thornapple | 1 | 01-Feb-2005 |
| Datura stramonium | common thornapple | 2 | 06-Mar-2015 |
| Echium plantagineum | patersons curse | 59 | 27-Nov-2018 |
| Echium vulgare | vipers bugloss | 1 | 01-Jan-1878 |
| Elodea canadensis | canadian pondweed | 1 | 07-Mar-2018 |
| Erica lusitanica | spanish heath | 91 | 08-Jul-2018 |
| Erica scoparia | twig heath | 5 | 30-Jul-2013 |
| Foeniculum vulgare | fennel | 5 | 14-Jan-2010 |
| Genista monspessulana | montpellier broom | 11 | 11-Dec-2012 |
| Hypericum perforatum subsp. veronense | perforated st johns-wort | 1 | 18-Jan-1993 |
| Ilex aquifolium | holly | 12 | 03-Aug-2018 |
| Lepidium draba | hoary cress | 3 | 28-Oct-1978 |
| Leycesteria formosa | himalayan honeysuckle | 1 | 01-Nov-2015 |
| Lycium ferocissimum | african boxthorn | 1 | 08-Apr-2016 |
| Marrubium vulgare | white horehound | 1 | 03-Mar-2009 |
| Oenanthe pimpinelloides | dropwort | 1 | 16-Dec-2015 |
| Rubus fruticosus | blackberry | 93 | 11-Dec-2012 |
| Salix alba var. vitellina | golden willow | 1 | 20-Oct-1953 |
| Salix x fragilis nothovar. fragilis | crack willow | 24 | 01-Nov-2015 |
| Salix x sepulcralis nothovar. chrysocoma | golden weeping willow | 1 | 20-Nov-2006 |
| Senecio jacobaea | ragwort | 11 | 18-Nov-2016 |
| Ulex europaeus | gorse | 125 | 14-Oct-2018 |
| Xanthium spinosum | bathurst burr | 2 | 29-Mar-2000 |

Unverified Records

| Species | Common Name | Observation Count |
|----------------|-------------|-------------------|
| Ulex europaeus | gorse | 1 |

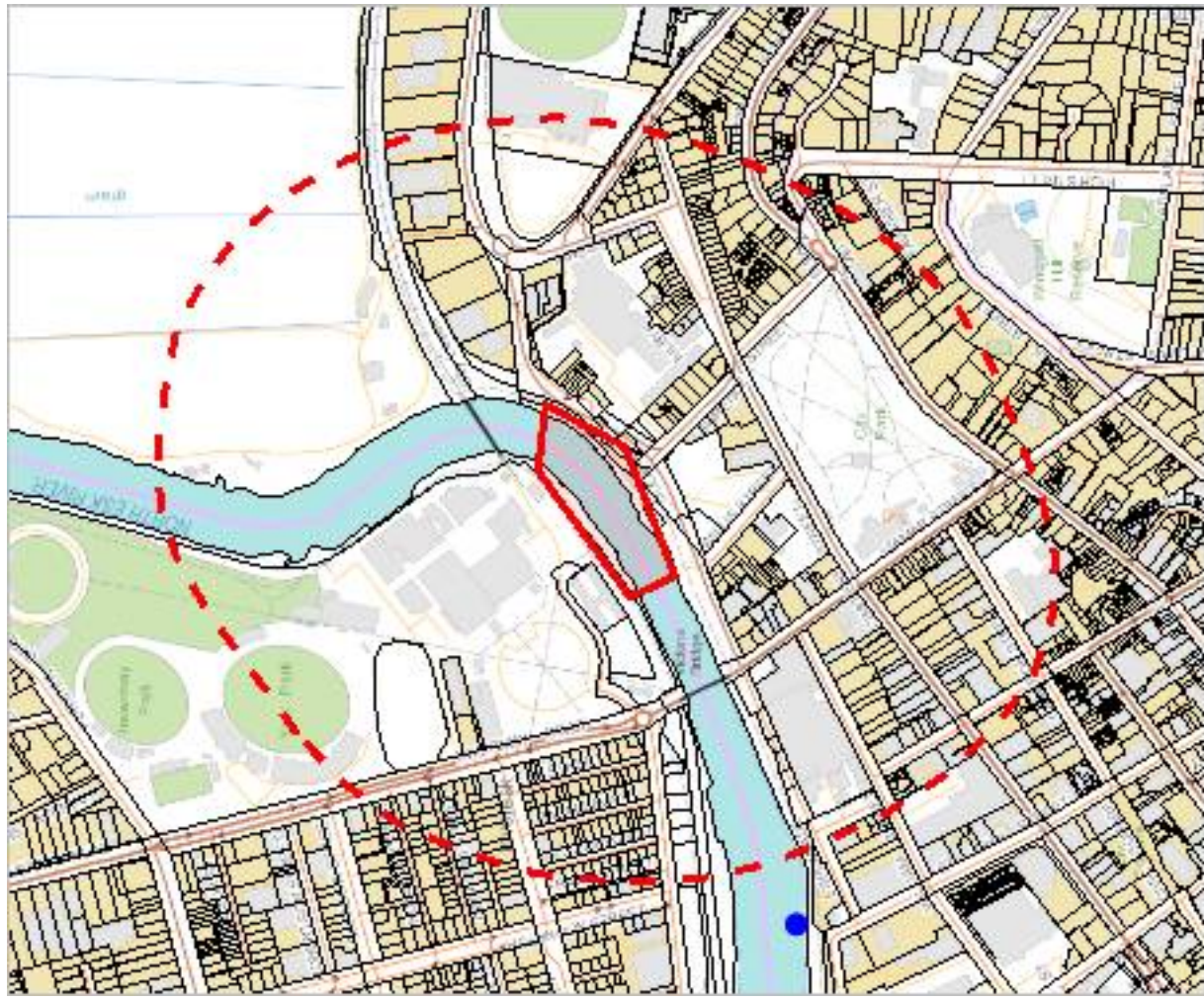
For more information about introduced weed species, please visit the following URL for contact details in your area:

<http://dpiwwe.tas.gov.au/invasive-species/weeds>



Priority Weeds within 500 m

512527, 5414320



511217, 5412741

Please note that some layers may not display at all requested map scales

Priority Weeds within 500 m

Legend: Verified and Unverified observations

● Point Verified

● Point Unverified

— Line Verified

— Line Unverified

■ Polygon Verified

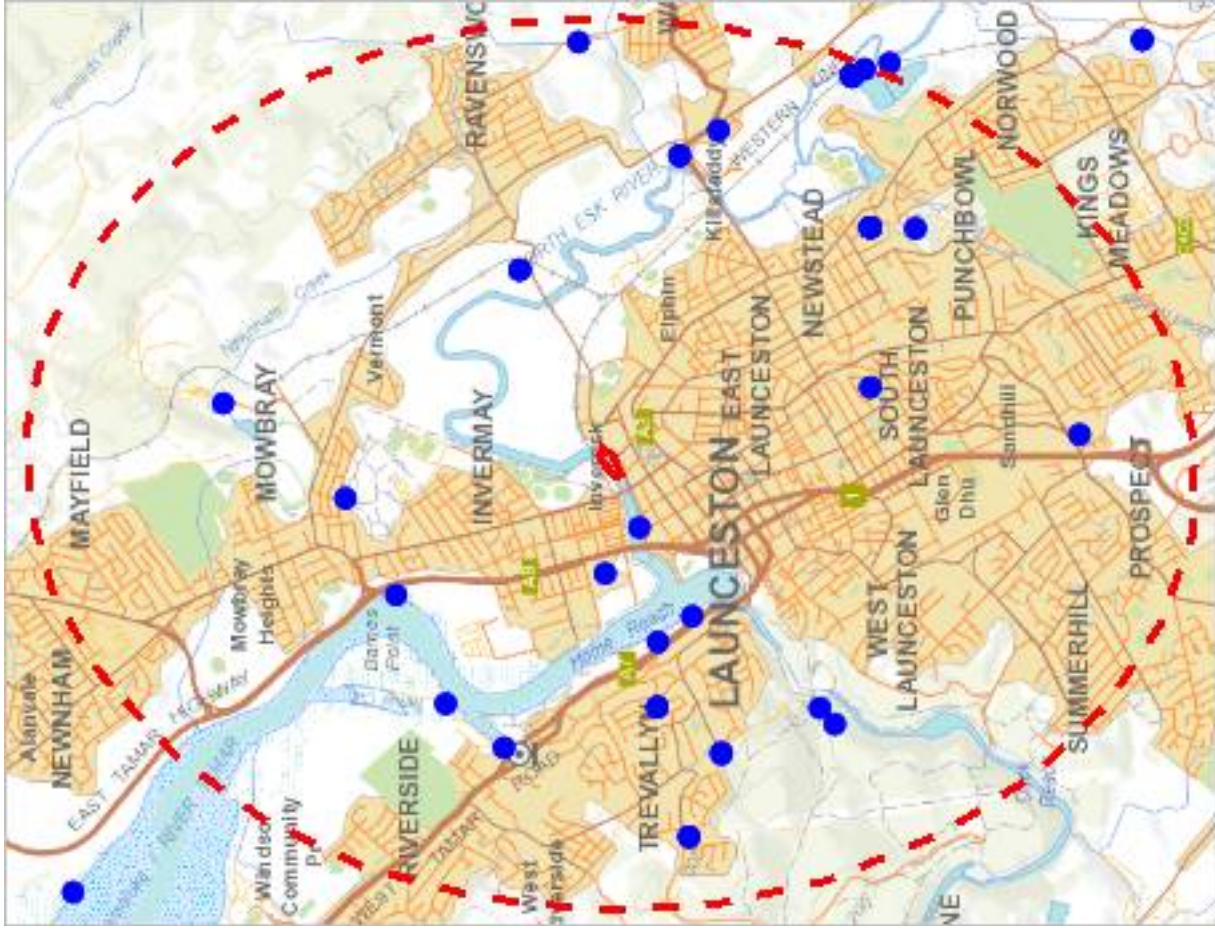
■ Polygon Unverified

Legend: Cadastral Parcels



Priority Weeds within 5000 m

515921, 5418813



507829, 5408247

Please note that some layers may not display at all requested map scales

Priority Weeds within 5000 m

Legend: Verified and Unverified observations

● Point Verified

● Point Unverified

— Line Verified

— Line Unverified

■ Polygon Verified

■ Polygon Unverified

Legend: Cadastral Parcels



Priority Weeds within 5000 m

Verified Records

| Species | Common Name | Observation Count | Last Recorded |
|----------------------------------|--------------------|-------------------|---------------|
| Acacia baileyana | cootamundra wattle | 8 | 23-Oct-2012 |
| Achillea millefolium | yarrow | 1 | 01-Feb-1971 |
| Anredera cordifolia | madeira vine | 1 | 03-May-1965 |
| Dipsacus fullonum | wild teasel | 3 | 30-Apr-2010 |
| Grevillea rosmarinifolia | rosemary grevillea | 1 | 16-Oct-1972 |
| Iris pseudacorus | yellow flag iris | 1 | 14-Dec-2010 |
| Juncus acutus | sharp rush | 1 | 18-Jan-2009 |
| Pittosporum undulatum | sweet pittosporum | 3 | 11-Apr-2018 |
| Prunus laurocerasus | cherry laurel | 2 | 13-Feb-2009 |
| Reseda luteola | weld | 3 | 11-Jun-2010 |
| Rumex obtusifolius | broadleaf dock | 1 | 29-Apr-2010 |
| Salix x pendulina var. pendulina | weeping willow | 1 | 01-Jan-1993 |
| Spartina anglica | common cordgrass | 2 | 13-Feb-2009 |
| Tradescantia fluminensis | wandering creeper | 4 | 12-Feb-2002 |
| Verbascum thapsus | great mullein | 2 | 10-Jun-2010 |
| Watsonia meriana var. bulbifera | bulbil watsonia | 2 | 11-Aug-2018 |

Unverified Records

For more information about introduced weed species, please visit the following URL for contact details in your area:

<http://dpipwe.tas.gov.au/invasive-species/weeds>

***** No Geoconservation sites found within 1000 metres. *****



Acid Sulfate Soils within 1000 metres

512904, 5414820



510840, 5412242

Please note that some layers may not display at all requested map scales

Acid Sulfate Soils within 1000 metres

Legend: Coastal Acid Sulfate Soils (0 - 20m AHD)



High



Low



Extremely Low

Legend: Inland Acid Sulfate Soils (>20m AHD)



High

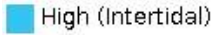


Low



Extremely Low

Legend: Marine Subaqueous/Intertidal Acid Sulfate Soil



High (Intertidal)



High (Subtidal)

Legend: Cadastral Parcels



Acid Sulfate Soils within 1000 metres

| Dataset Name | Acid Sulfate Soil Probability | Acid Sulfate Soil Atlas | Description |
|---|-------------------------------|-------------------------|---|
| Coastal Acid Sulfate Soils | Extremely Low | Ci(p3) | Extremely low probability of occurrence (1-5% of mapping unit). with occurrences in small areas. Sandplains and dunes 2-10m AHD, ASS generally below 1m from the surface. Heath, forests. Holocene or Pleistocene. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments. |
| Coastal Acid Sulfate Soils | High | Ac(p3) | High probability of occurrence (>70% chance of occurrence in mapping unit). Supratidal flats, ASS generally within upper 1m. Halophytes (mainly samphire), salt marsh, salt pans. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments. |
| Coastal Acid Sulfate Soils | High | Ae(p3) | High probability of occurrence (>70% chance of occurrence in mapping unit). Floodplains <2m AHD, ASS generally within upper 1m. Grasslands, reedlands and wetland forests. (e.g Melaleuca, Casuarina). Includes backplains. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments. |
| Coastal Acid Sulfate Soils | Low | Be(p3) | Low probability of occurrence (6-70% chance of occurrence in mapping unit). Floodplains <2m AHD, ASS generally within upper 1m. Grasslands, reedlands and wetland forests. (e.g Melaleuca, Casuarina). Includes backplains. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments. |
| Coastal Acid Sulfate Soils | Low | Bm(p3) | Low probability of occurrence (6-70% chance of occurrence in mapping unit). Hydrosols, ASS generally within upper 1m in wet/riparian areas with Hydrosols (Isbell 1996). Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments. |
| Coastal Acid Sulfate Soils | Low | Bu(p3) | Low probability of occurrence (6-70% chance of occurrence in mapping unit). Unclassified - Insufficient landscape information available to classify map unit. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments. |
| Coastal Acid Sulfate Soils | Low | Bx(p3) | Low probability of occurrence (6-70% chance of occurrence in mapping unit). Disturbed ASS terrain, ASS material present below urban development, or present in former tidal zones inside bund walls e.g dredge spoil etc. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments. |
| Marine Subaqueous and Intertidal Acid Sulfate Soils | High | Aa(p2) | High probability of occurrence (>70% chance of occurrence in mapping unit). Subaqueous material in subtidal wetland, PASS material and/or MBO. Often seagrasses. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). Analytical data are incomplete but are sufficient to classify the soil with a reasonable degree of confidence. |
| Marine Subaqueous and Intertidal Acid Sulfate Soils | High | Ab(p3) | High probability of occurrence (>70% chance of occurrence in mapping unit). Intertidal flats, PASS generally within upper 1m. Potential acid sulfate soil (PASS) = sulfidic material (Isbell 1996 p.122). No necessary analytical data are available but confidence is fair, based on a knowledge of similar soils in similar environments. |

For more information about Acid Sulfate Soils, please contact Land Management Enquiries.

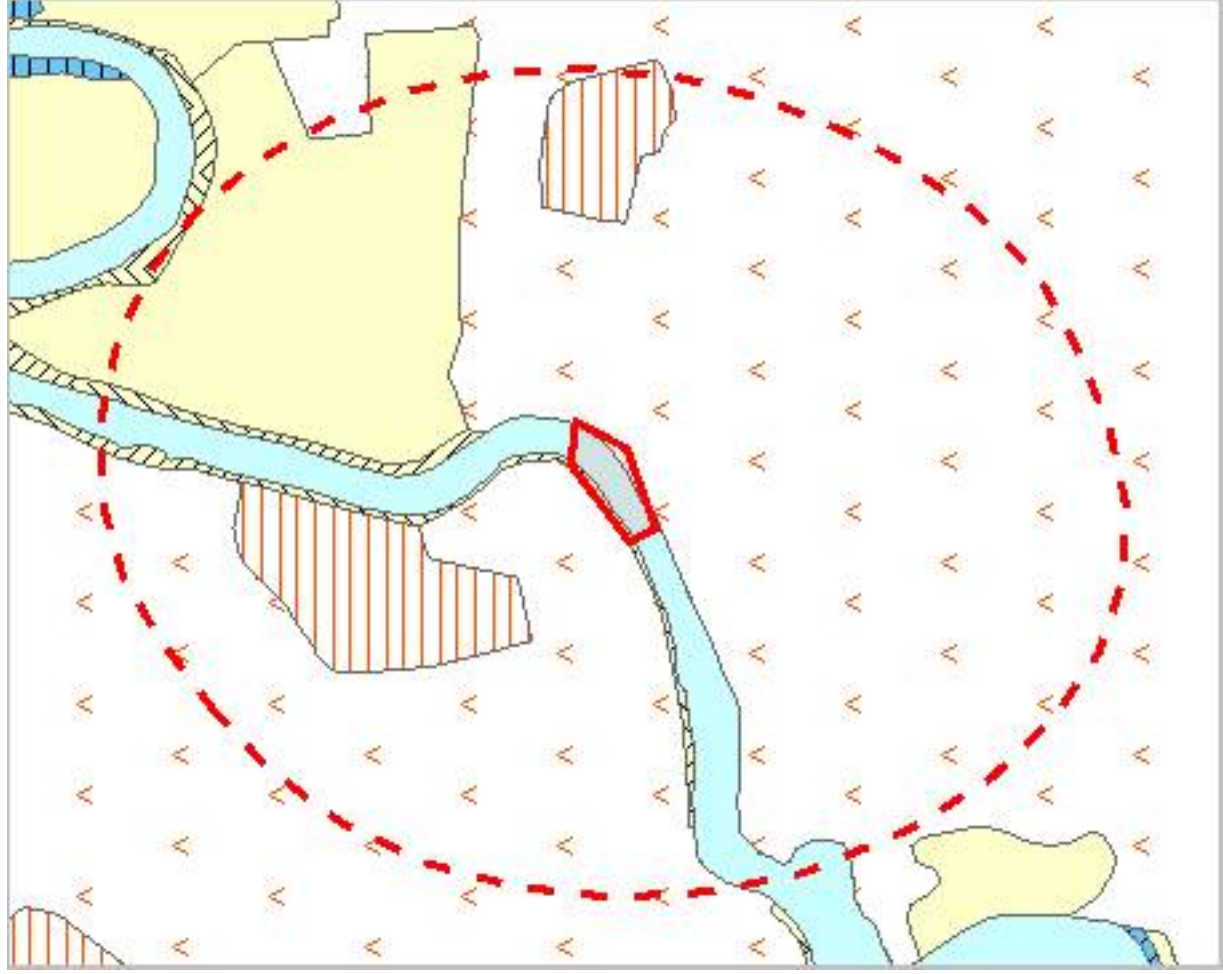
Telephone: (03) 6777 2227

Fax: (03) 6336 5111

Email: LandManagement.Enquiries@dipwe.tas.gov.au

Address: 171 Westbury Road, Prospect, Tasmania, Australia, 7250





510840, 5412242

Please note that some layers may not display at all requested map scales

Legend: TASVEG 3.0

-  DAC - Eucalyptus amygdalina coastal forest and woodland
-  DAD - Eucalyptus amygdalina forest and woodland on dolerite
-  DAS - Eucalyptus amygdalina forest and woodland on sandstone
-  DAM - Eucalyptus amygdalina forest on mudstone
-  DAZ - Eucalyptus amygdalina inland forest and woodland on Cainozoic deposits
-  DSC - Eucalyptus amygdalina - Eucalyptus obliqua damp sclerophyll forest
-  DBA - Eucalyptus barberi forest and woodland
-  DCO - Eucalyptus coccifera forest and woodland
-  DCR - Eucalyptus cordata forest
-  DDP - Eucalyptus dalrympleana - Eucalyptus pauciflora forest and woodland
-  DDE - Eucalyptus delegatensis dry forest and woodland
-  DGL - Eucalyptus globulus dry forest and woodland
-  DGW - Eucalyptus gunnii woodland
-  DMO - Eucalyptus morrisbyi forest and woodland
-  DNI - Eucalyptus nitida dry forest and woodland
-  DNF - Eucalyptus nitida Furneaux forest
-  DOB - Eucalyptus obliqua dry forest
-  DOV - Eucalyptus ovata forest and woodland
-  DOW - Eucalyptus ovata heathy woodland
-  DPO - Eucalyptus pauciflora forest and woodland not on dolerite
-  DPD - Eucalyptus pauciflora forest and woodland on dolerite
-  DPE - Eucalyptus perriniana forest and woodland
-  DPU - Eucalyptus pulchella forest and woodland
-  DRI - Eucalyptus risdonii forest and woodland
-  DRO - Eucalyptus rodwayi forest and woodland
-  DSO - Eucalyptus sieberi forest and woodland not on granite
-  DSG - Eucalyptus sieberi forest and woodland on granite
-  DTD - Eucalyptus tenuiramis forest and woodland on dolerite
-  DTG - Eucalyptus tenuiramis forest and woodland on granite
-  DTO - Eucalyptus tenuiramis forest and woodland on sediments
-  DVF - Eucalyptus viminalis Furneaux forest and woodland
-  DVG - Eucalyptus viminalis grassy forest and woodland
-  DVC - Eucalyptus viminalis - Eucalyptus globulus coastal forest and woodland
-  DKW - King Island Eucalypt woodland
-  DMW - Midlands woodland complex
-  WBR - Eucalyptus brookeriana wet forest
-  WDA - Eucalyptus dalrympleana forest
-  WDL - Eucalyptus delegatensis forest over Leptospermum
-  WDR - Eucalyptus delegatensis forest over rainforest
-  WDB - Eucalyptus delegatensis forest with broad-leaf shrubs
-  WDU - Eucalyptus delegatensis wet forest (undifferentiated)
-  WGK - Eucalyptus globulus King Island forest
-  WGL - Eucalyptus globulus wet forest
-  WNL - Eucalyptus nitida forest over Leptospermum
-  WNR - Eucalyptus nitida forest over rainforest
-  WNU - Eucalyptus nitida wet forest (undifferentiated)
-  WOL - Eucalyptus obliqua forest over Leptospermum
-  WOR - Eucalyptus obliqua forest over rainforest
-  WOB - Eucalyptus obliqua forest with broad-leaf shrubs
-  WOU - Eucalyptus obliqua wet forest (undifferentiated)
-  WRE - Eucalyptus regnans forest
-  WSU - Eucalyptus subcrenulata forest and woodland
-  WVI - Eucalyptus viminalis wet forest
-  RPF - Athrotaxis cupressoides - Nothofagus gunnii short rainforest
-  RPW - Athrotaxis cupressoides open woodland
-  RPP - Athrotaxis cupressoides rainforest
- RKF - Athrotaxis selaginoides - Nothofagus gunnii short rainforest
- RKP - Athrotaxis selaginoides rainforest
- RKS - Athrotaxis selaginoides subalpine scrub







































TASVEG 3.0 Communities within 1000 metres

- RCO - Coastal rainforest
- RSH - Highland low rainforest and scrub
- RKX - Highland rainforest scrub with dead Athrotaxis selaginoides
- RHP - Lagarostrobos franklinii rainforest and scrub
- RMT - Nothofagus - Atherosperma rainforest
- RML - Nothofagus - Leptospermum short rainforest
- RMS - Nothofagus - Phyllocladus short rainforest
- RFS - Nothofagus gunnii rainforest and scrub
- RMU - Nothofagus rainforest (undifferentiated)
- RFE - Rainforest fernland
- NAD - Acacia dealbata forest
- NAR - Acacia melanoxylon forest on rises
- NAF - Acacia melanoxylon swamp forest
- NAL - Allocasuarina littoralis forest
- NAV - Allocasuarina verticillata forest
- NBS - Banksia serrata woodland
- NBA - Bursaria - Acacia woodland and scrub
- NCR - Callitris rhomboidea forest
- NLE - Leptospermum forest
- NLM - Leptospermum lanigerum - Melaleuca squarrosa swamp forest
- NLA - Leptospermum scoparium - Acacia mucronata forest
- NME - Melaleuca ericifolia swamp forest
- NLN - Subalpine Leptospermum nitidum woodland
- AHF - Fresh water aquatic herbland
- ASF - Freshwater aquatic sedgeland and rushland
- AHL - Lacustrine herbland
- AHS - Saline aquatic herbland
- ARS - Saline sedgeland/rushland
- AUS - Saltmarsh (undifferentiated)
- ASS - Succulent saline herbland
- AWU - Wetland (undifferentiated)
- SAL - Acacia longifolia coastal scrub
- SBM - Banksia marginata wet scrub
- SBR - Broad-leaf scrub
- SCH - Coastal heathland
- SSC - Coastal scrub
- SCA - Coastal scrub on alkaline sands
- SRE - Eastern riparian scrub
- SED - Eastern scrub on dolerite
- SCL - Heathland on calcareous substrates
- SKA - Kunzea ambigua regrowth scrub
- SLG - Leptospermum glaucescens heathland and scrub
- SLL - Leptospermum lanigerum scrub
- SLS - Leptospermum scoparium heathland and scrub
- SLW - Leptospermum scrub
- SRF - Leptospermum with rainforest scrub
- SMP - Melaleuca pustulata scrub
- SMM - Melaleuca squamea heathland
- SMR - Melaleuca squarrosa scrub
- SRH - Rookery halophytic herbland
- SSK - Scrub complex on King Island
- SSZ - Spray zone coastal complex
- SHS - Subalpine heathland
- SWR - Western regrowth complex
- SSW - Western subalpine scrub
- SWW - Western wet scrub
- SHW - Wet heathland
- HCH - Alpine coniferous heathland
- HCM - Cushion moorland
- HHE - Eastern alpine heathland
- HSE - Eastern alpine sedgeland



TASVEG 3.0 Communities within 1000 metres

-  HUE - Eastern alpine vegetation (undifferentiated)
-  HHW - Western alpine heathland
-  HSW - Western alpine sedgeland/herbland
-  MAP - Alkaline pans
-  MBU - Buttongrass moorland (undifferentiated)
-  MBS - Buttongrass moorland with emergent shrubs
-  MBE - Eastern buttongrass moorland
-  MGH - Highland grassy sedgeland
-  MBP - Pure buttongrass moorland
-  MRR - Restionaceae rushland
-  MBR - Sparse buttongrass moorland on slopes
-  MSP - Sphagnum peatland
-  MDS - Subalpine Diplarrena latifolia rushland
-  MBW - Western buttongrass moorland
-  MSW - Western lowland sedgeland
-  GHC - Coastal grass and herbfield
-  GPH - Highland Poa grassland
-  GCL - Lowland grassland complex
-  GSL - Lowland grassy sedgeland
-  GPL - Lowland Poa labillardierei grassland
-  GTL - Lowland Themeda triandra grassland
-  GRP - Rockplate grassland
-  FAG - Agricultural land
-  FUM - Extra-urban miscellaneous
-  FMG - Marram grassland
-  FPE - Permanent easements
-  FPL - Plantations for silviculture
-  FPF - Pteridium esculentum fernland
-  FRG - Regenerating cleared land
-  FSM - Spartina marshland
-  FPU - Unverified plantations for silviculture
-  FUR - Urban areas
-  FWU - Weed infestation
-  QCS - Coastal slope complex
-  QCT - Coastal terrace mosaic
-  QKB - Kelp beds
-  QAM - Macquarie alpine mosaic
-  QMI - Mire
-  QST - Short tussock grassland/rushland with herbs
-  QTT - Tall tussock grassland with megaherbs
-  ORO - Lichen lithosere
-  OSM - Sand, mud
-  OAQ - Water, sea

Legend: Cadastral Parcels



TASVEG 3.0 Communities within 1000 metres

| Code | Community | Emergent Species |
|------|---------------------------------|------------------|
| FAG | (FAG) Agricultural land | |
| FUM | (FUM) Extra-urban miscellaneous | |
| FUR | (FUR) Urban areas | |
| FWU | (FWU) Weed infestation | |
| OAQ | (OAQ) Water, sea | |

For more information contact: Coordinator, Tasmanian Vegetation Monitoring and Mapping Program.

Telephone: (03) 6165 4320

Email: TVMMPsupport@dipw.tas.gov.au

Address: GPO Box 44, Hobart, Tasmania, Australia, 7000



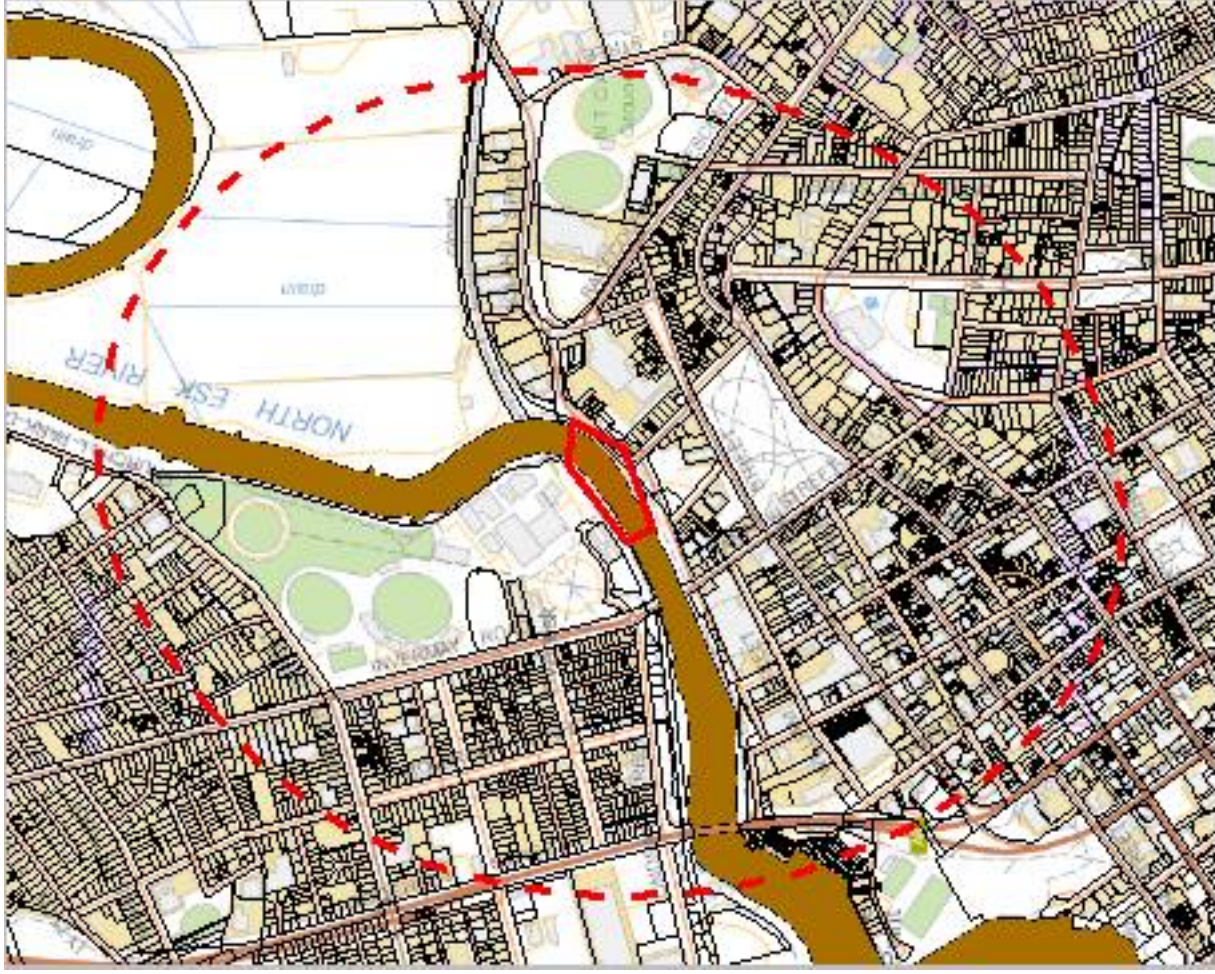
***** No threatened Communities (TNVC 2014) found within 1000 metres *****

***** No Fire History (All) found within 1000 metres *****

***** No Fire History (Last Burnt) found within 1000 metres *****

Reserves within 1000 metres

512904, 5414820





















510840, 5412242

Please note that some layers may not display at all requested map scales

Reserves within 1000 metres

Legend: Tasmanian Reserve Estate

-  Conservation Area
-  Conservation Area and Conservation Covenant (NCA)
-  Game Reserve
-  Historic Site
-  Indigenous Protected Area
-  National Park
-  Nature Reserve
-  Nature Recreation Area
-  Regional Reserve
-  State Reserve
-  Wellington Park
-  Public authority land within WHA
-  Future Potential Production Forest
-  Informal Reserve on Permanent Timber Production Zone Land or Forestry Tas. managed land
-  Informal Reserve on other public land
-  Conservation Covenant (NCA)
-  Private Nature Reserve and Conservation Covenant (NCA)
-  Private Sanctuary and Conservation Covenant (NCA)
-  Private Sanctuary
-  Private land within WHA
-  Management Agreement
-  Management Agreement and Stewardship Agreement
-  Stewardship Agreement
-  Part 5 Agreement (Meander Dam Offset)
-  Other Private Reserve

Legend: Cadastral Parcels



Reserves within 1000 metres

| Name | Classification | Status | Area (HA) |
|-------------------------|-------------------|----------------------|------------|
| Tamar Conservation Area | Conservation Area | Other Formal Reserve | 0.00262794 |
| Tamar Conservation Area | Conservation Area | Other Formal Reserve | 0.0334983 |
| Tamar Conservation Area | Conservation Area | Other Formal Reserve | 62.1784 |
| Tamar Conservation Area | Conservation Area | Other Formal Reserve | 4451.63 |

For more information about the Tasmanian Reserve Estate, please contact the Sustainable Land Use and Information Management Branch.

Telephone: (03) 6777 2224

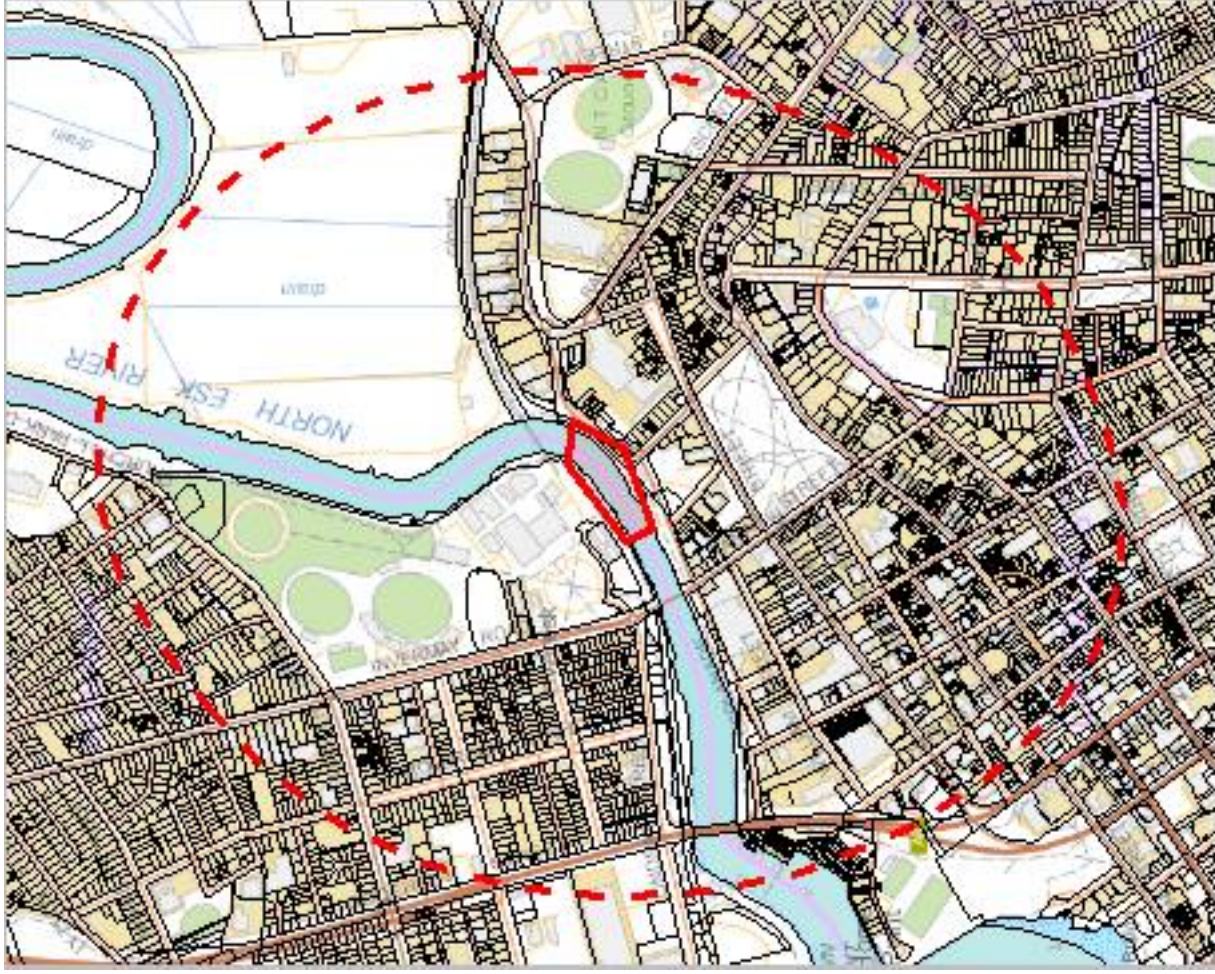
Email: LandManagement.Enquiries@dpiwve.tas.gov.au

Address: GPO Box 44, Hobart, Tasmania, Australia, 7000



Known biosecurity risks within 1000 meters

512904, 5414820



510840, 5412242

Please note that some layers may not display at all requested map scales

Known biosecurity risks within 1000 meters

Legend: Biosecurity Risk Species

- Point Verified
- Point Unverified
- Polygon Verified
- Polygon Unverified
- Line Verified
- Line Unverified

Legend: Hygiene infrastructure

- Location Point Verified
- Location Point Unverified
- Location Line Unverified
- Location Line Verified
- Location Polygon Verified
- Location Polygon Unverified

Legend: Cadastral Parcels



Known biosecurity risks within 1000 meters



Verified Species of biosecurity risk

No verified species of biosecurity risk found within 1000 metres

Unverified Species of biosecurity risk

No unverified species of biosecurity risk found within 1000 metres

Generic Biosecurity Guidelines

The level and type of hygiene protocols required will vary depending on the tenure, activity and land use of the area. In all cases adhere to the land manager's biosecurity (hygiene) protocols. As a minimum always Check / Clean / Dry (Disinfect) clothing and equipment before trips and between sites within a trip as needed <http://dpiwwe.tas.gov.au/invasive-species/weeds/weed-hygiene/keeping-it-clean-a-tasmanian-field-hygiene-manual>

On Reserved land, the more remote, infrequently visited and undisturbed areas require tighter biosecurity measures.

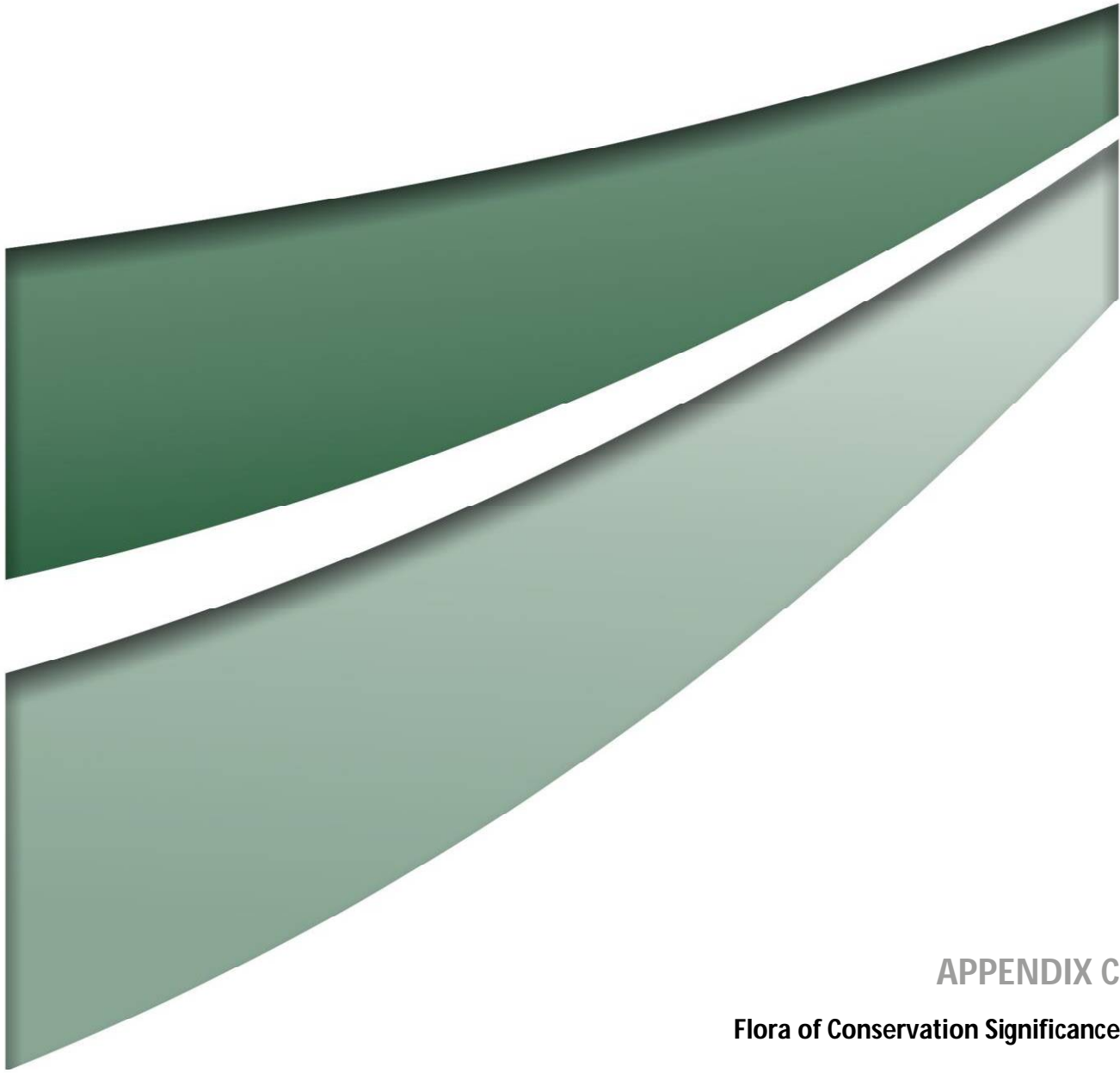
In addition, where susceptible species and communities are known to occur, tighter biosecurity measures are required.

Apply controls relevant to the area / activity:

- Don't access sites infested with pathogen or weed species unless absolutely necessary. If it is necessary to visit, adopt high level hygiene protocols.
- Consider not accessing non-infested sites containing known susceptible species / communities. If it is necessary to visit, adopt high level hygiene protocols.
- Don't undertake activities that might spread pest / pathogen / weed species such as deliberately moving soil or water between areas.
- Modify / restrict activities to reduce the chance of spreading pest / pathogen / weed species e.g. avoid periods when weeds are seeding, avoid clothing/equipment that excessively collects soil and plant material e.g. Velcro, excessive tread on boots.
- Plan routes to visit clean (uninfested) sites prior to dirty (infested) sites. Do not travel through infested areas when moving between sites.
- Minimise the movement of soil, water, plant material and hitchhiking wildlife between areas by using the Check / Clean / Dry (Disinfect when drying is not possible) procedure for all clothing, footwear, equipment, hand tools and vehicles <http://dpiwwe.tas.gov.au/invasive-species/weeds/weed-hygiene>
- Neoprene and netting can take 48 hours to dry, use non-porous gear wherever possible.
- Use walking track boot wash stations where available.
- Keep a hygiene kit in the vehicle that includes a scrubbing brush, boot pick, and disinfectant <http://dpiwwe.tas.gov.au/invasive-species/weeds/weed-hygiene/keeping-it-clean-a-tasmanian-field-hygiene-manual>
- Dispose of all freshwater away from natural water bodies e.g. do not empty water into streams or ponds.
- Dispose of used disinfectant ideally in town through a treatment or septic system. Always keep disinfectant well away from natural water systems.
- Securely contain any high risk pest / pathogen / weed species that must be collected and moved e.g. biological samples.

Hygiene Infrastructure

No known hygiene infrastructure found within 1000 metres



APPENDIX C
Flora of Conservation Significance

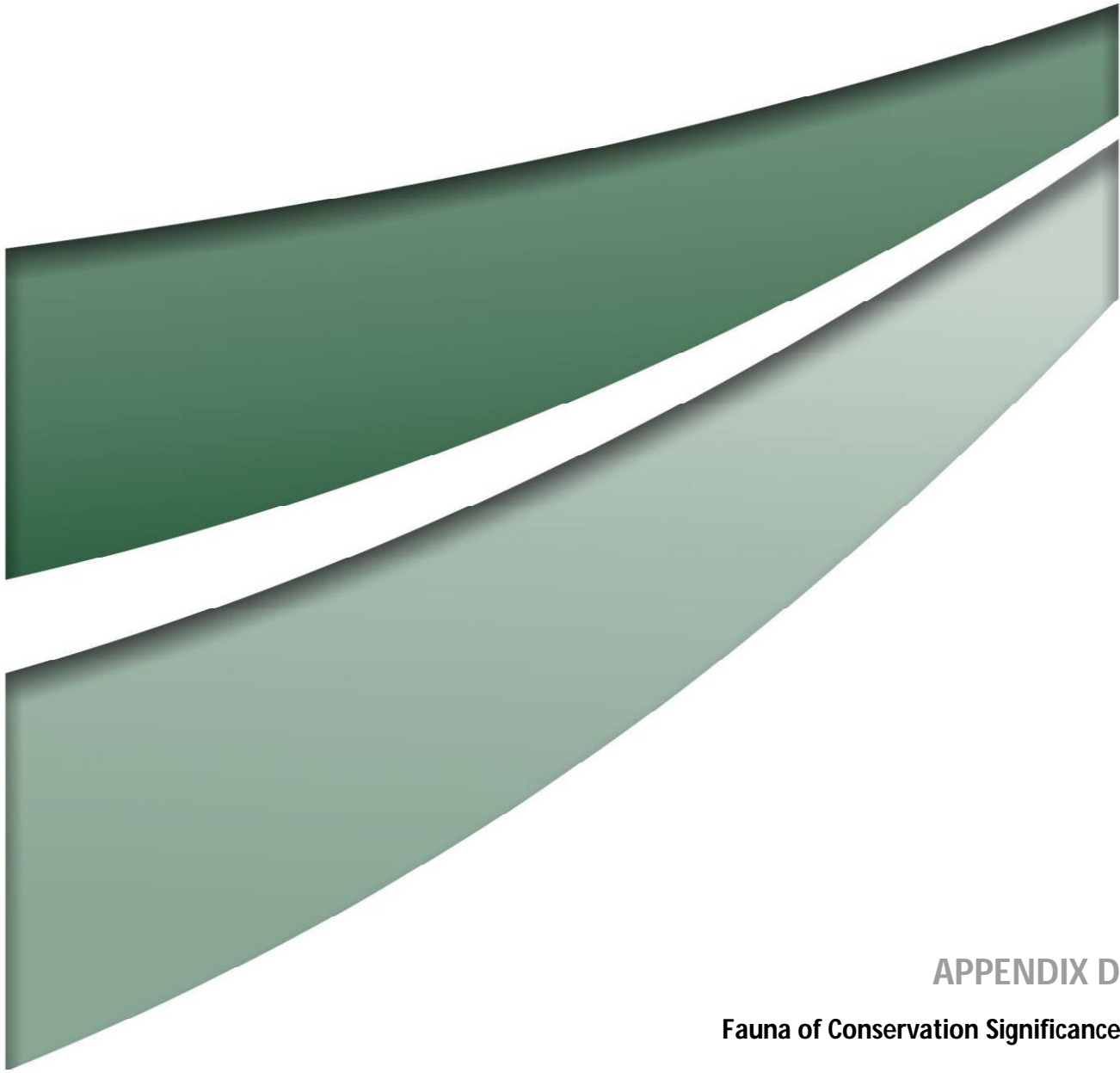
| Family | Scientific Name | Common Name | (Wealth Status) | State Status | Records within 500m | Records within 1km | Habitats | Potential to Occur |
|----------------|---------------------------------------|-----------------|-----------------|--------------|---------------------|--------------------|--|--|
| Convolvulaceae | <i>Calystegia sepium</i> | swamp bindweed | - | R | 1 | | A riparian species that is widespread throughout temperate Australia. In Tasmania, this species has been recorded from riverbanks and the margins of forests in the north of the State around the Tamar region. | Potential to occur. |
| Cyperaceae | <i>Schoenoplectus tabernaemontani</i> | river clubsedge | - | R | 1 | | Inhabits the margins of lagoons on King Island, Flinders Island and on some riverbanks in the Midlands. | Potential to occur. |
| Cyperaceae | <i>Bolboschoenus caldwellii</i> | sea clubsedge | - | R | - | 1 | In Tasmania, this species occurs in shallow, standing, sometimes brackish water where it is often rooted in heavy black mud. | Potential to occur. |
| Goodeniaceae | <i>Brunonia australis</i> | blue pincushion | - | R | - | 2 | Typically occurs in grassy woodlands and dry sclerophyll forests dominated by black peppermint (<i>Eucalyptus amygdalina</i>) or less commonly white gum (<i>Eucalyptus viminalis</i>) or stringybark (<i>Eucalyptus obliqua</i>). Some smaller populations are found in heathy and shrubby dry forests. | Given high levels of disturbance within the Study Area, considered unlikely to occur. |

| Family | Scientific Name | Common Name | (Wealth Status) | State Status | Records within 500m | Records within 1km | Habitats | Potential to Occur |
|--------------|--|-------------------|-----------------|--------------|---------------------|--------------------|---|--|
| Orchidaceae | <i>Caladenia filamentosa</i> | daddy longlegs | - | R | - | 1 | Occurs in lowland heathy and sedgy open eucalypt forest and woodland on sandy soils. | Given high levels of disturbance within the Study Area, considered unlikely to occur . |
| Cupressaceae | <i>Callitris oblonga</i> subsp. <i>oblonga</i> | south esk pine | E | V | - | 1 | Occurs in a range of vegetation types, including woodland, scrub and shrubland dominated by eucalypts, the most common dominants being <i>Eucalyptus ovata</i> and <i>Eucalyptus viminalis</i> , followed by <i>Eucalyptus amygdalina</i> | Given high levels of disturbance within the Study Area, considered unlikely to occur . |
| Asteraceae | <i>Calocephalus lacteus</i> | milky beautyheads | - | R | - | 1 | Occurs in open, dry sites in lowland areas of eastern and northern Tasmania and on lower altitudes of the Central Plateau. Species requires bare ground for recruitment. Disturbance appears to be beneficial for this species as it is often found on roadsides and beside tracks. | Study Area occurs on the frequently in-undated low bank of the Esk River. Due to the high moisture levels of the Study Area, species considered unlikely to occur . |

| Family | Scientific Name | Common Name | (Wealth Status) | State Status | Records within 500m | Records within 1km | Habitats | Potential to Occur |
|---------------|--|--------------------|-----------------|--------------|---------------------|--------------------|---|---|
| Lamiaceae | <i>Scutellaria humilis</i> | dwarf skullcap | - | R | - | 1 | Found in moist, shady places in the north-east of the State. Key sites include Falmouth, Fingal, George Town, Clarence Point (West Tamar), Launceston, Cataract Gorge, Binalong Bay and Maria Island. | No suitable habitat present. Unlikely to occur. |
| Asteraceae | <i>Senecio squarrosus</i> | leafy fireweed | - | R | - | 1 | Species is associated with dry sclerophyll forest. | No suitable habitat present. Unlikely to occur. |
| Rhamnaceae | <i>Spyridium vexilliferum</i> var. <i>vexilliferum</i> | helicopter bush | - | R | - | 3 | Is found in sandy heaths and on rocky outcrops in the east, north and west of Tasmania. | No suitable habitat present. Unlikely to occur. |
| Tremandraceae | <i>Tetratheca ciliata</i> | northern pinkbells | - | R | - | 1 | Recorded from heathlands and heathy woodlands on sandy well-drained soils, the woodland dominated by <i>Eucalyptus amygdalina</i> (black peppermint). Associated species include <i>Acacia suaveolens</i> , <i>Allocasuarina monilifera</i> , <i>Aotus ericoides</i> , <i>Dillwynia glaberrima</i> , <i>Hibbertia procumbens</i> , <i>Leptospermum scoparium</i> , <i>Lepidosperma concavum</i> and <i>Xanthorrhoea australis</i> . | No suitable habitat present. Unlikely to occur. |

| Family | Scientific Name | Common Name | (Wealth Status) | State Status | Records within 500m | Records within 1km | Habitats | Potential to Occur |
|------------|----------------------------|--------------------------|-----------------|--------------|---------------------|--------------------|--|---|
| Asteraceae | <i>Vittadinia gracilis</i> | woolly new-holland-daisy | - | R | - | 1 | Is known from dry sites on dolerite and basalt. It is predominantly found in dry sclerophyll forest around Hobart, into the Midlands and extending up into the north-east. | No suitable habitat present in the Study Area. Unlikely to occur. |
| Asteraceae | <i>Xerochrysum bicolor</i> | east-coast paperdaisy | - | R | - | 1 | Species is recorded from heathland near the coast in the north-east, and in alpine situations. | No suitable habitat present in the Study Area. Unlikely to occur. |

PEX – Presumed Extinct (EPBC Act and TSP Act), Ex – Extinct (EPBC Act and TSP Act), CE – Critically Endangered (EPBC Act, E – Endangered (EPBC Act and TSP Act), V – Vulnerable (EPBC Act and TSP Act), R – Rare (TSP Act)



APPENDIX D
Fauna of Conservation Significance

| Scientific Name | Common Name | 'Wealth Status | State Status | Records within 500m | Records within 1km | Habitats | Potential to Occur |
|-----------------------------------|------------------------------|----------------|--------------|---------------------|--------------------|---|---|
| <i>Litoria raniformis</i> | Green and gold frog | V | V | 1 | 10 | Is dependent upon permanent freshwater lagoons for breeding. Ideal breeding habitat is the shallow part of lagoons (to approx. 1.5 m) where there is generally a complex vegetation structure. Breeding sites often contain vegetation communities dominated by emergent plants such as water ribbons (<i>Triglochin</i>) and spikerush (<i>Eleocharis</i>), and submerged plants such as watermilfoil (<i>Myriophyllum</i>), marsh-flower (<i>Villarsia</i>), and pondweed (<i>Potamogeton</i>). However, other plant communities can form equally suitable habitat. | No suitable habitat present in the Study Area. Unlikely to occur. |
| <i>Pseudemoia pagenstecheri</i> | Tussock skink | - | V | 1 | 1 | Found exclusively in tussock grassland habitats where trees are absent or form only well-spaced woodland. They prefer areas where the grass is medium to tall. | No suitable habitat present in the Study Area. Unlikely to occur. |
| <i>Aquila audax subsp. fleayi</i> | Tasmanian wedge-tailed eagle | E | E | 1 | 11 | Inhabits coastal, lowland and highland regions. It has been recorded in a wide variety of habitats including dry sclerophyll forest, temperate rainforest, sub-alpine forest, dry woodland, coastal heathland, small wetlands, riparian vegetation, sedgeland, grassland and farmland. | Potential to occur. |
| <i>Accipiter novaehollandiae</i> | Grey goshawk | - | E | - | 10 | The species nests in mature wet forest, usually in the vicinity of a watercourse. However birds can also be seen in more open woodland and around urban fringes. | Potential to occur. |

| Scientific Name | Common Name | 'Wealth Status | State Status | Records within 500m | Records within 1km | Habitats | Potential to Occur |
|-----------------------------|--------------------------|----------------|--------------|---------------------|--------------------|---|---|
| <i>Limnodynastes peroni</i> | Striped marsh frog | - | E | 1 | | Is dependent upon permanent freshwater lagoons for breeding. Ideal breeding habitat is the shallow part of lagoons (to approx. 1.5 m) where there is generally a complex vegetation structure. Breeding sites often contain vegetation communities dominated by emergent plants such as water ribbons (<i>Triglochin</i>) and spikerush (<i>Eleocharis</i>), and submerged plants such as watermilfoil (<i>Myriophyllum</i>), marsh-flower (<i>Villarsia</i>), and pondweed (<i>Potamogeton</i>). However, other plant communities can form equally suitable habitat. | No suitable habitat present in the Study Area. Unlikely to occur. |
| <i>Tyto novaehollandiae</i> | Masked owl | V | PEX | 1 | 8 | A diverse range of forest, woodland and non-forest vegetation including agricultural and forest mosaics; nesting habitat - eucalypt forests and woodlands containing old growth trees with suitable hollows for nesting/roosting, but will also nest in isolated old growth trees with suitable hollows. | No suitable habitat present in the Study Area. Unlikely to occur. |
| <i>Perameles gunnii</i> | Eastern barred bandicoot | V | - | 1 | 8 | Mosaic habitats of pasture and remnant native forest, often with a significant amount of cover provided by dense-growing weeds such as gorse, blackberry, blackthorn, rose briar, etc.; small remnant populations may occur in remnant native grassland and grassy woodland; all records occur below 950 m altitude. | No suitable habitat present in the Study Area. Unlikely to occur. |

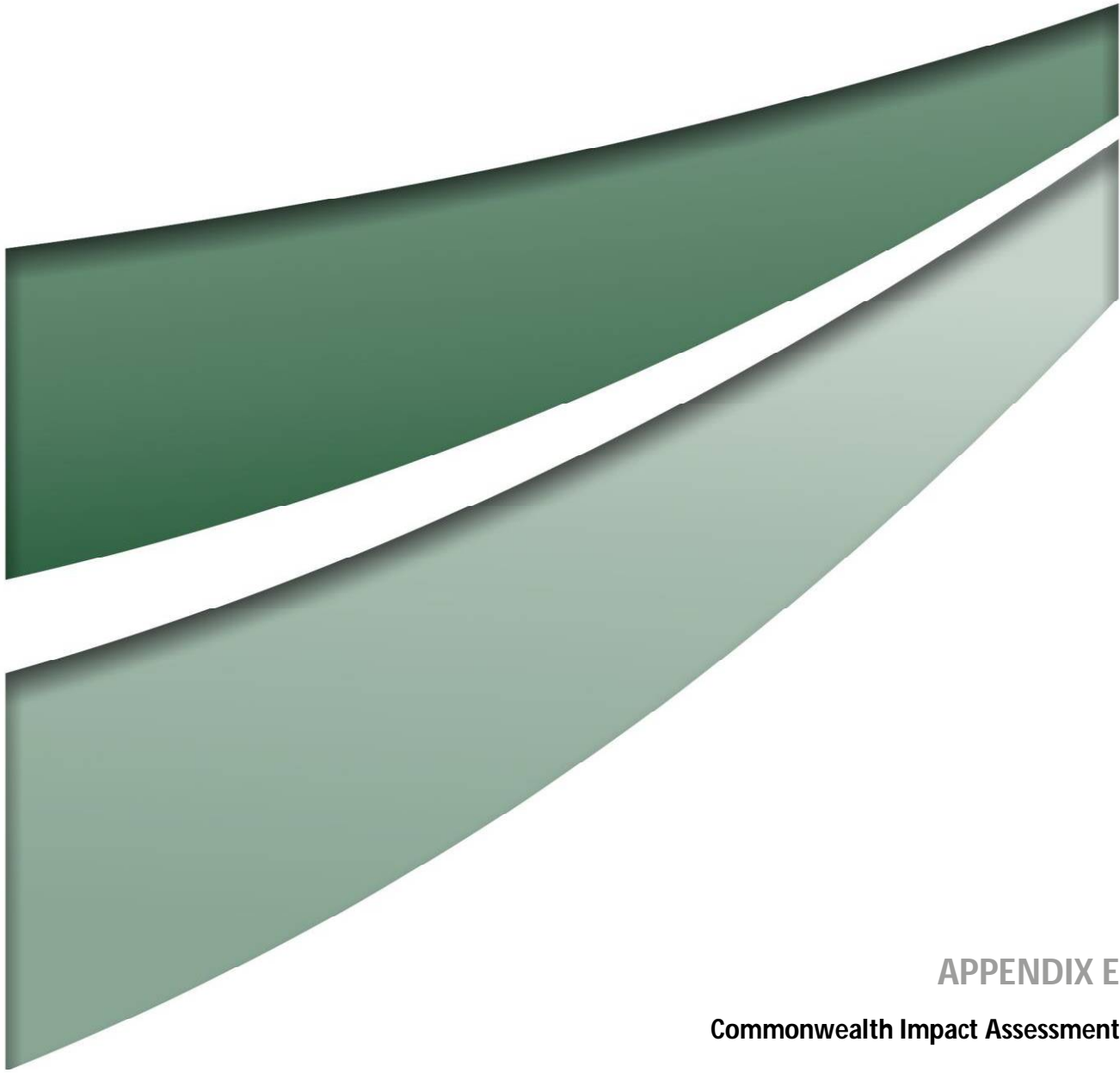
| Scientific Name | Common Name | 'wealth Status | State Status | Records within 500m | Records within 1km | Habitats | Potential to Occur |
|-------------------------------|----------------------|----------------|--------------|---------------------|--------------------|--|---|
| <i>Dasyurus maculatus</i> | Spotted-tailed quoll | V | R | 1 | 11 | Forest elements such as rainforest, and wet and dry eucalypt forest are important components of their habitat. They can also be found in non-forest vegetation types such as coastal scrub and heath, and pastoral areas. This wide range of vegetation types are generally characterised by relatively high and predictable seasonal rainfall. | No suitable habitat present in the Study Area. Unlikely to occur. |
| <i>Dasyurus viverrinus</i> | Eastern quoll | E | - | 0 | 7 | Found in a variety of habitats including rainforest, heathland, alpine areas and scrub. However, it seems to prefer dry grassland and forest mosaics which are bounded by agricultural land, particularly where pasture grubs are common. | No suitable habitat present in the Study Area. Unlikely to occur. |
| <i>Sarcophilus harrisi</i> | Tasmanian devil | E | E | 1 | | Species requires denning habitat for daytime shelter (e.g. dense vegetation, hollow logs, burrows or caves); hunting habitat (consisting of open understorey mixed with patches of dense vegetation); breeding den habitat (areas of burrowable, well-drained soil or sheltered overhangs such as cliffs, rocky outcrops, knolls, caves and earth banks, free from risk of flooding; windrows and log piles may also be used). | No suitable habitat present in the Study Area. Unlikely to occur. |
| <i>Thylacine cynocephalus</i> | Thylacine | Ex | Ex | - | 1 | Grasslands, wetlands and dry eucalyptus forests. | No suitable habitat present in the Study Area. Unlikely to occur. |

| Scientific Name | Common Name | 'Wealth Status | State Status | Records within 500m | Records within 1km | Habitats | Potential to Occur |
|-------------------------------|-------------------------|----------------|--------------|---------------------|--------------------|---|---|
| <i>Pseudemoia rawlinsoni</i> | Glossy grass skink | - | R | - | 1 | Habitat includes rushy grasses and low dense vegetation in moist situations along the margins of swamps and watercourses. The species has also been found where dry sclerophyll forest meets wet heathland subject to frequent flooding. It shelters in dense vegetation and in rotting logs. | No suitable habitat present in the Study Area. Unlikely to occur. |
| <i>Prototroctes maraena</i> | Australian grayling | V | V | 1 | 3 | Adult Australian Grayling inhabit and breed in rivers and streams, usually in cool waters often with alternating pool and riffle zones; larvae and juveniles inhabit estuaries and coastal seas, although their precise habitat requirements are poorly known. | Potential to occur. |
| <i>Pteropus poliocephalus</i> | Grey-headed Flying fox | V | - | - | 2 | Species typically restricted to mainland Australia. Occasional transient individual may occur in Tasmania. | No suitable habitat present in the Study Area. Unlikely to occur. |
| <i>Haliaeetus leucogaster</i> | White-bellied sea-eagle | - | V | 2 | 10 | Mainly coastal, it is also found in many large rivers and lakes. Tasmania's coastline with its many rivers, bays and islands provides ideal habitats. | Potential to occur. |

| Scientific Name | Common Name | 'Wealth Status | State Status | Records within 500m | Records within 1km | Habitats | Potential to Occur |
|-------------------------------|--------------------------|----------------|--------------|---------------------|--------------------|--|--|
| <i>Lathamus discolor</i> | Swift Parrot | CE | E | - | 16 | Habitat for the Swift Parrot outside of the breeding season in Tasmania includes any eucalypt forest. Habitat for Swift Parrot during the breeding season broadly includes the following elements: flowering Tasmanian blue gum and black gums (foraging habitat) and any eucalypt forest containing hollow-bearing trees (nesting habitat). Hollow-bearing trees are typically large and old with dead limbs or branches and at least some visible hollows. Note that the importance of breeding habitat in any one year varies depending on its location in relation to foraging habitat (i.e. blue gums or black gums in flower). | No suitable habitat present in the Study Area. Unlikely to occur. |
| <i>Botaurus poiciloptilus</i> | Australasian bittern | E | - | - | 4 | Found in shallow and vegetated freshwater or brackish swamps. | Potential to occur. |
| <i>Migas plomleyi</i> | Plomleys Trapdoor Spider | - | E | - | 4 | Moss covered boulders in Launceston's Cataract Gorge. | No suitable habitat present in the Study Area. Unlikely to occur. |

| Scientific Name | Common Name | 'Wealth Status | State Status | Records within 500m | Records within 1km | Habitats | Potential to Occur |
|----------------------------------|----------------------------------|----------------|--------------|---------------------|--------------------|---|---|
| <i>Engaeus orramakunna</i> | Mount Arthur Burrowing Crayfish | V | V | | | The Mt Arthur Burrowing Crayfish is known from a range of approximately 300 square km centred on Mt. Arthur in north-east Tasmania. The species extends to near Lilydale, Nabowla and South Springfield, and is also found in the vicinity of Launceston. This is a freshwater species. The Mt Arthur Burrowing Crayfish prefers moist seeps and flat swampy or marshy land feeding into or next to streams and rivers, but can also be found in stream banks, wet pasture, culverts and roadside drains. | No suitable habitat present in the Study Area. Unlikely to occur. |
| <i>Posmaditta jungermanniae</i> | Cataract Gorge Pinhead Snail | - | V | 1 | 10 | A freshwater snail occurring in some sections of Lake Trevallyn and Cataract Gorge, at Launceston, in central north Tasmania. | No suitable habitat present in the Study Area. Unlikely to occur. |
| <i>Beddomeia launcestonensis</i> | Hydrobiid snail (Cataract Gorge) | - | E | - | 8 | A freshwater snail occurring in some sections of Lake Trevallyn and Cataract Gorge, at Launceston, in central north Tasmania. | No suitable habitat present in the Study Area. Unlikely to occur. |

PEX – Presumed Extinct (EPBC Act and TSP Act), Ex – Extinct (EPBC Act and TSP Act), CE – Critically Endangered (EPBC Act, E – Endangered (EPBC Act and TSP Act), V – Vulnerable (EPBC Act and TSP Act), R – Rare (TSP Act)



APPENDIX E

Commonwealth Impact Assessment

Endangered Tasmanian Wedge-tailed Eagle

Significant Impact Criteria Assessment

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

The proposed development occurs in a highly modified landscape between the central business district of Launceston, and the Inveresk Community Precinct. The proposed development is not expected to result in a long-term decrease in the size of the Tasmanian wedge-tailed eagle population as no breeding habitat will be impacted, and only a short term impact will result on potential low quality foraging areas for this species.

- *reduce the area of occupancy of the species*

The proposed development will result in the redevelopment of highly disturbed fringing habitats to the North Esk River of a total area of 0.25 ha.

- *fragment an existing population into two or more populations*

Due to the high mobility of this species, the proposed development will not fragment existing populations into two or more populations.

- *adversely affect habitat critical to the survival of a species*

No critical habitat for the Tasmanian wedge-tailed eagle has been identified. The habitat present in the Study Area is considered likely to represent low quality potential foraging habitat for this species.

- *disrupt the breeding cycle of a population*

No breeding habitat for wedge-tailed eagle occurs within or adjacent to the Study Area. Therefore the proposed development will not disrupt the breeding cycle of this species.

- *modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The habitat present in the Study Area is considered likely to represent low quality potential foraging habitat for this species. The proposed construction of the pedestrian-cycleway bridge will result in the disturbance of 0.25 ha of this habitat. Due to the high mobility of this species, this impact will not adversely modify, destroy, isolate or decrease availability or quality of habitat to the extent that the species will be likely to decline or impact any critical habitat for this species.

- *result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*

Due to the highly urbanised landscape, the proposed development is unlikely to result in invasive species that are harmful to this species become established in the potential foraging habitat identified within the Study Area.

- *introduce disease that may cause the species to decline, or*

Construction activities associated with the proposed development are unlikely to introduce any diseases that may cause the wedge-tailed eagle species to decline.

- *interfere with the recovery of the species.*

The proposed development will not interfere with the recovery of this species as the area of impact will be less than 0.25 ha of low quality potential foraging habitat. No roosting trees or nesting locations were identified in or near the Study Area.

Endangered Australasian bittern

Significant Impact Criteria Assessment

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*

The proposed development occurs in a highly modified landscape between the central business district of Launceston, and the Inveresk Community Precinct. The proposed development is not expected to result in a long-term decrease in the size of the Australasian bittern population as no breeding habitat will be impacted as this species predominantly breeds in freshwater swamps, and only a short term impact will result on potential low quality foraging areas for this species will be impacted.

- *reduce the area of occupancy of the species*

The proposed development will result in the redevelopment of highly disturbed fringing habitats to the North Esk River of a total area of 0.25 ha. The available habitats present in the Study Area are considered low quality habitat for this predominantly freshwater species.

- *fragment an existing population into two or more populations*

Due to the high mobility of this species, the proposed development will not fragment existing populations into two or more populations.

- *adversely affect habitat critical to the survival of a species*

No critical habitat for the Australasian bittern has been identified. The habitat present in the Study Area is considered likely to represent low quality potential foraging habitat for this species.

- *disrupt the breeding cycle of a population*

No breeding habitat for Australasian bittern occurs within or adjacent to the Study Area. Therefore the proposed development will not disrupt the breeding cycle of this species.

- *modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The habitat present in the Study Area is considered likely to represent low quality potential foraging habitat for this species. The proposed construction of the pedestrian-cycleway bridge will result in the disturbance of 0.25 ha of marginal habitat. Due to the high mobility of this species, this impact will not adversely

modify, destroy, isolate or decrease availability or quality of habitat to the extent that the species is likely to decline.

- *result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*

Due to the highly urbanised landscape, the proposed development is unlikely to result in invasive species that are harmful to this species become established in the potential foraging habitat identified within the Study Area.

- *introduce disease that may cause the species to decline, or*

The construction activities associated with the proposed development are unlikely to introduce any diseases that may cause the Australasian bittern species to decline.

- *interfere with the recovery of the species.*

The proposed development will not interfere with the recovery of this species as the area of impact will be less than 0.25 ha of low quality potential foraging habitat. No roosting trees or nesting locations were identified in or near the Study Area.

Vulnerable Eastern Grayling

Significant Impact Criteria Assessment

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of an important population of a species*

The proposed development will not lead to a long-term decrease in the size of an important population. With respect to the habitat of this species, impacts from the proposed development will be restricted to the installation of two bridge pylons. This species main lifecycle stages (adult occurrence and breeding) occur in freshwater, upstream of the estuarine Study Area. Larvae of this species are typically swept downstream into marine waters, from where juveniles eventually move back to the freshwater stream from where they were born. As no barriers to the flow of water into or out of the North Esk River will result from the proposed development, the proposed development will not result in a decrease in the size of a population of this species.

- *reduce the area of occupancy of an important population*

The proposed development will not reduce the area of occupancy of an important population of this species. With respect to the habitat of this species, impacts from the proposed development will be restricted to the installation of two bridge pylons in an estuarine area. This species main lifecycle stages (adult occurrence and breeding) occur in freshwater, upstream of the Study. Larvae of this species are seasonally swept downstream into marine waters, from where juveniles eventually move back to the freshwater areas from where they were born. As no barriers to the flow of water into or out of the North Esk River will result from the proposed development, the proposed development will not result in a reduction in the area of occupancy of an important population of this species.

- *fragment an existing important population into two or more populations*

The proposed development will not fragment populations of this species as impacts on the habitat of this species will be restricted to the installation of two bridge pylons. This species main lifecycle stages (live and breeding) occur in freshwater, upstream of the Study Area. Larvae of this species are typically swept downstream into marine waters, from where they eventually move back to the freshwater stream where they were born. As no barriers to the flow of water into or out of the North Esk River will result from the proposed development, the proposed development will not fragment the habitat of this species.

- *adversely affect habitat critical to the survival of a species*

No critical habitat for this species has been identified under the EPBC Act. The proposed development will impact two small areas within the North Esk channel, associated with the installation of two bridge pylons. This species main lifecycle stages (live and breeding) occur in freshwater, upstream of the Study Area. Larvae of this species are typically swept downstream into marine waters, from where they eventually move back to the freshwater stream where they were born. As no barriers to the flow of water into or out of the North Esk River will result from the proposed development, the proposed development will not adversely affect habitat for this species.

- *disrupt the breeding cycle of an important population*

This species main lifecycle stages (adult and breeding) occur in freshwater, upstream of the Study Area. Larvae of this species are typically swept downstream into marine waters, from where juveniles eventually move back to the freshwater reaches from where they were born. As no barriers to the flow of water into or out of the North Esk River will result from the proposed development, the proposed development will not adversely disrupt the breeding cycle of an important population of this species.

- *modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*

The proposed development will not interfere with the recovery of this species as the area of impact will be restricted to the installation of two bridge pylons. This species main lifecycle stages (live and breeding) occur in freshwater, upstream of the Study Area. As no barriers to the flow of water into or out of the North Esk River will result from the proposed development, the proposed development will not impact the species or the habitat of this species to the point that the extent of this species is likely to decline.

- *result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat*

The proposed development does not involve the relocation of any fish species. No invasive fish, harmful to the Australian Grayling will therefore become established in the North Esk River as a result of this development.

- *introduce disease that may cause the species to decline, or*

The proposed development does not involve the relocation of any fish species. No introduced diseases harmful to the Australian Grayling will therefore be introduced to the Study Area.

- *interfere substantially with the recovery of the species.*

The proposed development will not interfere with the recovery of this species as the area of impact will be restricted to the installation of two bridge pylons. This species main lifecycle stages (live and breeding) occur in freshwater, upstream of the Study Area. Larvae of this species are typically swept downstream

into marine waters, from where they eventually move back to the freshwater stream where they were born. As no barriers to the flow of water into and out of the North Esk River will result from the proposed development, the proposed development will not impact the recovery of this species.



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Construction Environmental Management Plan

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