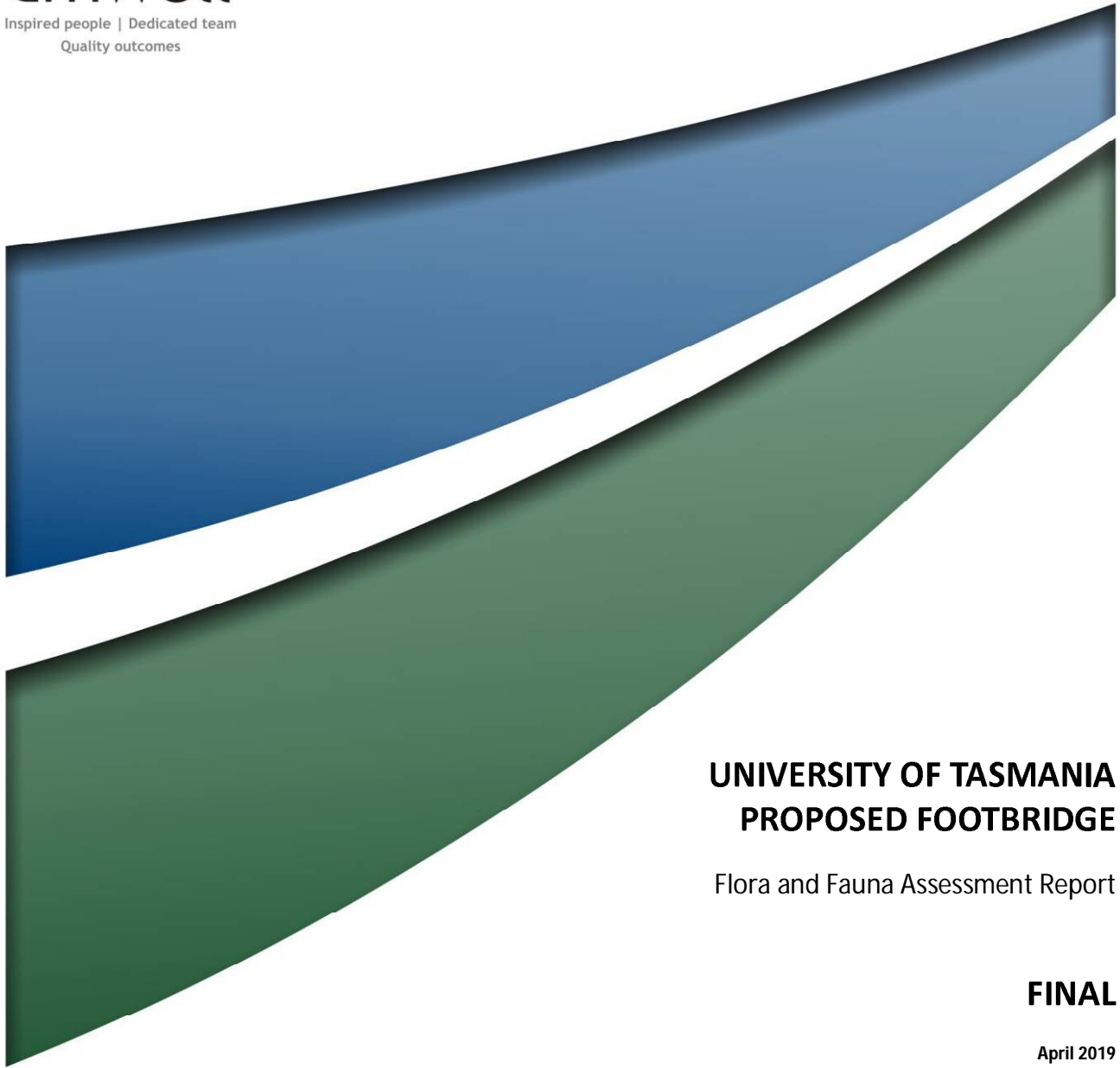


Ecological Assessment

Appendix C



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UNIVERSITY OF TASMANIA PROPOSED FOOTBRIDGE

Flora and Fauna Assessment Report

FINAL

April 2019

UNIVERSITY OF TASMANIA PROPOSED FOOTBRIDGE

Flora and Fauna Assessment Report

FINAL

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

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Report No. R01
Date: April 2019



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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.

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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**).

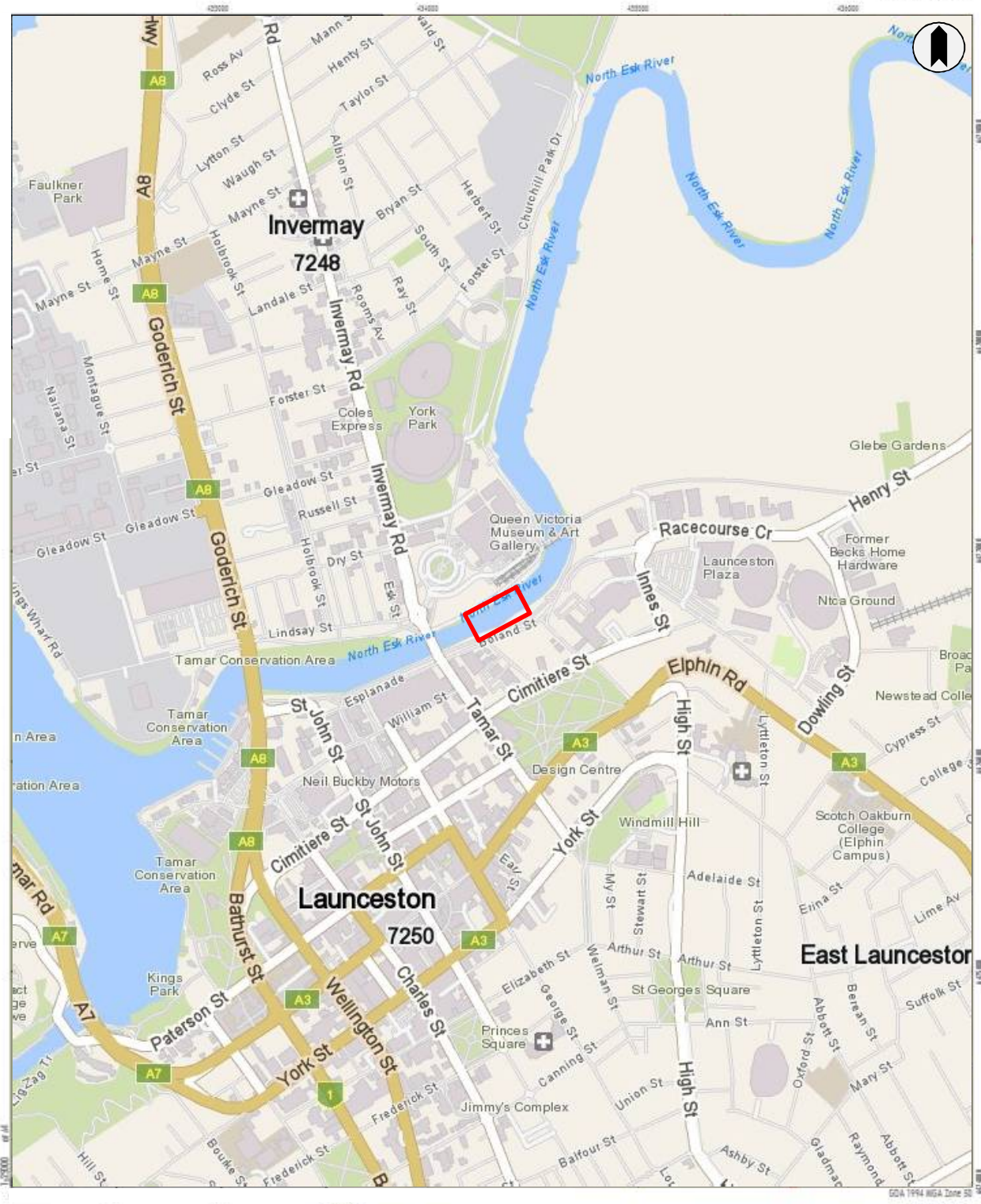
The terrestrial flora and fauna assessment consists of a two stage process involving literature review followed by a field assessment, undertaken in December 2018. The literature review analysed existing ecological data to identify conservation significant flora and fauna species as well as conservation 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.



Legend

FIGURE 1
 Location Map

Image Sources: Sources: Esri, HERE, Garmin, Inetmap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeBCo, IGN, Kadaster 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, four construction areas have been identified. These are shown in **Figure 1.2** and the potential impacts are identified in **Table 1.1**.

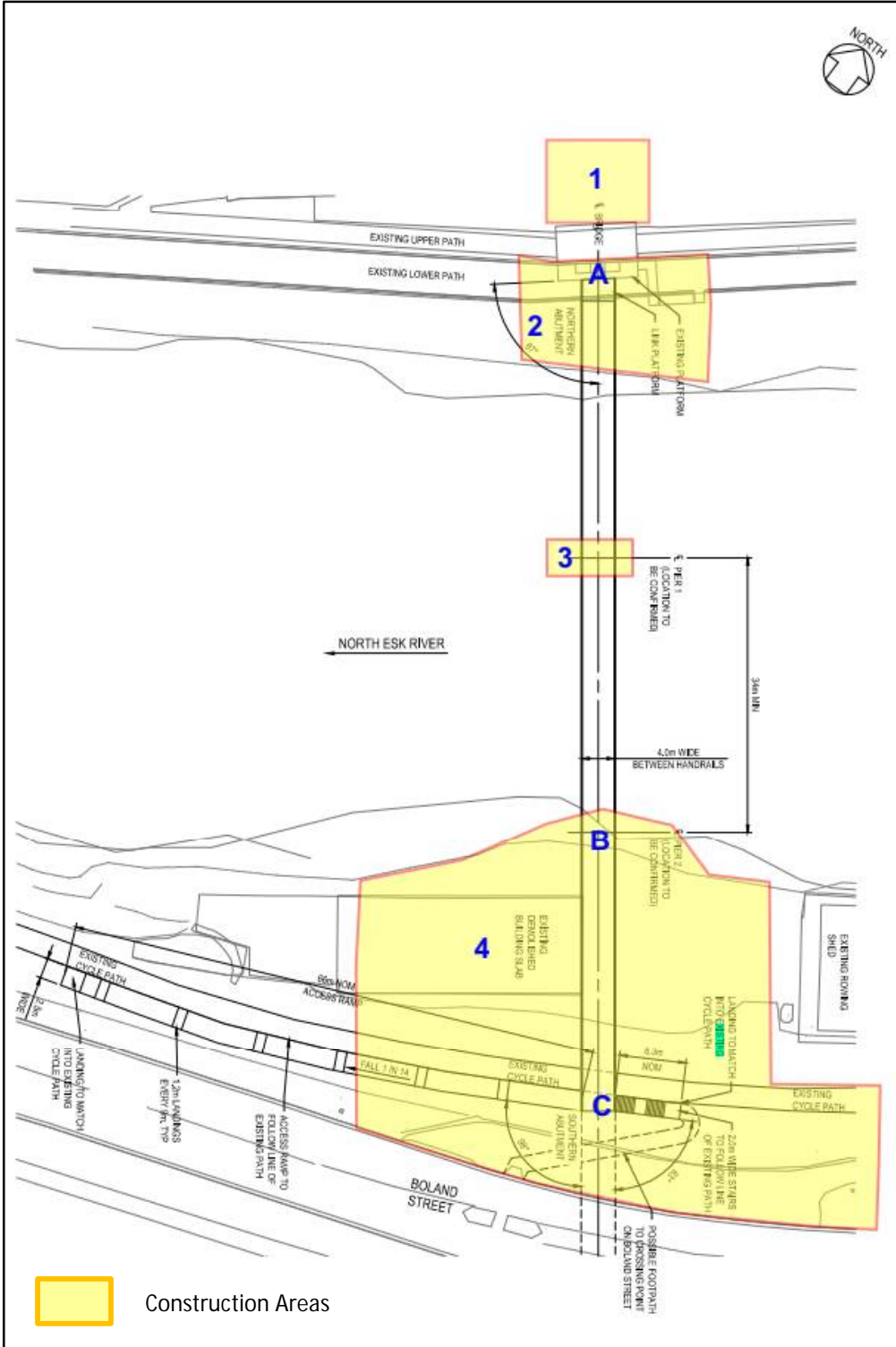


Figure 1.2 Conceptual Representation of Proposed UTAS Pedestrian-Cycle Bridge

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. |
| Area 3 | Driving pylon below water. No excavation proposed. |
| Area 4 | Excavations up to 1 m deep in areas B and C. 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 (TECs) and migratory species. Should a listed matter be significantly impacted, the Minister of the Environment must approve the activity causing the impact.

2.2 Tasmania

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 6.0** 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

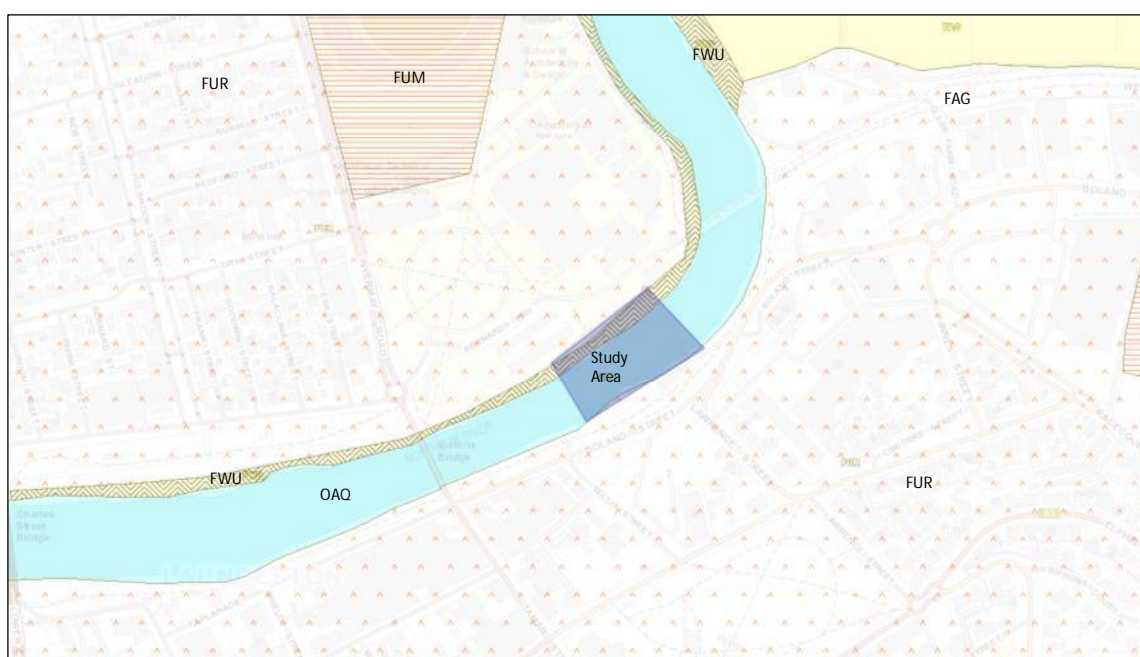
Review of TASVEG 3.0 mapping identified that no native vegetation communities have been mapped within 1 km of the Study Area. No areas of remnant native vegetation are mapped within 5 km of the Study Area.

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</i> subsp. <i>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 28 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 |
|-------------------|----------------------------------|-------------------|
| Araceae | <i>Zantedeschia aethiopica</i> * | arum lily |
| Araliaceae | <i>Hedera helix</i> * | ivy |
| Asphodelaceae | <i>Phormium tenax</i> * | New Zealand flax |
| Asteraceae | <i>Taraxacum officinale</i> * | dandelion |
| Asteraceae | <i>Hypochaeris radicata</i> * | rough catsear |
| Asteraceae | <i>Lactuca saligna</i> * | willow lettuce |
| <u>Asteraceae</u> | <i>Erigeron bonariense</i> * | flaxleaf fleabane |
| Boraginaceae | <i>Echium plantagineum</i> * | Paterson's curse |
| Brassicaceae | <i>Raphanus raphanistrum</i> * | wild radish |
| Convolvulaceae | <i>Calystegia silvatica</i> * | great bindweed |
| Convolvulaceae | <i>Convolvulus arvensis</i> * | field bindweed |
| Euphorbiaceae | <i>Euphorbia helioscopia</i> * | sun spurge |

| Family | Scientific Name | Common Name |
|----------------|--|-----------------------|
| Juncaceae | <i>Juncus pauciflorus</i> | common sedge |
| Juncaginaceae | <i>Triglochin procerum</i> | greater water ribbons |
| Plantaginaceae | <i>Plantago lanceolata</i> * | ribwort plantain |
| Poaceae | <i>Phragmites australis</i> | southern reed |
| Poaceae | <i>Spartina anglica</i> * | common cordgrass |
| 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 |
| Polygonaceae | <i>Persicaria hydropiper</i> | green water-pepper |
| Primulaceae | <i>Lysimachia arvensis</i> * | scarlet pimpernel |
| Rosaceae | <i>Rubus fruticosus</i> * | blackberry |
| Salicaceae | <i>Salix alba</i> X <i>fragilis</i> * | crack willow |
| Solanaceae | <i>Solanum nigrum</i> * | blackberry nightshade |
| Verbenaceae | <i>Verbena officinalis</i> * | common verbena |

* 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 |

| Faunal Group | Scientific Name | Common Name |
|--------------|--------------------------------|-------------------------|
| | <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

Patersons 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 TECs 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 potentially impacted. As disturbance to the water way will involve the installation of a pylon within the channel, these works are not anticipated to impact upon the Australian Grayling and its potential |

| Performance Criteria | Comment |
|--|---|
| | movement along this waterway. |
| (f) the value of riparian vegetation to the protection of habitats and wildlife corridors; | 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. |
| (g) any rehabilitation and maintenance measures; | 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. |
| (h) the impacts of development and vegetation clearance, in proximity to the priority habitat or priority vegetation communities; | 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. |
| (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://dpi.pwe.tas.gov.au/Documents/General-Offset-Principles.pdf ; | Limited clearing of highly disturbed vegetation will be undertaken as a result of the proposed development. No TECs or threatened species will be impacted by the proposed development. |
| (j) any agreement under section 71 of the Act relating to vegetation management; | No agreements have been made relating to vegetation management. |
| (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 | No conservation covenants have been made under the NC Act that exists on or adjacent to the site of the proposed development. |
| (l) any recommendations or advice contained in a flora and fauna report. | Silt curtains to reduce silt impacts from construction of piles for the bridge. 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. 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. |

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 pylon, siltation curtains will be installed around the location of the pylon to eliminate sediment disturbance, and adjacent upstream or downstream siltation. Provide the recommended 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. |

| Performance Criteria | | Comment |
|----------------------|---|---|
| | (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. One pylon 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 used for the installation/construction of the in stream pylon. |
| | (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 armoring 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 of one in channel pylon; 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 the in channel pylon 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 Commonwealth 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 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 listed under either the EPBC Act or the TSP Act 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 7.0** 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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