MAHERS LANDING BOAT LAUNCHING FACILITY

Town Planning Report

Client: Better Boating Victoria

Ricardo ref. 31595 Issue 2 20/12/2022

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1. INTRODUCTION

This town planning report has been prepared by Ricardo Energy Environment & Planning (Ricardo) on behalf of Better Boating Victoria to accompany the planning permit application for upgrades to the Mahers Landing Boat Launching Facility.

Better Boating Victoria (BBV) and Bass Coast Shire Council (Council) are working in partnership to upgrade the Mahers Landing facility to improve its capacity, functionality and safety. BBV were established in March 2019 to oversee the Victorian Government's commitment to make boating cheaper and easier. The works at Mahers Landing are part of an upgrade of boating facilities at priority locations across Victoria.

The project area comprises Crown land, a road reserve and freehold title owned by Council as defined in Section 2 of this report and otherwise referred to in this report as the 'Subject Site' or Mahers Landing for ease of reference.

The upgrades require a planning permit pursuant to the following clauses within the Bass Coast Planning Scheme (Scheme):

- Clause 35.07-1, to use land for boat launching facility (in locations where the project extends the existing boating use).
- Clause 36.03-1, to use land for boat launching facility (in locations where the project extends the existing boating use).
- Clause 42.01-2, to remove, destroy or lop vegetation within ESO1.
- Clause 44.04-2, to construct a building or construct or carry out works within the LSIO.
- Clause 42.03-2, to construct a building or construct or carry out works within the SLO5.
- Clause 42.03-2, to remove, destroy or lop native vegetation within SLO5.
- Clause 52.17-1, to remove, destroy or lop native vegetation.
- Clause 63.05, to construct a building or construct or carry out works.

We further note:

- Consent for use and development of coastal Crown land under the *Marine and Coastal Act 2018* has been sought and will be forward to Council when received.
- An approved Cultural Heritage Management Plan is expected January 2023.
- The application is accompanied by the written consent of Parks Victoria pursuant to Clause 36.03-3 to the application for a planning permit being made.
- Referral of the application to construct a building or construct or carry out works within the LSIO is required to West Gippsland Catchment Management Authority (WGCMA) pursuant to Section 55 of the Act.
- Referral of the application to remove vegetation under ESO1 is required to the Secretary to DELWP in accordance with the Schedule to Clause 66.04 and Section 55 of the Act.
- Notice of the application to remove, destroy or lop native vegetation is required to the Secretary to DELWP pursuant to Clause 67.02 and Section 52(1)(c) of the Act.
- Notice of the application for permit is required to owners and occupiers of adjoining land pursuant to Clause 67.02-2 and Section 52(1)(c) of the Act as Clause 67.01 exempts the application by Council being made to the Minister under Section 96(1) of the Act.

This report should be read together with the following documents accompanying the application:

- Completed application form.
- Copy of titles / Crown folio searches.
- Drawings A11698_ML-01-01B and A11698_ML-01-03B to A11698_ML-01-05B (all Revision B) and A11698_ML-01-06A to A11698_ML-01-07A (Revision A), prepared by BMT.
- Drawing A11698_ML-SK 01A_Layers prepared by BMT. Note: this plan is not for endorsement under the permit. It replicates information in the above drawings prepared by BMT and is an interactive PDF with layers enabling the viewer to turn on/off different features. This document is provided to assist the public and authorities in the consideration of the proposal.

- Vegetation Retention and Removal Plan, prepared by BMT and ID Ecological Management dated December 2022.
- Coastal Process and Marine Ecology Impact Assessment, prepared by BMT dated 16 December 2022.
- Ecological Assessment and Native Vegetation Removal Report (Terrestrial Ecology) prepared by ID Ecological Management, December 2022.
- Feature and Level Survey prepared by M.J. Reddie Surveys, Revision 2.
- Title Re-establishment Survey prepared by M.J. Reddie Surveys, Revision 3.
- Arboricultural Assessment prepared by Treemap dated December 2022.
- Geotechnical Investigation Report, Geotesta, 5 Oct 2022.
- Letter prepared by Parks Victoria providing public land manager consent.
- Letter prepared by Gippsland Ports, providing support for the application for consent under the *Marine and Coastal Act 1998.*

This report describes the physical and planning context of the subject site, the proposed use and development and assesses the proposal against the Bass Coast Planning Scheme. We conclude that the proposal will result in net community benefit and a planning permit should be granted.

Figure 1-1: Existing Boat Ramp (Oct 2022)

2. SITE AND SURROUNDS

2.1 SUBJECT SITE

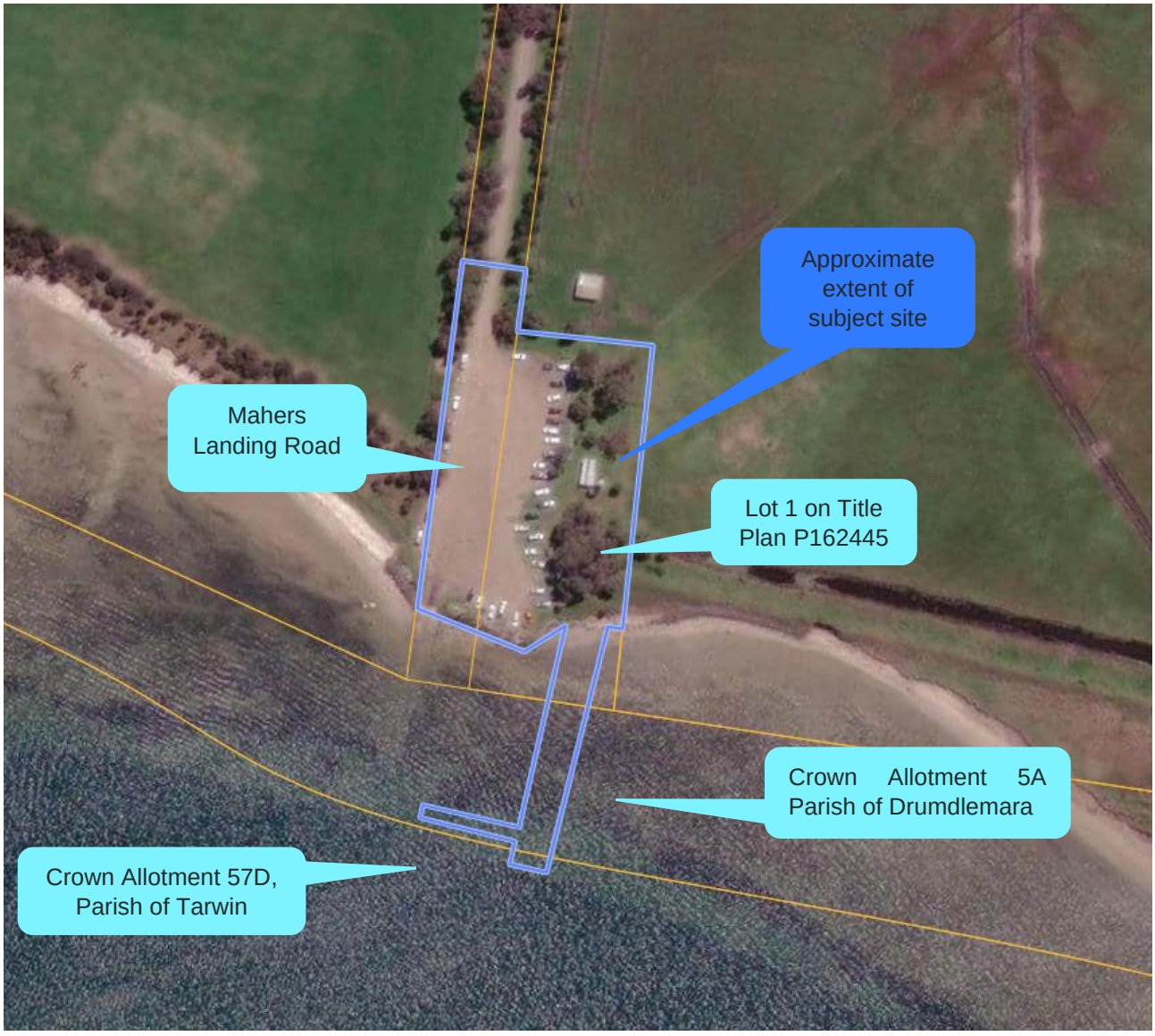
The subject site is located on the northern side of Andersons Inlet, approximately 3.5km east of the Inverloch township and at the southern end of Mahers Landing Road.

The subject site comprises the following land tenure:

- Mahers landing Road (in part),
- Lot 1 on Title Plan 162445Q,
- Crown Allotment 5A Parish of Drumdlemara (in part), and
- Crown Allotment 57D, Parish of Tarwin (in part),

as shown below.

Figure 2-1: Aerial Photograph, Nearmap



Particulars of the land tenure are tabulated below.

Table 1: Land Tenure

Land	Status	Public Land Manager[1]	Public Land Administrator
Mahers Landing Road	Road listed on the road register	Council	N/A
Lot 1 on TP162445Q	Freehold land	Council	N/A
Crown Allotment 5A Parish of Drumdlemara	Crown land – permanently reserved for protection of the coastline.	Parks Victoria	Parks Victoria
Crown Allotment 57D, Parish of Tarwin	Crown land – permanently reserved for public purpose.	Gippsland Ports	Parks Victoria

There are no restrictive covenants, easements or other encumbrances on the titles that prevent the project from proceeding.

Vehicular access to the site is provided via Mahers Landing Road leading to an informal gravel car park.

The site is currently used as a boat launching facility with a shallow gradient, single-lane boat ramp, located on the western side of the site. This only enables launching of smaller vessels (typically up to 5 metres) and generally only at high tides.

A number of amenities are provided on-site including a public toilet utilising a septic system and tank water, a public seat and fish cleaning table.

The Ecological Assessment prepared by ID Ecological Management assessed terrestrial areas of the subject site and found[2]:

> *Land surrounding Mahers Landing has been predominantly cleared for agriculture with scattered remnants of native vegetation remaining along some roadsides and waterways.*
>
> *Vegetation present within the study area is comprised of planted indigenous and non-indigenous native trees in the north-east of the site, and remnant vegetation, including mature canopy trees, in the south-east, west and north of the study area, all classed as EVC 2: Coast Banksia Woodland.*
>
> *38 trees were identified, including planted indigenous and non-indigenous species, which includes three large size-class canopy trees, one of which is dead.*
>
> *Following assessment against the appropriate determination flowcharts, no individual native patches met the definition of a threatened ecological community listed under the EPBC Act or under Victoria's FFG Act.*
>
> *No threatened fauna species were identified within the study area during the site survey. A likelihood assessment determined that all but two threatened fauna species identified in the database searches had a low or unlikely likelihood of occurring within or be reliant on any of the habitats within the study area, with White-bellied Sea Eagle and Little Eagle deemed to have a moderate likelihood, based on roosting potential in the remnant Gippsland Manna Gums on the east and west of the study area. However, no further measures are recommended due to the retention of canopy trees adjacent to and outside the study area.*
>
> *No threatened flora species were identified within the study area. The likelihood assessment determined that all threatened flora species identified in the database searches were had an unlikely or low likelihood of occurring within the study area.*

[1] As defined in Clause 73.01

[2] At page 38

BMT assessed the ecological values in marine areas of the site and found (in part)[3]:

> *Marine habitat within and immediately adjacent to the Mahers Landing boat ramp upgrade footprint is comprised of shallow, unvegetated sands and intertidal flats, as well as seagrass beds (GHD, 2011).*
> *….*
> *…The existing Mahers Landing boat ramp carpark area, including the toilet block and surrounding vegetation is highly modified due to land use and land modifications over time (e.g., clearing, agriculture, bund construction, revetment wall construction, weed introduction etc.). Visual inspection of the site did not identify any areas of coastal saltmarsh in close proximity to the proposed works…*
>
> *…*
> *In additional to coastal saltmarsh (addressed above), seagrass is the only relevant marine flora for consideration at Mahers Landing. Seagrass mapping of Anderson Inlet (Blake, Roob, & Patterson, 2000) showed two significant patches of sub-tidal seagrass near the Mahers Landing boat ramp. Subsequently the Mahers Landing Boating Action Plan (GHD, 2011) described the presence of seagrass beds immediately offshore of the existing Mahers Landing boat ramp and carpark area in the intertidal zone in 2010 (Figure 5.1).*
>
> *Recent low tide visual inspection of this area in May 2022 confirmed that the seagrass observed in 2011 is still present on both sides of the existing boat ramp, however, the area of intertidal flats covered seems to have declined slightly. Given the seagrass was continuously present when investigated – 2000, 2011, 2022), the seagrass is likely permanent meadows as opposed to ephemeral. However, the size of the meadows would fluctuate over time, depending largely on local sediment dynamics. The seagrass beds at this location appear to have a moderate coverage/density of seagrass (Figure 5.3).*

BMT further provide a detailed assessment of marine fauna in the Coastal Process and Marine Impact Assessment report.

Treemap assessed the arboricultural values of trees on-site and found[4]:

> *The site contained planted native trees and indigenous trees. The retention value of all the vegetation on the site was rated 'Low' or 'None', because of its poor condition or low quality. The low quality or poor arboricultural condition of the trees supports an approach whereby existing trees and shrubs should offer reasonably limited constraint to the proposed design.*

Photographs of the site are provided below.

[3] Section 5
[4] Page 4

Figure 2-2 Site Photographs, Oct 2022

WOMEN
MEN

2.2 SURROUNDS

The subject site is located approximately 3.5km east of the Inverloch township boundary and is flanked by rural land used for farming (grazing) to the north, east and west and Andersons Inlet to the south. As a result, the site is not proximate to any uses that are particularly sensitive to off-site amenity impacts that may be caused by the boat launching facility.

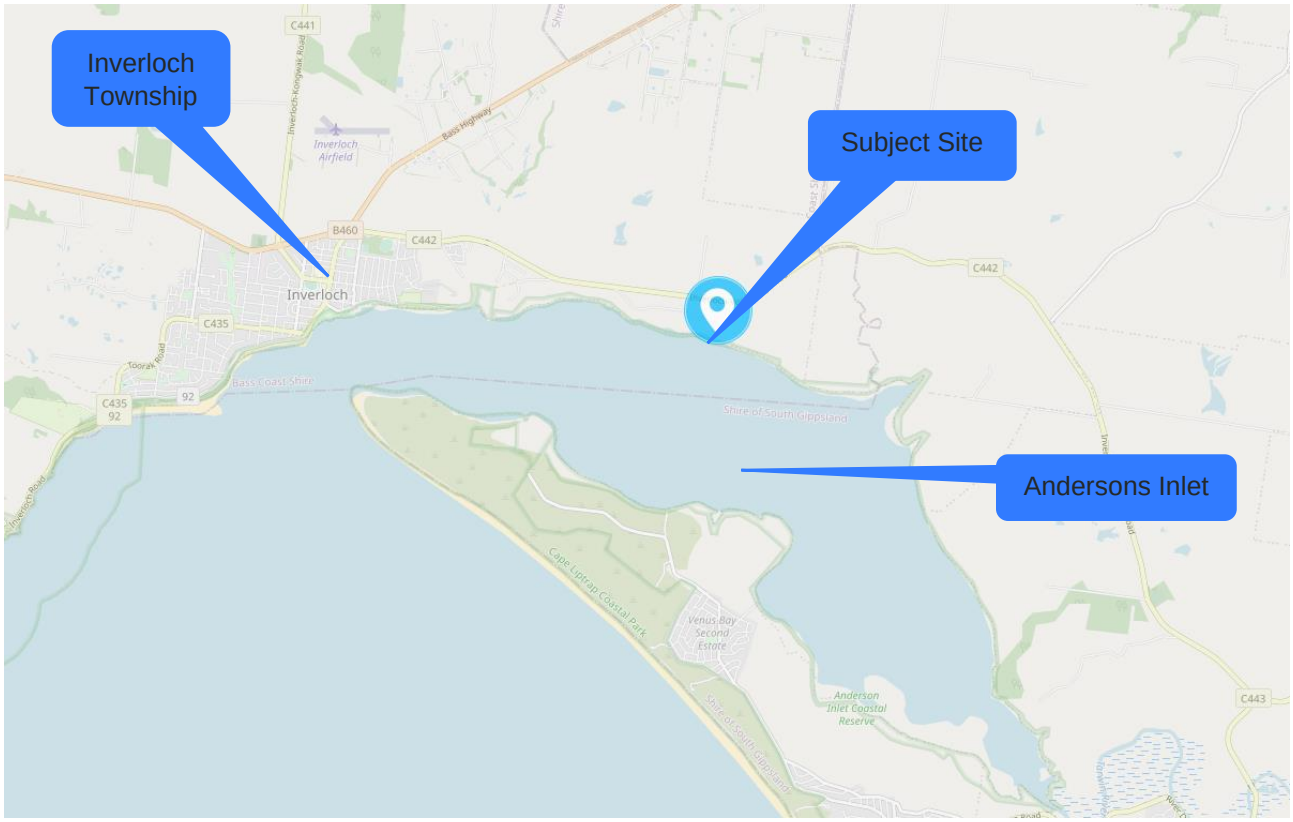
More particularly, the site has the following immediate interfaces

Direction	Comment
North and East	556 Inverloch-Venus Bay Road, a rural property used for farming (grazing) with a dwelling located approximately 500m away.
South	Anderson Inlet.
West	130 Treadwell's Road, a rural property uses for farming (grazing).

2.3 LOCALITY

The site's location in its wider context is illustrated on the following locality plan.

Figure 2-3: Locality Plan, Melways Online



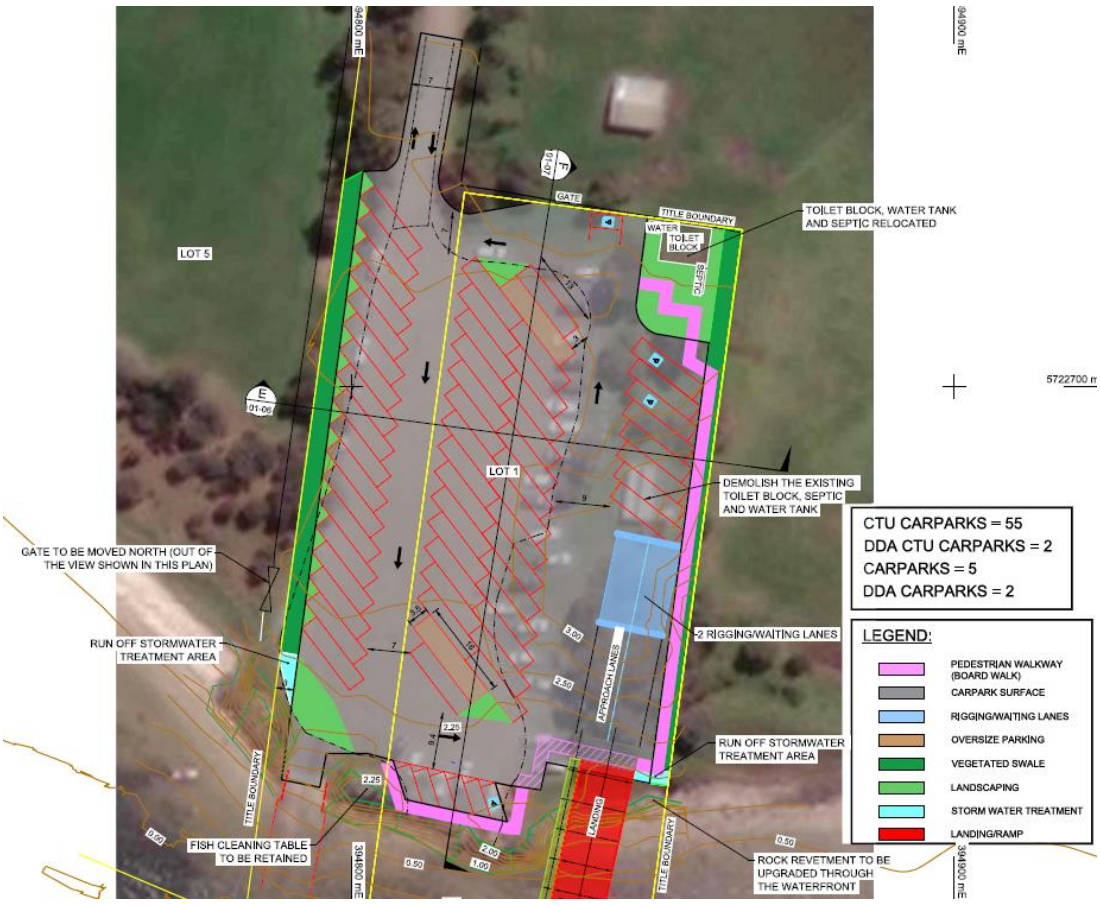
3. PROPOSAL

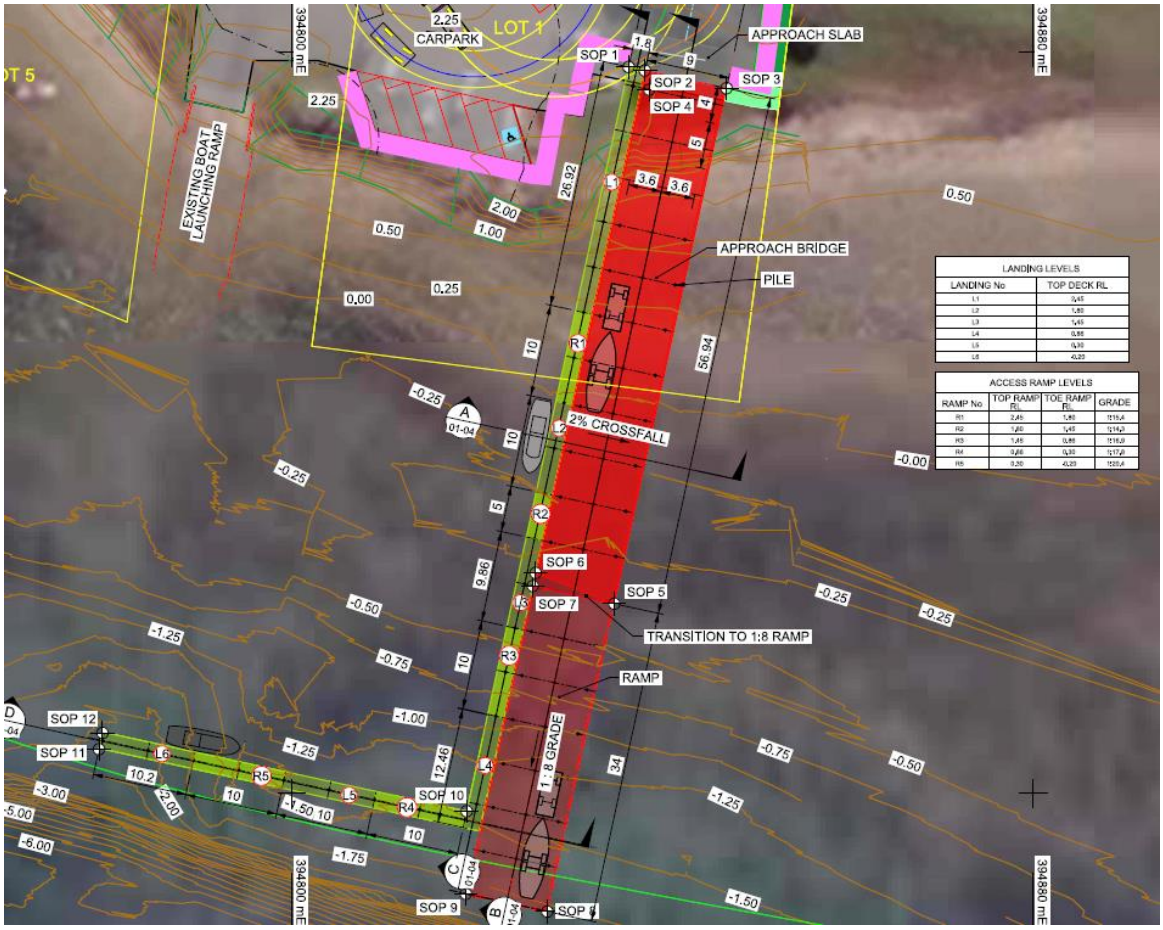
The proposed upgrade to Mahers Landing Boat Launching Facility has been prepared in consultation with recreational boaters and fishers, key management agencies, Bass Coast Shire Council and the broader community. In summary the project comprises:

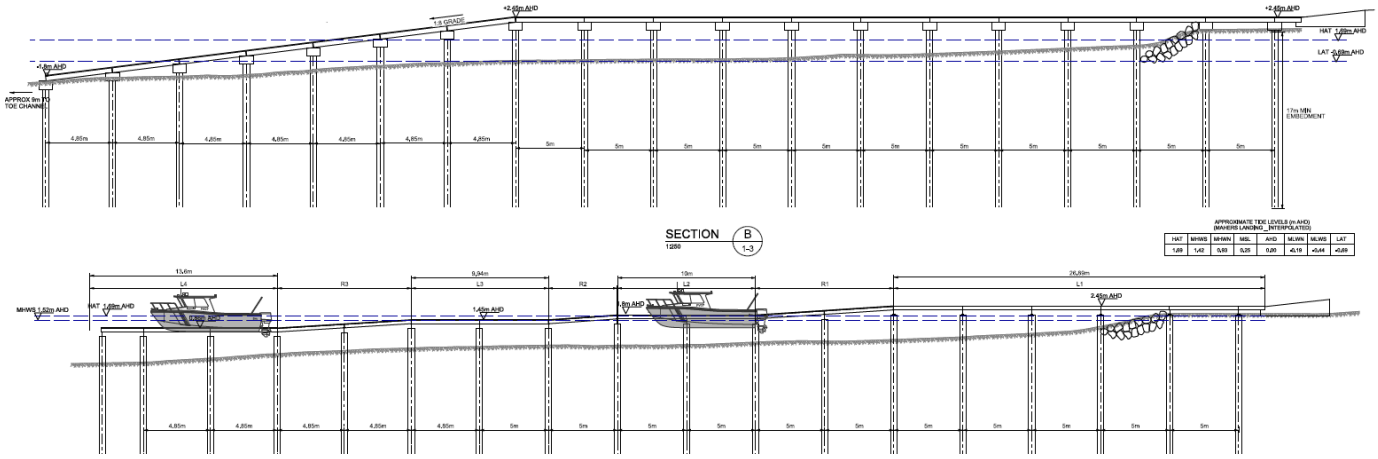
- Retention of the existing boat ramp to provide a launching place for non-powered craft.
- A new all-tide dual-lane boat ramp extending approximately 80m from the carpark into Anderson Inlet, elevated above the beach on concrete piles.
- A 2m wide dual level jetty/holding structure adjacent to the ramp.
- Formalised rigging and de-rigging area adjacent to the boat ramp.
- Formalised and extended paved car park accommodating a total of 66 spaces:
    - 57 x car-trailer spaces.
    - 5 x standard car spaces.
    - 2 x car-trailer spaces and 2 x standard car spaces for people living with disabilities.
- Widening of the entry to the carpark.
- Upgraded rock revetment around the water side of the Mahers Landing precinct.
- Construction of a new public toilet/amenities block and park benches.
- Retention of the fish clearing facilities.
- Removal of existing vegetation and provision of new landscaping.
- Provision of pedestrian paths.
- Provision for stormwater treatment (swales and sand traps).

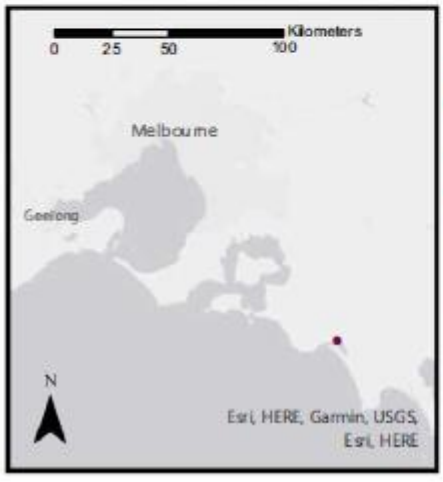
Extracts of the proposed plans are provided below. Please refer to the plans and reports accompanying this application for further information on the proposal.

Figure 3-1 Extracts of proposed plans




LOT 1
CARPARK
APPROACH SLAB
APPROACH BRIDGE
PILE
EXISTING BOAT LAUNCHING RAMP
2% CROSSFALL
TRANSITION TO 1:8 RAMP
RAMP
1:8 GRADE
SOP 1
SOP 2
SOP 3
SOP 4
SOP 5
SOP 6
SOP 7
SOP 9
SOP 10
SOP 11
SOP 12
394800 mE
394880 mE
LANDING LEVELS
LANDING No
TOP DECK RL
ACCESS RAMP LEVELS
RAMP No
TOP RAMP RL
TOE RAMP RL
GRADE


SECTION B
1-3
APPROXIMATE TIDE LEVELS (m AHD)
HAT
MHWS
MHWN
NSL
AHD
MLWN
MLWS
LAT



Legend

- Proposed ConstructionFootprint Area
- Native Vegetation Patches
- Native Vegetation Patches to be Removed
- Tree Protection Zone Buffer
- Non Indigenous Planted Trees to be Removed

Indigenous Tree Species (Tree ID No.) to be removed

- Direct
- Indirect - TPZ

Meters
0 10 20 40

N

BMT
www.bmt.org

ID ECOLOGICAL MANAGEMENT

Date of Aerial: Sep 22, 2022

While all effort has been made to ensure the content of this map is correct and accurate, Indigenous Design cannot explicitly guarantee that it is free from error and accepts no responsibility for damages resulting from its use.

4. BASS COAST PLANNING SCHEME

The subject site is located within the Farming Zone (FZ) (in part) and the Public Conservation and Resource Zone (PCRZ) (in part) and is affected by the following overlays:

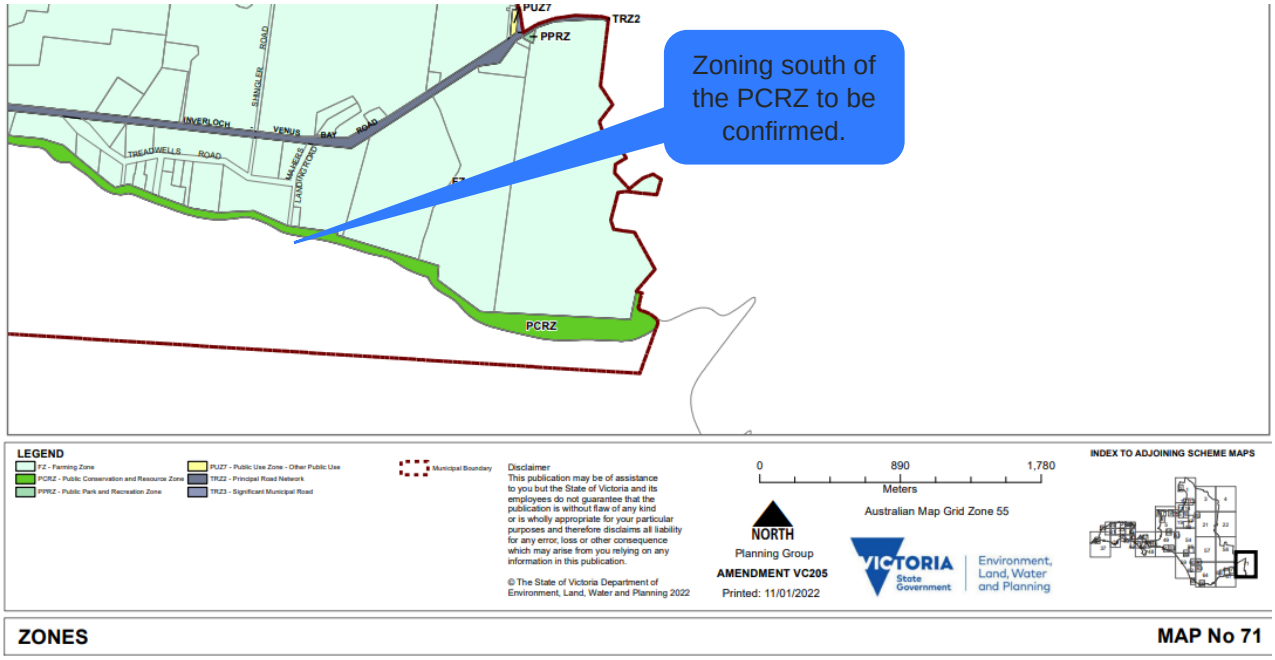
- Environmental Significance Overlay – Schedule 1 (ESO1) (in part),
- Land Subject to Inundation Overlay (LSIO), and
- Significant Landscape Overlay – Schedule 5 (SLO5) (in part).

At the time of writing, the zoning of the land south of Crown Allotment 5A Parish of Drumdlemara / the PCRZ is still being determined. We understand Council will seek DELWP's view on this as part of the application process..

This land is located within the Shire of Bass Coast[5] and is not marked as Commonwealth Land on the Scheme maps so is located within in the Bass Coast Planning Scheme[6]. However, this land is not shown with a zone in the planning scheme maps.

The boat ramp marginally extends within this land. This report proceeds on the assumption that the portion of the boat ramp located on land south of Crown Allotment 5A is within the PCRZ being the adjacent zone.

Figure 4-1: Zoning Map 71, Bass Coast Planning Scheme



[5] Based on the gazetted boundary map for Bass Coast municipal area on the Land Vic Website

[6] Clause 72.02 provides that the Bass Coast Planning Scheme applies to the municipal district of the Bass Coast Shire Council.

Figure 4-2:Zoning Map, VicPlan (December 2022)

Figure 4-3: ESO Map, VicPlan (December 2022)

Figure 4-4: SLO Map, VicPlan (December 2022)

Figure 4-5: LSIO Map, VicPlan (December 2022)

4.1 ZONING

4.1.1 Farming Zone (FZ)

The purpose of the FZ is:

- *To provide for the use of land for agriculture.*
- *To encourage the retention of productive agricultural land.*
- *To ensure that non-agricultural uses, including dwellings, do not adversely affect the use of land for agriculture.*
- *To encourage the retention of employment and population to support rural communities.*
- *To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision.*
- *To provide for the use and development of land for the specific purposes identified in a schedule to this zone*

The site is presently used for a boat launching facility in the Farming Zone. A boat launching facility is defined in Clause 73.03 as:

> *Land used to launch boats into the water and to retrieve boats from the water.*

The existing car parking area, the amenities and grassed areas of open space are ancillary to this use.

The proposed upgrades to the facility will maintain this existing use, although the new boat ramp and jetty will extend the use within the Farming Zone further south.

Accordingly, pursuant to Clause 35.07-1, a planning permit is triggered to use land for boat launching facility within the FZ.

Figure 4-6: Use permission in Farming Zone

As a result of the permit exemptions in Clause 52.31 (Local Government Projects), discussed at Section 4.3 of this report, the Farming Zone does not trigger a planning permit for development.

The extension of the existing use within the Farming Zone, over the new ramp / pontoon, is compatible with the purpose and decision guidelines of the zone as:

- The boat launching facility is presently operating next to the surrounding agricultural land uses (grazing) and is compatible with these uses.
- The minor extension of the boat launching facility use in the Farming Zone further to the south will not materially change the compatibility of the boat launching facility use with the surrounding farming uses.
- The site is not presently used for agricultural purposes. The proposed upgrades will not remove productive agricultural land from primary production, rather 'take in' an additional small area of Farming zoned land to the south in the location of the new ramp / pontoon.

4.1.2 Public Conservation and Resource Zone (PCRZ)

The purpose of the PCRZ is:

- *To implement the Municipal Planning Strategy and the Planning Policy Framework.*
- *To protect and conserve the natural environment and natural processes for their historic, scientific, landscape, habitat or cultural values.*
- *To provide facilities which assist in public education and interpretation of the natural environment with minimal degradation of the natural environment or natural processes.*
- *To provide for appropriate resource based uses.*

The use of the site for a 'Boat Launching Facility' does not require planning approval within the PCRZ if the use is:

> *Conducted by or on behalf of a public land manager, Parks Victoria or the Great Ocean Road Coast and Parks Authority, under the relevant provisions of the Local Government Act 1989, the Reference Areas Act 1978, the National Parks Act 1975, the Fisheries Act 1995, the Wildlife Act 1975, the Forests Act 1958, the Water Industry Act 1994, the Water Act 1989, the Marine Safety Act 2010, the Port Management Act 1995 or the Crown Land (Reserves) Act 1978.*

Both DELWP and Parks Victoria have advised that Parks Victoria is the Public Land Manager for the portion of the project within Crown Allotment 5A Parish of Drumdlemara, being the land located within the PCRZ.

Figure 4-7: Public Conservation and Resource Zone permit trigger

As the Applicant for this permit application is Council, the proponent for the project is both Council and Better Boating Victoria, Council will contract manage the construction of the project and manage the on-going use of the ramp, the use is therefore not conducted "by or on behalf of" Parks Victoria.

Parks Victoria has indicated that "prior to the works commencing, a licence under the *Crown Land (Reserves) Act 1978* will be required from Parks Victoria for the infrastructure within Anderson Inlet Coastal Reserve". Again, this indicates the use will not be conducted by or on behalf of Parks Victoria.

Accordingly, a planning permit is triggered pursuant to Clause 36.03-1, to use land for boat launching facility (area of new ramp / jetty) within the PCRZ.

As a result of the permit exemptions in Clause 52.31 (Local Government Projects) the PCRZ does not trigger a planning permit for development.

The letter prepared by Parks Victoria dated 7 November 2022 provides written consent for a planning permit application being made as required by Clause 36.03-3.

The project is consistent with the purpose of the PCRZ: *To provide facilities which assist in public education and interpretation of the natural environment with minimal degradation of the natural environment or natural processes.*

The upgrades will increase the public's access to the marine environment which assist in public education and interpretation of the natural environment. This is recognised within Policy 10.1 of the Marine and Coastal Policy which seeks to:

> *Enable a diversity of sustainable recreational uses and activities that strengthen peoples' connection with the marine and coastal environment (such as fishing, boating, surfing, swimming, bushwalking, camping, caravanning, cultural tourism).*

We also note that the PCRZ straddles much of the Victorian coast and recreational boating facilities are commonly located in this zone.

Subject to the views of Parks Victoria, as public land manager, the proposed use within the PCRZ is appropriate.

4.2 OVERLAYS

4.2.1 Environmental Significance Overlay – Schedule 1 (ESO1)

The purpose of the ESO1 is:

- *To implement the Municipal Planning Strategy and the Planning Policy Framework.*
- *To identify areas where the development of land may be affected by environmental constraints.*
- *To ensure that development is compatible with identified environmental values.*

Schedule 1 is titled 'Coastal Westlands Areas' and includes the following statement of environmental significance:

> *The coastline of Bass Coast Shire varies from internationally significant wetlands in Western Port and the rugged coastal cliffs along Bass Strait to Anderson Inlet. Development in these environmentally significant areas has the potential to impact on water quality and habitat values of these wetland ecosystems.*
>
> *…*
>
> *Anderson Inlet has significant natural qualities and is the most clearly defined estuary in Victoria. It is both scenic and an important area for flora and fauna. The area provides an internationally significant habitat for migratory wader birds and habitat for endangered bird species.*
>
> *…..*

Schedule 1 lists the following environmental objectives to be achieved:

- *To ensure that development is compatible with the environmentally sensitive coastal areas.*
- *To maintain and enhance the ecological attributes such as the biological, physical and chemical components of the wetland ecosystem, and their interactions which maintain the function of wetlands and of Ramsar sites.*
- *To protect and ensure the long-term future of terrestrial and aquatic habitat for native plants and animals, include shorebird feeding areas and roosts and species and communities listed under the Flora and Fauna Guarantee Act 1988.*

- *To encourage ecological restoration, regeneration and revegetation with indigenous species within the site and in adjoining areas.*
- *To ensure that land abutting or draining into wetlands is managed to prevent any degradation of wetland function and values.*
- *To protect water quality and prevent water pollution in watercourses, water bodies, wetlands and groundwater.*

Schedule 1 to the ESO provides that a planning is not required for:

- *The construction of a building or to construct or carry out works approved under the Coastal Management Act 1995 or carried out as part of a management plan approved by the Department of Sustainability and Environment.*

The *Coastal Management Act 1995* has been replaced with the *Marine and Coastal Act 1998* (MAC Act). As part of the project, consent is required under the MAC Act.

Accordingly, the "first leg" of the above exemption will be met, and the ESO1 will not trigger a permit for buildings and works upon receipt of the consent under the MAC Act.

Section 61 of the *Planning and Environment Act 1987* provides that the responsible authority must not decide to grant a permit to use or develop marine and coastal Crown land unless consent under the MAC Act has been issued.

Consent under the MAC Act has recently been sought and will be forwarded to Council when received.

Pursuant to Clause 42.01-2, a planning permit is triggered to remove all terrestrial vegetation on the site.

An application to remove vegetation affecting sites of International, National and State zoological significance must be referred to the Secretary to DELWP in accordance with the Schedule to Clause 66.04 and Clause 55 of the Planning Scheme.

The statement of environmental significance in ESO1 recognises that the area of Andersons Inlet "..*provides an internationally significant habitat for migratory wader birds and habitat for endangered bird species".* Accordingly, referral of the application to the Secretary to DELWP is required.

BMT have undertaken a marine ecology impact assessment and their report is included with the application. This assessed the impact of the project on marine flora and fauna including migratory and wader shorebirds and found:

> *The timing of construction works should consider avoiding the overwintering period for migratory waders. Noise control measures are also recommended for piling activities (e.g., soft start / ramp up of piling).*
>
> *Although there is some risk of disturbing seagrass habitat, the area is approximately equivalent to 0.3% of seagrass in Anderson Inlet. Considering these factors, we consider the proposed works as low risk of having significant impact on the environmental values of Mahers Landing and Anderson Inlet as a whole.*
>
> *Water runoff from the boat ramp, bridge and carpark areas may impact the marine environment if not managed effectively. We recommend stormwater be collected from the carpark areas and discharged into onshore sand trap infiltration swales. These could be planted with appropriate vegetation to slow water flow rates and increase infiltration of potentially contaminated water. We also recommend that control measures including signage be implemented to ensure boat bilge water is not emptied while boats are on the ramp/bridge structure. See Annex A for a risk assessment of various possible designs of the stormwater collection system from the boat ramp structure noting that with appropriate control measures, the existing risk profile will be maintained for the facility in terms of intertidal pollution.*
>
> *Excavation of the land-side areas should be avoided, if possible, to ensure potential acid sulfate soils are not exposed. Where excavations are unavoidable, appropriate acid sulfate soil measures should be in place (e.g., testing and liming) to ensure acidic runoff does not enter Anderson Inlet.*
>
> *Light pollution of the area could be minimised by incorporating downward directed sensor lights which only turn on with movement nearby and turn off quickly afterwards.*
>
> *If appropriate stormwater retention from the boat ramp and the potential presence of acid sulfate soils are addressed in the boat ramp upgrade designs as per our recommendations, we conclude there is*

low risk of any negative impacts to local coastal processes and the marine environment from the boat ramp upgrade works.

The above recommendations should be addressed through conditions of permit requiring:

- A construction environmental management plan to mitigate potential environmental impacts caused by construction activity; and,
- Detailed engineering designs for the car park including stormwater treatment.

ID Ecological Assessment have undertaken an ecological assessment of the terrestrial areas of the site and found:

Vegetation present within the study area is comprised of planted indigenous and non-indigenous native trees in the north-east of the site, and remnant vegetation, including mature canopy trees, in the south-east, west and north of the study area.

No threatened fauna species were identified within the study area during the site survey. A likelihood assessment determined that all but two threatened fauna species identified in the database searches had a low or unlikely likelihood of occurring within or be reliant on any of the habitats within the study area. White-bellied Sea Eagle and Little Eagle were deemed to have a moderate likelihood of occurrence, based on roosting potential in the remnant Gippsland Manna Gums on the east and west of the study area.

The likelihood assessment determined that all threatened flora species identified in the database searches were had an unlikely or low likelihood of occurring within the study area.

Based on the extent of the project's vegetation and habitat removal under final designs, no additional surveys are recommended in relation to the site's biodiversity values. This recommendation assumes that all construction works are contained within the designated 'limits of works' and that No-go zones are established and maintained. However, it is recommended that a suitably qualified wildlife expert / zoologist with appropriate DELWP authorisations be present during removal of native vegetation to observe and salvage any fauna if found.

The above recommendations of ID Ecological Management should be addressed as part of a construction environmental management plan required as a condition of permit.

We recommend a detailed landscape plan be required as a condition of permit to detail the landscaping design within landscape beds and swales shown on the BMT plans. This should utilise planting species indigenous to the area.

Subject to the recommendations of the above recommendations of BMT and ID Ecological Management and a condition requiring a detailed landscape plan, we conclude the proposed removal of vegetation in ESO1 is compatible with the environmental values protected by ESO1.

4.2.2 Land Subject to Inundation Overlay (LSIO)

The purpose of the LSIO is:

- *To implement the Municipal Planning Strategy and the Planning Policy Framework.*
- *To identify flood prone land in a riverine or coastal area affected by the 1 in 100 (1 per cent Annual Exceedance Probability) year flood or any other area determined by the floodplain management authority.*
- *To ensure that development maintains the free passage and temporary storage of floodwaters, minimises flood damage, responds to the flood hazard and local drainage conditions and will not cause any significant rise in flood level or flow velocity.*
- *To minimise the potential flood risk to life, health and safety associated with development.*
- *To reflect a declaration under Division 4 of Part 10 of the* Water Act, 1989*.*
- *To protect water quality and waterways as natural resources by managing urban stormwater, protecting water supply catchment areas, and managing saline discharges to minimise the risks to the environmental quality of water and groundwater.*
- *To ensure that development maintains or improves river, marine, coastal and wetland health, waterway protection and floodplain health.*

Pursuant to Clause 44.04-2, a planning permit is required to construct a building or construct or carry out works.

The Coastal Impact Assessment prepared by BMT includes an assessment of tide levels including predicted extreme water levels caused by a range of combining scenarios including sea level rise, storm tide, design windows and flood flow.

The top of the new boat ramp will be constructed to 2.45m AHD, which appears at the upper end of the predicted extreme water levels, with the toe of the ramp at -1.8m AHD accommodating boat access during the low tides. The sections show the car park to be constructed to 2.7m AHD (approx. 500mm of fill in some places) with a gentle slope of 1% down towards the swales to the eastern and western boundaries.

Referral of the application to construct a building or construct or carry out works within the LSIO is required to West Gippsland Catchment Management Authority (WGCMA) pursuant to Section 55 of the Act.

4.2.3 Significant Landscape Overlay – Schedule 5 (SLO5)

The purpose of the SLO is:

- *To implement the Municipal Planning Strategy and the Planning Policy Framework.*
- *To identify significant landscapes.*
- *To conserve and enhance the character of significant landscapes.*

Schedule 5 is titled 'Anderson Inlet' and includes the following Statement of Nature and Key Elements of Landscape:

> *Anderson Inlet has relatively calm waters and a flat swampy hinterland. This provides a scenic outlook for the township of Inverloch. The landscape is largely natural and undeveloped. Vegetation is predominately indigenous.*
>
> *The landscape is highly significant for its Aboriginal cultural heritage values, with many known sites scattered throughout the coastal sand dunes. It is also of high community value for its scenic qualities and recreation opportunities, including fishing, walking, and boating.*

The landscape character objectives to be achieved in the SLO5 are:

- *To retain and improve indigenous vegetation, particularly at roadsides and in riparian strips, to minimise the visual intrusion of new development.*
- *To protect locally significant views and vistas which contribute to the character of the landscape, particularly open views across Anderson Inlet.*
- *To ensure buildings and structures sit within, rather than dominate, the landscape.*
- *To retain the sense of uncluttered openness throughout the area.*
- *To minimise the visual impact of signage and other infrastructure, particularly on hill faces, in coastal areas and in other areas of high landscape values or visibility.*
- *To protect landscape character and attributes that are consistent with the Aboriginal cultural heritage values of the area.*
- *To recognise, and protect, the landscape of Anderson Inlet as places of significant Aboriginal cultural heritage value.*

Pursuant to Clause 42.03-2, a planning permit is required to construct a building or construct or carry out works.

Pursuant to Clause 42.03-2, a planning permit is required to remove, destroy or lop native vegetation.

The proposed works are considered to be compatible with the Anderson Inlet's significant landscape character. The open nature of the works (including the boat ramp and jetty constructed piles), the use of materials suitable to the coastal environment and the maritime nature of the works are suitable to the coastal location of the site.

The proposed upgrades to the existing boating facility do not result on the proliferation of built form in the Andersons Inlet landscape.

The area's landscape includes of a patchwork of open areas of grassed farmland and groups / windrows of trees and coastal shrub. The proposed removal of vegetation and provision of new landscaping are compatible

with this patchwork. A detailed landscape plan should be required as a condition of permit. This should incorporate new planting species indigenous to the area.

The project has been informed by consultations with the Bunurong Land Council Aboriginal Corporation being the applicable Registered Aboriginal Party for this location. An approved cultural heritage management plan is anticipated in mid-January 2023 and will be forwarded to Council when received.

Overall, we consider the project is appropriate having regard to the Significant Landscape Overlay – Schedule 5.

4.3 PARTICULAR PROVISIONS

The following paragraphs outline relevant particular provisions.

4.3.1 Clause 52.06: Car parking

Clause 52.06 sets out requirements for the design and provision of car parking. As no statutory rate of car parking provision is provided for boat launching facility use, the provision of car parking is to the satisfaction of the responsible authority.

The proposal provides for the formalisation and extension of the car park to accommodate 66 spaces, a significant improvement to the existing ad hoc parking arrangements:

- 57 x car-trailer spaces.
- 5 x standard car spaces.
- 2 x car-trailer spaces and 2 x standard car spaces for people living with disabilities.

The provision of 57 CTU spaces is in line with the ratio of 20-30 CTU spaces to each boat ramp lane for rural areas recommended in the *Victorian Boating Facility Design Guidelines, Victorian Government January 2022*.

Swept paths for LC100-7.5 design vehicles are included on the application plans. This is a CTU of approximately 13m length, composed of a large SUV/4WD/Ute (e.g. Toyota Land Cruiser / Nissan Patrol / Ford Ranger) towing a 7.5m trailer (i.e., 8.5m boat). This is in line with the CTU recommended in the Better Boating Victoria Guidelines for Design of Boating Facilities.

Detailed engineering plans should be required as a condition of permit as usually required for a project of this nature to provide details in relation to traffic control signage, kerbing treatments, pavement design, detailed drainage design and the like.

The views of Council's engineers will be sought as part of the application.

4.3.2 Clause 52.17: Native Vegetation

The purpose of Clause 52.17 is:

- *To ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation. This is achieved by applying the following three step approach in accordance with the Guidelines for the removal, destruction or lopping of native vegetation (Department of Environment, Land, Water and Planning, 2017) (the Guidelines):*
  1. *Avoid the removal, destruction or lopping of native vegetation.*
  2. *Minimise impacts from the removal, destruction or lopping of native vegetation that cannot be avoided.*
  3. *Provide an offset to compensate for the biodiversity impact if a permit is granted to remove, destroy or lop native vegetation.*
- *To manage the removal, destruction or lopping of native vegetation to minimise land and water degradation.*

Pursuant to Clause 52.17-1, the project requires a planning permit to remove native vegetation.

The Ecological Assessment and Native Vegetation Removal Report prepared by ID Ecological Management includes the application requirements under Clause 52.17.

This assessment identified 13 habitat zones across the terrestrial areas of the site representative of EVC 2: Coast Banksia Woodland with vegetation quality assessments ranging from 7-27 out of 100.

All native vegetation has been assessed as lost. In total the project requires the removal of 0.266 Ha of native vegetation (EVC 2: Coast Banksia Woodland) including 3 large trees which equates to an offset of 0.61 general habitat units with a minimum strategic biodiversity score of 0.351.

The offsets will ensure there is no net loss of biodiversity. New plantings on-site are additional to the formal offset requirements under Clause 52.17.

The vegetation removal is subject to the Intermediate Assessment Pathway, which does not trigger a referral to DELWP under Section 55 of the Act. However, under Clause 67.02-1, notice of the application to remove, destroy or lop native vegetation under Clause 52.17 must be given to the Secretary to DELWP in accordance with Section 52(1)(c) of the Act.

4.3.3 Clause 52.30: State Projects

Clause 52.30 exempts projects declared as State Projects by the Minister for Planning from the requirements of the planning scheme. This project has not been declared as a State Project and accordingly a planning permit is required.

4.3.4 Clause 52.31: Local Government Projects

The purpose of this clause is:

- *To facilitate the development of land by or on behalf of municipal councils.*

Pursuant to Clause 52.31-1, *any requirement in a zone or a schedule to a zone to obtain a permit to construct a building or construct or carry out works does not apply to the development of land carried out by or on behalf of a municipal council. This exemption does not apply to:*

- *A development with an estimated cost of more than $10 million.*
- *A development in the Urban Floodway Zone unless the development is carried out to the satisfaction of the relevant floodplain management authority.*
- *A development associated with the use of land for accommodation, earth and energy resources industry, energy generation facility, industry or warehouse.*
- *A development for which an environment effects statement has been, or is required to be, prepared under the Environment Effects Act 1978.*
- *A development for which the Minister for Planning has decided that an assessment through an environment effects statement under the Environment Effects Act 1978 is not required if the Minister's decision is subject to conditions.*

As the estimated cost of development is $4 million and Council will contract manage the delivery of the project, the above exemption is met, and a planning permit is not triggered under the FZ and PCRZ for development.

Clause 52.31-2 sets out notice and review exemptions. The buildings and works components of the application are exempt from the notice requirements of Sections 52(1)(a), (b) and (d) while the vegetation removal permit triggers are not.

We note that notice of the buildings and works permit triggers in required in any event to owners and occupiers of adjoining land under Section 52(1)(c) of the Act pursuant to Clause 67.02-2.

4.3.5 Clause 52.34: Bicycle Facilities

This clause does not require any bicycle facilities to be provided in association with the use / development of the land for boat launching facility.

4.4 GENERAL PROVISIONS

4.4.1 Clause 63 Existing Use Rights

There are no previous planning permits applying to the site, however, the existing use of the land for a boat launching facility in the FZ has evidently occurred for an extensive period of time.

In these circumstances, existing use rights may be established by demonstrating on the balance of probabilities 15 years of continuous use. We consider this is demonstrated via the below photographic records and common knowledge of the Mahers Landing boating facility over many years.

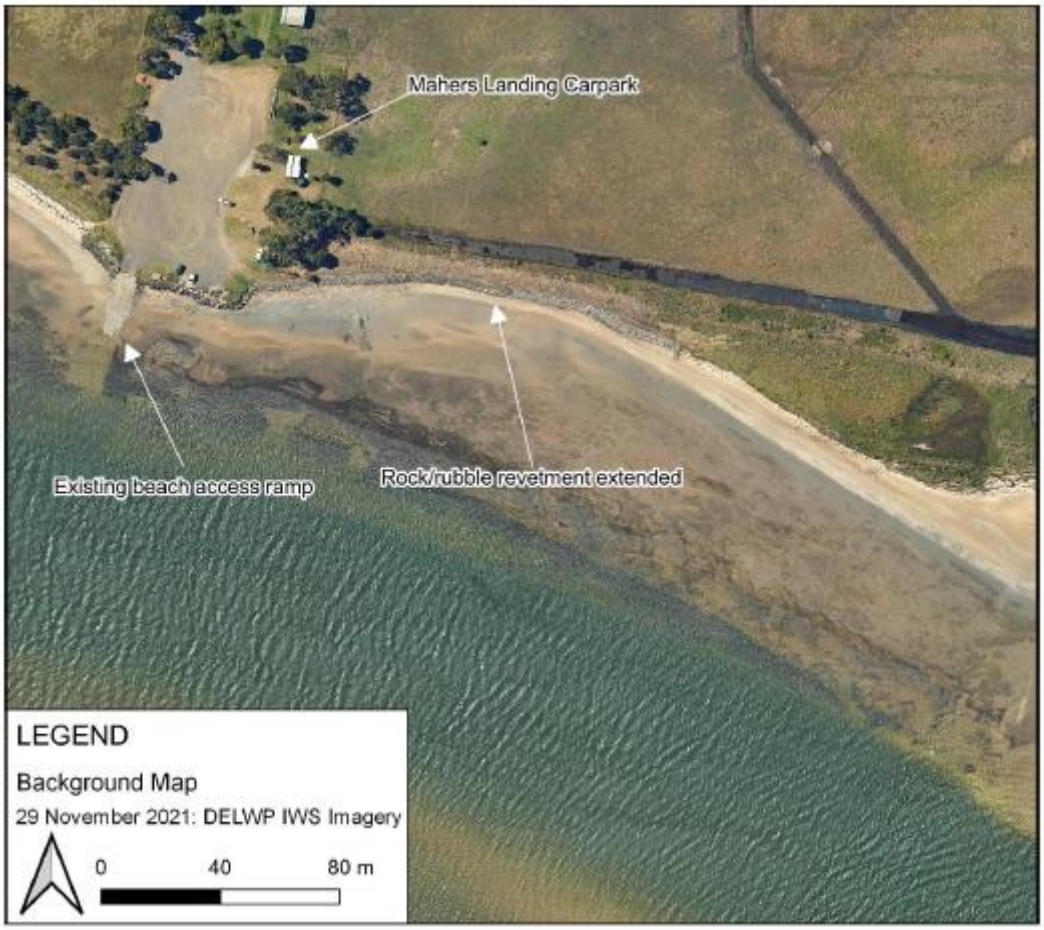
Figure 4-8: 22 March 2006 Aerial Photograph, extract from BMT Report

Figure 4-9: Google Streetview, February 2008

Figure 4-10: Google Streetview, March 2010

Figure 4-11: 2018 Aerial photograph extract from Mahers Landing Boating Facility Upgrade Functional Design Report, Feb 2021 prepared by Oldfield Consulting Australia

Figure 4-12: 29 November 2021 Aerial Photograph, extract from BMT Report



Clause 63.05 provides that a use in Section 2 or 3 for which an existing use right is established may continue provided (our comments follow):

- *No building or works are constructed or carried out without a permit. A permit must not be granted unless the building or works complies with any other building or works requirement in this scheme.*

A planning permit is triggered under Clause 63.05 for the building and works. This report assesses the building and works requirements in the Scheme.

- *Any condition or restriction to which the use was subject continues to be met. This includes any implied restriction on the extent of the land subject to the existing use right or the extent of activities within the use.*

A planning permit is sought for the extension of the use within the FZ. The existing facility is freely accessible to the public and this will continue with the proposed upgrades.

- *The amenity of the area is not damaged or further damaged by a change in the activities beyond the limited purpose of the use preserved by the existing use right.*

There are no existing uses nearby that are sensitive to potential off-site amenity impacts generated by the boat facility use in the FZ.

4.4.2 Clause 67: Land owned or permit required by responsible authorities

Clause 67.02 sets out Section 52(1)(c) notice requirements for the planning application as Clause 67.01 exempts the application from the requirements of Section 96(1) of the Act. Pursuant to this clause:

- Notice of the application to remove, destroy or lop native vegetation is required to the Secretary to DELWP pursuant to Clause 67.02 and Section 52(1)(c) of the Act.

- Notice of the application for permit is required to owners and occupiers of adjoining land pursuant to Clause 67.02-2 and Section 52(1)(c) of the Act as Clause 67.01 exempts the application by Council being made to the Minister under Section 96(1) of the Act.

4.5 PLANNING POLICY

The applicable State, regional and local planning policies are set out in Clause 02 (Municipal Planning Strategy) and Clause 10 (Planning Policy Framework) within the Bass Coast Planning Scheme. An outline of these clauses is provided in Appendix A to this report together with key background and adopted documents.

The following policies are broadly relevant to the application:

- Clause 02.03 (Strategic directions).
- Clause 11.01-1S (Settlement).
- Clause 11.01-1L-08 (Inverloch).
- Clause 11.03-4S (Coastal settlement).
- Clause 11.03-5S (Distinctive areas and landscapes).
- Clause 12.01-1S (Protection of biodiversity).
- Clause 12.01-2S (Native vegetation management).
- Clause 12.02-1S (Protection of the marine and coastal environment).
- Clause 12.02-2S (Marine and coastal Crown land).
- Clause 12.03-1S (River corridors, waterways, lakes and wetlands).
- Clause 12.03-1R (High value water body assets – Gippsland).
- Clause 12.05-1S (Environmentally sensitive areas).
- Clause 12.05-2S (Landscapes).
- Clause 12.05-2L-02 (Landscape character areas).
- Clause 12.05-2L-03 (Hilltops, ridgelines and prominent coastal landform protection in Rural Zones).
- Clause 13.01-1S (Natural hazards and climate change).
- Clause 13.02-1S (Bushfire planning).
- Clause 13.03-1S (Floodplain management).
- Clause 14.01-1S (Protection of agricultural land).
- Clause 14.02-1S (Catchment planning and management).
- Clause 15.01-1S (Urban design).
- Clause 15.01-1L-01 (Urban design in Bass Coast).
- Clause 15.01-1L-02 (Landscape design).
- Clause 15.03-2S (Aboriginal cultural heritage).
- Clause 17.04-1S (Facilitating tourism).
- Clause 17.04-1R (Tourism – Gippsland).
- Clause 17.04-1L (Facilitating tourism).
- Clause 17.04-2S (Coastal and maritime tourism and recreation).
- Clause 19.02-4L (Social and Cultural Infrastructure).
- Clause 19.02-6S (Open space).
- Clause 19.02-6L (Open space).

The applicable policy matrix includes a range of policies that deal with settlement and coastal Crown land, the environment and coastal processes, built form and character, and tourism and recreation.

The following paragraphs discuss the proposal in relation to these policy themes.

4.5.1 Settlement and Coastal Crown Land

Settlement policy at Clause 11 states that planning is to anticipate and respond to the needs of existing and future communities through provision of zoned and serviced land for housing, employment, recreation and open space, commercial and community facilities and infrastructure.

The *Marine and Coastal Policy 2020* at Chapter 10 states:

> *Increases in permanent populations and visitor numbers are adding to demand for buildings and structures to support safe, equitable and sustainable recreational and tourist activities…*

The works at Mahers Landing are part of an upgrade of boating facilities identified at priority locations across Victoria.

The upgrades do not introduce a new activity to a coastal environment that is not already modified from its natural state. Rather the works improve the capacity, functionality and safety of the existing boating facility to better accommodate coastal dependant recreational activity.

The proposal protects areas of environmental sensitivity by directing infrastructure to an existing "recreational node" in an area already used for recreational activity and is consistent with the following policy:

- Marine and coastal Crown land policy at Clause 12.02-2S, which seeks: *To ensure the use and development of marine and coastal Crown land is ecologically sustainable, minimises impacts on cultural and environmental values, and improves public benefit for current and future generations.* A relevant strategy under this objective is to *ensure that use and development on or adjacent to marine and coastal Crown land….Demonstrates need and has a coastal dependency.* Recreational boating facilities have a functional need for locating on the coast. The Mahers landing facility is identified as a "high priority" for renewal in the *Victorian Recreational Boating Strategy (2021-2030)*.
- Clause 12.03-1R (High value water body assets – Gippsland) which provides the following strategy: *Minimise the impact of urban growth on high value water body assets such as the Gippsland Lakes, Corner Inlet, Anderson Inlet, Mallacoota Inlet and their source rivers.* The upgrade of the Mahers Landing facility will improve the capacity and functionality of the existing facility which minimises the impact of urban growth on Andersons Inlet.
- The objective of Clause 11.01-1L-08 (Inverloch) *to support the development of Inverloch as a consolidated and sustainable coastal village that optimises existing natural assets and character, and services the lifestyle and recreational needs of residents and visitors.*
- The "first principles" in the *Siting and Design Guidelines for Structures on the Victorian Coast* (DELWP, 2020) which include: *Only structures that functionally need to be located near or in the water, or that significantly contribute to social values, should be on marine and coastal Crown land.* Boating facilities are one such activity that do have a functional need to be located on the coast.

Consistent with Clause 12.02-2S (Marine and coastal Crown land), the project:

- Maintains safe, equitable access - the upgrades include accessible parking spaces, standard parking spaces and car-trailer spaces to accommodate:
  - Recreational boating users.
  - Non-boating recreational activities such as walking, fishing from the new jetty, bird watching or relaxing.
  - People living with a disability.
  - Increased capacity, which facilitating increased public access to the coast.
- Improves public benefit – the project will improve public access to the marine and coastal environment and is freely accessible by the public.
- Demonstrates need and has coastal dependency – the Mahers Landing Facility is identified as a "high priority" for renewal in the *Victorian Recreational Boating Strategy (2021-2030).* The letter prepared by Gippsland Ports accompanying the application states:

  > *The existing boat ramp facility is in poor condition and the ramp is substandard with a very flat gradient that restricts use. The car and trailer parking area is also in need of upgrading to provide a facility suitable for use for recreational boating activities.*
  >
  > *…*

> *Upgrading and rebuilding core recreational boating infrastructure is critical to ensuring increased demands from existing and increasing boating activity is satisfied. When completed, the upgraded boat ramp and associated infrastructure will assist to address demand during peak times, such as Christmas and Easter, when other boat ramps at Inverloch and surrounding areas are at full capacity.*

Overall, the proposal receives strong support from settlement and coastal Crown land policies.

4.5.2 Environment and Coastal Processes

Other policies seek to protect environmental values of coastal and estuarine environments such as the subject site and to take into consideration coastal processes. These policies include:

- Clause 12.01-1S (Protection of biodiversity) which seeks: *To protect and enhance Victoria's biodiversity.*
- Clause 12.01-2S (Native vegetation management) which seeks: *To ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation.*
- Clause 12.02-1S (Protection of the marine and coastal environment) which seeks: *To protect and enhance the marine and coastal environment.*
- Clause 12.02-2S (Marine and coastal Crown land) which seeks: *To ensure the use and development of marine and coastal Crown land is ecologically sustainable, minimises impacts on cultural and environmental values, and improves public benefit for current and future generations.* Strategies include: *Design, locate and maintain buildings and structures to effectively manage:*
  - *Any increase in exposure to coastal hazard risk, including rates of sea level rise, erosion, accretion or inundation.*
  - *Exposure to public health and safety risks.*
  - *Any detrimental impacts (in particular increased hazard risk) on neighbouring Crown or private land.*
  - *Adverse effects on the environment and associated uses and values.*
  - *Impact on marine and coastal functions and processes.*
- Clause 12.03-1R (High value water body assets – Gippsland) which provides the following strategy: *Minimise the impact of urban growth on high value water body assets such as the Gippsland Lakes, Corner Inlet, Anderson Inlet, Mallacoota Inlet and their source rivers.*
- Clause 12.05-1S (Environmentally sensitive areas) which aims: *To protect and conserve environmentally sensitive areas.*
- Clause 14.02-1S (Catchment planning and management) which aims: *To assist the protection and restoration of catchments, waterways, estuaries, bays, water bodies, groundwater, and the marine environment.*

The proposed upgrades require a permit to remove all existing vegetation within terrestrial areas of the site. This comprising 0.266 Ha of native vegetation (EVC 2: Coast Banksia Woodland) including 3 large trees with the balance of the existing trees being planted natives.

This vegetation has been assessed as having limited ecological and arboricultural values in all the assessments undertaken for the project:

- The ecological assessment prepared by ID Ecological Management identified 13 habitat zones across the terrestrial areas of the site with vegetation quality assessments ranging from 7-27 out of 100.
- The arboricultural assessment undertaken by Treemap assessed all trees on the site as having a 'Low' or 'None' arboricultural retention rating due to the poor condition or low quality of the trees. Treemap assessed that: *The low quality or poor arboricultural condition of the trees supports an approach whereby existing trees and shrubs should offer reasonably limited constraint to the proposed design.*
- The BMT coastal ecological assessment found[7]:

  > *Natural Damp Grasslands of the Victorian Coastal Plains are restricted to terrestrial areas and not known to occur in close proximity to the proposed works. Subtropical and temperate Coastal*

[7] Page 27

Saltmarsh occur on the landward side of the coastal intertidal area and are inundated occasionally by high tides. The existing Mahers Landing boat ramp carpark area, including the toilet block and surrounding vegetation is highly modified due to land use and land modifications over time (e.g., clearing, agriculture, bund construction, revetment wall construction, weed introduction etc.). Visual inspection of the site did not identify any areas of coastal saltmarsh in close proximity to the proposed works. For further details of the terrestrial ecology present at the site, see the ecological assessment report produced by Indigenous Designs (2022). We note that although coastal saltmarsh is not present at the site of the proposed works, it is present approximately 200m to the west where some mangroves and other saltmarsh plants are growing.

The native vegetation removal will be offset in accordance with Clause 52.17 to ensure there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation.

The new landscaping to be undertaken as part of the project is additional to the formal native vegetation offsets.

ID Ecological Management indicate that Trees 1, 2, 12, 17, 18, 33 and 36 although deemed lost, could be prioritised for retention where possible through the detailed design phase of the works. A permit is sought for the removal of these trees (which all have a 'low' or 'none' arboricultural rating), however, further consideration will be given to the retention of these trees during the detailed engineering design stage.

In relation to potential implications under the *Environment Protection and Biodiversity Conservation Act 1999*, ID Ecological Management found:

- *No threatened species or ecological communities were found to occur within the study area during the site inspection;*
- *All flora species identified in database searches, within a 5 km search radius, that are listed as threatened under the EPBC Act are considered to have a low likelihood or deemed unlikely to occur within the study area; and*
- *All other fauna species identified in database searches, within a 5 km search radius, that are listed as threatened under the EPBC Act are considered to have a low likelihood or deemed unlikely to occur within the study area; and*
- *The project is not expected to significantly impact on any Matters of National Environmental Significance (MNES).*

In relation to *Flora and Fauna Guarantee Act 1988*, ID Ecological Management found:

- *Only one flora species was identified adjacent to the site that is listed as protected under the FFG Act; Atriplex paludosa (Marsh Saltbush) (DELWP, 2020a). As long as works are undertaken within the study area and no encroachment beyond the study area takes place, this species is deemed protected.*

In relation to the *Catchment and Land Protection Act 1994*, ID Ecological Management found:

- *Four weeds declared noxious under the Catchment and Land Protection Act 1994 (CaLP Act) were identified on site during assessments (Table 7). Two of these weeds are categorised within the West Gippsland Catchment Management Authority region as 'Regionally Controlled' and two are categorised as 'Restricted' (Agriculture Victoria, 2022).*

Figure 4-13: Noxious weeded on-site (ID Ecological Management)

Scientific Name	Common Name	Classification
Allium triquetrum	Angled Onion	Restricted
Cirsium vulgare	Spear Thistle	Regionally controlled
Lycium ferocissimum	African Box-thorn	Regionally controlled
Oxalis pes-caprae	Soursob	Restricted

BMT have undertaken a marine ecology impact assessment and have recommended measures at Section 6 of their assessment to mitigate potential environmental impacts.

BMT have also undertaken a coastal process impact assessment which is included with the application. At Section 4.4 they conclude: *All potential impacts from the boat ramp upgrade works on coastal processes are considered minimal.*

Overall, the proposal is an appropriate response to environmental and coastal process policy.

4.5.3 Built Form and Character

A range of policies in the Scheme require that new built form respond to the features of a site and surrounding area. Notably:

- Clause 12.05-2L-02 (Landscape character areas) locates the site within the "South Gippsland Coastal Plains" landscape Character Type and the "Bunurong Coast and Hinterland" Character Area.
- Clause 15.01-1S (Urban design) seeks: *To create urban environments that are safe, healthy, functional and enjoyable and that contribute to a sense of place and cultural identity.*
- Clause 15.01-1L-01 (Urban design in Bass Coast) provides the following local strategies (as relevant):
    - *Design development to reflect the coastal setting and coastal architecture through built form and materiality.*
    - *Ensure that view lines and vistas are protected and shared between the public and private realm.*
- Clause 15.01-1L-02 (Landscape design) seeks:
    - *To increase vegetation across the municipality.*
    - *To identify and enhance the landscape values in urban areas.*
    - *To ensure development creates and maintains a high-quality landscape setting.*
- *The Siting and Design Guidelines for Structures on the Victorian Coast (DELWP, 2020)* provides guidance in relation to Aborigional Cultural Heritage, Coastal Processes, Geology, Morphology, Hydrology, Vegetation and Ecology, Climatic Conditions, Views, Public Open Space, Local Character and Sense of Place, Heritage, Public Access, Increased Function and Adaptability, Sustainability and Materials and Finishes.

As outlined in Section 4.2.3 of this report, the proposed works are considered to be compatible with the Anderson Inlet's significant landscape character as protected under SLO5.

The open nature of the works (including the boat ramp and jetty constructed piles) minimise the impact of the structures on the area's character.

The use of materials suitable to the coastal environment and the maritime nature of the works are suitable to the coastal location of the site.

The proposed upgrades to the existing boating facility do not result on the proliferation of built form in the Andersons Inlet landscape; rather they upgrade an existing facility.

The upgrades provide a functional design that responds to the coastal environment and is designed to provide improved facilities for recreational boating users and other user groups.

The proposed vegetation removal and new landscaping opportunities are in fitting with the area's patchwork of open grassed areas and groups of trees.

The footprint of the public toilet shown on the BMT plans is based on plans provided by Council officers but the detailed elevations and floor plans are yet to be prepared. The public toilet is exempt from a planning permit under Clause 62.02-2 except within the LSIO where Clause 52.31 provides that a permit is not required for development carried out to the satisfaction of the floodplain management authority. The satisfaction of West Gippsland Catchment Management Authority to the public toilet design will be sought via a separate process.

A detailed landscape plan should be required as a condition of permit. This should incorporate new planting species indigenous to the area.

Geotechnical considerations have informed the preliminary design and will continue to inform the detailed design of pavements and footings through the detailed engineering plan approval stage.

Overall, we consider the proposal responds appropriately to built form and character policies.

4.5.4 Tourism and Recreation

The planning policy framework also seeks to support sustainable management of growth around coastal environments for tourism, economic and recreational benefits.

The *Marine and Coastal Policy, March 2020* at Chapter 10 "Recreation and Tourism" states:

> *Recreational use of the marine and coastal environment is highly valued by Victorians and visitors alike. Recreation and tourism are key economic drivers for Victoria, contributing billions of dollars to the state economy each year. By connecting people with the marine and coastal environment, recreation and tourism also foster a sense of stewardship among users and provide community-wide health benefits from active and outdoor lifestyles.*
>
> *The ways in which people enjoy Victoria's marine and coastal environment are many and varied, from the passive (staying near the water and beach walking) to the active (swimming, surfing, boating, kite surfing, fishing) and engaging with and learning about Aboriginal coastal culture. These activities are often supported by water-based clubs including angling, sailing, boating and lifesaving clubs, and structures and facilities such as camping grounds, public jetties, boat ramps and interpretive signage. Maintaining and improving facilities through initiatives such as Better Boating Victoria will play an important role in supporting ongoing sustainable recreation and tourism in Victoria.*

The *Gippsland Regional Growth Plan (2014)*, a policy document at Clause 11.01-1S recognises that:

> *Gippsland has an important role as a centre for both commercial and recreational fishing based on freshwater fishing in its inland rivers and lakes, and saltwater fishing in its bays and ocean waters.*

The proposed upgrade will contribute positively to this role and is supported by State coastal and maritime tourism and recreation policy at Clause 17.04-2S (Coastal and maritime tourism and recreation) which seeks:

> *To encourage a diverse range of strategically located and well-designed coastal and maritime tourism and recreational opportunities that strengthen people's connection with the marine and coastal environment.*

Local tourism policy at Clause 17.04-1R (Tourism – Gippsland) further supports...*nature-based tourism proposals that complement and are compatible with the region's environment and landscape attractions or are close to identified strategic tourism investment areas.* The subject site is close to the Bunurong Coast Strategic Tourism Investment Area.

The *Recreational Boating Facilities Framework July 2014 - Central Coastal Board*, a policy guideline at Clause 17.04-2S, identifies the Mahers Landing boat ramp as having a "local role" in the hierarchy of boating facilities in both the years 2013 and 2030.

There are two boating facilities identified on the Andersons Inlet Precinct map; the Inverloch Boat Ramp and the Mahers Landing facility. The following key point is identified for the Andersons Inlet Precinct:

> *This is one of the few areas along the south Gippsland coast where boats can gain access to Bass Strait and it also provides haven from weather.*

The goal for the Andersons Inlet Precinct is:

> *To provide haven from the exposed open coast and safe access for recreational boating.*

The more recent *Victorian Recreational Boating Strategy (2021-2030)* an adopted document of State government identifies the Mahers landing facility as a "high priority" for renewal.

The existing facility at Mahers Landing comprises a shallow gradient, single-lane boat ramp, enables only restricted launching by smaller vessels (typically up to 5 metres), generally only at high tides. The upgrades include an all-tide, double lane boat ramp, a jetty, a formalised 64 space car / trailer park, improved pedestrian connections and amenities.

As one of just two boat launching facilities within the Andersons Inlet which provide a haven from the exposed open coast, the upgrades at Mahers Landing are expected to significantly improve recreational boating opportunities in the area.

The upgrades also include provision of 7 car spaces for non-boating recreational activities such as walking, fishing from the new jetty, bird watching or just relaxing.

The proposal also supports the following policies:

- Clause 19.02-4L (Social and Cultural Infrastructure) which seeks: *To provide fairer distribution of and access to, social and cultural infrastructure* and includes the following strategy:
    - *Encourage complementary water based recreational activities and facilities to group together along the coastline*

- Clause 19.02-6S (Open space) which seeks: *To establish, manage and improve a diverse and integrated network of public open space that meets the needs of the community.*
- Clause 19.02-6L (Open space) which includes the strategy: *provide recreational facilities for year-round activities (particularly for the winter months) that cater to the needs of the local population, non-permanent residents and tourists.*

Overall, the proposal is strongly supported by tourism and recreation policy.

4.6 NET COMMUNITY BENEFIT

Clause 71.02-3 (Integrated decision making) states that:

> *Victorians have various needs and expectations such as land for settlement, protection of the Environment, economic wellbeing, various social needs, proper management of resources and infrastructure. Planning aims to meet these needs and expectations by addressing aspects of economic, environmental and social wellbeing affected by land use and development.*
>
> *The Planning Policy Framework operates together with the remainder of the scheme to deliver integrated decision making. Planning and responsible authorities should endeavour to integrate the range of planning policies relevant to the issues to be determined and balance conflicting objectives in favour of net community benefit and sustainable development for the benefit of present and future generations.*

On balance, it is considered the proposal will deliver a clear net community benefit in the form of:

- Increased public access to coastal dependant recreational activity through:
  - Provision of a new all-tide, double lane boat ramp enabling greater capacity to launch and retrieve boats during all tides.
  - Provision of dedicated rigging / de-rigging areas to reduce queuing.
  - Retention of the existing boat ramp as a dedicated ramp for users of non-powered craft.
  - Provision of a new jetty for temporary berthing.
  - Formalisation of 66 car / car-trailer spaces, a significant improvement to the existing ad hoc parking arrangements.
  - Provision of car parking for people living with disabilities.
  - Improved pedestrian linkages.
  - Improved circulation and vehicle movements within the car park.
  - Improved public amenities including a new toilet block.
- A functional design in fitting with the area's landscape significance and coastal environment.
- Minimising environmental impacts through:
  - Upgrading existing infrastructure in an environment already modified from its natural state.
  - Provision of native vegetation offsets for native vegetation removal which cannot be avoided and provision of new landscaping on-site.
  - Removing noxious weeds declared under the CaLP Act.
  - Implementing a construction environmental management plan to mitigate potential environmental impacts caused by construction.
  - Making provision for stormwater treatment on-site.
- Ensuring the area's coastal values have been considered and ensuring the project responds to climate change and coastal processes.
- Improved facilities for recreation and tourism.

5. CONCLUSION

In summary, subject to receipt of consent under the MAC Act and an approved CHMP, and subject to the usual referral and notification processes of the application, we conclude that a planning permit should be issued on the basis that the proposal:

- Complies with the applicable zoning, overlay and particular provision controls.
- Facilitates shared and equitable access to the coast.
- Implements policies which encourage sustainable tourism and recreation in coastal areas.
- Implements policies which seek to protect environmental values of coastal and estuarine environments and to take into consideration coastal processes.
- Provides a functional design in fitting with the area's coastal / estuarine environment and Andersons Inlet's landscape character.
- Will deliver a clear net community benefit.

Appendix A Outline of Planning Policy

The following paragraphs outline key State, regional and local planning policies applicable to the project together with background and adopted documents.

Clause 02.03-1 (Settlement) described Inverloch as:

> *Inverloch is a small coastal town and a popular holiday destination. Its character is defined by natural features including the Andersons Inlet entrance, a foreshore reserve providing opportunities for passive and active recreation, surf beaches, vegetated waterways and inner-residential areas dominated by dense indigenous vegetation. The town centre contains a broad range of commercial, community and recreational uses.*

Clause 02.03-2 (Environmental and Landscape Values) identifies that the Bunurong Coast and Hinterland is a significant landscape.

Clause 02.03-7 (Economic Development) states in relation to tourism:

> *Tourism is the pillar of the Bass Coast economy with internationally recognised tourism destinations such as Phillip Island and the coastlines of Western Port and Bass Strait.*
>
> *Nature plays an important role in tourism in the Shire. A range of accommodation, food premises and shops also contribute to the visitor's experience and to the economy by providing job opportunities, investments and facilities for residents to enjoy. Tourism is broadening its focus and seeking to capitalise on a wider product-base around the agricultural, environmental and landscape values of the rural hinterland.*
>
> *There is a growing demand for environmentally sustainable tourism development and, more recently, for large-scale tourism development.*

Inverloch is identified as a key tourist area within Bass Coast.

Clause 02.03-9 (Infrastructure) indicated that Council seeks to support the provision of public open spaces that cater for a range of users and age groups and meet the needs of growing communities.

Clause 11.01-1S (Settlement) seeks: *To facilitate the sustainable growth and development of Victoria and deliver choice and opportunity for all Victorians through a network of settlements.*

The *Gippsland Regional Growth Plan* (2014), a policy document at Clause 11.01-1S states:

> *Gippsland has an important role as a centre for both commercial and recreational fishing based on freshwater fishing in its inland rivers and lakes, and saltwater fishing in its bays and ocean waters.*

Clause 11.01-1L-08 (Inverloch) does not strictly apply to the project. However, we note the site is located approximately 3.5km east of the Inverloch township and the project will support the objective at Clause 11.01-1L-08:

> *To support the development of Inverloch as a consolidated and sustainable coastal village that optimises existing natural assets and character, and services the lifestyle and recreational needs of residents and visitors.*

Clause 11.03-4S (Coastal settlement) seeks: *To plan for sustainable coastal development.*

Clause 11.03-5S (Distinctive areas and landscapes) seeks: *To recognise the importance of distinctive areas and landscapes to the people of Victoria and protect and enhance the valued attributes of identified or declared distinctive areas and landscapes.* Bass Coast was declared a 'distinctive area and landscape' in October 2019. A statement of planning policy is presently being prepared.

Clause 12.01-1S (Protection of biodiversity) seeks: *To protect and enhance Victoria's biodiversity.*

Clause 12.01-2S (Native vegetation management) seeks: *To ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation.*

Clause 12.02-1S (Protection of the marine and coastal environment) seeks: *To protect and enhance the marine and coastal environment.* Strategies include:

- *Manage privately-owned foreshore consistently with the adjoining public land.*

- *Protect and enhance the overall extent and condition of native habitats and species diversity distributions across public and private land in the marine and coastal environment.*
- *Protect and enhance natural features, landscapes, seascapes and public visual corridors.*
- *Plan for marine development and infrastructure to be sensitive to marine national parks and environmental assets*

Clause 12.02-1L (Protection coastal areas) includes the following strategies:

- *Set development back from the coast to accommodate coastal features, vegetation and climate change impacts.*
- *Discourage any new or additional access points and pathways to foreshore reserves, dunes, wetlands and inter-tidal areas directly from private properties.*
- *Discourage the establishment or extension of car parks and roads in sensitive coastal locations such as on dunes or in wetlands.*

Clause 12.02-2S (Marine and coastal Crown land) seeks: *To ensure the use and development of marine and coastal Crown land is ecologically sustainable, minimises impacts on cultural and environmental values, and improves public benefit for current and future generations.*

Clause 12.03-1S (River corridors, waterways, lakes and wetlands) seeks: *To protect and enhance river corridors, waterways, lakes and wetlands.* Strategies include: *Ensure development responds to and respects the significant environmental, conservation, cultural, aesthetic, open space, recreation and tourism assets of water bodies and wetlands.*

Clause 12.03-1R (High value water body assets – Gippsland) provides the following strategy: *Minimise the impact of urban growth on high value water body assets such as the Gippsland Lakes, Corner Inlet, Anderson Inlet, Mallacoota Inlet and their source rivers.*

Clause 12.05-1S (Environmentally sensitive areas) aims: *To protect and conserve environmentally sensitive* areas.

Clause 12.05-2S (Landscapes) seeks: *To protect and enhance significant landscapes and open spaces that contribute to character, identity and sustainable environments.* Clause 12.05-2L-01 (Landscapes) further provides local objectives and strategies addressing landscapes.

Clause 12.05-2L-02 (Landscape character areas) locates the site within the “South Gippsland Coastal Plains” landscape Character Type and the “Bunurong Coast and Hinterland” Character Area. Strategies for the Bunurong Coast and Hinterland Character Type are:

- *Protect existing native vegetation corridors and encourage their establishment.*
- *Protect the open rural hinterland landscape and undeveloped coastal edge.*
- *Protect open and uncluttered views to scenic coastal features, such as high sand dunes, sea cliffs, rocky headlands and rock stacks, and more notable landmarks such as the Bass Hills, Mt Liptrap, Mt Hoddle and the Venus Bay dunes.*
- *Protect the native vegetation in coastal reserves, riparian reserves and along roadsides.*
- *Restrict development in the coastal hinterland unless the development is:*
    - *Located within Cape Paterson or can be set back from the coast.*
    - *Sited and designed to be screened from view by the existing topography and landscaping, particularly on the inland side of coastal viewpoints.*

Clause 12.05-2L-03 (Hilltops, ridgelines and prominent coastal landform protection in Rural Zones) seeks:

- *To protect the environmental, landscape and visual significance of hilltops, ridgelines and prominent coastal landforms.*
- *To maintain panoramic roadside views of the scenic natural landscape along hilltops, ridgelines and prominent coastal landforms.*

Clause 13.01-1S (Natural hazards and climate change) seeks: *To minimise the impacts of natural hazards and adapt to the impacts of climate change through risk-based planning.*

Clause 13.02-1S (Bushfire planning) seeks: *To strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life.* While the site is in part

located within a Designated Bushfire Prone Area, boat launching facility is not a type of use that Clause 13.02-1S requires a specialist assessment of bushfire risk.

Clause 13.03-1S (Floodplain management) aims: *To assist the protection of*:

- *Life, property and community infrastructure from flood hazard, including coastal inundation, riverine and overland flows.*
- *The natural flood carrying capacity of rivers, streams and floodway's.*
- *The flood storage function of floodplains and waterways.*
- *Floodplain areas of environmental significance or of importance to river, wetland or coastal health.*

Clause 14.01-1S (Protection of agricultural land) seeks: *To protect the state's agricultural base by preserving productive farmland.* Whilst the site is zoned Farming (in part), the site is not used for agricultural purposes and the project will not result in the loss of productive agricultural land.

Clause 14.02-1S (Catchment planning and management) aims: *To assist the protection and restoration of catchments, waterways, estuaries, bays, water bodies, groundwater, and the marine environment.*

Clause 15.01-1S (Urban design) seeks: *To create urban environments that are safe, healthy, functional and enjoyable and that contribute to a sense of place and cultural identity.*

Clause 15.01-1L-01 (Urban design in Bass Coast) provides the following local strategies (as relevant):

- *Design development to reflect the coastal setting and coastal architecture through built form and materiality.*
- *Ensure that view lines and vistas are protected and shared between the public and private realm.*

Clause 15.01-1L-02 (Landscape design) seeks:

- *To increase vegetation across the municipality.*
- *To identify and enhance the landscape values in urban areas.*
- *To ensure development creates and maintains a high-quality landscape setting.*

Clause 15.01 provides further State and local objectives and strategies to guide built form.

Clause 15.03-2S (Aboriginal cultural heritage) seeks: *To ensure the protection and conservation of places of Aboriginal cultural heritage significance.* The site is mapped within an area of Aboriginal Cultural Heritage Sensitivity. The project has been informed by consultations with the Bunurong Land Council Aboriginal Corporation being the applicable Registered Aboriginal party for this location. An approved cultural heritage management plan is anticipated in mid-January 2023.

Clause 17.04-1S (Facilitating tourism) seeks: *To encourage tourism development to maximise the economic, social and cultural benefits of developing the state as a competitive domestic and international tourist destination.*

Clause 17.04-1R (Tourism – Gippsland) includes the strategy: *Support nature-based tourism proposals that complement and are compatible with the region's environment and landscape attractions or are close to identified strategic tourism investment areas.* The subject site is close to the Bunurong Coast Strategic Tourism Investment Area.

Clause 17.04-1L (Facilitating tourism) includes the following location strategy:

- *Support the location of tourist development in the tourist areas identified in Clauses 02.03 and 02.04 (Inverloch).*

Clause 17.04-2S (Coastal and maritime tourism and recreation) seeks: *To encourage a diverse range of strategically located and well-designed coastal and maritime tourism and recreational opportunities that strengthen people's connection with the marine and coastal environment.* This will be achieved through strategies, inter alia:

- *Support safe and sustainable recreation and tourism development including ecotourism, tourism and major maritime events that:*
    - *Responds to identified demand.*
    - *Minimises impact on environmental and cultural values.*
    - *Minimises impact on other users.*

    - *Minimises direct and cumulative impacts.*
    - *Maintains public safety.*
    - *Responds to the carrying capacity of the site.*
    - *Minimises exposure to coastal hazard risks and risks posed by climate change.*
- *Ensure sites and facilities are accessible to all.*
- *Ensure development is of an appropriate scale, use and intensity relative to its location and minimises impacts on the surrounding natural, visual, environmental and coastal character.*
- *Support a sustainable network of facilities for recreational boating and water-based activities that respond to:*
    - *Identified demand.*
    - *Use and safety considerations.*
    - *The carrying capacity of the location.*
    - *Coastal processes.*
    - *Environmental values.*
- *Provide public access to recreational facilities and activities on land and water.*

The *Recreational Boating Facilities Framework July 2014 - Central Coastal Board*, a policy guideline at Clause 17.04-2S, identified the Mahers Landing boat ramp as having a "local role" in the hierarch of boating facilities in both the years 2013 and 2030. There are two boating facilities identified on the Andersons Inlet Precinct map; the Inverloch Boat Ramp and the Mahers Landing facility. The following key point is identified for the Andersons Inlet Precinct:

- *This is one of the few areas along the south Gippsland coast where boats can gain access to Bass Strait and it also provides haven from weather.*

The goal for the Andersons Inlet Precinct is:

- *To provide haven from the exposed open coast and safe access for recreational boating.*

The *Victorian Recreational Boating Strategy (2021-2030)* is not a background document listed in the Scheme but is an adopted document of Government. This identifies the Mahers landing facility as a "high priority" for renewal.

The *Marine and Coastal Policy (DELWP, 2020)* is a policy document at Clause 17.04-2 (amongst other clauses). This strategy sets out policies for planning and managing marine and coastal environments to achieve the marine and Coastal Act's objectives over a 10-15 year horizon.

The *Siting and Design Guidelines on the Victorian Coast* (DELWP, 2020) were also recently adopted and are a policy guideline at Clause 17.04-2, amongst other clauses. This policy provides guidelines for the siting and design of structures along the Victorian coast in relation to Aboriginal cultural heritage, coastal processes, geology, morphology, hydrology, vegetation and ecology, climatic conditions, views, public open space, local character and sense of place, heritage, public access, increased function and adaptability, sustainability and materials and finishes.

Clause 19.02-4L (Social and Cultural Infrastructure) seeks: *To provide fairer distribution of and access to, social and cultural infrastructure* and includes the following strategy:

- *Encourage complementary water based recreational activities and facilities to group together along the coastline*

Clause 19.02-6S (Open space) seeks: *To establish, manage and improve a diverse and integrated network of public open space that meets the needs of the community.*

Clause 19.02-6L (Open space) includes the following strategies

- *Provide recreational facilities for year-round activities (particularly for the winter months) that cater to the needs of the local population, non-permanent residents and tourists.*
- *Minimise any impact of recreational land use and development on the natural environment.*

Clause 19.03-3S (Integrated water management) seeks: *To sustainably manage water supply and demand, water resources, wastewater, drainage and stormwater through an integrated water management approach.*

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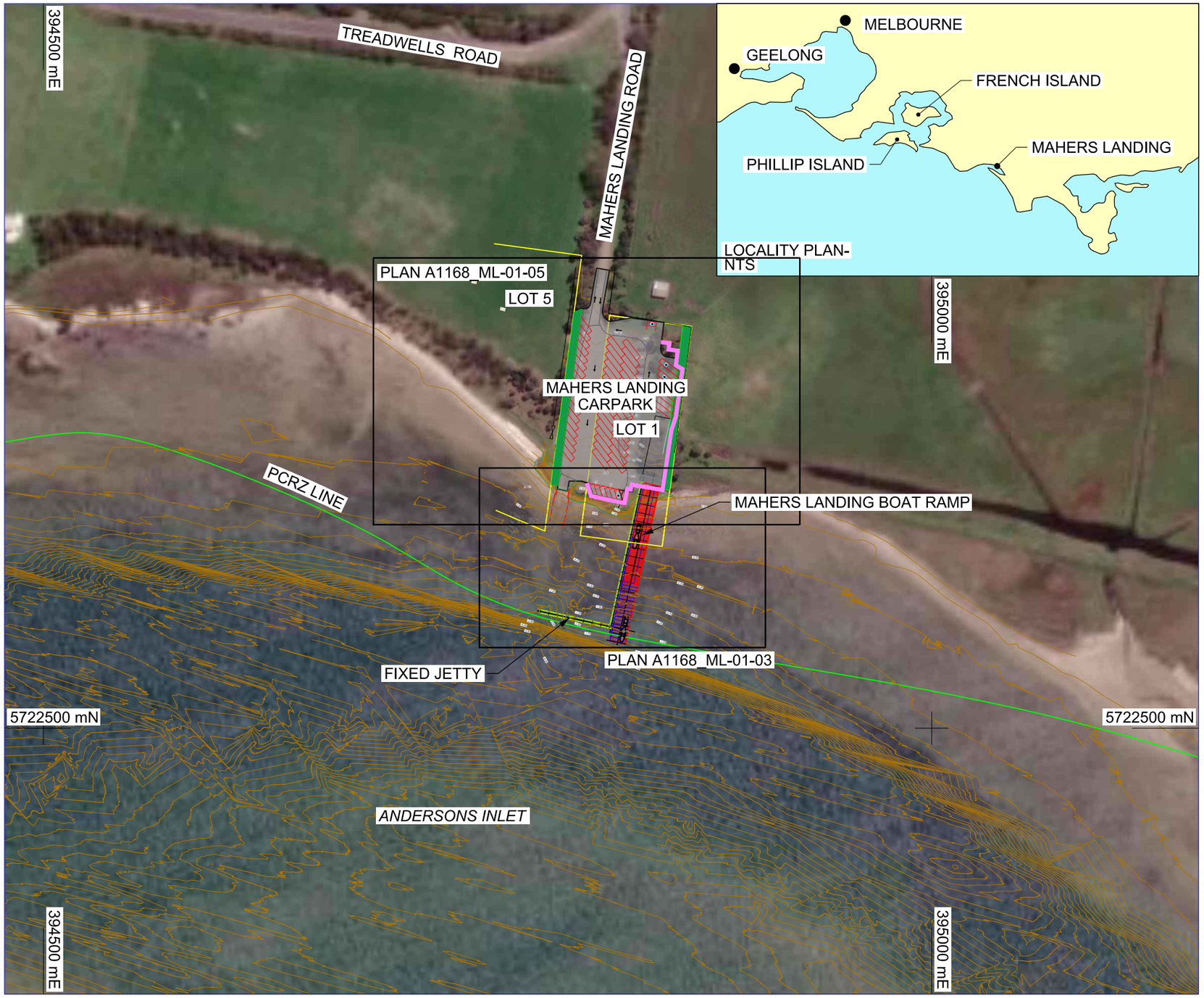
BASS COAST SHIRE



SITE LOCALITY PLAN

SCALE 1:2,500

DRAWING LIST

TITLE	DRAWING No.	REV.
SITE LOCALITY PLAN, DRAWING INDEX	A11698_ML - 01 - 01	B
TECHNICAL SPECIFICATIONS	A11698_ML - 01 - 02	B
GENERAL ARRANGEMENT	A11698_ML - 01 - 03	B
JETTY AND RAMP LONG SECTIONS & CROSS SECTION	A11698_ML - 01 - 04	B
BOAT RAMP UPGRADE - CARPARP CONCEPT	A11698_ML - 01 - 05	B
CARPARK SECTIONS	A11698_ML - 01 - 06	A
VEHICLE SWEPT PATHS	A11698_ML - 01 - 07	A

SCOPE OF WORK

THE WORKS INCLUDED IN THIS CONTRACT ARE AS FOLLOWS:

1. UPGRADE THE EXISTING CAR PARK INCLUDING, CAR SPACES, RIGGING AREA, STORMWATER DRAINAGE SYSTEM, SIGNAGE, LIGHTING AND LANE MARK
2. A NEW STEPPED JETTYÓ. A NEW RAMP AND ACCESS BRIDGE
3. RELOCATING THE TOILET BLOCK, SEPTIC AND WATER TANK
4. UPGRADE SHORE PROTECTION REVETMENT

GENERAL NOTES:

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION AND SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT.
2. BEFORE PROCEEDING WITH THE WORK DISCREPANCIES IN THE CONTRACT DOCUMENTS SHALL BE REFERRED TO THE SUPERINTENDENT.
3. ALL DIMENSIONS AND LEVELS SHALL BE CHECKED BY THE CONTRACTOR BEFORE CONSTRUCTION.
4. UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN METRES (m).
5. ALL LEVELS ARE TO AHD.
6. ALL COORDINATES ARE TO MAP GRID OF AUSTRALIA BASED ON GDA 94, ZONE 55.
7. SET OUT POINTS ARE APPROXIMATE AND SHALL BE CONFIRMED ON SITE WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION

ABBREVIATIONS AND ACRONYMS:

1.	RL	REDUCED LEVEL
2.	CD	CHART DATUM
3.	NS	NATURAL SURFACE
4.	HAT	HIGHEST ASTRONOMICAL TIDE
5.	MHWS	MEAN HIGH WATER SPRINGS
6.	MHWN	MEAN HIGH WATER NEAPS
7.	AHD	AUSTRALIAN HEIGHT DATUM
8.	MSL	MEAN SEA LEVEL
9.	MLWN	MEAN LOW WATER NEAPS
10.	MLWS	MEAN LOW WATER SPRINGS
11.	LAT	LOWEST ASTRONOMICAL TIDE

APPROXIMATE TIDE LEVELS (m AHD)
(MAHERS LANDING _ INTERPOLATED)

HAT	MHWS	MHWN	MSL	AHD	MLWN	MLWS	LAT
1.69	1.42	0.93	0.25	0.00	-0.19	-0.44	-0.69

REV	DATE	AMENDMENT	DRN	APP
B	15/12/22	PRELIMINARY DESIGN	GKB	
A	08/12/22	ISSUED FOR REVIEW	GKB	

ORIG SIZE A3 | ARCHIVE A11698_ML-01-01A.DGN

NOTES
1. AERIAL PHOTOGRAPHY FROM GOOGLE EARTH

PRELIMINARY DESIGN FOR PLANNING PERMIT APPLICATION

SCALE 1 : 2,500 @ A3
25 0 100
METRES

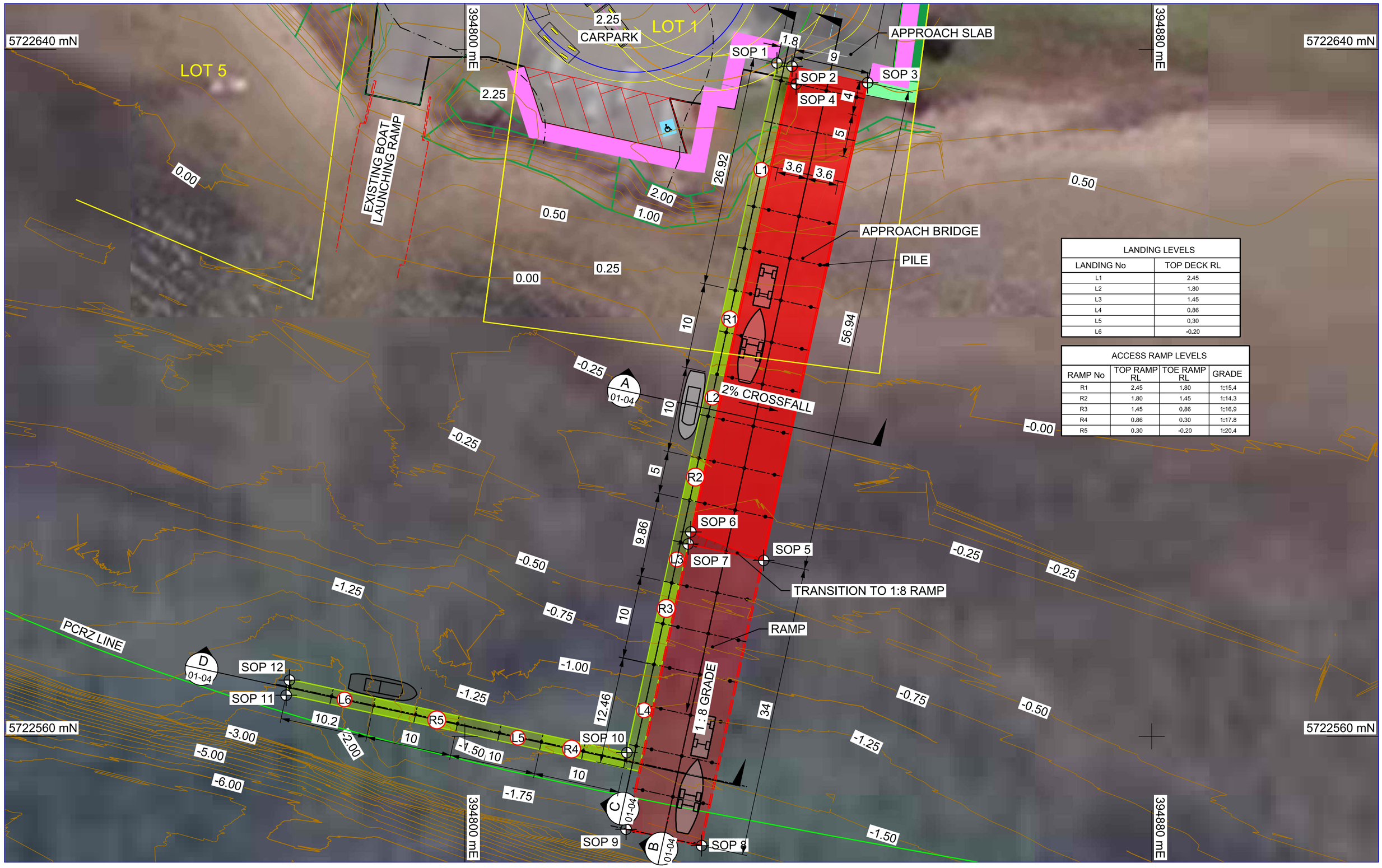
DATUM
VERTICAL AHD
HORIZONTAL MAP GRID OF AUSTRALIA BASED ON GDA 94, ZONE 55

GDA
BebbCart

BMT

ENGINEER	L.JOHNSTON	02/12/2022
DRAWN	G.BEBBINGTON	02/12/2022
DRAFTING CHECK	S.MOUCHEMORE	02/12/2022
ENGINEERING CHECK	M.TAJZIEHCHI	08/12/2022
APPROVED PROJECT MGR	D.MACHADO	02/12/2022

CLIENT: BETTER BOATING VICTORIA
PROJECT: MAHERS LANDING BOAT RAMP & JETTY
TITLE: LOCATION PLAN, DRAWING INDEX & GENERAL NOTES
DRAWING NUMBER: A11698_ML- 01 - 01
REV: B



LANDING LEVELS	
LANDING No	TOP DECK RL
L1	2.45
L2	1.80
L3	1.45
L4	0.86
L5	0.30
L6	-0.20

ACCESS RAMP LEVELS			
RAMP No	TOP RAMP RL	TOE RAMP RL	GRADE
R1	2.45	1.80	1:15.4
R2	1.80	1.45	1:14.3
R3	1.45	0.86	1:16.9
R4	0.86	0.30	1:17.8
R5	0.30	-0.20	1:20.4

REV	DATE	AMENDMENT	DRN	APP
B	15/12/22	PRELIMINARY DESIGN	GKB	
A	08/12/22	INITIAL ISSUE	GKB	

ORIG SIZE A3 | ARCHIVE A11698_ML-01-03A.dgn

NOTES
1. AERIAL IMAGERY GOGGLE EARTH
2. BATHYMETRIC CONTOURS FROM JUNE 2022 SURVEY
3. LAND CONTOURS FROM FEATURE SURVEY AUGUST 2020
4. ALL DEMENSIONS METRES

PRELIMINARY DESIGN FOR PLANNING PERMIT APPLICATION

SCALE 1 : 400 @ A3
5 0 20
METRES

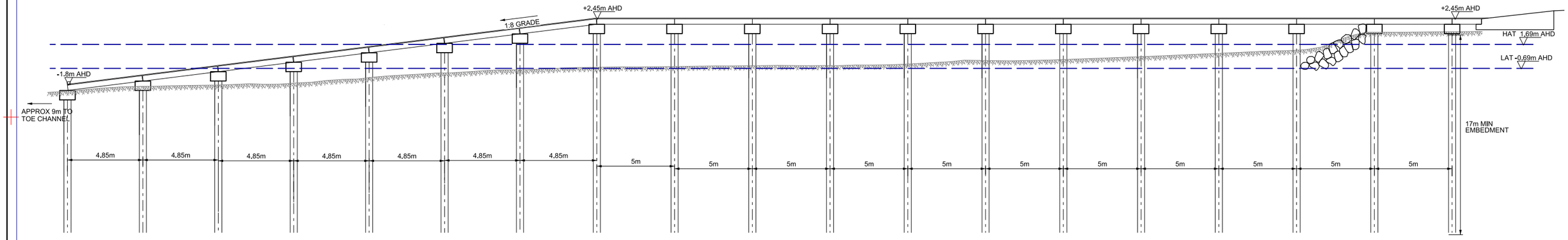
DATUM
VERTICAL AHD
HORIZONTAL MAP GRID OF AUSTRALIA BASED ON GDA 94, ZONE 55

GDA
BebbCart

BMT

ENGINEER	L.JOHNSTON	02/12/2022
DRAWN	G.BEBBINGTON	02/12/2022
DRAFTING CHECK	S.MOUCHEMORE	02/12/2022
ENGINEERING CHECK	M.TAJZIEHCHI.	08/12/2022
APPROVED PROJECT MGR	D.MACHADO	02/12/2022

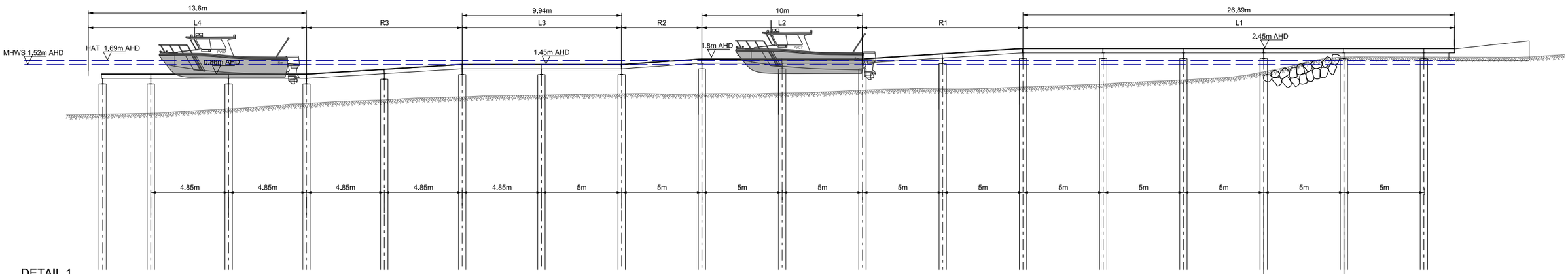
CLIENT: BETTER BOATING VICTORIA
PROJECT: MAHERS LANDING BOAT RAMP & JETTY
TITLE: GENERAL ARRANGEMENT
DRAWING NUMBER: A11698-ML-01-03
REV: B



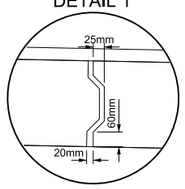
SECTION B
1:250
1-3

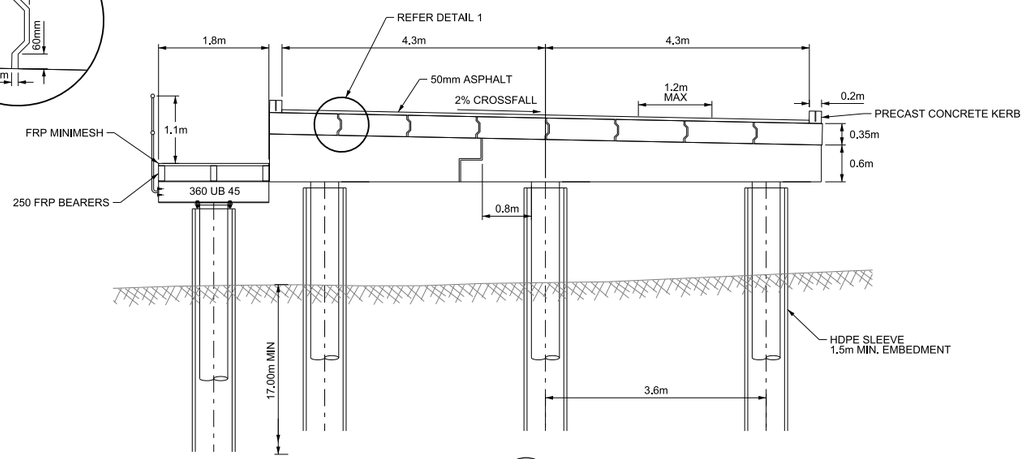
APPROXIMATE TIDE LEVELS (m AHD)
(MAHERS LANDING _ INTERPOLATED)

HAT	MHWS	MHWN	MSL	AHD	MLWN	MLWS	LAT
1.69	1.42	0.93	0.25	0.00	-0.19	-0.44	-0.69



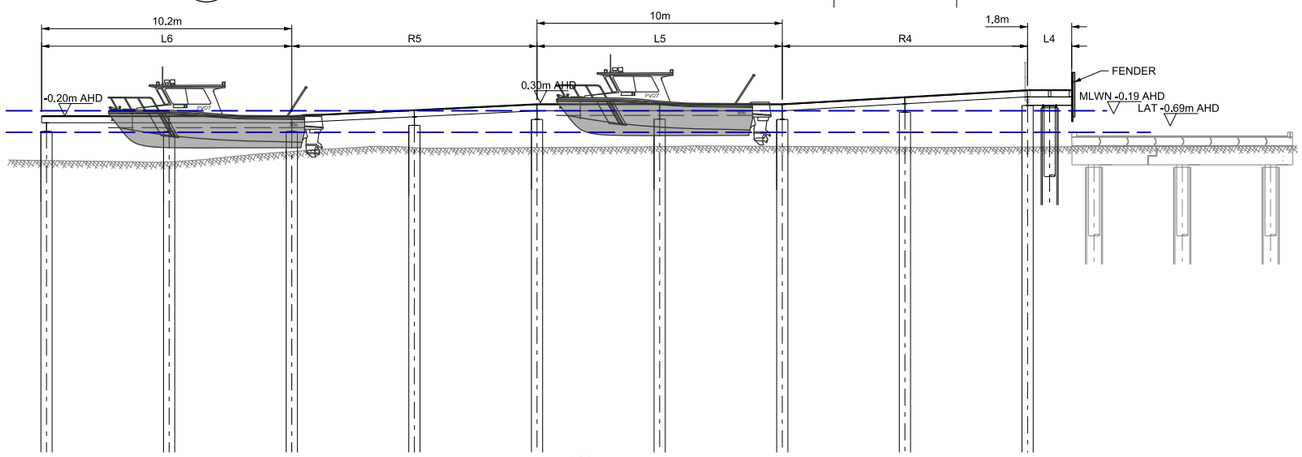
DETAIL 1





SECTION A
1:100
1-3

SECTION C
1:250
1-3



SECTION D
1:250
1-3

REV	DATE	AMENDMENT	DRN	APP
B	15/12/22	PRELIMINARY DESIGN	GKB	
A	08/12/22	ISSUED FOR REVIEW	GKB	

ORIG SIZE A3 | ARCHIVE A11698_ML-01-04B.DGN

NOTES

PRELIMINARY DESIGN FOR PLANNING PERMIT APPLICATION

SCALE 1 : 250 @ A3

2.5 0 10
METRES

DATUM
VERTICAL AHD
HORIZONTAL N/A

BMT

BebbCart

ENGINEER	L.JOHNSTON	05/12/2022	
DRAWN	G.BEBBINGTON	05/12/2022	
DRAFTING CHECK	S.MOUCHEMORE	05/12/2022	
ENGINEERING CHECK	M.TAJZIEHCHI		
APPROVED PROJECT MGR	D.MACHADO	05/12/2022	

CLIENT: BETTER BOATIBG VICTORIA

PROJECT: MAHERS LANDING BOAT RAMP & JETTY

TITLE: JETTY AND RAMP LONG SECTIONS & CROSS SECTION

DRAWING NUMBER: A11698_ML- 01 - 04

REV: B

394700 mE

394800 mE

394900 mE

5722700 mN

LOT 5

LOT 1

GATE

TITLE BOUNDARY

WATER

TOILET BLOCK

SEPTIC

TOILET BLOCK, WATER TANK AND SEPTIC RELOCATED

DEMOLISH THE EXISTING TOILET BLOCK, SEPTIC AND WATER TANK

GATE TO BE MOVED NORTH (OUT OF THE VIEW SHOWN IN THIS PLAN)

RUN OFF STORMWATER TREATMENT AREA

2 RIGGING/WAITING LANES

APPROACH LANES

LANDING

FISH CLEANING TABLE TO BE RETAINED

ROCK REVETMENT TO BE UPGRADED THROUGH THE WATERFRONT

E 01-06

F 01-07

CTU CARPARKS = 55
DDA CTU CARPARKS = 2
CARPARKS = 5
DDA CARPARKS = 2

LEGEND:

- PEDESTRIAN WALKWAY (BOARD WALK)
- CARPARK SURFACE
- RIGGING/WAITING LANES
- OVERSIZE PARKING
- VEGETATED SWALE
- LANDSCAPING
- STORM WATER TREATMENT
- LANDING/RAMP

REV	DATE	AMENDMENT	DRN	APP
B	15/12/22	PRELIMINARY DESIGN		
A	08/12/22	INITIAL ISSUE	GKB	

ORIG SIZE A3 | ARCHIVE A11698_ML-01-05B.dgn

NOTES

1. AERIAL IMAGERY GOGGLE EARTH
2. BATHYMETRIC CONTOURS FROM JUNE 2022 SURVEY
3. LAND CONTOURS FROM FEATURE SURVEY AUGUST 2020
4. ALL DEMENSIONS METRES

PRE:IMINARY DESIGN FOR PLANNING PERMIT APPLICATION

SCALE 1 : 600 @ A3

5 0 20 METRES

DATUM
VERTICAL AHD

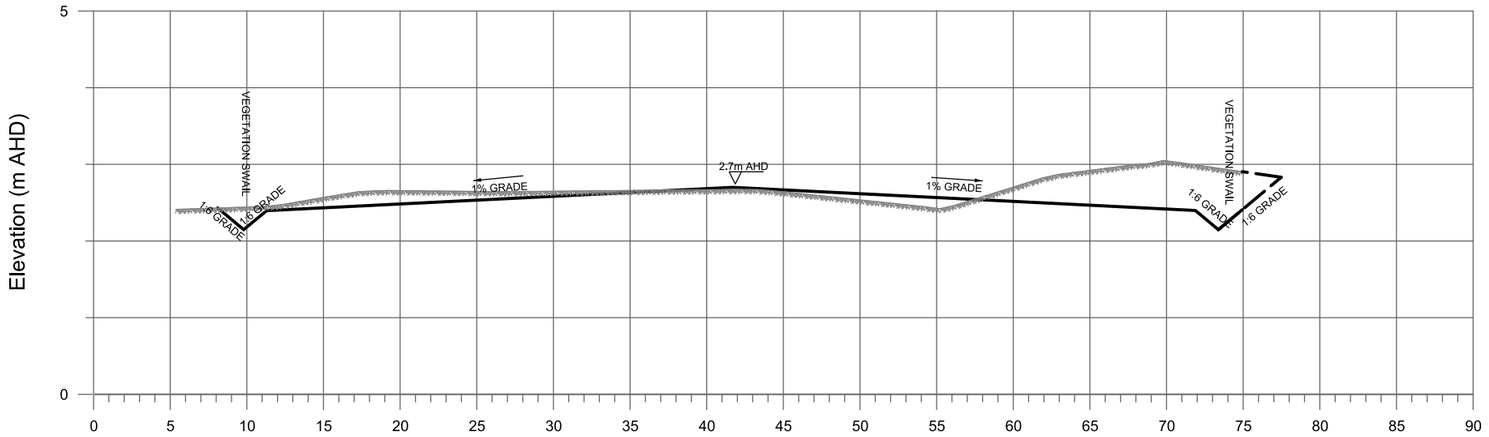
HORIZONTAL MAP GRID OF AUSTRALIA BASED ON GDA 94, ZONE 55

GDA

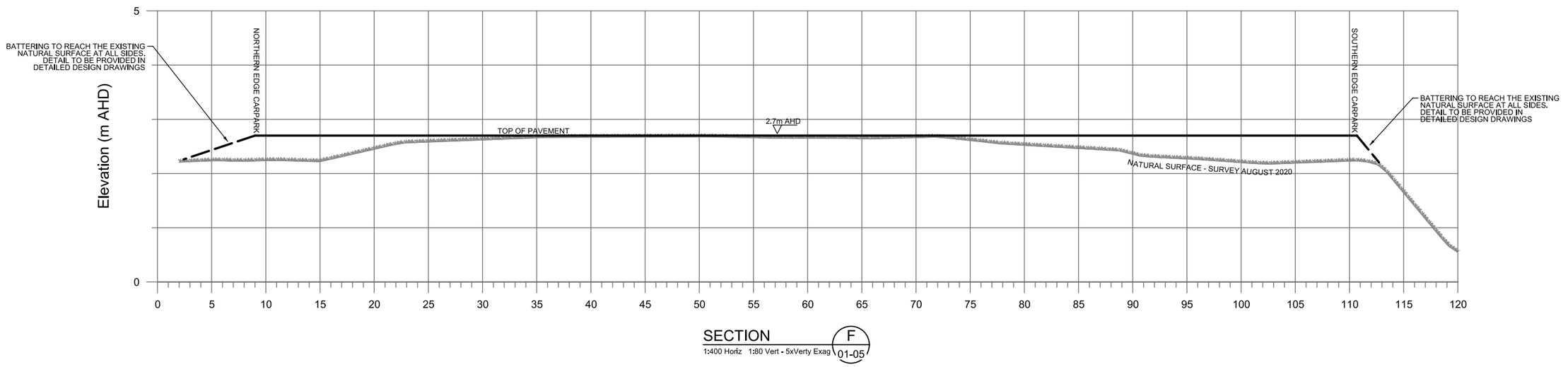
BebbCart

BMT

ENGINEER	L.JOHNSTON	09/12/2022	CLIENT: BETTER BOATING VICTORIA
DRAWN	G.BEBBINGTON L.JOHNSTON	09/12/2022	PROJECT: MAHERS LANDING BOAT RAMP & JETTY
DRAFTING CHECK	S.MOUCHEMORE	09/12/2022	TITLE: CARPARK CONCEPT
ENGINEERING CHECK	M.TAJZIEHCHI.	09/12/2022	
APPROVED PROJECT MGR	D.MACHADO	09/12/2022	DRAWING NUMBER: A11698-ML-01-05 REV: B



SECTION E
1:400 Horiz 1:80 Vert - 5xVerty Exag 01-05



SECTION F
1:400 Horiz 1:80 Vert - 5xVerty Exag 01-05

REV	DATE	AMENDMENT	DRN	APP
A	15/12/22	PRELIMINARY DESIGN	GKB	

ORIG SIZE A3 | ARCHIVE A11698_ML-01-06A.dgn

NOTES
1. AERIAL IMAGERY GOGGLE EARTH
2. BATHYMETRIC CONTOURS FROM JUNE 2022 SURVEY
3. LAND CONTOURS FROM FEATURE SURVEY AUGUST 2020
4. ALL DEMENSIONS METRES

PRELIMINARY DESIGN FOR PLANNING PERMIT APPLICATION

SCALE 1 : 400 @ A3
5 0 20
METRES

DATUM
VERTICAL AHD
HORIZONTAL N/A

GDA
BebbCart

BMT

ENGINEER	L.JOHNSTON	02/12/2022	CLIENT: BETTER BOATING VICTORIA
DRAWN	G.BEBBINGTON	02/12/2022	PROJECT: MAHERS LANDING BOAT RAMP & JETTY
DRAFTING CHECK	S.MOUCHEMORE	02/12/2022	TITLE: CARPARK SECTIONS
ENGINEERING CHECK	M.TAJZIEHCHI.	08/12/2022	
APPROVED PROJECT MGR	D.MACHADO	02/12/2022	DRAWING NUMBER: A11698-ML-01-06 REV: A

394700 mE

394800 mE

394900 mE

5722700 mN

LOT 5

LOT 1

GATE

TITLE BOUNDARY

WATER

TOILET BLOCK

SEPTIC

APPROACH LANES

LANDING

TITLE BOUNDARY

2 RIGGING/WAITING LANES

ROCK REVETMENT TO BE UPGRADED THROUGH THE WATERFRONT

CTU CARPARKS = 55
DDA CTU CARPARKS = 2
CARPARKS = 5
DDA CARPARKS = 2

LEGEND:

- PEDESTRIAN WALKWAY (BOARD WALK)
- CARPARK SURFACE
- RIGGING/WAITING LANES
- OVERSIZE PARKING
- VEGETATED SWALE
- LANDSCAPING
- STORM WATER TREATMENT
- LANDING/RAMP

NOTE

LAYERS ON TURNING CONCEPT REFERENCE MUST BE TURNED ON AND OFF TO SEE INDIVIDUAL SWEPT PATHS

REV	DATE	AMENDMENT	DRN	APP
B	15/12/22	PRELIMINARY DESIGN		
A	08/12/22	INITIAL ISSUE	GKB	

ORIG SIZE A3 | ARCHIVE A11698_ML-01-07A.dgn

NOTES
1. AERIAL IMAGERY GOGGLE EARTH
2. BATHYMETRIC CONTOURS FROM JUNE 2022 SURVEY
3. LAND CONTOURS FROM FEATURE SURVEY AUGUST 2020
4. ALL DEMENSIONS METRES

PRE:IMINARY DESIGN FOR PLANNING PERMIT APPLICATION

SCALE 1 : 600 @ A3

5 0 20 METRES

DATUM
VERTICAL AHD
HORIZONTAL MAP GRID OF AUSTRALIA BASED ON GDA 94, ZONE 55

GDA

BebbCart

BMT

ENGINEER	L.JOHNSTON	09/12/2022	
DRAWN	G.BEBBINGTON L.JOHNSTON	09/12/2022	
DRAFTING CHECK	S.MOUCHEMORE	09/12/2022	
ENGINEERING CHECK	M.TAJZIEHCHI.	09/12/2022	
APPROVED PROJECT MGR	D.MACHADO	09/12/2022	

CLIENT: BETTER BOATING VICTORIA

PROJECT: MAHERS LANDING BOAT RAMP & JETTY

TITLE: CARPARK CONCEPT VEHICLE SWEPT PATHS

DRAWING NUMBER: A11698-ML-01-07 REV: A

394700 mE

394800 mE

394900 mE

5722700 mN

LOT 5

LOT 1

GATE

TITLE BOUNDARY

WATER

TOILET BLOCK

SEPTIC

APPROACH LANES

LANDING

TITLE BOUNDARY

TITLE BOUNDARY

FISH CLEANING TABLE TO BE RETAINED

7

13

3

9

3.5

16

3

2.25

9.4

2.25

0.00

0.50

2.00

1.00

0.50

3.00

2.50

LEGEND:

10 — NON INDIGENOUS VEGETATION POSITION/COVERAGE & DOCUMENTED NUMBER

36 — INDIGENOUS VEGETATION POSITION/COVERAGE & DOCUMENTED NUMBER

REV	DATE	AMENDMENT	DRN	APP
A	16/12/22	INITIAL ISSUE	GKB	

ORIG SIZE A3

ARCHIVE A11698_ML-SK-01A.dgn

NOTES

1. AERIAL IMAGERY GOGGLE EARTH
2. BATHYMETRIC CONTOURS FROM JUNE 2022 SURVEY
3. LAND CONTOURS FROM FEATURE SURVEY AUGUST 2020
4. ALL DEMENSIONS METRES

PRE:IMINARY DESIGN FOR PLANNING PERMIT APPLICATION

SCALE 1 : 600 @ A3

5 0 20 METRES

DATUM

VERTICAL AHD

HORIZONTAL MAP GRID OF AUSTRALIA BASED ON GDA 94, ZONE 55

GDA

BebbCart

BMT

ENGINEER	L.JOHNSTON	09/12/2022
DRAWN	G.BEBBINGTON L.JOHNSTON	09/12/2022
DRAFTING CHECK	S.MOUCHEMORE	09/12/2022
ENGINEERING CHECK	M.TAJZIEHCHI.	09/12/2022
APPROVED PROJECT MGR	D.MACHADO	09/12/2022

CLIENT: BETTER BOATING VICTORIA

PROJECT: MAHERS LANDING BOAT RAMP & JETTY

TITLE: ORIGINAL VEGETATION

DRAWING NUMBER: A11698-ML-SK-01

REV: A

TREEMAP
ARBORICULTURE

Arboricultural Assessment & Report

Lot 1 - TP162445 Mahers Landing Road, Inverloch

Treemap Arboriculture
PO Box 465, Heidelberg VIC 3084
ABN 20 325 463 261
www.treemap.com.au

December 2022

Prepared for:
Victorian Fisheries Authority

TREEMAP
ARBORICULTURE

1 Name and address of consultant

Dean Simonsen (AQF Level 7)
Treemap Arboriculture
PO Box 465, Heidelberg, Victoria 3084

2 Instructions

2.1 The instructions provided to Treemap Arboriculture on 15/11/22 by the Victorian Fisheries Authority were to provide an Arboricultural assessment and report for trees located on or adjacent to the subject site, the subject site being Lot 1 - TP162445 Mahers Landing Road, Inverloch.

3 Introduction

3.1 The managers of the subject site are undertaking investigations to make improvements to the property. As part of the design and application process, the managers are undertaking a review of the vegetation located on or near the site. This report examines the arboricultural matters associated with this vegetation.

3.2 Under the guidelines of AS4970-2009 (Australian Standard – Protection of trees on development sites), the following report would be defined as an 'Arboricultural impact assessment'. The standard indicates that "*The report will identify possible impacts on trees to be retained. The report will explain design and construction methods proposed to minimize impacts on retained trees where there is encroachment into the calculated TPZ*."

4 Key Objectives

4.1 To undertake a general assessment of trees located on or near the subject site.

4.2 To provide an assessment of the subject trees with respect to their overall condition, structure, safety and suitability for protection.

4.3 To provide recommendations on the suitability of the trees for protection, and provide general methods of tree protection.

5 Method

5.1 A site and tree inspection were conducted on Tuesday 22nd November, 2022.

5.2 The tree assessment consisted of a visual inspection, which was undertaken with regard to modern arboricultural principles and practices. The assessment did not involve a detailed examination of below ground or internal tree parts. The assessment was undertaken from the ground of the subject site to determine tree condition and species type. Measurements were taken to establish trunk and crown dimensions. No tree samples or site soil samples were taken unless specified. Trunk diameters for trees on adjoining properties may be estimated due to site access restrictions.

5.3 The trees have been allocated a retention value rating which combines tree condition factors with functional and aesthetic characteristics in the context of an urban landscape. The retention or preservation of trees may not depend solely on arboricultural considerations; therefore, the ratings may act as a guide to assist in decisions relating to tree management and retention.

5.4 A feature survey plan was provided by the client (Plan of Feature Survey prepared by MJ Reddie Surveys P/L, REF: 20-08-53 and dated 25/08/20). The assessed trees have been numbered on this plan (Appendix 3).

5.5 A proposed plan was provided by the client for analysis (Carpark concept, prepared by BMT, Project: Mahers Landing Boat Ramp, Revision A, dated 08/12/22). The trees have been indicated on a section of this plan (Appendix 3a) and Tree Protection Zones are provided.

6 Observations

6.1 The site under review presented as an allotment located near the foreshore of Andersons Inlet, Inverloch. The site adjoins a public road to the west and rural land to the east and north. The site contained planted native trees and indigenous trees.

6.2 Forty-six (46) trees were assessed in detail as part of the site review. This included 36 trees on the subject site and 10 street trees. The detail of each individual tree assessment is provided in table format at Appendix 1. Tree numbers within the assessment table correspond to those provided on the site feature plan (Appendix 3).

6.3 The tree numbering used in this report has been adopted (where possible) from Bowler, T. (2022), *Ecological Assessment of Mahers Landing Boat Ramp*. ID Ecological Management, Research, Victoria.

6.3.1 An additional 8 trees are included in this report (Tree 39-46).

6.4 The property is influenced by the following local vegetation controls under the Bass Coast Shire Council Planning Scheme. This is based on a planning property report for the site being obtained from www.planning.vic.gov.au/ on 22/11/22.

6.4.1 Schedule 1 to Clause 42.01 Environmental Significance Overlay

6.4.2 Schedule 5 To Clause 42.03 Significant Landscape Overlay

6.5 Trees that are native to Victoria would also be influenced by Clause 52.17 (Native vegetation) of the planning scheme because each parcel of land is larger than 0.4ha. This clause has specific obligations and requirements relating to indigenous trees, but there are also exemptions that apply under this clause. In particular, planted native vegetation is exempt from any requirements under this clause. The clause states at 52.17-7, Table of Exemptions;

> ***Planted vegetation**, Native vegetation that is to be removed, destroyed or lopped that was either planted or grown as a result of direct seeding.*
> *This exemption does not apply to native vegetation planted or managed with public funding for the purpose of land protection or enhancing biodiversity unless the removal, destruction or lopping of the native vegetation is in accordance with written permission of the agency (or its successor) that provided the funding.*

6.6 Native vegetation is defined as '*Plants that are indigenous to Victoria, including trees, shrubs, herbs, and grasses'* under the Definitions of the State Planning provisions – Clause 72.

6.7 The site is also influenced by exemptions under Clause 52.12 of the Victoria Planning Provisions (Bushfire Protection: Exemptions) in relation to any vegetation controls. This is because the site is located in a designated bushfire prone area. Trees that are situated within 10m of an existing dwelling (that is used for accommodation) or within 4m of a property boundary fence line (with conditions) are exempt from any permit requirements relating to vegetation removal.

6.8 The proposed design indicates car and trailer parking, together with a facility for amenities.

7 Discussion

The Australian Standard (AS4970-2009) – 'Protection of trees on development sites' puts forward a process for undertaking tree inspections and reports on property where development is being considered. It recommends a preliminary assessment be undertaken to help guide planners and property owners with regard to the preservation of existing trees; that is trees that might contribute to the completed proposal. The standard points out that the preliminary report 'information is to be used by planners, architects and designers, in conjunction with any planning controls and other legislation, to develop the design layout in such a way that trees selected for retention are provided with enough space'.

These assessments typically reveal a range of trees with varying attributes for health, structure and overall value. Some trees may be considered insignificant for their size, age, species type or condition, but they might still be considered for retention because they are situated conveniently on the site. Conversely, some trees may be exceptional for various reasons but there may be no scope for their retention because of their location or other site constraints. An objective of the tree assessment is to determine the trees that may be preferable, in terms of

preservation, and to identify poor or insignificant trees that might be easily replaced or replaced with better species.

The arborist must also exercise judgement and expertise with respect to the types of trees that are deemed suitable for retention, and they should also consider what stage the tree is at in its overall lifecycle.

The site contained planted native trees and indigenous trees. The retention value of all the vegetation on the site was rated 'Low' or 'None', because of its poor condition or low quality. The low quality or poor arboricultural condition of the trees supports an approach whereby existing trees and shrubs should offer reasonably limited constraint to the proposed design.

On the basis of their arboricultural condition, the following 22 trees could be considered for retention.

- Tree 6, 7, 10, 11, 13, 14, 15, 18, 20, 22, 23, 24, 25, 27, 28, 35, 36, 37, 38, 39, 40, 42

On the basis of their arboricultural condition, the following 14 trees are recommended for removal.

- Tree 3, 4, 5, 8, 9, 12, 16, 17, 19, 21, 26, 41, 43, 44

The proposed car park design indicates practically all trees within the title boundary will require removal as a consequence of the design because of the level of TPZ and SRZ encroachment. Furthermore, even if the carpark surfacing used a permeable material to avoid Tree Protection Zone interference, the level of crown pruning required to individual trees would be excessive.

A further factor that may influence development on the subject site will be the proposed design in the vicinity of the street trees. The Tree Protection Zone for the street trees are also illustrated on the plan at Appendix 3a.

The following 10 trees are located in the road reserve to the west of the site.

- Tree 1, 2, 29, 30, 31, 32, 33, 34, 45, 46

All of the aforementioned street trees would be exposed to 'major' Tree Protection Zone encroachment from the design, as a result of Tree Protection Zone encroachment and Structural Root Zone encroachment.

There are no other tree protection matters associated with trees or shrubs on adjoining land.

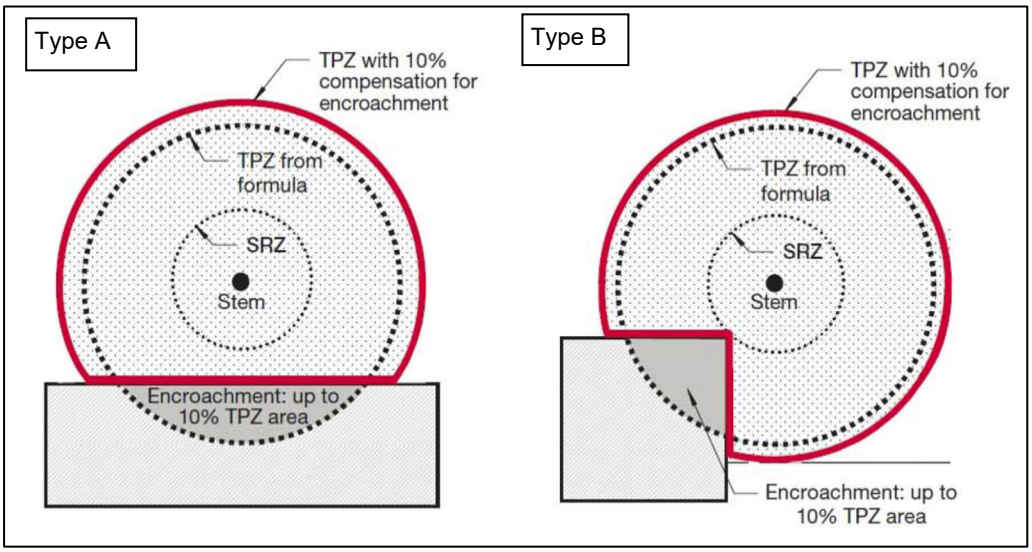
7.1 Tree protection zones on development sites

The level of encroachment and the impact to specific trees can be estimated by comparing standard or modified tree protection clearances with those clearances provided to trees in the development design. The overall impact towards a specific tree will be based on the severity of encroachment into the respective tree protection zones. The degree of root activity in the tree protection zone can vary significantly, which can result in more or less severe impacts to trees. The most accurate means of determining root activity in these zones is to undertake subsurface root investigations. The alternative to undertaking root investigations is to assign appropriate tree protection zones.

This report adopts AS4970-2009, Australian Standard – Protection of trees on development sites as the preferred tree protection method. The method provides a tree protection zone and a tree protection fencing distance (radial measurement from trunk centre) by using the width of

the trunk at 1.4m above ground multiplied by 12. The prescribed TPZ distances are provided for each tree in Appendix 1 and tree protection zones are indicated for trees at Appendix 3 & 3a.

There is scope to reduce the tree protection zone by an area of 10% without further investigations. The rationale for any reduced tree protection distance is detailed in AS4970-2009 (*Australian Standard – Protection of trees on development sites*). Under encroachment Type A, it is acceptable to reduce the Tree Protection Zone (TPZ) area by 10%. This translates to a reduction in radial clearance distance of approximately 33% on one side of the tree only. This can be applied if there is contiguous space around the tree for root development to occur. The following diagram, from AS4970-2009, is provided to illustrate the approach.



8 Recommendations

8.1 The retention value of all the vegetation on the site was rated 'Low' or 'None', because of its poor condition or low quality. The low quality or poor arboricultural condition of the trees supports an approach whereby existing trees and shrubs should offer reasonably limited constraint to the proposed design.

8.2 On the basis of their arboricultural condition, the following 22 trees could be considered for retention.

- Tree 6, 7, 10, 11, 13, 14, 15, 18, 20, 22, 23, 24, 25, 27, 28, 35, 36, 37, 38, 39, 40, 42

8.3 On the basis of their arboricultural condition, the following 14 trees are recommended for removal.

- Tree 3, 4, 5, 8, 9, 12, 16, 17, 19, 21, 26, 41, 43, 44

8.4 The proposed car park design indicates practically all trees within the title boundary will require removal as a consequence of the design because of the level of TPZ and SRZ encroachment. Furthermore, even if the carpark surfacing used a permeable material to avoid Tree Protection Zone interference, the level of crown pruning required to individual trees would be excessive.

8.4.1 This report acknowledges and defers to the findings of the Bowler, T. (2022), Ecological Assessment of Mahers Landing Boat Ramp Report with regard to the permit requirements for any proposed tree removals.

8.5 The following 10 trees are located in the road reserve to the west of the site.

- Tree 1, 2, 29, 30, 31, 32, 33, 34, 45, 46

8.5.1 All of the aforementioned street trees would be exposed to 'major' Tree Protection Zone encroachment from the design, as a result of Tree Protection Zone encroachment and Structural Root Zone encroachment.

8.6 Any vegetation in the study area that was not assessed as part of this report was considered insignificant, generally undesirable or sufficiently clear of any expected works.

Dean Simonsen (BAppSc *Melb.*)
Consultant Arborist

9 References

Australian Standard AS 4970, 2009. *Protection of trees on development sites*. Standards Australia

Bowler, T. (2022), *Ecological Assessment of Mahers Landing Boat Ramp*. ID Ecological Management, Research, Victoria.

10 Definitions

The TPZ and SRZ are defined in AS4970-2009, Australian Standard – Protection of trees on development sites as:

Tree protection zone (TPZ)
A specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

Structural root zone (SRZ)
The area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres. This zone considers a tree's structural stability only, not the root zone required for a tree's vigour and long-term viability, which will usually be a much larger area.

11 Expertise of Arborist to prepare report

Qualifications and expertise of consultant

- Bachelor of Applied Science, Horticulture (Plant Production) – University of Melbourne, Burnley College.
- Diploma of Applied Science, Horticulture (Arboriculture) – University of Melbourne, Burnley College. Dux of Arboriculture.

- More than 25 years of experience in the arboriculture/horticulture industry (private and local government experience).
- Consultant Arborist and Director at Tree Logic Pty Ltd from June 1999 to September 2011.
- Manager of Arboriculture – Royal Botanic Gardens, Melbourne (27 Months 1997-1999).
- Secretary for the Victorian Tree Industry Organisation (VTIO) 2007-2012.
- Financial member of the International Society of Arboriculture (ISA).
- Trained and licensed to use Quantified Tree Risk Assessment method (Lic No. 809).
- Presented paper at the International Society of Arboriculture Conference, 2011 at Parramatta, NSW.

Expertise to prepare report

- My qualifications and experience have primarily involved the management of tree issues in the urban landscape. Specifically, this has involved hazard, general or detailed assessment of tree condition on private and public land with recommendations made on preservation strategies or remedial works.
- Tree assessments to establish tree health, tree structure and arboricultural values are core components of Treemap Arboriculture's business activities.
- Prepared in excess of 4000 development reports.
- I have experience at Victorian Civil Administrative Tribunal and the magistrate's court as an expert witness on arboricultural matters.
- I have inspected and assessed well over one hundred thousand trees and managed assessment programs for at least ten times as many.

Tree Assessment Detail - Lot 1 - TP162445 Mahers Landing Road, Inverloch

December 2022

Appendix 1

No	SPECIES	COMMON NAME	DBH (cm)	TPZ CofW (m)	SRZ AS4970 (m)	HxW (m)	AGE	HEALTH	STRUCTURE	FORM	ULE	COMMENT	TREE TYPE	RETENTION VALUE	RECOMMEND	X coordinate MGA Zone 55	Y coordinate MGA Zone 55
1	*Eucalyptus pryoriana*	Gippsland Manna Gum	60,50,35 (85.6)	10.27	3.22	13x13	Maturing	Poor	Poor	Asymmetric	5 to 15 years	Borer damage, In decline	Indigenous	Low	Street tree	394791.449	5722676.372
2	*Eucalyptus pryoriana*	Gippsland Manna Gum	60,30,30 (73.5)	8.82	3.02	8x12	Maturing	Fair	Poor	Asymmetric	5 to 15 years	Stump re-sprout	Indigenous	Low	Street tree	394793.693	5722693.893
3	*Allocasuarina verticillata*	Drooping She-oak	46	5.52	2.48	12x9	Maturing	Poor	Poor	Asymmetric	5 to 15 years	In decline	Victorian native	Low	Remove	394837.293	5722683.217
4	*Allocasuarina verticillata*	Drooping She-oak	25	3.00	1.92	5x4	Maturing	Fair	Very poor	Stump re-sprout	0 years		Victorian native	None	Remove	394836.056	5722679.533
5	*Melaleuca armillaris*	Bracelet Honey-myrtle	44,34 (55.6)	6.67	2.69	11x12	Maturing	Fair	Poor	Asymmetric	0 years	Collapsing	Victorian native	None	Remove	394848.206	5722711.683
6	*Eucalyptus pryoriana*	Gippsland Manna Gum	60,25 (65)	7.80	2.87	16x20	Maturing	Fair to Poor	Fair to Poor	Asymmetric	15 to 30 years		Indigenous	Low	Could be retained	394842.601	5722648.265
7	*Banksia integrifolia*	Coast Banksia	<5	2.00	1.50	2x1	Young	Fair	Fair	Symmetric	15 to 30 years		Planted indigenous	Low	Could be retained	394843.964	5722687.595
8	*Leptospermum laevigatum*	Coast Tea-tree	20	2.40	1.75	3x3	Semi-mature	Poor	Poor	Asymmetric	1 to 5 years		Indigenous	Low	Remove	394845.075	5722691.836
9	*Allocasuarina verticillata*	Drooping She-oak	25	3.00	1.92	5x4	Maturing	Fair	Very poor	Stump re-sprout	0 years		Victorian native	None	Remove	394848.265	5722691.092
10	*Eucalyptus leucoxolyn subsp. megalocarpa*	Large-fruited Yellow Gum	44	5.28	2.43	10x10	Semi-mature	Fair to Poor	Fair to Poor	Minor asymmetry	15 to 30 years	Mistletoe	Australian native	Low	Could be retained	394855.223	5722690.441
11	*Banksia integrifolia*	Coast Banksia	<5	2.00	1.50	2x1	Young	Fair	Fair	Symmetric	15 to 30 years		Planted indigenous	Low	Could be retained	394854.485	5722699.332
12	*Allocasuarina verticillata*	Drooping She-oak	54,53 (75.7)	9.08	3.06	16x12	Maturing	Fair to Poor	Poor	Asymmetric	5 to 15 years	Defective structure	Victorian native	Low	Remove	394857.458	5722704.915
13	*Eucalyptus leucoxolyn subsp. megalocarpa*	Large-fruited Yellow Gum	52,45,42 (80.6)	9.67	3.14	11x12	Maturing	Fair to Poor	Poor	Minor asymmetry	5 to 15 years	Borer damage, Bifurcation of main stem with included bark	Australian native	Low	Could be retained	394859.159	5722715.504
14	*Banksia integrifolia*	Coast Banksia	<5	2.00	1.50	2x1	Young	Fair	Fair	Symmetric	15 to 30 years		Planted indigenous	Low	Could be retained	394851.797	5722719.868
15	*Allocasuarina verticillata*	Drooping She-oak	47	5.64	2.50	11x11	Maturing	Fair	Fair to Poor	Asymmetric	15 to 30 years		Victorian native	Low	Could be retained	394849.311	5722715.170
16	*Allocasuarina verticillata*	Drooping She-oak	60	7.20	2.77	4x4	Maturing	Fair	Very poor	Stump re-sprout	0 years		Victorian native	None	Remove	394844.348	5722720.740
17	*Eucalyptus ovata*	Swamp Gum	36,30 (46.9)	5.63	2.50	11x12	Maturing	Fair to Poor	Poor	Stump re-sprout	5 to 15 years		Indigenous	Low	Remove	394851.286	5722707.500
18	*Leptospermum laevigatum*	Coast Tea-tree	12	2.00	1.50	3x3	Semi-mature	Fair to Poor	Fair to Poor	Asymmetric	5 to 15 years		Indigenous	Low	Could be retained	394845.686	5722697.007
19	*Melaleuca armillaris*	Bracelet Honey-myrtle	29,20,20 (40.5)	4.86	2.35	6x10	Maturing	Fair	Poor	Asymmetric	0 years	Collapsed	Victorian native	None	Remove	394846.557	5722701.777
20	*Leptospermum laevigatum*	Coast Tea-tree	23	2.76	1.85	5x5	Maturing	Fair to Poor	Fair to Poor	Asymmetric	5 to 15 years		Indigenous	Low	Could be retained	394851.040	5722701.703
21	*Eucalyptus sp.*	Gum Tree	43	5.16	2.41	5x8	Maturing	Dead	Poor	Major asymmetry	0 years		Australian native	None	Remove	394851.292	5722662.445
22	*Eucalyptus pryoriana*	Gippsland Manna Gum	47,44,43,35 (85)	10.20	3.21	15x17	Maturing	Poor	Poor	Asymmetric	5 to 15 years		Indigenous	Low	Could be retained	394850.162	5722656.557
23	*Eucalyptus pryoriana*	Gippsland Manna Gum	42	5.04	2.39	9x13	Semi-mature	Poor	Poor	Major asymmetry	5 to 15 years		Indigenous	Low	Could be retained	394848.623	5722646.641
24	*Allocasuarina verticillata*	Drooping She-oak	23	2.76	1.85	11x3	Semi-mature	Fair	Fair	Minor asymmetry	15 to 30 years		Victorian native	Low	Could be retained	394842.615	5722635.276
25	*Banksia integrifolia*	Coast Banksia	<5	2.00	1.50	2x1	Young	Fair	Fair	Symmetric	15 to 30 years		Planted indigenous	Low	Could be retained	394838.942	5722720.188
26	*Melaleuca armillaris*	Bracelet Honey-myrtle	45,45 (63.6)	7.63	2.84	8x8	Maturing	Fair	Poor	Asymmetric	0 years	Collapsing	Victorian native	None	Remove	394844.269	5722727.647
27	*Banksia integrifolia*	Coast Banksia	<5	2.00	1.50	2x1	Young	Fair	Fair	Symmetric	15 to 30 years		Planted indigenous	Low	Could be retained	394830.440	5722722.108
28	*Eucalyptus ovata*	Swamp Gum	67,44 (80.2)	9.62	3.13	8x11	Maturing	Fair to Poor	Poor	Minor asymmetry	5 to 15 years	Previously lopped	Indigenous	Low	Could be retained	394827.574	5722729.423
29	*Eucalyptus leucoxylon*	Yellow Gum	40,30 (50)	6.00	2.57	8x10	Maturing	Fair	Fair to Poor	Minor asymmetry	15 to 30 years		Victorian native	Low	Street tree	394820.605	5722731.162
30	*Eucalyptus ovata*	Swamp Gum	16,14,13 (24.9)	2.99	1.92	7x6	Semi-mature	Fair	Poor	Minor asymmetry	15 to 30 years	Stump re-sprout?	Indigenous	Low	Street tree	394802.457	5722722.755
31	*Banksia integrifolia*	Coast Banksia	28,16 (32.2)	3.86	2.14	7x5	Semi-mature	Fair	Fair to Poor	Minor asymmetry	15 to 30 years		Indigenous	Low	Street tree	394800.456	5722719.950
32	*Leptospermum laevigatum*	Coast Tea-tree	24	2.88	1.89	5x5	Maturing	Poor	Poor	Major asymmetry	1 to 5 years		Indigenous	Low	Street tree	394819.789	5722726.541
33	*Banksia integrifolia*	Coast Banksia	64,29,23 (73.9)	8.87	3.03	12x11	Maturing	Fair	Poor	Minor asymmetry	15 to 30 years		Indigenous	Low	Street tree	394802.557	5722733.160
34	*Allocasuarina verticillata*	Drooping She-oak	26,16,14 (33.6)	4.03	2.17	12x7	Semi-mature	Poor	Poor	Asymmetric	5 to 15 years		Victorian native	Low	Street tree	394803.593	5722730.253
35	*Allocasuarina verticillata*	Drooping She-oak	49	5.88	2.55	12x16	Maturing	Fair	Poor	Asymmetric	15 to 30 years	Bifurcation of main stem with included bark	Victorian native	Low	Could be retained	394841.395	5722646.905
36	*Allocasuarina verticillata*	Drooping She-oak	30	3.60	2.08	6x6	Semi-mature	Fair	Poor	Minor asymmetry	15 to 30 years		Indigenous	Low	Could be retained	394853.883	5722638.865
37	*Allocasuarina verticillata*	Drooping She-oak	36,26 (44.4)	5.33	2.44	9x8	Semi-mature	Fair	Poor	Asymmetric	15 to 30 years	Bifurcation of main stem with included bark	Victorian native	Low	Could be retained	394842.968	5722658.511
38	*Allocasuarina verticillata*	Drooping She-oak	25	3.00	1.92	8x5	Semi-mature	Fair	Fair to Poor	Minor asymmetry	15 to 30 years		Victorian native	Low	Could be retained	394847.554	5722661.334
39	*Allocasuarina verticillata*	Drooping She-oak	24	2.88	1.89	5x5	Semi-mature	Fair to Poor	Fair to Poor	Minor asymmetry	15 to 30 years		Victorian native	Low	Could be retained	394858.011	5722674.991
40	*Eucalyptus leucoxylon*	Yellow Gum	17	2.04	1.63	4x6	Semi-mature	Fair	Fair to Poor	Major asymmetry	15 to 30 years		Victorian native	Low	Could be retained	394844.827	5722666.957
41	*Banksia integrifolia*	Coast Banksia	10	2.00	1.50	4x3	Semi-mature	Fair	Very poor	Asymmetric	1 to 5 years		Indigenous	Low	Remove	394844.850	5722658.651
42	*Allocasuarina verticillata*	Drooping She-oak	34	4.08	2.18	12x9	Semi-mature	Fair	Fair to Poor	Asymmetric	15 to 30 years		Victorian native	Low	Could be retained	394846.796	5722649.196
43	*Eucalyptus pryoriana*	Gippsland Manna Gum	15	2.00	1.55	5x5	Semi-mature	Dead	Poor	Major asymmetry	0 years		Indigenous	None	Remove	394847.192	5722646.514
44	*Allocasuarina verticillata*	Drooping She-oak	49	5.88	2.55	2x1	Maturing	Dead	Poor	Asymmetric	0 years	Collapsed stump	Victorian native	None	Remove	394843.038	5722637.517
45	*Allocasuarina verticillata*	Drooping She-oak	50,25,25,20 (64.4)	7.73	2.86	13x12	Maturing	Poor	Poor	Asymmetric	5 to 15 years		Victorian native	Low	Street tree	394799.507	5722724.778
46	*Allocasuarina verticillata*	Drooping She-oak	56,39 (68.2)	8.18	2.93	16x13	Maturing	Fair to Poor	Poor	Asymmetric	15 to 30 years		Victorian native	Low	Street tree	394805.089	5722737.619

Appendix 2
Descriptors (Version C - 2013)

Field name	Description
No.	Tree identification number. Unique numbers are assigned to each assessed individual tree or tree group.
Species	Identifies the tree using the international taxonomic classification system of binomial (or trinomial) nomenclature (genus, species, variety and cultivar).
Common Name	Provides the common name as occurs in current Australian horticultural literature. More than one common name can exist for a single tree species, or several species can share the same common name.
DBH (Diameter at breast height)	Indicates the trunk diameter (expressed in centimetres) of an individual tree usually measured at 1.4m above the existing ground level. Multiple stemmed trees are calculated using a formula to combine the stems into a single stem for tree protection zone calculations.
TPZ (Tree protection zone)	Tree protection zone expressed as a radial distance in metres, measured from trunk centre. Based on AS 4970
SRZ (Structural Root Zone)	Radial distance in metres measured from trunk centre to maintain tree stability - AS4970
HxW (Height x Width)	Indicates height and width of single tree and measurement generally expressed in whole metres

Age	Description
Young	Sapling tree and/or recently planted
Semi-mature	Tree rapidly increasing in size and yet to achieve expected size in situation
Maturing	Specimen approaching expected size in situation, with reduced incremental growth
Over-mature	Tree is senescent and in decline

Health	Term assigned that provides a broad description of the health and vigour of the tree.					
Ratings	*Good*	*Fair*	*Fair to Poor*	*Poor*	*Very poor*	*Dead*

Structure	Term assigned that provides a broad description of the structure and stability of the tree.					
Ratings	*Good*	*Fair*	*Fair to Poor*	*Poor*	*Very poor*	*Failed*

Form	Description
Symmetric	Evenly balanced crown
Asymmetric	Crown biased in one direction; can be minor or major
Stump re-sprout	Adventitious shoots originating from stump or trunk
Manipulated	Hedge, pollard, topiary, windrow; managed for specific landscape use or aesthetic outcome

Comment	Additional comments that provide specific detail on the condition of the tree or management requirements

Tree type	Description
Indigenous	Occurs naturally in the area or region of the subject site
Victorian native	Occurs naturally within some part of Victoria (not exclusively) but is not indigenous
Australian native	Occurs naturally within Australia but is not a Victorian native or indigenous
Exotic deciduous	Occurs outside of Australia and typically sheds its leaves during winter
Exotic evergreen	Occurs outside of Australia and typically holds its leaves all year round
Exotic conifer	Occurs outside of Australia and is classified as a gymnosperm
Native conifer	Occurs naturally within Australia and is classified as a gymnosperm
Palm	Woody monocotyledon
Other	Other descriptions as indicated

Retention value	Qualitative rating provided on tree based on assessment factors. Provided as a guide for management decisions.			
Ratings	*High*	*Moderate*	*Low*	*None*

Recommend	Recommended action based on condition of the tree with reference to proposed site changes							
Responses	*Retain*	*Could be retained*	*Consider removal*	*Remove*	*Street tree*	*Neighbour's Tree*	*Already removed*	*Transplant*

Descriptors reviewed annually and subject to change

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Appendix 3

IMPORTANT NOTICE

This plan must be used only for the purpose for which it was intended.
Any uncertainty in this plan must be clarified with the author.

IMPORTANT NOTICE

This plan is prepared for OLDFIELD CONSULTING from a field survey for the purpose of designing new constructions on the land and should not be used for any other purpose.
Services shown hereon have been located by field survey. Prior to any demolition, excavation or construction on site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services.
This note is an integral part of this plan.

IMPORTANT NOTICE

This plan is not the subject of a title search.
This plan is not based on a re-establishment survey nor is it related to title.

WARNING

Features and windows which were obstructed on the date of survey have not been located or shown on this plan. M J Reddie Surveys Pty Ltd take no responsibility for any damages caused as a result of this.

NOTATIONS

AHD heights have been computed from GNSS data using AUSGeoid09. Data was provided by VRSNow CORS services on 25/08/2020. Heights have not been calibrated on to permanent marks.

Level datum: AHD.
Levels shown thus: 2.58
Contour interval: 0.2m
POSTAL ADDRESS: MAHERS LANDING ROAD INVERLOCH 3996

Date of survey: 25/08/2020

PLAN OF FEATURE SURVEY

SCALE 0 2 4 8 12
LENGTHS ARE IN METRES

ORIGINAL SCALE 1:200 SHEET SIZE A0

NUMBER OF SHEETS IN PLAN 1
NUMBER OF THIS SHEET 1

SURVEYORS REF 20-08-53
VERSION 1
FILE: BN

LEGEND

- ELECTRICTY PIT
- ELECTRICITY POLE
- ELECTRICITY POLE AND LIGHT
- FIRE HYDRANT
- SEWER INSP. PT.
- GAS METER
- GAS VALVE
- LIGHT/LIGHT POLE
- SIGN
- SEWER PIT
- GRATED PIT
- PHOTO POINT
- T.B.M.
- INSTRUMENT POINT
- P.M.
- WATER METER
- TAP
- GATE
- TELSTRA PIT
- TREE

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Appendix 3a

TPZ - AS4970

SRZ - AS4970

Assumptions and limiting conditions of arboricultural consultancy report

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2. Treemap Arboriculture assumes that any property or project is not in violation of any applicable codes, ordinances, statutes or other local, state or federal government regulations.

3. Treemap Arboriculture has taken care to obtain all information from reliable sources. All data has been verified insofar as possible; however Treemap Arboriculture can neither guarantee nor be responsible for the accuracy of the information provided by others not directly under Treemap Arboriculture control.

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8. Sketches, diagrams, graphs and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural drawings, reports or surveys.

9. Unless expressed otherwise: 1) Information contained in this report covers only those items that were covered in the project brief or that were examined during the assessment and reflect the condition of those items at the time of inspection; and 2) The inspection is limited to visual examination of accessible components without dissection, excavation or probing unless otherwise stipulated.

10. There is no warranty or guarantee, expressed or implied by Treemap Arboriculture, that the problems or deficiencies of the plants or site in question may not arise in the future.

11. All instructions (verbal or written) that define the scope of the report have been included in the report and all documents and other materials that the Treemap Arboriculture consultant has been instructed to consider or to take into account in preparing this report have been included or listed within the report.

12. To the writer's knowledge all facts, matter and all assumptions upon which the report proceeds have been stated within the body of the report and all opinion contained within the report have been fully researched and referenced and any such opinion not duly researched is based upon the writers experience and observations.

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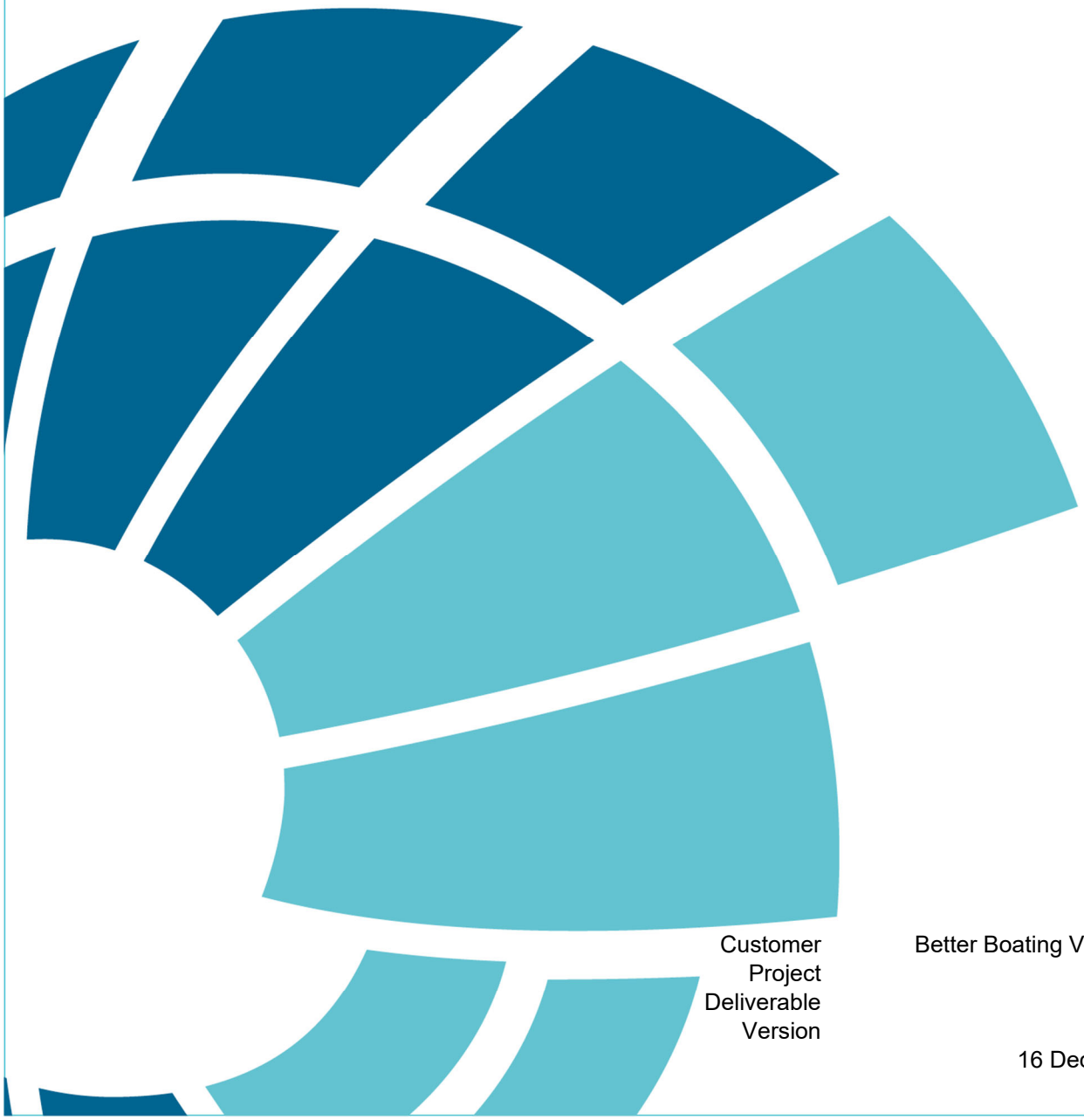
Mahers Landing Boat Ramp Design: Coastal Processes and Marine Ecology Impact Assessment

FINAL



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Deliverable	301
Version	01
	16 December 2022

Document Control

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Author	Taylor Rubinstein, Ali Tamizi
Reviewed By	Daniel Machado
Project Manager	Daniel Machado

Amendment Record

The Amendment Record below records the history and issue status of this document.

Version	Version Date	Distribution	Record
00	27 October 2022	Better Boating Victoria (BBV)	Draft for review
01	16 December 2022	Better Boating Victoria (BBV)	Final

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1 Introduction

Better Boating Victoria (BBV) and Bass Coast Shire Council (BCSC) are working in partnership to upgrade Mahers Landing boat ramp to improve the capacity, functionality, and safety of the facility. BBV has engaged BMT to prepare the detailed design for the upgrades, including preparation of the required permit applications and ancillary studies.

All works within the coastal zone require Marine and Coastal Act (MACA) Consent granted by Department of Land Water and Planning (DELWP) before works can begin. As part of the MACA consent application process, DELWP assesses information on the predicted environmental social and economic impacts of the proposed works.

To inform the MACA Consent permit application we have thus prepared this Coastal Process and Marine Environment Impact Assessment report detailing potential environmental impacts of the boat ramp upgrade works. This report culminates in recommendations for mitigating the potential impacts identified throughout the body of the report.

1.1 Study Area

Mahers Landing boat ramp is located 6 kms east of Inverloch on the shores of Anderson Inlet estuary, within the BCSC Local Government Area (LGA) in the West Gippsland region (Figure 1.1). The ramp provides an alternate access location to the busier Inverloch boat ramp nearby and is often more protected when inclement conditions impact launching safety at Inverloch. Historical aerial images indicate that the site has been used for boat launching and retrieval since the early 1960s. Originally, this was performed from the beach when conditions were favourable (i.e., low tide, northerly/light winds, slack tide) with beach access from a track running along the dune extending from the east side of where the current carpark is situated.

A small vehicle beach access ramp was constructed in the late 1960s at the Mahers Landing carpark (Figure 1.3), however, aerial imagery from the early 1970's shows the toe of this ramp was eroded away making the ramp unusable. During this period people continued to access the beach for boat launching and retrieval from the informal track east of the carpark (Figure 1.4). Between 1991 and 2006 the existing concrete boat ramp was constructed to make boat launching and retrieval at Mahers Landing easier, and to avoid erosion of the ramp (Figure 1.5).

Evidence of erosion in the study area can be seen in all aerial images available as far back as 1950 (See Section 4.3 for further detail). Between the year 2000 and present, rock revetment was progressively built in sections from the western side of the Mahers Landing carpark area to approximately 160m east of the site (Figure 1.6). Currently the whole study area is protected from further erosion by a rock and rubble revetment.

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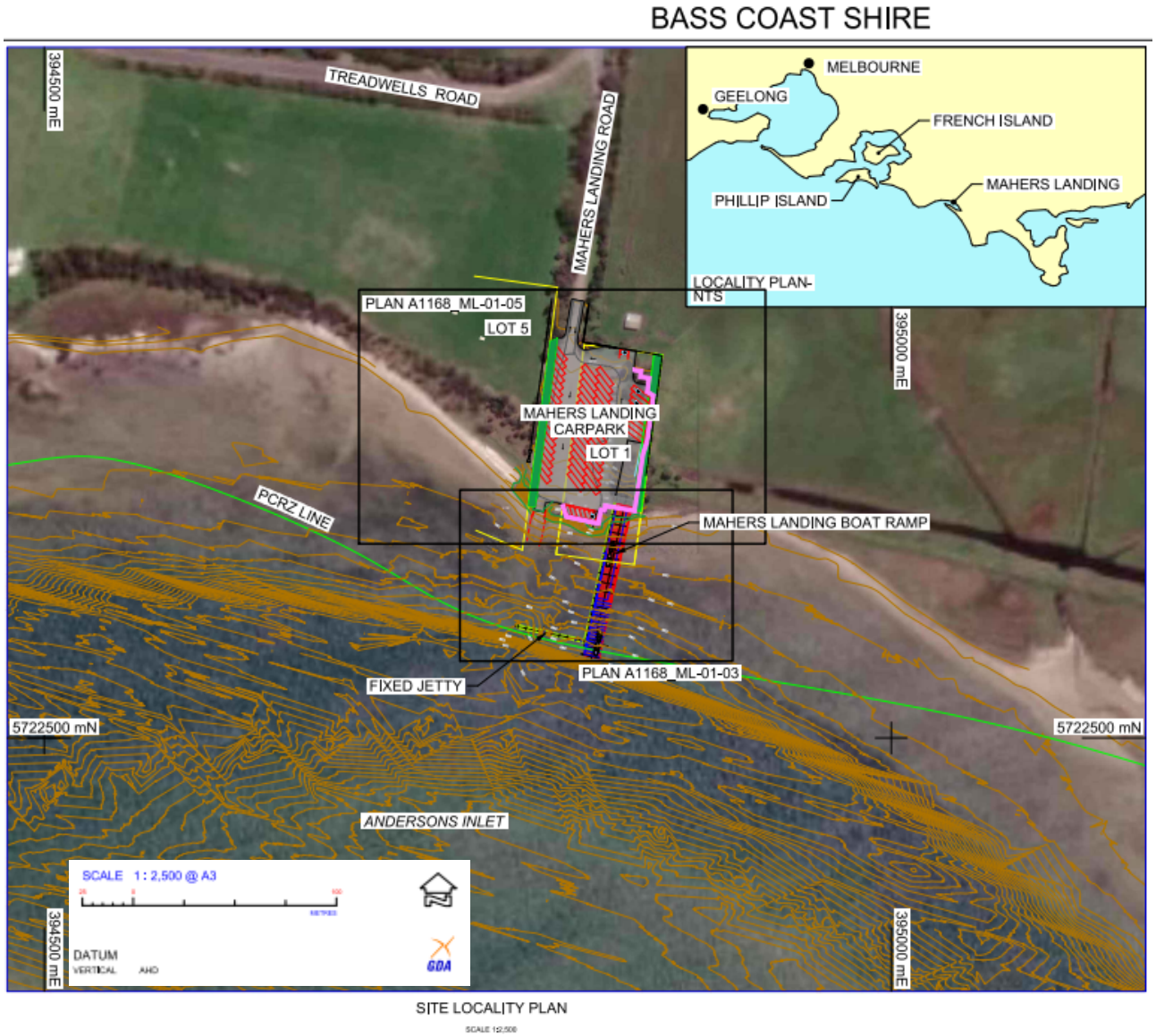

Figure 1.1 Mahers Landing location map

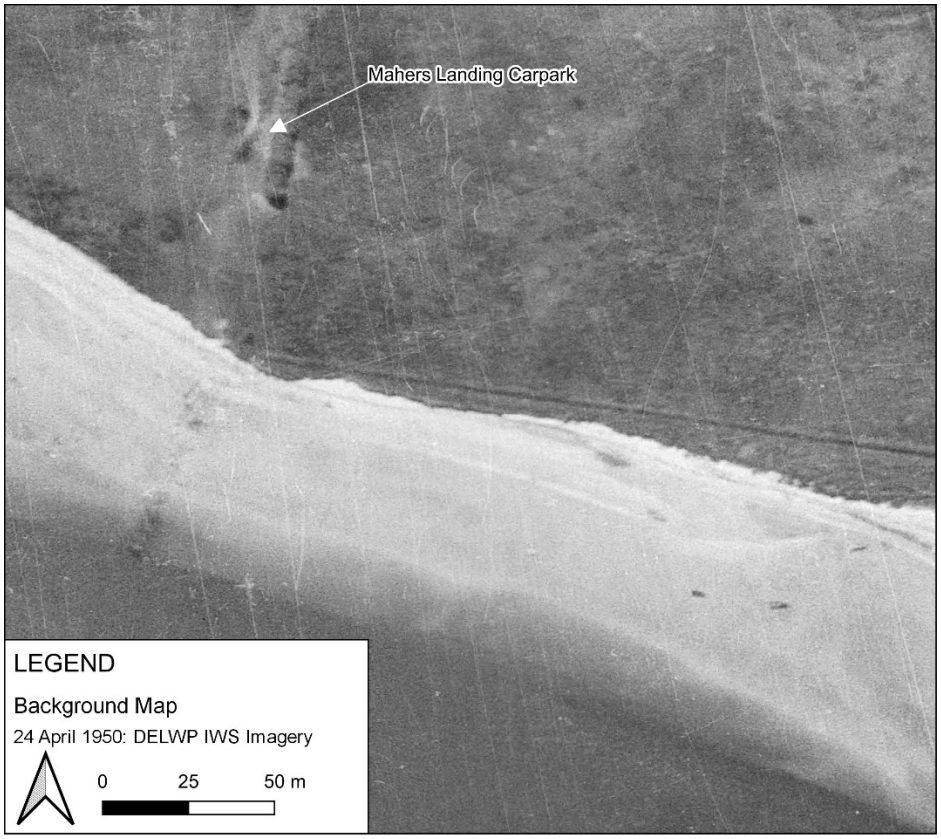

Figure 1.2 Mahers Landing 1950

Figure 1.3 Mahers Landing 1968

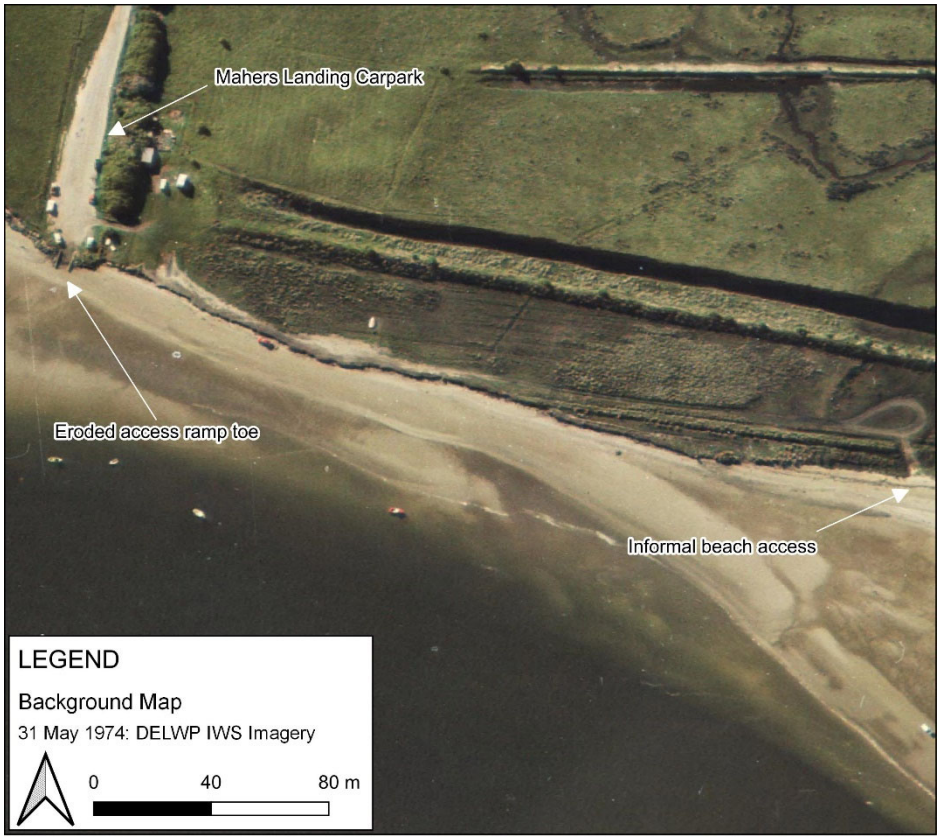

Figure 1.4 Mahers Landing 1974

Figure 1.5 Mahers Landing 2006

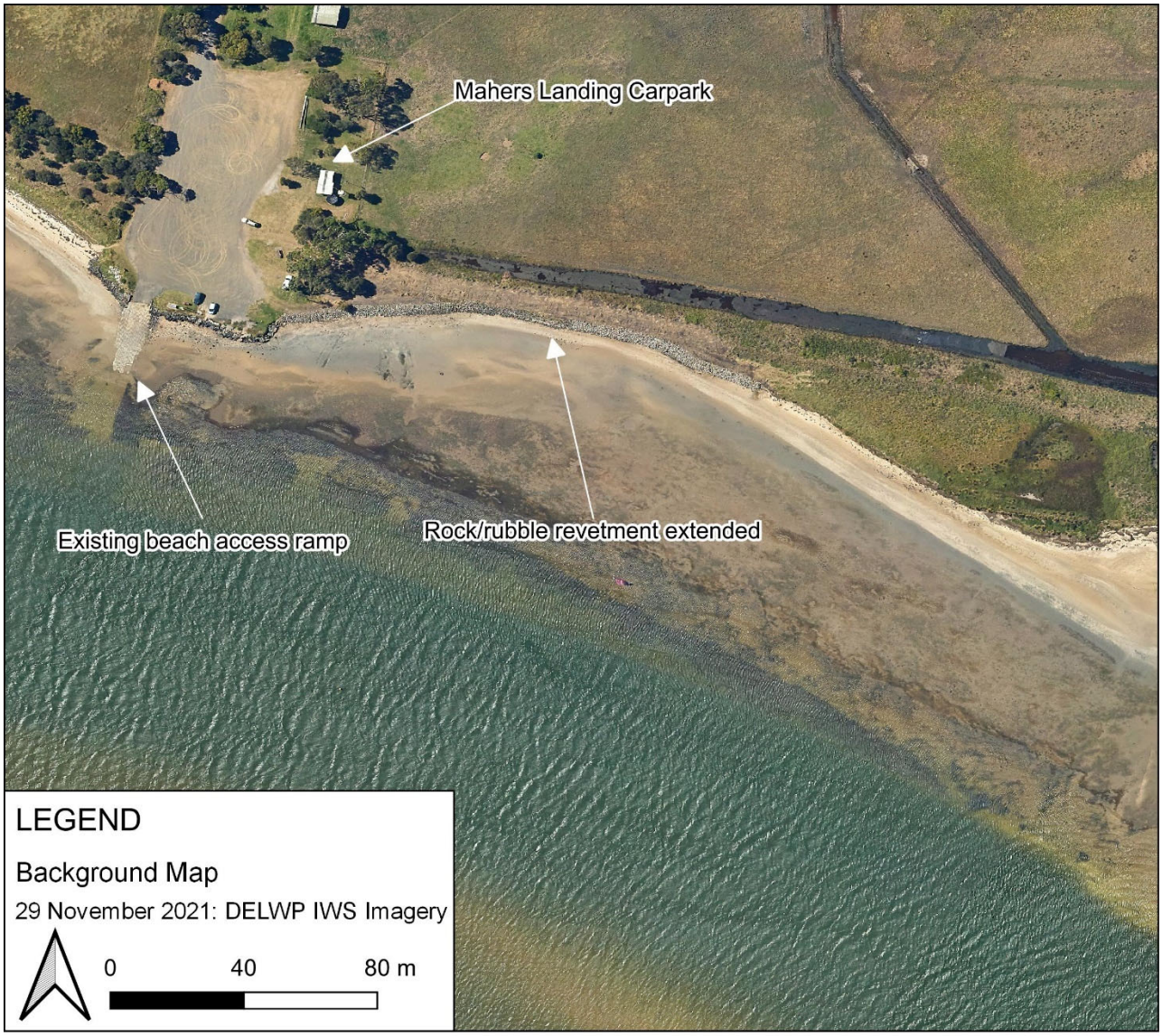

Figure 1.6 Mahers Landing 2021

2 Planned Works

2.1 Description of the Activity

The Mahers Landing boat ramp upgrade concept design has recently been finalised by BMT in consultation with BBV and BCSC. The upgrade concept is shown below in (Figure 2.1) and will include the following:

- Extended paved carpark area
- Formalised car and boat trailer parking throughout the carpark
- A new dual-lane boat ramp extending approximately 80m from the carpark into Anderson Inlet, elevated above the beach on concrete piles
- A 2m wide dual level jetty/holding structure adjacent to the ramp, possibly with attached pontoon
- Formalised rigging and de-rigging area adjacent to the boat ramp
- Widening of the entry to the carpark
- Upgraded rock revetment around the water side of the Mahers Landing precinct
- Relocated toilet/amenities block and park benches
- Removal of a number of existing trees from the facility area (See Terrestrial Ecology Impact Assessment report (Indigenous Design, 2022)

The existing boat ramp extends from the western side of the carpark area. This will be retained as part of the concept design to limit works in the intertidal areas and to provide a launching place for non-powered craft.

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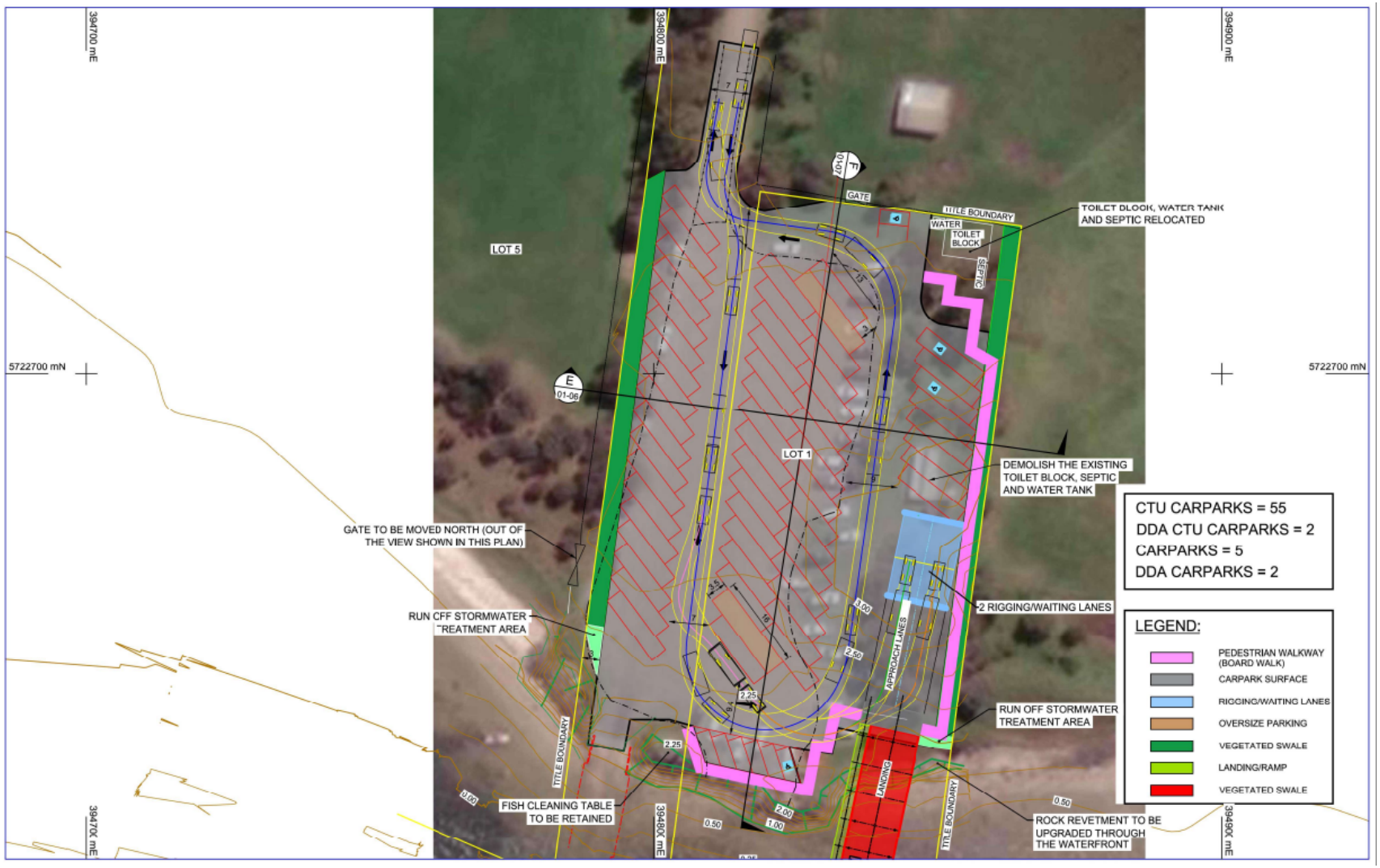

Figure 2.1 Concept sketch of Mahers Landing boat ramp upgrades – Terrestrial Works

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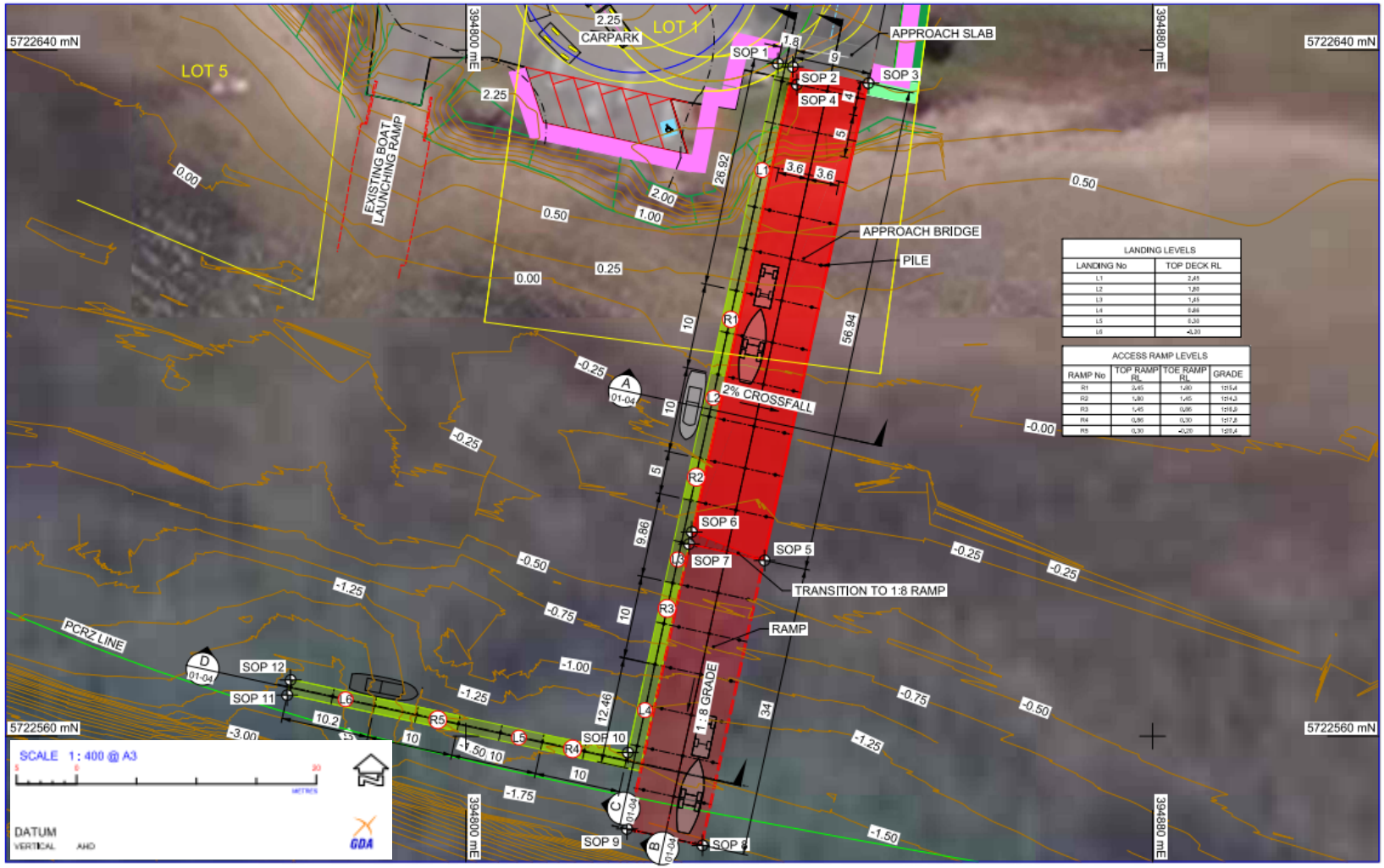

Figure 2.2 Concept sketch of Mahers Landing boat ramp upgrades – Marine Works

3 Methodology

3.1 Coastal Processes Impact Assessment

We performed three key analyses in the coastal processes impact assessment as follows:

1. **Desktop review of previous studies**

The desktop review indicated that there are few studies available detailing coastal processes at Mahers Landing. The Boating Action Plan report (GHD ,2011) indicated that the net sediment transport rate in the area is negligible, with seasonal transport of small volumes of sediment westward and eastward depending on weather conditions. The report predicted that installation of a boat ramp across a beach profile will cause minor accretion and corresponding erosion.

2. **Aerial Image analysis for shoreline change**

Historical aerial images were compared from 1950, 1960, 1970, 2000, 2015, 2018, 2019, 2020 and 2021 (accessed with permission through the DELWP[1] Image Web Server). For each of these images we mapped vegetation lines approximately 400m either side of the Mahers Landing boat ramp carpark. Comparison of the position of these historical vegetation lines enabled us to identify trends in shoreline change over time. From this information we then estimated the likely future impacts the boat ramp upgrades may have on shoreline position.

3. **Bathymetry surveys comparison**

We also compared available bathymetric surveys of Anderson Inlet from 2012 and 2020 (supplied by Gippsland Ports) and 2022 (survey performed as part of this scope of works) to identify any changes to bathymetry over time. We specifically focused on the location and movement of the main channel (immediately offshore of the Mahers Landing boat ramp). This was to identify both potential impacts of the boat ramp upgrade on the channel, and any potential future impacts the migration of this channel may have on the upgraded boat ramp structures.

3.2 Marine Ecology Impact Assessment

Anderson Inlet is an important migratory and wader shorebird location and is popular with bird watchers all year round. There have been multiple previous studies detailing the bird species likely to be present at different times throughout the year and associated marine ecology values. The marine ecology impact assessment commenced with a review of the following documents:

- Mahers Landing Boating Action Plan (GHD, 2011)
- Mahers Landing Boating Facility Upgrade: Functional Design Report (Oldfield Consulting, 2021)

We compared the findings of these reports to the following relevant databases to validate the key marine environmental values for the area, with a focus on threatened, migratory or otherwise protected flora and fauna:

- EPBC Act 1999 Protected Matters Search Tool

[1] Victorian Department of Environment, Land, Water and Planning

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- Flora and Fauna Guarantee Act (1988) Threatened List (DELWP, 2021)
- Fisheries Act 1995 Protected Aquatic Biota List (Fisheries Victoria, 2021)
- Victorian Biodiversity Atlas (VBA) Survey Records (DELWP, 2022)
- Seagrass Mapping of Victoria's Minor Inlets (Blake, Roob, & Patterson, 2000)

The key marine environmental values likely to occur were then each considered in the context of potential impacts resulting from the construction and operation of the proposed boat ramp upgrade.

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4 Coastal Process Assessment

4.1 Water Levels

The astronomical tides at Mahers Landing are predominantly semi-diurnal. For purpose of this report we have estimated the tides at Mahers Landing using measured water levels from both the Inverloch boat ramp jetty and the Tarwin Lower boat ramp jetty. Results of this assessment are outlined in Table 4.1, with more details on the calculation process provided in the Mahers Boat Ramp Upgrade Basis of Design report (BMT, 2022).

Table 4.1 Astronomical tides at Mahers Landing

Tidal Plane	Elevation (m AHD)
Highest Astronomical Tide	1.42
Mean Higher High Water	0.93
Mean Lower High Water	0.68
Mean Sea Level	0.25
Mean Higher Low Water	-0.19
Mean Lower Low Water	-0.44
Lowest Astronomical Tide	-0.69

Elevation of water levels above the predicted astronomical tide via 'storm surge' occurs regularly along the Victorian Coast when intense low-pressure systems migrate eastward through Bass Strait. Storm surges occur because these weather systems cause the meteorological air pressure to drop which subsequently causes local water levels to rise. The combination of astronomical tide and storm surge is termed ‘storm tide’.

Extreme water levels along the Australian coast caused by a combination of seal level rise and storm tides (under a 2022 sea level rise scenario) were assessed by the University of Western Australia Coastal Oceanography Group and Bushfire and Natural Hazard CRC (UWA, 2021). The assessment considered evenly spaced locations approximately 1.5km apart along the entire Australian coast with a model extraction location (29931) approximately 500m east of Mahers Landing. The results for this location for 1-year and 100-year ARI water level events are outlined in Table 4.2 and shows graphically in below.

Table 4.2 Predicted storm tide water levels for Mahers Landing in 2022.

Storm Tide ARI (years)	Water Level Elevation (m AHD)
1	1.74
100	2.12

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Storm tides under future sea level rise scenarios have been predicted as part of Inverloch Regional Coastal Hazar Assessment study which were conducted by Water Technology (2021). The extreme water levels were estimated as the product of offshore storm tide, design winds and flood flow through Tarwin Lower on the east end of Anderson inlet. The predicted design water levels at Mahers Landing were supplied by Water Technology (2022) which is reproduced in Table 4.3.

Table 4.3 Design extreme water level at Mahers Landing (Water Technology, 2022)

Mean Sea Level rise (m AHD)	0.0	0.2	0.5	0.8
Storm Tide 1%, Flood 10%	2.3	2.4	0.5	0.8
Storm Tide 5%, Flood 1%	2.2	2.4	2.6	2.9
Storm Tide 10%, Flood 1%	2.0	2.3	2.5	2.8

4.2 Wind and Waves

Anderson Inlet has a shallow and relatively narrow entrance to the ocean. Because of this, most ocean swell waves break on offshore sandbars and do not travel far past the inlet mouth. As such, wind waves are the only waves which impact the Mahers Landing boat ramp. These waves are caused when wind blows from the southeast through southwest directions across Anderson Inlet at high tide.

Extreme wind wave characteristics have been estimated using fetch-limited methods. These are simple, empirical calculations and are generally quite conservative. Two wind directions (S, SW) and two calculation methods (Shore Protection Manual, 1984 and Coastal Engineering Manual 2003, have been used in the assessment with results presented in Table 4.3.

Table 4.4 Estimated extreme wind waves

ARI	Direction	Fetch Length (m)	Average Water Depth (m)	Wind Speed (m/s)	SPM-1984 Period (sec)	SPM-1984 Wave Height (m)
1:1	S	2300	2.9	20.4	2.46	0.7
1:50				24.3	2.64	0.84
1:200				26.5	2.74	0.92
1:1	SW	2560	3.4	20.4	2.56	0.75
1:50				28.8	2.56	1.08
1:200				31.5	3.05	1.18

The results indicate waves of close to 1.2m wave height could occur in extreme storms (ARI 200-year wind speeds). We note that these wave heights are calculated assuming an open boundary for the length of fetch and constant depth. Anderson Inlet has sudden changes in depth throughout with a deep main channel and very shallow sandbars elsewhere. Considering these factors, the fetch limited wave height calculation results presented in Table 4.3 are considered very conservative. If greater accuracy in incident wave heights at the Maher Landing boat ramp is required, we recommend a numerical wave modelling exercise.

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4.3 Sediment Transport

As mentioned previously, there have been no previous studies into the coastal processes of Anderson Inlet. As such, the first section below will undertake a brief review of the likely governing processes impacting sediment transport in the inlet, while subsequent sections detail the analyses performed to characterise these processes and their potential impacts on the Mahers Landing boat ramp location.

Sediment Transport Governing Processes

The Anderson Inlet is an estuary that is fed by the Tarwin River on East and tidal current from the West. It is a dynamic system characterised by highly variable morphology due to the complex interactions between **coastal processes** and **catchment flows**. These two factors impact the morphology as Anderson Inlet as outlined below.

Coastal Processes

Coastal processes impact Anderson Inlet as shown in Figure 4.1 and described below.

- Ocean swell waves break on the shallow sandbars offshore of the inlet entrance. On hightide, these waves travel some distance into the entrance of Anderson Inlet bringing sand with them. This has the effect of pumping sand into the entrance of Anderson Inlet on high tides.

- Wind blowing across Anderson Inlet in all directions creates waves on the water surface (see Table 4.4). During high tides, these waves travel across shallow sandbars and break on the inlet shores. When strong winds blow, larger waves form that can cause erosion of the shoreline sediment out into offshore sandbars. When light winds blow, small waves have the effect of bringing sediment back from these offshore sandbars onto the beach. When waves impact shores obliquely, sediment is pushed along the shorelines in the direction of the wind.

- When winds blow from a predominant direction, this has the effect of creating waves that, more often than not, push sediment in one direction along the shore causing erosion in some areas and accretion in others.

Catchment Flows

The Tarwin River flows into the eastern end of Anderson Inlet approximately 8km east of the Mahers Landing boat ramp. From this location, river water flows predominantly through a meandering main channel up to approximately 200m wide before it flows out through the entrance to Anderson Inlet and into the ocean. During high tides, water also flows across the shallow sandy flats on either side of the main channel. During low tides, flow velocity may increase within the main channel as water is confined to a much smaller cross-sectional area.

The main channel (especially during low tide) can be described as a meandering riverbed in a sandy substrate. As such, typical fluvial sedimentation and erosion processes most likely occur. These processes include:

- Higher flow rates near the outside of a bend and lower flow rates near the inside of a bend leading to erosion of the outer bank and sedimentation on the inner bank around bends in the river main channel.

- General downstream movement of sediment towards the ocean.

- Flood events which may wash out much of the sediment from the riverbed and create wholly new flow channels.

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In Anderson Inlet, these processes likely occur on much shorter timescales than for an inland river, with relatively large shifts in channel position occurring during relatively short times. This is predominantly because the sandy bed of the inlet is much less cohesive and less erosion-resistant than an inland soils.

The interaction of both coastal processes and catchment flows creates the sediment transport patterns seen within Anderson Inlet. These are analysed more closely in the following sections.

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Figure 4.1 Sediment dynamics within Anderson Inlet

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Aerial Image Analysis

The aerial image analysis has been used to study the impact of the existing boat ramp (constructed between 1979 and 2000) had on the shoreline, and thus predict the likely impact of the proposed expansion.

The analysis focused on patterns of horizontal accretion and erosion (mapped using the position of the vegetation line) at the shoreline in three separate focus areas in the vicinity of the Mahers Landing boat ramp:

- West Shoreline – shore area extending 150m west of boat ramp
- East Shoreline – shore area extending 300m east of boat ramp
- Ramp and Access Point – shore area immediately shoreward of the existing boat ramp and carpark.

These locations are shown in Figure 4.2 with the results of the analysis shown in Figure 4.3, Table 4.5 and summarised in subsequent sections.

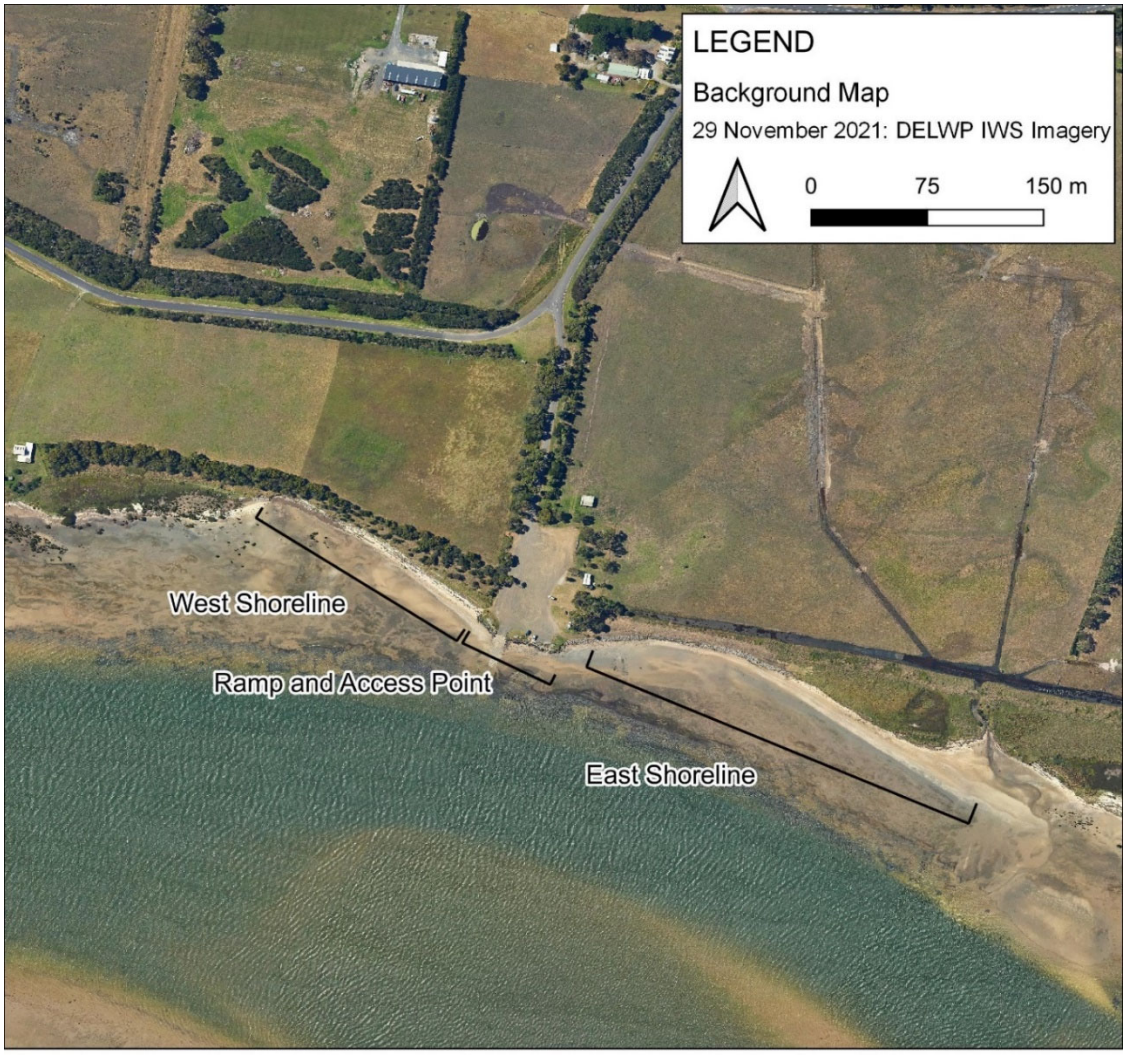

Figure 4.2 Study area for investigation of shoreline changes

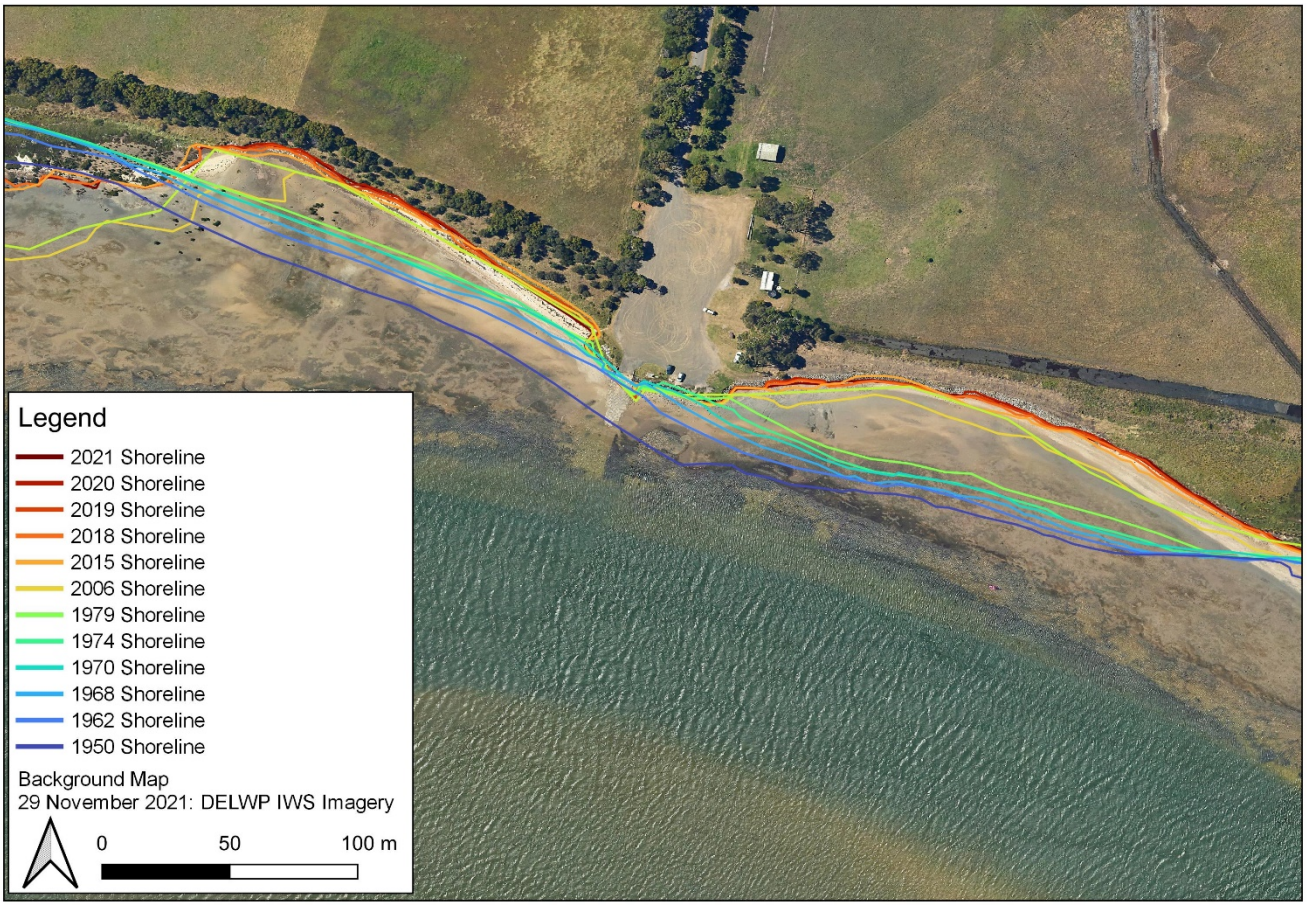

Figure 4.3 Horizontal shorelines change analysis results between 1950 and 2021

Horizontal Shoreline Change Analysis Results

The results of the shoreline change analysis are shown in Figure 4.3 are summarised below in Table 4.5.

Table 4.5 Shoreline change analysis results

Focus Area	Typical Shoreline Change (Accretion +ve and Erosion -ve) in Each Area			
	1950-1962 (Before Ramp)	1962-2006 (After Ramp Construction)	2006-2015 (After Carpark Revetment Constructed)	2015-2021 (Extension of Revetment to Present Alignment)
West Shoreline	-12m	-24m	-3	+5 (next to carpark) -4 (western end)
Ramp and Access Point	-19m	-8m	No change	No change
East Shoreline	-8m	-34m	-7	-4

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Patterns of horizontal shoreline change that were identified include the following:

- Considerable erosion (>8m) observed on both the east and west shorelines before constructed of the ramp .
- Continued erosion at a comparable rate on both the east and west shorelines after construction of access ramp.
- Approximately 8m of erosion at the Ramp and Access Point after construction of the initial boat ramp in the late 1960s.
- Continued erosion at a comparable rate on the east and west shorelines after construction of the revetment at the carpark edge.
- Erosion and accretion of similar magnitude respectively at the western end of the West Shoreline, and adjacent to the west side of the carpark during the last 7 years.
- Continued erosion past the end of the rock revetment at a similar rate to previous years since extension of the rock revetment to its current position.
- End scour was present at the end of the revetment to the east of the boat ramp in 2020, before it was extended in 2021. There is not yet end scour present east of the revetment in the 2021 image.

It is clear from the analysis that erosion was occurring at Mahers Landing before any infrastructure was constructed. After construction of the first vehicle beach access ramp in the early 60s, erosion continued both east and west of the ramp location, but much more slowly immediately shoreward of the carpark.

After construction of the rock rubble revetment between 2006 and 2015, erosion of the carpark edge ceased while erosion continued both east and west of the carpark.

As the rock revetment was extended to the east of the carpark from 2015-2021, erosion of the shoreline ceased where the revetment was implemented. East of the revetment end, unprotected areas of shoreline continued to erode with some end scour impacts adjacent to the revetment end. During this period, the shoreline west of the Mahers Landing carpark demonstrated a level of clockwise shoreline rotation with the western edge of the carpark revetment acting as a small groyne structure (Figure 4.4). This rotation, as well as the presence of end scour east of the revetment end demonstrates the predominance of south westerly wind waves in coastal process of this area.

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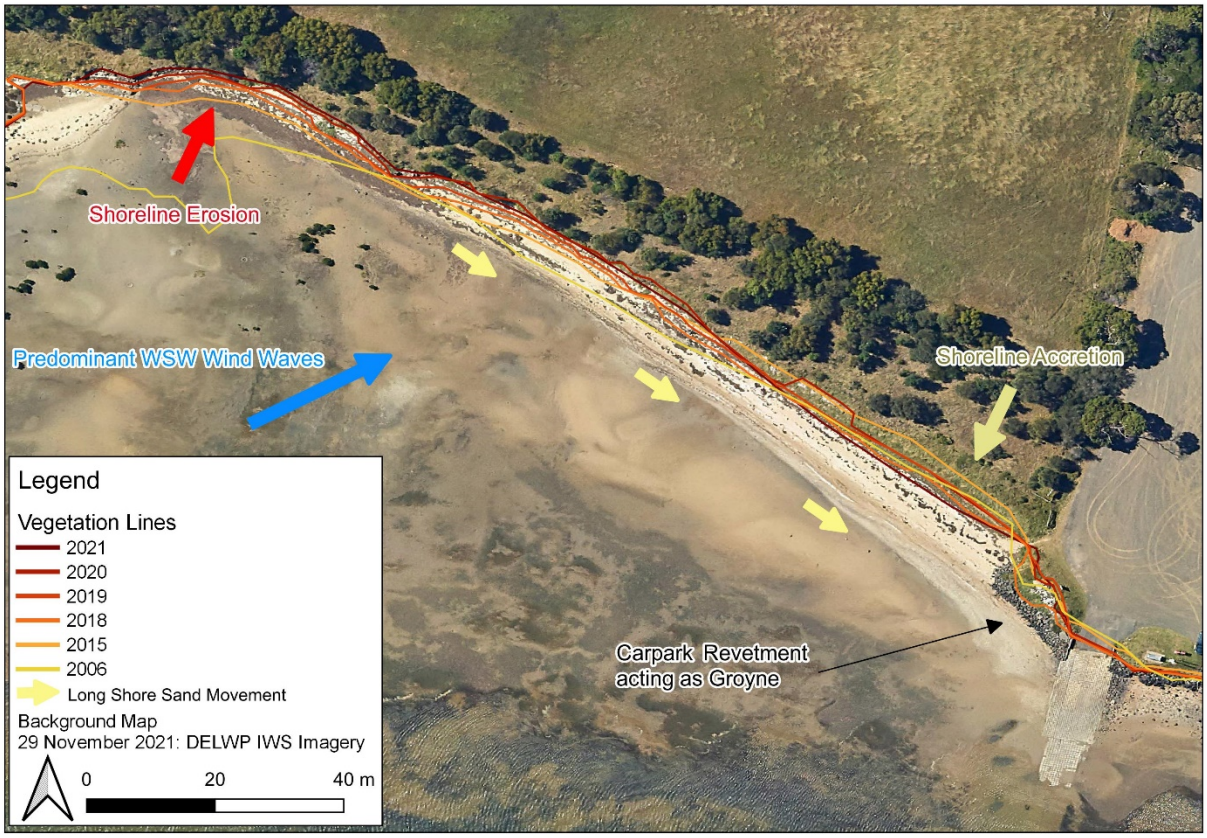

Figure 4.4 Slight shoreline rotation west of the Mahers Landing carpark between 2015 and 2021 after construction of carpark revetment

Analysis of Bathymetry Surveys

Gippsland Ports supplied DEM bathymetry data for Anderson Inlet covering the area adjacent to the Mahers Landing boat ramp from years 2012 and 2020. The bathymetry of the area was also surveyed as part of the current scope of works. Our comparative analysis of these data focused on the position and depth of the channel and sandbars along the following three cross sections:

- West Cross Section – approximately 150m west of the boat ramp
- Central Cross Section – running through the boat ramp
- East Cross Section – approximately 150m east of the boat ramp

The positions of these cross sections are shown in Figure 4.5 with a summary of the results shown in Figure 4.6 below.

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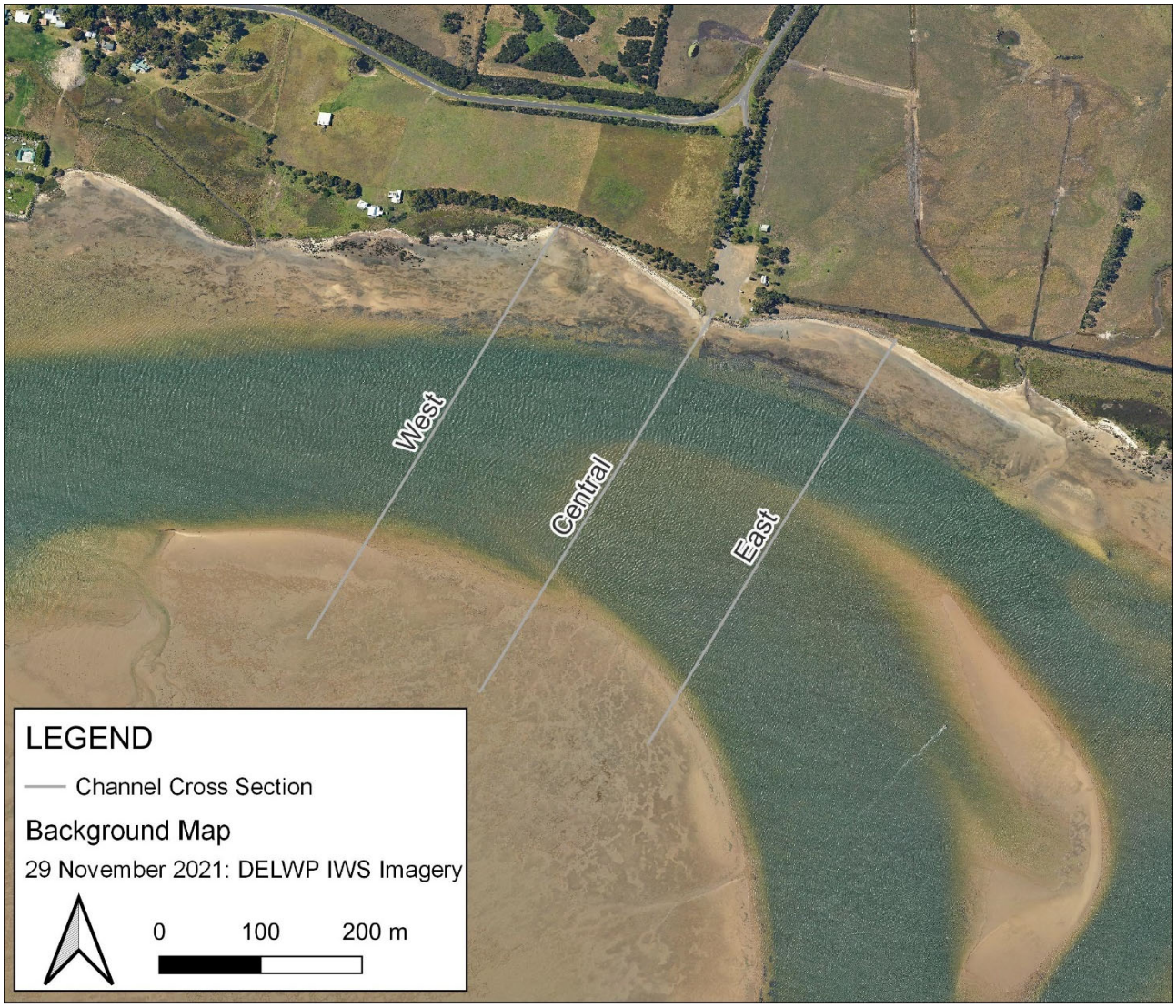

Figure 4.5 Transect locations in bathymetry analysis

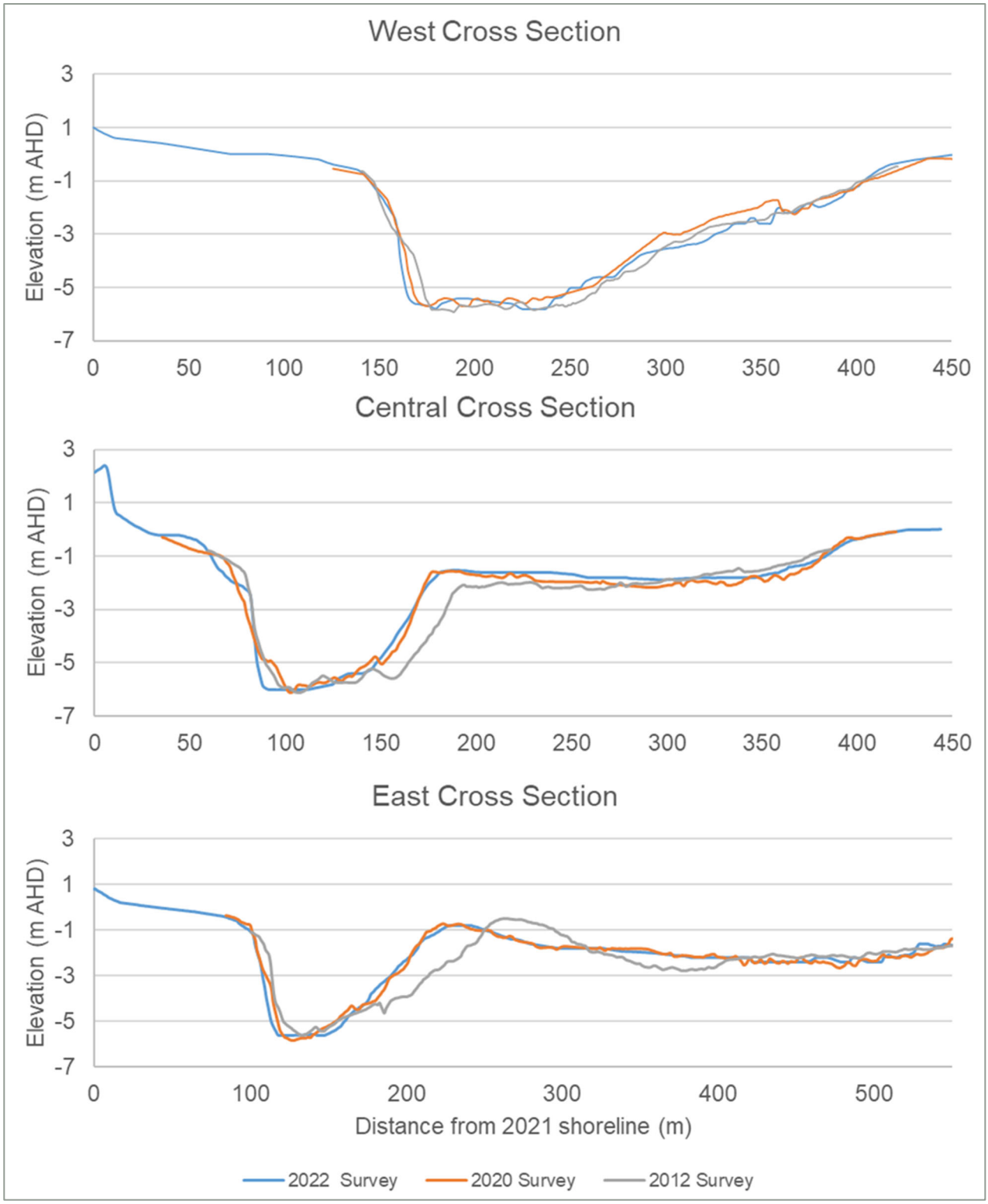

Figure 4.6 Bathymetry profiles comparison

Key results of this analysis are as follows:

- Progressive northward migration of the channel with erosion of the northern bank across all cross sections) and accretion on the southern bank (seen in east and central cross sections)
- No significant change in channel maximum depth over time

The northward migration of the main channel over time within Anderson Inlet is most likely due to fluvial erosion and accretion processes (erosion of the outer bank and accretion on the inner bank) caused by differential water flow rates across the channel. Erosion and accretion patterns identified in Figure 4.6 are consistent with fluvial processes which occur on the bend of a meandering river.

Mahers Landing boat ramp is situated at the northern tip of a horseshoe meander in the main channel (Figure 4.1). It is likely that the main channel at the tip of the horseshoe bend will continue to gradually migrate northward until a high-water flow event causes water to breach the narrow southern section of the bend and flow straight to the western side of the horseshoe. After such an event, the main channel will flow straight through the narrow section of the former horseshoe bend and the former main channel near Mahers Landing boat ramp will become a secondary channel which will slowly infill with sand.

The fluvial processes in the main channel at Mahers Landing may result in erosion around the supporting piles of any structure inside the channel. This process is a result of turbulence generated as water flows around an object that can cause erosion at the base of the object. The proposed Mahers Landing boat ramp upgrades include construction of a piled boat ramp and a new jetty out into what is currently the main channel. Water flow turbulence around the base of each pile may cause erosion and subsequent structural failure if the structure is not designed adequately. Measurement of the flow rate and the current speed within the main channel and adjacent to the study area is recommended to further investigate and characterise these processes.

4.4 Predicted Impact of the Proposed Boat Ramp Upgrade on Coastal Processes

The Mahers Landing boat ramp upgrades will include the following works in intertidal areas:

- Upgrade of the rock and rubble revetment shoreward of the carpark
- Retaining the existing ramp for launching of non-powered craft
- Construction of a new piled bridge (for access to a piled boat ramp a total of 80 offshore.
- Construction of a piled jetty/holding structure adjacent to the new ramp.

Because the proposed elevated/piled structures, the new bridge, ramp and jetty are not predicted to have any impact on coastal processes within Anderson Inlet. Upgrading the rock revetment shoreward of the existing carpark may cause the beach to the west of the boat ramp to accrete adjacent to the carpark if the revetment extends further seaward, potentially also causing further erosion of the shore further west (Figure 4.4). All potential impacts from the boat ramp upgrade works on coastal processes are considered minimal.

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5 Marine and Coastal Ecology Assessment

5.1 Description of Marine and Coastal Environment

Marine habitat within and immediately adjacent to the Mahers Landing boat ramp upgrade footprint is comprised of shallow, unvegetated sands and intertidal flats, as well as seagrass beds (GHD, 2011). Other habitat types are present more broadly in Anderson Inlet including coastal saltmarsh. The key marine environmental values known to occur at, or likely to utilise, these habitats are described in brief here.

Ecological Communities

The EPBC Protected Matters Search Tool (PMST) identified two listed threatened ecological communities possibly present within 5km of the works area as follows:

- Natural Damp Grasslands of the Victorian Coastal Plains – Critically Endangered
- Subtropical and Temperate Coastal Saltmarsh – Vulnerable

Natural Damp Grasslands of the Victorian Coastal Plains are restricted to terrestrial areas and not known to occur in close proximity to the proposed works. Subtropical and temperate Coastal Saltmarsh occur on the landward side of the coastal intertidal area and are inundated occasionally by high tides. The existing Mahers Landing boat ramp carpark area, including the toilet block and surrounding vegetation is highly modified due to land use and land modifications over time (e.g., clearing, agriculture, bund construction, revetment wall construction, weed introduction etc.). Visual inspection of the site did not identify any areas of coastal saltmarsh in close proximity to the proposed works. For further details of the terrestrial ecology present at the site, see the ecological assessment report produced by Indigenous Designs (2022). We note that although coastal saltmarsh is not present at the site of the proposed works, it is present approximately 200 m to the west where some mangroves and other saltmarsh plants are growing.

Marine Flora

In additional to coastal saltmarsh (addressed above), seagrass is the only relevant marine flora for consideration at Mahers Landing. Seagrass mapping of Anderson Inlet (Blake, Roob, & Patterson, 2000) showed two significant patches of sub-tidal seagrass near the Mahers Landing boat ramp. Subsequently the Mahers Landing Boating Action Plan (GHD, 2011) described the presence of seagrass beds immediately offshore of the existing Mahers Landing boat ramp and carpark area in the intertidal zone in 2010 (Figure 5.1).

Recent low tide visual inspection of this area in May 2022 confirmed that the seagrass observed in 2011 is still present on both sides of the existing boat ramp, however, the area of intertidal flats covered seems to have declined slightly. Given the seagrass was continuously present when investigated – 2000, 2011, 2022), the seagrass is likely permanent meadows as opposed to ephemeral. However, the size of the meadows would fluctuate over time, depending largely on local sediment dynamics. The seagrass beds at this location appear to have a moderate coverage/density of seagrass (Figure 5.3).

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Figure 5.1 Seagrass beds observed offshore of the Mahers Landing boat ramp carpark in 2010 by GHD (2011)

Figure 5.2 Seagrass beds offshore of the Mahers Landing carpark, observed in May 2022 by BMT

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Figure 5.3 Moderate coverage of seagrass within the seagrass beds at Mahers Landing (Image: BMT)

Overall seagrass coverage within Anderson Inlet is low, with initial mapping estimating seagrass coverage of approximately 2% of Anderson Inlet (Blake, Roob, & Patterson, 2000). In spite of this relatively low coverage, seagrass beds within Anderson Inlet are known to be important nursery habitat for juvenile King-George whiting, flounder and mullet, as well as other seagrass dependant species including syngnathids (seahorses, sea dragons, pipefish etc.).

Visual inspection, aerial imagery analysis and review of the EPBC PMST results showed the presence of no other marine flora in the vicinity of the Mahers Landing boat ramp.

Marine Fauna

We present here marine fauna listed on public databases for the study area, with reference to their conservation status and the likelihood of particular species actually occurring in the study area.

Listed Fauna

Listed marine fauna reported for the study area by the relevant databases are tabulated in Table 5.1. Of these fauna, Syngnathids (seahorses and related taxa) are the listed marine fauna most likely to be present in the study area. Of the syngnathids, pipefish (e.g., spotted pipefish) are the most likely to occur, since they are reasonably common inhabitants of seagrass beds. Syngnathids are listed as 'Listed Marine Species' under the EPBC Act, noting no threatened syngnathid species are reported for the study area.

The only threatened marine species reported by the EPBC Protected Matters Search Tool and possibly able to utilise habitat in the study area and immediate surrounds are the school Shark *Galeorhinus galeus* . This species is listed as Conservation Dependent under the EPBC Act.

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Other listed fauna possibly occurring in the study area from time to time (e.g., as transient visitors) include: dusky dolphin *Lagenorhynchus obscurus* and porbeagle shark *Lamna nasus*, which are both Listed Migratory Species; as well as the long-nosed fur seal *Arctocephalus forsteri* and Australian fur seal *Arctocephalus pusillus doriferus*, which are both Listed Marine Species.

Table 5.1 Listed marine fauna

Species	EPBC Listing	FFG Listing	Fisheries Act (1995)	Likelihood of Presence in Study Area
Australian grayling *Prototroctes maraena*	Listed Threatened Species – Vulnerable	Endangered	-	**Unlikely** - predominantly freshwater species
Blue warehou *Seriolella brama*	Listed Threatened Species – Conservation Dependant	Conservation Dependent	-	**Unlikely** - predominantly pelagic species
Southern bluefin tuna *Thunnus maccoyii*	Listed Threatened Species – Conservation Dependant	Conservation Dependent	-	**Unlikely** - predominantly pelagic species
Blue Whale *Balaenoptera musculus*	Listed Migratory Species - Endangered	Endangered	-	**Unlikely** - maximum depth in study area approximately 5m in confined main channel. Shallow elsewhere.
Southern right whale *Eubalaena australis*	Listed Threatened Species – Endangered	Endangered	-	**Unlikely** - maximum depth in study area approximately 5m in confined main channel. Shallow elsewhere
Loggerhead turtle *Caretta caretta*	Listed Threatened Species – Endangered	-	-	**Unlikely** - predominantly tropical and subtropical species
Green turtle *Chelonia mydas*	Listed Threatened Species – Vulnerable	-	-	**Unlikely** - predominantly tropical and subtropical species
Leatherback turtle *Dermochelys coriacea*	Listed Threatened Species – Endangered	-	-	**Unlikely** - predominantly tropical and subtropical species
Great white shark *Carcharodon carcharias*	Listed Threatened Species – Vulnerable	Endangered	Protected Aquatic Biota	**Possible** - have been seen nearby the entrance to Anderson Inlet.
School shark *Galeorhinus galeus*	Listed Threatened Species – Conservation Dependent	-	-	**Possible** - juvenile may be present, adult unlikely

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Species	EPBC Listing	FFG Listing	Fisheries Act (1995)	Likelihood of Presence in Study Area
Pygmy right whale *Caperea marginata*	Listed Migratory Species	-	-	**Unlikely** - maximum depth in study area approximately 5m in confined main channel. Shallow elsewhere.
Dusky dolphin *Lagenorhynchus obscurus*	Listed Migratory Species	-	-	**Possible**, present in other areas of the Victorian Coast (e.g., Port Phillip Bay)
Porbeagle, mackerel shark *Lamna nasus*	Listed Migratory Species	-	-	**Possible**, Present near the entrance of Anderson Inlet
Humpback whale *Megaptera novaeangliae*	Listed Migratory Species	Critically Endangered	-	**Unlikely** - maximum depth in study area approximately 5m in confined main channel. Shallow elsewhere.
Killer Whale - Orca *Orcinus orca*	Listed Migratory Species	-	-	**Unlikely** - maximum depth in study area approximately 5m in confined main channel. Shallow elsewhere.
Long-nosed fur-seal, New Zealand fur seal *Arctocephalus forsteri*	Listed Marine Species	Vulnerable	-	**Possible** - no colonies nearby but may transit through area
Australian fur-seal *Arctocephalus pusillus doriferus*	Listed Marine Species	-	-	**Possible -** no colonies nearby but may transit through area
Sygnathidae (seahorses, pipefish, pipehorses and seadragons)	Listed Marine Species	-	Protected Aquatic Biota	**Likely**, shallow seagrass and macroalgae beds are preferred habitat

Migratory and Wader Shorebirds

We present here migratory and wader shorebirds listed on public databases for the study area, with reference to their conservation status and the likelihood of particular species actually occurring in the study area.

Listed Species

The upper reaches of Anderson Inlet in the vicinity of the Mahers Landing boat ramp is a very popular destination for those wishing to see migratory and wader shorebirds. Assessment of bird species possibly present at the location during the proposed boat ramp upgrade works was performed via review the Victorian Biotope Atlas (VBA) survey records for the area through CoastKit and review of the EPBC PMST results.

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Table 5.2 summarises the EPBC and/or FFG listed migratory and wader bird species possibly present in the area. We note that many of the species are listed as both migratory and threatened. Where migratory birds are possibly present, their presence would generally occur between August and March while they over-winter (northern hemisphere winter) in Victoria.

If these birds are present within the proposed works area, they will most likely be present on intertidal flats at low tide feeding on invertebrates living beneath the sand surface.

Table 5.2 Listed migratory and wader shorebirds

Species	EPBC Listing	FFG Listing	Likelihood of Presence in Study Area
Great Egret *Ardea modesta*	-	Vulnerable	**Known to occur** – Observed at Mahers Landing
Curlew Sandpiper *Calidris ferruginea*	Listed Threatened Migratory Species – Critically Endangered	Critically Endangered	**Known to occur** – Observed at Mahers Landing (August – March)
White Bellied Sea Eagle *Haliaeetus leucogaster*	-	Endangered	**Known to occur** – Observed at Mahers Landing
Caspian Tern *Hydroprogne caspia*	-	Vulnerable	**Known to occur** – Observed at Mahers Landing
Eastern Curlew *Numenius madagascariensis*	Listed Threatened Migratory Species – Critically Endangered	Critically Endangered	**Known to occur** – Observed at Mahers Landing (August – March)
Little Egret *Egretta garzetta*	-	Endangered	**Known to occur** – Observed at Mahers Landing
Pacific Golden Plover *Pluvialis fulva*	Listed Marine Migratory Species	Vulnerable	**Known to occur** – Observed at Mahers Landing (August – March)
Lesser Sand Plover *Charadrius mongolus*	Listed Threatened Migratory Species – Endangered	Endangered	**Known to occur** – Observed at Mahers Landing (August – March)
Musk Duck *Biziura lobata*	Listed Threatened Species – Vulnerable	Vulnerable	**Known to occur** – Observed at Mahers Landing
Common Greenshank *Tringa nebularia*	Listed Marine Migratory Species	Endangered	**Known to occur** – Observed at Mahers Landing (August – March)
Whimbrel *Numenius phaeopus*	Listed Marine Migratory Species	Endangered	**Known to occur** – Observed at Mahers Landing (August – March)
Terek Sandpiper Xenus cinereus	Listed Marine Migratory Species	Endangered	**Known to occur** – Observed at Mahers Landing (August – March)

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Species	EPBC Listing	FFG Listing	Likelihood of Presence in Study Area
Red Knot *Calidris canutus*	Listed Threatened Migratory Species - Endangered	Endangered	**Known to occur** – Observed at Mahers Landing (August – March)
Bar-tailed Godwit *Limosa lapponica*	Listed Migratory Species	Vulnerable	**Known to occur** – Observed at Mahers Landing (August – March)
Australasian Shoveler *Anas rhynchotis*	-	Vulnerable	**Known to occur** – Observed at Mahers Landing
White-throated Needletail *Hirundapus caudacutus*	Listed Threatened Migratory Species - Vulnerable	Vulnerable	**Known to occur** – Observed at Mahers Landing (August – March)
Plumed Egret *Ardea intermedia plumifera*	-	Critically Endangered	**Known to occur** – Observed at Mahers Landing
Ruddy Turnstone *Arenaria interpres*	Listed Migratory Species	Endangered	**Known to occur** – Observed at Mahers Landing (August – March)
Great Knot *Calidris tenuirostris*	Listed Threatened Migratory Species – Critically Endangered	Critically Endangered	**Known to occur** – Observed at Mahers Landing (August – March)
Australasian Bittern *Botaurus poiciloptilus*	Listed Threatened Species –Endangered	Critically Endangered	**Possible** – Observed within 5km of Mahers Landing
Fairy Prion (southern) *Pachyptila turtur*	Listed Threatened Species –Vulnerable	-	**Known to occur** – Observed within 5km of Mahers Landing
Eastern Hooded Plover, Eastern Hooded Plover *Thinornis rubricollis*	Listed Threatened Species –Vulnerable	Vulnerable	**Known to occur** – Observed within Anderson Inlet
Australian Fairy Tern *Sternula nereis*	Listed Threatened Species –Vulnerable	Critically Endangered	**Known to occur** – Observed in Anderson Inlet
Grey-headed Albatross *Thalassarche chrysostoma*	Listed Threatened Migratory Species – Endangered	Endangered	**Unlikely** – Predominantly pelagic species
Australian Painted Snipe *Rostratula australis*	Listed Threatened Species –Endangered	Critically Endangered	**Unlikely** – Predominantly pelagic species
Southern Giant-Petrel, Southern Giant Petrel *Macronectes giganteus*	Listed Threatened Migratory Species – Endangered	Endangered	**Unlikely** – Predominantly pelagic species
Shy Albatross *Thalassarche cauta*	Listed Threatened Migratory Species – Endangered	Endangered	**Unlikely** – Predominantly pelagic species

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Species	EPBC Listing	FFG Listing	Likelihood of Presence in Study Area
Gould's Petrel, Australian Gould's Petrel *Pterodroma leucoptera*	Listed Threatened Species – Endangered	-	**Unlikely** – Predominantly pelagic species
Northern Royal Albatross *Diomedea sanfordi*	Listed Threatened Migratory Species – Endangered	-	**Unlikely** – Predominantly pelagic species
Black-browed Albatross *Thalassarche melanophris*	Listed Threatened Migratory Species – Vulnerable	-	**Unlikely** – Predominantly pelagic species
Sooty Albatross *Phoebetria fusca*	Listed Threatened Migratory Species – Vulnerable	Critically Endangered	**Unlikely** – Predominantly pelagic species
Northern Giant Petrel *Macronectes halli*	Listed Threatened Migratory Species – Vulnerable	Endangered	**Unlikely** – Predominantly pelagic species
Southern Royal Albatross *Diomedea epomophora*	Listed Threatened Migratory Species – Vulnerable	Critically Endangered	**Unlikely** – Predominantly pelagic species
Wandering Albatross *Diomedea exulans*	Listed Threatened Migratory Species – Vulnerable	Critically Endangered	**Unlikely** – Predominantly pelagic species
Soft-plumaged Petrel *Pterodroma mollis*	Listed Threatened Species –Vulnerable	-	**Unlikely** – Predominantly pelagic species
Blue Petrel *Halobaena caerulea*	Listed Threatened Species –Vulnerable	-	**Unlikely** – Predominantly pelagic species
Northern Buller's Albatross, Pacific Albatross *Thalassarche bulleri platei*	Listed Threatened Migratory Species – Vulnerable	-	**Unlikely** – Predominantly pelagic species
Gibson's Albatross *Diomedea antipodensis gibsoni*	Listed Threatened Migratory Species – Vulnerable	-	**Unlikely** – Predominantly pelagic species
White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) *Fregetta grallaria*	Listed Threatened Species – Vulnerable	-	**Unlikely** – Predominantly pelagic species
Buller's Albatross, Pacific Albatross *Thalassarche bulleri*	Listed Threatened Migratory Species – Vulnerable	Endangered	**Unlikely** – Predominantly pelagic species

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Species	EPBC Listing	FFG Listing	Likelihood of Presence in Study Area
Salvin's Albatross *Thalassarche salvini*	Listed Threatened Migratory Species – Vulnerable	-	**Unlikely** – Predominantly pelagic species
White-capped Albatross *Thalassarche steadi*	Listed Threatened Migratory Species – Vulnerable	-	**Unlikely** – Predominantly pelagic species
Indian Yellow-nosed Albatross *Thalassarche carteri*	Listed Threatened Migratory Species – Vulnerable	Endangered	**Unlikely** – Predominantly pelagic species
Campbell Albatross, Campbell Black-browed Albatross *Thalassarche impavida*	Listed Threatened Migratory Species – Vulnerable	-	**Unlikely** – Predominantly pelagic species
Antipodean Albatross *Diomedea antipodensis*	Listed Threatened Migratory Species – Vulnerable	-	**Unlikely** – Predominantly pelagic species
Greater Sand Plover, Large Sand Plover *Charadrius leschenaultii*	Listed Threatened Migratory Species – Vulnerable	Vulnerable	**Unlikely** – not previously seen in Anderson Inlet (August – March)

Potential Coastal Acid Sulfate Soils

According to the Victorian Resources Online (VRO) Coastal Acid sulfate soils (CASS) resource (VRO, 2021):

> *"Occur naturally along many parts of Victoria's coastal zone and, if left undisturbed, are largely benign. However, if disturbed, i.e., water drains from the soil and air enters, they can react with oxygen and produce sulfuric acid. This can be detrimental to the environment with impacts that include acidification of water and soil, de-oxygenation of water, poor water quality, dissolution of soil, rock and concrete, and corrosion of metals. Sometimes impacts can be extreme, e.g., resulting in fish kills."*

The locations of known acid sulfate soils along the Victorian Coast have been mapped in Coastkit to aid in planning for future development. Figure 5.4 demonstrates that the entire Mahers Landing precinct is mapped as having acid sulfate soil present. In line with this, excavation of any soil on the land side should be avoided where possible. If this is not possible, planned disturbance of acid sulfate soils should be managed appropriately to avoid negative impacts on the marine environment.

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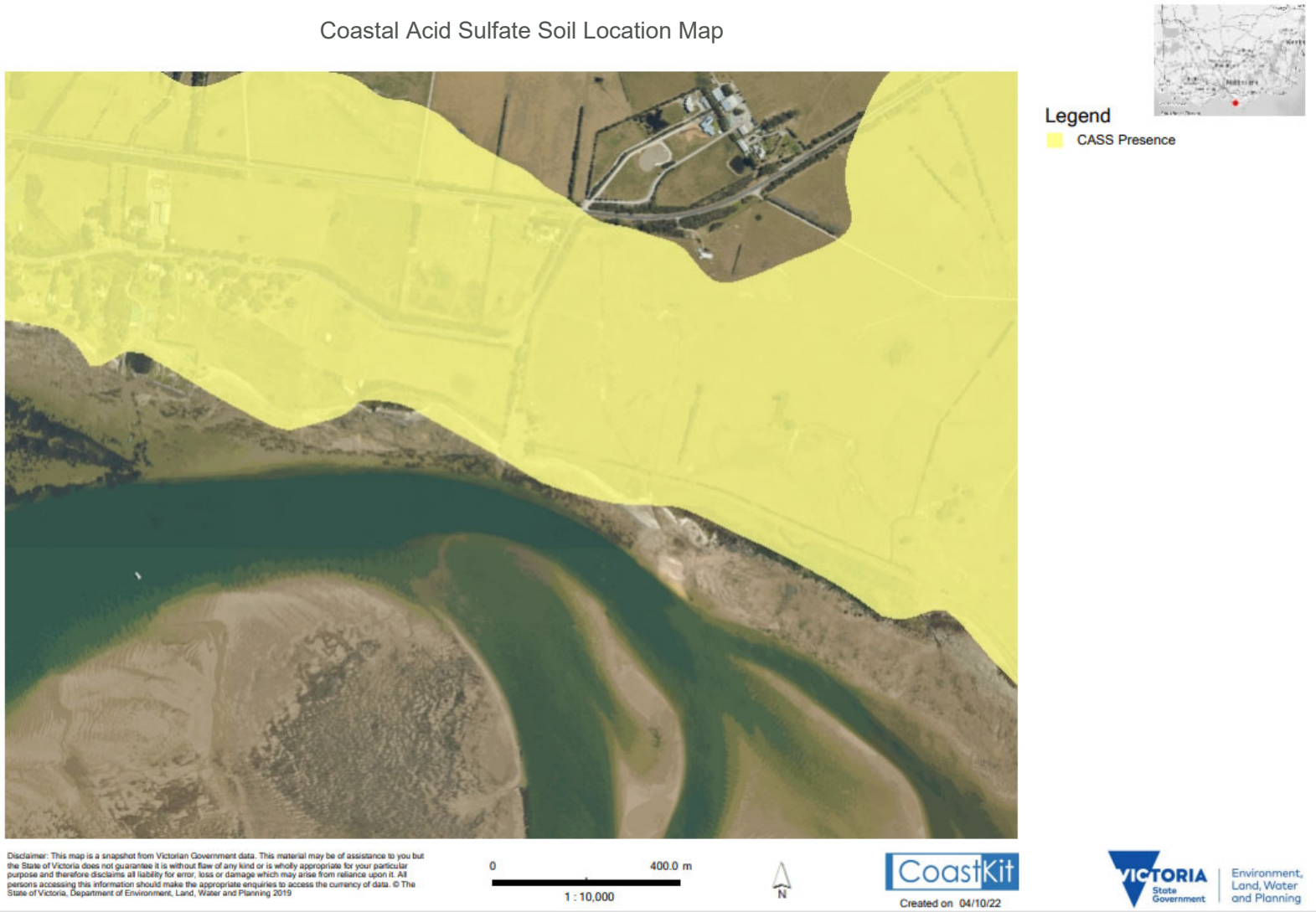

Figure 5.4 Acid sulfate soil location map (Source: Coastkit)

5.2 Predicted Impact of Boat Ramp Upgrades on Marine and Coastal Ecology

Seagrass Beds

There are permanent seagrass meadows with moderate coverage offshore of the Mahers Landing boat ramp carpark, on either side of the existing ramp. The proposed boat ramp upgrade works at Mahers Landing include construction of a large, suspended deck platform boat ramp and jetty built on piles. Once completed, the boat ramp will be used for boat launching and retrieval and the jetty will be used for boat tie up.

Potential impacts to the seagrass beds from these works include:

- Loss of seagrass underneath the proposed boat ramp and jetty from reduced light.
- Temporary disturbance during the piling process for the suspended deck boat ramp and jetty within approximately 5 m of the piling and construction works (i.e., potential sediment mobilisation causing increased turbidity).
- Ongoing disturbance to seagrass from propeller scarring in the boat tie-up zone.

Disturbance may occur within an area of approximately 1400 m^2 due to construction and operation of the boat ramp. Two percent of the seabed area in Anderson Inlet has been estimated to be covered in seagrass in previous studies (Blake, Roob, & Patterson, 2000) equating to approximately 460,000m^2 of seagrass within the inlet. The possible disturbance to the seagrass beds at Mahers Landing, therefore, may potentially impact up to 0.3% of all seagrass in Anderson Inlet.

Disturbance of the seagrass may have flow on impacts to key marine fauna included in the *Victorian Fisheries Act* 1995, including listed Syngnathids (including seahorses, pipefish and pipehorses) and juvenile King George Whiting (important fishery in Anderson Inlet) that use seagrass as habitat. However, as noted above, the seagrass disturbance is estimated to affect a very small proportion of seagrass in Anderson Inlet (99.7% unaffected), such that these faunae will still be able to utilise seagrass habitat elsewhere in Anderson Inlet if required.

Stormwater runoff from the boat ramp structure and carpark may cause contaminants such as oils and fuel to be flushed into Anderson Inlet. These fuels may impact the seagrass, animals living amongst the seagrass beds and associated substrate, and may also have flow on effects to migratory and wader shorebirds. However, given the relatively isolated nature of Mahers Landing, such inputs are expected to be minor compared with that sourced from Inverloch and elsewhere in the Anderson Inlet and Tarwin River catchments. A risk assessment for different boat ramp upgrade scenarios regarding runoff capture has been undertaken in Annex A. This demonstrates that the risk profile of the existing ramp may be maintained if appropriate control measures are utilised (e.g., signage detailing that bilge water removal should occur in the carpark, not on the bridge or ramp).

Migratory and Wader Birds

Migratory and wader birds predominantly use the intertidal flats at Mahers Landing to forage for infauna living in the seabed. During high tides, they roost mainly in saltmarsh habitat present on some shores of Anderson Inlet.

The proposed works are designed to have minimal impact on both local coastal processes and the seabed, with both the boat ramp and jetty elevated on piles. The piles themselves will have some minimal impact to the seabed where they are inserted, but such a design will allow natural movement of sand around the structure and will allow migratory and wader birds access to the seabed area underneath the structure at low tides for foraging.

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Birds are likely to temporarily avoid the study area during construction due to noise (e.g., piling and other noisy construction activities) and the presence of contractors and vehicles. During this time, any birds temporarily displaced from the study area would be expected to utilise comparable habitat elsewhere in Anderson Inlet as an alternative.

Increased use of the facility may also have impacts to migratory and wader birds via increased noise, increased presence of humans/vehicles/vessels, increased light pollution, and potential stormwater runoff from the structure. Increased disturbance may limit the time birds spend foraging for food. Migratory birds overwintering in Anderson Inlet use this foraging time to build important fat reserves for their flight back to the northern hemisphere. If they do not forage enough during Australian summer months, they may not make it their northern hemisphere breeding grounds having dire consequences for bird populations.

Stormwater runoff from the boat ramp structure and carpark may cause contaminants such as oils and fuel to be flushed into Anderson Inlet, impacting not only migratory and wader birds but also other marine flora and fauna.

Coastal Acid Sulfate Soil

The entire Mahers Landing precinct is mapped as having potential acid sulfate soil present (Figure 5.4). If these soils are disturbed and exposed to the air (i.e., oxidised), they become highly acidic. Negative marine environmental impacts could occur if runoff (e.g., rain water) from acidic soils is allowed to enter into Anderson Inlet. Should exposure of acid sulfate soils be unavoidable during construction, then appropriate management measures should be in place to ensure acid runoff does not enter Anderson Inlet.

Terrestrial Ecology

The impacts of the proposed works on the terrestrial ecology at Mahers Landing has been assessed by Indigenous Designs (2022) which is reported as a separate document.

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6 Impact Summary and Recommendations

The possible impacts of the proposed Mahers Landing boat ramp upgrade works are summarised in Table 6.1 below. Key risks for consideration by BBV relate to the presence of seagrass beds within the direct footprint of the suspended deck boat ramp and jetty structures, as well as the likely presence of migratory waders (including threatened bird species) if construction were to occur during their time in Australia (typically August-March).

Table 6.1 Summary of impacts

Impact Categories	Impact	Risk Rating
Wave Climate	• No impact to wave climate in Anderson Inlet predicted	Low Risk
Shoreline Change	• No impact to shorelines in Anderson Inlet predicted	Low Risk
Seabed	• Minimal impact on the seabed where piles are inserted	Low Risk
Migratory and Wader Shorebirds	• Temporary local displacement of migratory waders and shorebirds (including threatened species) during noisy construction activities (e.g., piling). Birds expected to utilise habitat elsewhere in Anderson Inlet in interim. • Possible increased disturbance to birds from increased use of the facility (e.g., noise and light pollution during the night) • Polluted runoff (e.g., from oils and fuel) from the boat ramp and carpark may impact invertebrates living in the seabed with flow on effects to shorebirds.	Moderate Risk
Seagrass Beds	• May impact up to 1400 m^2 of ephemeral seagrass beds (~0.3% of seagrass in Anderson Inlet area) if seagrass is present in direct footprint during construction • Polluted runoff (e.g., from oils and fuel) from the boat ramp and carpark may impact seagrass beds	Moderate Risk
Syngnathidae Species	• May impact up to 1400 m^2 of Syngnathidae habitat (ephemeral seagrass beds). Beds at Mahers Landing have low density of seagrass, so lower likelihood of impact to syngnathids • Polluted runoff (e.g., from oils and fuel) from the boat ramp and carpark may impact syngnathids living in the seagrass beds	Low Risk
Intertidal Infauna Invertebrates	• Likely minimal impact on intertidal infauna • Negligible flow on effects to broader values linked to intertidal invertebrates (i.e., migratory birds) • Polluted runoff (e.g., from oils and fuel) from the boat ramp and carpark may impact invertebrates living in the seabed. This may have flow on effects to migratory and wader shorebirds.	Low Risk
Coastal Acid Sulfate Soil	• If acid sulfate soils are exposed to oxygen and are then allowed to enter Anderson Inlet (i.e., via rain erosion of soil), marine flora and fauna may be killed by the highly acidic nature of the soil.	Low Risk

The timing of construction works should consider avoiding the overwintering period for migratory waders. Noise control measures are also recommended for piling activities (e.g., soft start / ramp up of piling).

Although there is some risk of disturbing seagrass habitat, the area is approximately equivalent to 0.3% of seagrass in Anderson Inlet. Considering these factors, we consider the proposed works as low risk of having significant impact on the environmental values of Mahers Landing and Anderson Inlet as a whole.

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Water runoff from the boat ramp, bridge and carpark areas may impact the marine environment if not managed effectively. We recommend stormwater be collected from the carpark areas and discharged into onshore sand trap infiltration swales. These could be planted with appropriate vegetation to slow water flow rates and increase infiltration of potentially contaminated water. We also recommend that control measures including signage be implemented to ensure boat bilge water is not emptied while boats are on the ramp/bridge structure. See Annex A for a risk assessment of various possible designs of the stormwater collection system from the boat ramp structure noting that with appropriate control measures, the existing risk profile will be maintained for the facility in terms of intertidal pollution.

Excavation of the land-side areas should be avoided, if possible, to ensure potential acid sulfate soils are not exposed. Where excavations are unavoidable, appropriate acid sulfate soil measures should be in place (e.g., testing and liming) to ensure acidic runoff does not enter Anderson Inlet.

Light pollution of the area could be minimised by incorporating downward directed sensor lights which only turn on with movement nearby and turn off quickly afterwards.

If appropriate stormwater retention from the boat ramp and the potential presence of acid sulfate soils are addressed in the boat ramp upgrade designs as per our recommendations, we conclude there is low risk of any negative impacts to local coastal processes and the marine environment from the boat ramp upgrade works.

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Annex A Boat Ramp Structure Stormwater Collection Risk Assessment

This assessment was undertaken to better understand the risk surrounding boat ramp related pollutants including fuel and oil entering the intertidal zone from the bridge and boat ramp structures during boat ramp operations.

The risk assessment looked at two possible risk events as follows:

Risk Event (RE) 1 - A spill of between 1 and 10 litres oil or fuel occurs on the boat ramp / bridge

Risk Event (RE) 2 - Frequent chronic spilling of small volumes of oil/fuel when bilge water is released from boats immediately after boat retrieval

Five risk scenarios were assessed including the existing base-case scenario and four potential options for risk mitigation. We note that each option for runoff capture from the bridge and boat ramp structure would be very costly and would likely require regular maintenance.

As presently designed, scenario 5 does not capture any potentially contaminated runoff before it reaches intertidal areas, leading to an increased risk rating compared to the existing case. However, the use of interpretive signage control measures to inform boaters of the risks posed to the sensitive intertidal habitat by fuel/oil in bilge water would lower the likelihood of occurrence from Almost Certain to Likely. This subsequently lowers the risk rating to Significant, maintaining the existing risk profile of the facility.

We thus suggest that detailed design of the facility should include interpretive signage detailing (a) the risks posed to intertidal flora and fauna from contamination, and (b) best practise bilge water removal to minimise harm.

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A11698: Mahers Landing Boat Ramp Upgrade Drainage Risk Assessment

Author Taylor Rubinstein
Date 22/11/2022
Project A11698: Bass Coast Boat Ramps Upgrades Detail Designs

Number	Scenario
1	Base case existing scenario with no upgrade of ramp
2	Ramp upgrade as per concept design with all runoff captured and drianing back towards land and funnelled into the proposed sand trap infiltration swales for the carpark
3	Ramp upgrade as per concept design with all runoff captured and drianing back towards land and funnelled into a dedicated sand trap infiltration swale for the bridge/ramp
4	Ramp upgrade as per concept design with all runoff captured and draining forward and into the waterway, avoiding the intertidal zone
5	Ramp upgrade as per concept design with no capture of runoff, all runoff allowed to flow over the side of the bridge/ramp into Anderson Inlet

	Description	Likelihood
Risk Event 1	A spill of between 1 and 10 litres oil or fuel occurs on the boat ramp / bridge	Possible
Risk Event 2	Frequent spills of small volumes of oil/fuel when bungs are released from boats immediately after boat retrieval	Almost Certain

Likelihood	Consequence: Negligible	Minor	Moderate	Major	Extreme
Almost certain MHWS	Medium	Significant	High	High	High
Likely 10% AEP	Medium	Medium	Significant	High	High
Possible 1% AEP	Low	Medium	Medium	Significant	High
Rare 0.2% AEP	Low	Low	Low	Medium	Significant

Consequence	Example consequence categories/themes: Traditional Owner / biocultural landscape values	Environmental values	Social values	Infrastructure and services	Other (e.g. public safety, tourism)
Extreme	Permeant adverse impact/loss of values* Recovery unlikely.			Damage and loss > $X M Recovery > X years	
Major	Major adverse impact on values* Recovery may take many years.			Damage and loss > $X M Recovery > X years	
Moderate	Moderate adverse impact on values* Recovery may take 1-2 years.			Damage and loss > $X M Recovery > X years	
Minor	Minor adverse impact on values* Recovery feasible within less than 1 year.			Damage and loss > $X M Recovery > X years	
Negligible	Negligible impact on values*			Damage and loss > $X M Recovery > X years	

** Detail for these should be defined with project partners and incorporate Stage 2 values and objectives.*

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Scenario 1 - Base case existing scenario with no upgrade of ramp

Consequences

Consequences		Criteria				
			Potential Environmental Impact	Relative Cost	Ongoing Maintenance	General Commentary/Notes
	RE1	Extreme				Spilled fuel would infiltrate into carpark surface or towards the grassed SE corner. There is no flow path for fuel spilt in the carpark to reach Anderson Inlet. If fuel was spilt on the ramp itself, fuel would reach the intertidal zone but there is a low likelihood of this occuring as most manouvering of CTUs, rigging and de-rigging presently occurs in the carpark
		Major				
		Moderate				
		Minor	✓			
		Negligable		✓	✓	
	RE2	Extreme				Chronic spilling of low volumes of fuel/oil from people releasing the bungs from their boats after boat retrieval would most likely occur in the carpark under present conditions rather than on the ramp. As such, spills of this kind would have minor environmental consequences under present conditions and would not reach the intertidal zone.
		Major				
		Moderate				
		Minor				
		Negligable	✓	✓	✓	

Risk

Likelihood	Consequences					
		Negligable	Minor	Moderate	Major	Extreme
	Almost Certain	Medium	Significant	High	High	High
	Likely	Medium	Medium	Significant	High	High
	Possible	Low	Medium	Medium	Significant	High
	Rare	Low	Low	Low	Medium	Significant

	Calculation	Risk
RE1	Minor x Possible	Medium
RE2	Minor x Almost Certain	Significant

CONFI

Likelihood	Consequence				
	Negligible	Minor	Moderate	Major	Extreme
Almost certain MHWS	Medium	Significant	High	High	High
Likely 10% AEP	Medium	Medium	Significant	High	High
Possible 1% AEP	Low	Medium	Medium	Significant	High
Rare 0.2% AEP	Low	Low	Low	Medium	Significant

Scenario 2 - Ramp upgrade, drainage back to infiltration swale shared with carpark

Consequences

		Criteria			
		Potential Environmental Impact	Relative Cost	Ongoing Maintenance	General Commentary/Notes
Consequences	RE1				
	Extreme				If all runoff from the upgraded boat ramp and bridge is captured and directed back to sand trap infiltration swales on the land, no spill that occurred on the bridge would enter anderson inlet. We note that the sand trap infiltration swales should be designed for a certain design storm event to ensure that they do not overflow and allow contamination to escape to the watercourse. High cost asspciated with this option and maitnenace of the drainage pipe under the boat ramp and bridge may be required.
	Major		✓		
	Moderate			✓	
	Minor				
	Negligable	✓			
	RE2				
	Extreme				Chronic minor spills fo oil/fuel from people releasing the bungs on their bot after retrieval would most likley occur either at the top of the ramp or on the bridge. If it occurs on the ramp, spilled fuel/oil would drain down the face of the ramp and into the main channel at Anderson Inlet, but would avoid the sensitive intertidal area. This risk is present at most boat ramps.
	Major		✓		
	Moderate			✓	
	Minor				
	Negligable	✓			

Risk

		Consequences				
		Negligible	Minor	Moderate	Major	Extreme
Likelihood	Almost Certain	Medium	Significant	High	High	High
	Likely	Medium	Medium	Significant	High	High
	Possible	Low	Medium	Medium	Significant	High
	Rare	Low	Low	Low	Medium	Significant

	Calculation	Risk
RE1	Negligible x Possible	Low
RE2	Negligible x Almost Certain	Medium

** Assuming that a single sand trap retention swale can be designed with sufficient volume to take water from both the carpark and ramp/bridge without overflowing

CONFI

		Consequence				
		Negligible	Minor	Moderate	Major	Extreme
Likelihood	Almost certain MHWS	Medium	Significant	High	High	High
	Likely 10% AEP	Medium	Medium	Significant	High	High
	Possible 1% AEP	Low	Medium	Medium	Significant	High
	Rare 0.2% AEP	Low	Low	Low	Medium	Significant

Scenario 3 - Ramp upgrade, drainage back to dedicated infiltration swale

Consequences

		Criteria			
		Potential Environmental Impact	Relative Cost	Ongoing Maintenance	General Commentary/Notes
Consequences	RE1				
	Extreme				If all runoff from the upgraded boat ramp and bridge is captured and directed back to sand trap infiltration swales on the land, no spill that occurred on the bridge would enter anderson inlet. We note that if a shared retention swale can be designed with adequate volume, there is no net benefit to having a dedicated swale for bridge/ramp runoff. High cost associated with this option and maitnenace of the drainage pipe under the boat ramp and bridge may be required.
	Major		✓		
	Moderate			✓	
	Minor				
	Negligable	✓			
	RE2				
	Extreme				Chronic minor spills fo oil/fuel from people releasing the bungs on their bot after retrieval would most likley occur either at the top of the ramp or on the bridge. If it occurs on the ramp, spilled fuel/oil would drain down the face of the ramp and into the main channel at Anderson Inlet, but would avoid the sensitive intertidal area. This risk is present at most boat ramps.
	Major		✓		
	Moderate			✓	
	Minor				
	Negligable	✓			

Risk

		Consequences				
		Negligible	Minor	Moderate	Major	Extreme
Likelihood	Almost Certain	Medium	Significant	High	High	High
	Likely	Medium	Medium	Significant	High	High
	Possible	Low	Medium	Medium	Significant	High
	Rare	Low	Low	Low	Medium	Significant

	Calculation	Risk
RE1	Negligible x Possible	Low
RE2	Negligible x Almost Certain	Medium

CONFI

		Consequence				
		Negligible	Minor	Moderate	Major	Extreme
Likelihood	Almost certain MHWS	Medium	Significant	High	High	High
	Likely 10% AEP	Medium	Medium	Significant	High	High
	Possible 1% AEP	Low	Medium	Medium	Significant	High
	Rare 0.2% AEP	Low	Low	Low	Medium	Significant

Scenario 4 - Ramp upgrade, drainage forward to waterway avoiding intertidal zone

Consequences

		Criteria			
		Potential Human/Environmental Impact	Relative Cost	Ongoing Maintenance	General Commentary/Notes
Consequences	RE1				
	Extreme				A single spill of up to 10L of fuel would drain down the ramp and into the main channel at Andertson Inlet. The fuel/oil would likley form a small slick on the water surface and would be carried out to sea relatively quickly where it would likley be quickly dispersed in the wave impact zone on sandbars at the entrance to the Inlet. It is possible that the slick may impact people at popular swimming areas in Anderson Inlet near the Inverloch boat ramp and the entrance before being fully dispersed. Less maintenance required than piping back to infiltration swale on land
	Major				
	Moderate		✓		
	Minor	✓		✓	
	Negligable				
	RE2				
	Extreme				Small volumes of oil and fuel would quickly be dispersed in the main channel of Anderson Inlet and would not likely impact any sensitive receptors
	Major				
	Moderate		✓		
	Minor			✓	
	Negligable	✓			

Risk

		Consequences				
		Negligable	Minor	Moderate	Major	Extreme
Likelihood	Almost Certain	Medium	Significant	High	High	High
	Likely	Medium	Medium	Significant	High	High
	Possible	Low	Medium	Medium	Significant	High
	Rare	Low	Low	Low	Medium	Significant

	Calculation	Risk
RE1	Minor x Possible	Medium
RE2	Negligable x Almost Certain	Medium

CONFI

		Consequence				
		Negligible	Minor	Moderate	Major	Extreme
Likelihood	Almost certain MHWS	Medium	Significant	High	High	High
	Likely 10% AEP	Medium	Medium	Significant	High	High
	Possible 1% AEP	Low	Medium	Medium	Significant	High
	Rare 0.2% AEP	Low	Low	Low	Medium	Significant

Scenario 5 - Ramp upgrade, no drainage capture, all runoff allowed to drain off the side of the bridge onto intertidal flats

Consequences

		Criteria			
		Potential Human/Environmental Impact	Relative Cost	Ongoing Maintenance	General Commentary/Notes
Consequences	RE1				
	Extreme				A once off spill of up to 10L of fuel on the bridge would drain onto the intertidal flats and possibly contaminate an area of sediment and infauna. Internationally protected migratory and wading shorebirds frequent the site during low tides to forage for infauna as their primary food source. This could lead to acute contamination and death of a small number of birds in the short term. It is unlikley there would be any long-term impacts to birds from a once-off spill in the area.
	Major				
	Moderate	✓			
	Minor		✓	✓	
	Negligable				
	RE2				
	Extreme				Chronic spills of small volumes of fuel/oil when people release bungs after retrieving their boats would occur very often. If this occurs on the bridge, the fuel/oil would frain off the sides of the bridge onto intertidal flats. Over time, this could lead to contaminatino of a relatively large area of sediments around the boat ramp/bridge structure. This could have considerable flow on effects for local infauna and migratory and wader shorebirds that frequent the area to forgae for infauna food. It is possible over time that a significant number of birds could be impacted.
	Major	✓			
	Moderate				
	Minor		✓	✓	
	Negligable				

Risk

		Consequences				
		Negligable	Minor	Moderate	Major	Extreme
Likelihood	Almost Certain	Medium	Significant	High	High	High
	Likely	Medium	Medium	Significant	High	High
	Possible	Low	Medium	Medium	Significant	High
	Rare	Low	Low	Low	Medium	Significant

	Calculation	Risk
RE1	Moderate x Possible	Medium
RE2	Moderate x Almost Certain	High**

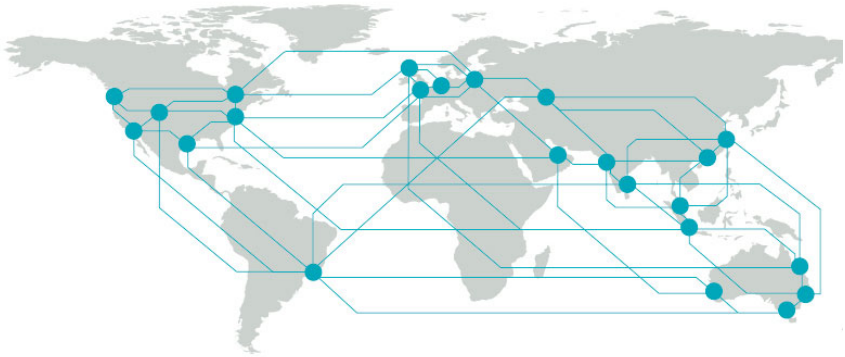
** If appropriate control measures are put in place including signage detailing that bilge water should not be removed from boats while on the bridge or ramp, the likelihood of occurence of RE2 would decrease to Likely and the overall risk would decrease to Significant, maintaining the existing risk profile (See Scenario 1)

CONFI

		Consequence				
		Negligible	Minor	Moderate	Major	Extreme
Likelihood	Almost certain MHWS	Medium	Significant	High	High	High
	Likely 10% AEP	Medium	Medium	Significant	High	High
	Possible 1% AEP	Low	Medium	Medium	Significant	High
	Rare 0.2% AEP	Low	Low	Low	Medium	Significant

Number	Scenario	Event	Risk
1	Base case existing scenario with no upgrade of ramp	Moderate volume once off spill	Medium
		Chronic small volume spill	Significant
2	Ramp upgrade as per concept design with all runoff captured and drianing back towards land and funnelled into the proposed sand trap infiltration swales for the carpark	Moderate volume once off spill	Low
		Chronic small volume spill	Medium
3	Ramp upgrade as per concept design with all runoff captured and drianing back towards land and funnelled into a dedicated sand trap infiltration swale for the bridge/ramp	Moderate volume once off spill	Low
		Chronic small volume spill	Medium
4	Ramp upgrade as per concept design with all runoff captured and draining forward and into the waterway, avoiding the intertidal zone	Moderate volume once off spill	Medium
		Chronic small volume spill	Medium
5	Ramp upgrade as per concept design with no capture of runoff, all runoff allowed to flow over the side of the bridge/ramp into Anderson Inlet	Moderate volume once off spill	Medium
		Chronic small volume spill	High**

** Could decrease to Significant with appropriate control measures



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Report for BMT

Ecological Assessment of Mahers Landing Boat Ramp

December 2022

Tim Bowler

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Disclaimer

ID Ecological Management and any associated contractors engaged for this project have endeavoured to provide an accurate and current document. However, this document is not guaranteed to be without flaw or omissions. The information and recommendations provided are current at the time of writing but do not account for any changes in circumstances after the time of publication. Indigenous Design Environmental Management accepts no liability for any error, loss or other consequence caused or arising from using the information provided within this report.

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Executive Summary

Project Description

Indigenous Design Environmental Management has been commissioned by BMT to undertake an assessment of native vegetation and biodiversity values in relation to the proposed Mahers Landing Boat Ramp project.

The proposed works involve native vegetation removal relating to an upgrade to the car park, that includes the installation of designated parking bays, and the construction of a new toilet block and new boat ramp at Mahers Landing, Inverloch. Assessment of all native vegetation within the study area was completed by Indigenous Design on the 6th and 20th October, 2022.

Study Area- Ecological Values

Vegetation present within the study area is comprised of planted indigenous and non-indigenous native trees in the north-east of the site, and remnant vegetation, including mature canopy trees, in the south-east, west and north of the study area.

No threatened fauna species were identified within the study area during the site survey. A likelihood assessment determined that all but two threatened fauna species identified in the database searches had a low or unlikely likelihood of occurring within or be reliant on any of the habitats within the study area. White-bellied Sea Eagle and Little Eagle were deemed to have a moderate likelihood of occurrence, based on roosting potential in the remnant Gippsland Manna Gums on the east and west of the study area.

The likelihood assessment determined that all threatened flora species identified in the database searches were had an unlikely or low likelihood of occurring within the study area.

Based on the extent of the project's vegetation and habitat removal under final designs, no additional surveys are recommended in relation to the site's biodiversity values. This recommendation assumes that all construction works are contained within the designated 'limits of works' and that No-go zones are established and maintained. However, it is recommended that a suitably qualified wildlife expert / zoologist with appropriate DELWP authorisations be present during removal of native vegetation to observe and salvage any fauna if found.

Avoid/Minimise Principles

The concept design has been developed attempting to balance the requirement of car and trailer unit parking / traffic flow and native vegetation removal. The available space has been used almost in its entirety and there are no feasible opportunities to further avoid removal or minimise impacts to native vegetation without compromising the proposal and its objectives.

Whilst almost all vegetation is either to be directly removed or is indirectly lost due to Tree Protection Zone impacts, where possible construction will prioritise retaining trees and shrubs. This primarily includes:

- Tree ID numbers 1, 2 and 33 along the western edge and number 36 along the eastern edge of the construction area, with designs for the swale drain in this area to allow for tree retention; and
- Tree ID number 12, 17 & 18 in the north east corner of the site , which has TPZ impacts from the proposed footpath. There is an opportunity for the pavement edge and walking path to be realigned immediately north of the disabled carpark in the vicinity of trees 12, 17 and 18 such that these trees may be retained. This possibility should be explored in the detailed design phase of works.

A native patch loss total of 0.266 hectares and 3 Large Old Trees are deemed lost under the Detailed Design Drawings.

Offset Requirements

A clearing shapefile outlining the extent of native vegetation deemed lost under the final design, was submitted to the DELWP's native vegetation support, who processed and provided a Native Vegetation Removal (NVR) report. The NVR identified the following offset requirements that apply to the proposal:

- 'Intermediate Assessment Pathway';
- Offset requirements are 0.061 General Habitat Units (GHUs) with a minimum strategic biodiversity score of 0.351 and 3 large tree;
- No specific offsets apply; and
- Offsets must be located within the West Gippsland Catchment Management Authority (CMA) boundary or within the Bass Coast Shire Council municipality.

Legislation/Policy Implications

Legislation and Policy	Relevant Ecological Feature on Site	Report/Approval required
Environment Protection and Biodiversity Conservation (EPBC) Act 1999	No threatened flora or fauna species or communities, listed under the EPBC Act, were identified on site. One fauna species, White bellied Sea -Eagle was determined to have a moderate likelihood of occurrence. However due to the small size of the project's footprint, absence of nests and the presence of canopy trees adjacent to and in the wider area, the project is not expected to significantly impact on any Matters of National Environmental Significance (MNES).	No further consideration required.
State – Flora and Fauna Guarantee Act 1988	Two fauna species, White-bellied Sea-eagle and Little Eagle were determined to have a moderate likelihood of occurrence. However due to the small size of the project's footprint and the presence of canopy trees adjacent to and in the wider area, the	No further consideration required.

Legislation and Policy	Relevant Ecological Feature on Site	Report/Approval required
	project is not expected to adversely impact these species. No protected flora species require removal on public land.	
Planning and Environment Act 1987	0.266 ha of native vegetation to be cleared (including overlaps), 3 large size class trees to be removed or deemed lost.	Under Clause 52.17 of the Bass Coast Planning Scheme, a planning permit is required to clear or disturb native vegetation within the study area. A Planning Permit will be required under the three overlays (LSIO, ESO5 and SLO5) that apply to the project, with no exemptions that are able to be applied to the works. In applying Victoria's Native Vegetation Permitted Clearing regulations the proposal falls under the 'intermediate assessment pathway. Offset requirements amount to 0.061 General Habitat Units with a Strategic Biodiversity Score of 0.351 and 3 Large Trees.
Catchment and Land Protection Act 1994	The following noxious weeds were present on the site: - *Allium triquetrum* (Angled Onion) (Restricted); - *Cirsium vulgare* (Spear Thistle) (Regionally Controlled); - *Lycium ferocissimum* (Boxthorn) (Regionally Controlled); - *Oxalis pes-caprae* (Soursob) (Restricted)	The contractor must comply with the requirements of the Act to control/eradicate and avoid spreading these weeds onsite or to other areas.
Environmental Effects Act 1978	No native vegetation with a Bioregional Conservation Status of Endangered is assessed as lost under the finalised designs.	No further consideration required.
State Wildlife Act 1979	8 small size class trees and 3 large size class tree within patches to be removed or deemed lost.	Persons engaged to remove, salvage, hold or relocate any native fauna must have a permit or approval issued by the DELWP.
Water Act 1989	No waterways are found within or immediately adjacent to the study area.	Provided the appropriate impact minimisation measures, outlined in *Section 5.1.2*, are implemented during construction no impact to natural banksides, bankside vegetation or natural waterway flows are expected.

1 Introduction

1.1 Project Background

ID Ecological Management has been commissioned by BMT to undertake an assessment of native vegetation and biodiversity values in relation to the proposed Mahers Landing Boat Ramp upgrade by Better Boating Victoria.

The upgrade will include moving the current toilet block northwards, and asphalting the car park, as well as installing designated parking bays, and constructing a new boat ramp in the south-east of the study area (*Figure 1*). Assessment of all native vegetation within the study area was completed by Indigenous Design on the 6th of October and 20th October 2022.

1.2 Objectives

The objectives of this assessment include:

- Undertake database searches and existing literature analysis to identify the presence or potential presence of significant species or habitat;
- Completion of field assessments of all vegetation and habitat within the 'study area'. Field assessment to include:
  - Recording the GPS location (to <1 metre accuracy where possible) and extent of all native vegetation patches within the assessment corridor;
  - Assign all native patches into habitat zones and undertake habitat hectare assessments in line with approved Vegetation Quality Assessment methods;
  - Recording the GPS location (to <1 metre accuracy where possible) of all trees within and immediately adjacent to the assessment corridor. Tree data recorded to include species, Diameter at Breast Height (DBH), any significant habitat features and noting if likely to have been planted; and
  - Recording the GPS location and/or extent (to <1 metre accuracy) of any threatened species or ecological communities.
- Preparation of an Ecological Assessment report that includes:
  - Description of the ecological values of the site;
  - Identification of any permits or approvals that may be required under the following environmental related legislation:
    - Environment Protection and Biodiversity Conservation Act 1999;
    - Flora and Fauna Guarantee Act 1988;
    - Catchment and Land Protection Act 1994;
    - Water Act 1989;
    - Planning and Environment Act 1987;
    - Wildlife Act 1975; and
    - Environment Effects Act 1978.
- Undertake an assessment of the likelihood of presence of any threatened species;

- Identify mitigation measures regarding any Matters of National Environmental Significance (MNES);
- Provide any recommendations for further actions such as targeted surveys or the like; and
- Provision of all GIS data and high quality maps to BMT Global that detail the location and extent of all ecological features and extent of impacts under final designs.

1.3 Study Area

BMT advised that the assessment area should be defined to include the current car park area at Mahers Landing, with the north and west boundaries being defined by property boundaries, the south boundary being the current gravelled area, and the east side being the fenceline.

The study area (*Figure 1*) is located approximately 7km east of the centre of the Inverloch township, approximately 145km south-east of Melbourne and is within the Gippsland Plain Bioregion.

Land surrounding Mahers Landing has been predominantly cleared for agriculture with scattered remnants of native vegetation remaining along some roadsides and waterways. Vegetation present within the study area is comprised of planted indigenous and non-indigenous native trees in the north-east of the site, and remnant vegetation, including mature canopy trees, in the south-east, west and north of the study area.

The site is subject to the following planning provisions:

Clauses

Clause 52.17 - Native Vegetation

Planning Zones

Farming Zone (FZ)

Planning Overlays

Environmental Significance Overlay – Schedule 1 (ESO1)
Land Subject to Inundation Overlay – Schedule (LSIO)
Significant Landscape Overlay – Schedule 5 (SLO5)
(DELWP, 2022)

Additional Encumbrances

The study area within an area marked as ‘aboriginal cultural heritage sensitivity’.

Any potential impacts of the proposal in relation to this matter must be considered under the Aboriginal Cultural Heritage Act 2006 (Aboriginal Victoria, 2019).

Figure 1: Study area

2 Description of Methods

2.1 Data and Literature Review

The DELWP's online interactive map, *Naturekit* (DELWP, 2022a) was used to gain an insight into the overall distribution of native vegetation on the site and the Ecological Vegetation Class (EVC) to which any remnant vegetation may belong.

The following resources were used to determine if any taxa listed or protected under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act), or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) have been, or potentially could be, located at the site:

- DELWP's *NatureKit Victoria* (DELWP, 2022a);
- DELWP's *Victorian Biodiversity Atlas* (VBA) (DELWP, 2022);
- The DELWP's Native Vegetation Information Management System (NVIM) (DELWP, 2022b); and
- The Commonwealth's Protected Matters Search Tool (DoEE, 2022).

2.2 Field Survey

Field surveys of the site were undertaken in October 2022. During these surveys, all flora present on the site was recorded and vegetation quality assessments were carried out using the methods described below.

The survey was completed by the following participants:

- Tim Bowler- B.A.Sc. (Env. Sc.), DELWP accredited native vegetation assessor, 8 years' experience in environmental consultancy and flora and fauna assessments.

The survey included:

- Recording all flora present. Flora species were recorded following the species nomenclature requirements of the VBA;
- Completion of a Vegetation Quality Assessment (VQA) for all native patches. These areas were Digital GPS (DGPS) mapped and assessed using the habitat hectare method described by DSE (2004) in the *Vegetation Quality Assessment Manual – Guidelines for applying the habitat hectares scoring method - Version 1.3*;
- Recording all scattered and large old trees including collecting data on species, DBH and any habitat features (i.e. nests or hollows);
- Identification and recording of any flora and fauna communities including threatened, protected species / communities or habitat;
- Completing a fauna assessment that included the opportunistic observation of scats, footprints, diggings, burrows, tracks, incidental bird and other fauna observations and listening for frog and bird calls;
- Identifying and recording notes on any habitat features including vegetation type and structure, proximity to water, the presence of hollow bearing trees and stags, logs and other

ground debris. The surrounding landscape was also observed, and notes taken regarding its habitat provision, intactness of native vegetation and connectivity with the study site; and
- Recording notes on specific issues such as noxious weed infestations and any evidence of pest animal disturbance including any active warrens or dens.

GPS mapping was completed using the ArcCollector application paired with a handheld Android device. An average recording accuracy of approximately +/- 2m was achieved.

The mapping included:

- Walking and recording a GPS location of the extent of all native vegetation patches within the proposed works area;
- Walking and recording a GPS location of all scattered trees, Large trees within patches and any Large trees immediately adjacent to the proposed works area;
- Walking and recording a GPS location of any threatened or protected flora species;
- Walking and recording a GPS location of the extent of any threatened ecological communities; and
- Walking and recording a GPS location of any pest animal activity locations and any noxious weed infestations.

2.2.1 Vegetation Quality Assessment

Native vegetation is defined in the Victoria Planning Provisions (Definitions – Clause 72) as *'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'*. DELWP's *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP, 2017) (the Guidelines) further defines native vegetation into two categories: 'remnant patches' and 'scattered trees' outlined below.

A 'remnant patch' of native vegetation is either:

- An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native; or
- Any area with three of more native canopy trees where the drip line of each tree touches the drip line of at least one other tree, forming a continuous canopy; or
- any mapped wetland included in the *Current wetlands map*, available in DELWP systems and tools.

A 'scattered tree' is:

- A native canopy tree that does not form part of a remnant patch.

Following these definitions all native vegetation on site was categorised as either 'remnant patches' or 'scattered trees'.

Remnant patches were further categorised into EVCs and furthermore into habitat zones. These areas were DGPS mapped and assessed using the habitat hectare method described by DSE (2004) in the *Vegetation Quality Assessment Manual – Guidelines for applying the habitat hectares scoring method - Version 1.3.*

All large size class trees within and immediately adjacent to the study area and all scattered trees on site were identified to species level, DGPS mapped and had their Diameter at Breast Height (DBH) and any other relevant data recorded.

2.3 Definitions of Significance

The significance of a species or ecological community described in this report follows its listing status under Commonwealth or State legislation.

- **National** significance includes all species listed as critically endangered, endangered or vulnerable under the EPBC Act 1999;
- **State** listed as critically endangered, endangered or vulnerable on the FFG Act Threatened List.

2.4 Likelihood of Occurrence

In determining the likelihood of presence of a listed species a likelihood rating of present, high, moderate, low or unlikely is assigned. This rating is based on consideration of the following factors:

- Was the species recorded on site or has it been previously recorded on the site;
- Is there likely to be a resident population within the local area (5km radius);
- Is suitable habitat present on site or is habitat modified but aspects of suitable habitat present;
- Is it possible the species may seasonally or opportunistically use resources within the local area; and
- Are there any records for the species within the local area within the last 5, 10 or 25 years.

2.5 Assessment of the extent of Native Vegetation Removal and Quantification of Losses

Previous direction from the DELWP in the determination of losses to roadside vegetation was applied to this project. This advice included:

1. *Where trees and large shrubs overhang an area which has a perennial understorey plant cover of less than 25% ie it does not meet the definition of remnant patch (e.g. non-native vegetation road verges), then no remnant patch losses needs to be recorded for the overhang area. This only applies if the trees attributable to the canopy is shown to have a Tree Protection Zone (TPZ) impact <10%.*
2. *All trees on visual assessment likely to have encroachment into their TPZ of greater than 10% should be independently assessed. Individual canopy trees assessed as having a TPZ impact >10% will be assigned the quality score of the patch they are contained within and have their canopy area mapped as lost.*
   (M. Bramwell, pers. Comm. 04 Sept 2017 - South Gippsland Highway SSRIP project).

The construction footprint is defined by the extent of works shown in *Appendix 1*.

2.5.1 Tree Protection Zone Impacts- Indirect Losses

The DELWP defines a Tree Protection Zone (TPZ) as '*an area around the trunk of the tree which has a radius of 12 × the diameter at breast height to a maximum of 15 metres but no less than 2 metres*'. Unless an arborist report indicates otherwise, a tree, or trees will be deemed lost if the encroachment from construction (i.e. compaction and excavation) into the TPZ is greater than 10%, or is inside the Structural Root Zone (SRZ) (DELWP, 2018).

2.5.2 Individual Canopy, Large or Scattered Trees

Under the *Guidelines* (DELWP, 2017) large trees in patches are accounted for in the overall condition score of remnant patches and a count of the number of large trees within a patch marked as lost is provided to DELWP when processing offset requirements. Scattered trees are assigned a default area and condition score of 0.2 while an individual canopy tree deemed lost within a patch is assigned the quality score of the patch it is contained within.

2.5.3 Marking the Extent of Native Vegetation Losses

Following the provision of the finalised detailed designs by BMT, a process of determining impacts to all remnant patches, trees within patches and scattered trees, and / or other affected vegetation was completed. The proposed construction area (*Appendix 1*) was overlaid on the GIS mapped native vegetation layers and applying the following methodology, the GIS program was used to mark native vegetation losses under the proposal:

- The full extent of a remnant patch, canopy tree or scattered tree that is contained within the construction footprint is assessed as lost and the outer extent of the canopy of any tree deemed lost is incorporated within the clearing extent;
- Where the construction footprint impacts on greater than 10% of an estimated TPZ of a tree located outside but adjacent to the construction footprint it is assessed as lost and:
    - A 10 meter buffer is applied to small size class trees;
    - A 15 meter buffer is applied to large size class trees;
    - Where a tree deemed lost is connected to an area of native patch deemed lost its canopy is traced and incorporated into that native patch loss extent; and
    - Where less than three trees are deemed lost that are not connected to an area of native patch deemed lost, the applicable buffer area is marked as a single circular polygon and labelled as ST (Scattered Trees) or Canopy Tree (CT) as appropriate.

2.6 Legislation and Policy

Any biodiversity related implications for the project were assessed against the following biodiversity legislation and policy:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) including related listing advice, recovery plans and significant impact guidelines;
- *Flora and Fauna Guarantee (Amendment) Act 2019* (FFG Act) including related action statements and listing advice;
- *Planning and Environment Act 1987* including *Clause 52.17* and any overlays applicable to the study area under the South Gippsland Planning Scheme;

- The DELWP's *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP, 2017);
- *Catchment and Land Protection Act 1994* (CaLP Act) including noxious weed and pest animal listings;
- *Water Act 1989;*
- *Wildlife Act 1979;*
- *Environmental Effects Act 1987*.

2.7 Limitations

The assessment was undertaken in October 2022. It is, therefore, possible that some annual, deciduous or dormant taxa may not have been visible. Additionally, some taxa have not been identified to specific or infraspecific rank due to the absence of flowering, or other material typically used for identification.

The assessment of fauna presence did not involve a targeted fauna survey. Consequently, further species are likely to be recorded given further time and or the undertaking of more detailed survey.

The timing of the survey (Spring) and level of survey effort are considered satisfactory to assess the general habitat values of the study area and identify any threatened or protected perennial flora species or habitat, threatened ecological communities or habitat and assess the likelihood of occurrence of any threatened or protected fauna species.

A handheld android phone was used as the GPS (GPS) equipment in recording the locations of all trees within and adjacent to the proposed construction footprint, to an average accuracy of +/- 1.9m.

3 Results

3.1 Database Review

3.1.1 Flora Species

Interrogation of the DELWP's *Victorian Biodiversity Atlas* (VBA) (DELWP, 2022) identified 15 flora species within a 5 km radius of the study area that are listed as threatened under the FFG or EPBC Acts (*Appendix 2*). Records of threatened flora species identified within or close to the study area include:

- *Atriplex paludosa* subsp. *paludosa* (Marsh Salt-bush), listed as Endangered under the FFG Guarantee Act. This species was recorded immediately adjacent to the site, on the foreshore approximately 5 metres outside study area. Eight records are found within 5 kilometres of the study area, including approximately 230 metres NE of the study area, 450 metres ENE of the study area, and 700 metres WNW of the study area.
- *Avicennia marina* subsp. *australasica* (Grey Mangrove), listed as Endangered under the FFG Guarantee Act. Eight records are found within 5 kilometres of the study area, with the nearest records to the site being 700 metres WNW of the study area, and 140 metres east of the site.
- *Juncus revolutus* (Creeping Rush), listed as Endangered under the FFG Guarantee Act. Three records are found within 5 kilometres of the study area, the nearest being 2.8km east of the study area, along Pound Creek.
- *Limonium australe var. australe* (Yellow Sea-lavender), listed as Endangered under the FFG Guarantee Act. Three records are found within 5 kilometres of the study area, the nearest being 2.8km east of the study area, along Pound Creek.

Interrogation of the EPBC Act *Protected Matters Search Tool* (DoEE, 2022) identified within a 5km search radius the potential presence of 8 significant flora species that are listed as threatened at the Federal level (*Appendix 3*).

Assessment of the Likelihood of Presence of Significant Flora Species within the Study Area

A description of the range of vegetation types and potential habitats for threatened flora species that are found within the study area are described in *Section 3.2.2.*

Appendix 4 provides a summary of the assessment of likelihood of presence for all threatened flora species found in both the EPBC Act Protected Matters Search Tool (DEE, 2022) and the Victorian Biodiversity Atlas (DELWP, 2022b) within five kilometres of the study area.

3.1.2 Fauna Species

Interrogation of the DELWP's VBA (DELWP, 2022) identified 35 fauna species within a 5 km radius of the study area that are listed as threatened under the EPBC or FFG Acts (*Appendix 6*). Records of threatened fauna species identified within or close to the study area include 14 migratory birds having been recorded within or immediately adjacent to the Mahers Landing site, along with:

- *Ardea intermedia plumifera* (Plumed Egret), listed as critically endangered under the FFG Guarantee Act. One record found immediately adjacent to Mahers Landing, from 2002.

- *Biziura lobata* (Musk Duck), listed as Vulnerable under the FFG Guarantee Act. One record found immediately adjacent to Mahers Landing, most recently from 2001.
- *Haliaeetus leucogaster* (White-bellied Sea-eagle), listed as Endangered under the FFG Guarantee Act. Nine records found within and adjacent to Mahers Landing, most recently from 2019.
- *Egretta garzetta* (Little Egret), listed as Endangered under the FFG Guarantee Act. Seventeen records are found within and adjacent to Mahers Landing, most recently from 2019.
- *Spatula rhynchotis* (Australasian Shoveler), listed as Vulnerable under the FFG Guarantee Act. Three records found within and adjacent to Mahers Landing, most recently from 2008.

Interrogation of the EPBC Act Protected Matters Search Tool (DEE, 2022) identified within a 5km search radius the potential presence of 61 significant fauna species that are listed as threatened at the Federal level (*Appendix 3*).

Assessment of the Likelihood of Presence of Significant Fauna Species within the Study Area

Appendix 6 provides a summary of the assessment of likelihood of presence for all threatened fauna species found in both the EPBC Act Protected Matters Search Tool and the Victorian Biodiversity Atlas within 5km of the study area.

3.1.3 Threatened Ecological Communities

Interrogation of the EPBC Act Protected Matters Search Tool (DoEE, 2022), *Appendix 3*, identified the possible presence of two listed threatened ecological communities within a 5km search radius of the study area that are listed under the EPBC Act.

- *Natural Damp Grassland of the Victorian Coastal Plains,* listed as Critically Endangered under the EPBC Act; and
- *Subtropical and Temperate Coastal Saltmarsh*, listed as Vulnerable under the EPBC Act.

Native patches were assessed against the flow charts contained within the following documents that are used to determine if either of the listed ecological communities were present on site.

- *Approved Conservation Advice (including listing advice) for the Natural Damp Grassland of the Victorian Coastal Plains*. (DoE, 2015); and
- *Conservation Advice for Subtropical and Temperate Coastal Saltmarsh* (DSEWPC, 2011).

Both communities were found not to occur within the study area.

3.1.4 Wetlands of National Importance (Ramsar)

Interrogation of the EPBC Act Protected Matters Search Tool (DoEE, 2022), did not identify any wetlands of national importance within proximity to the study area.

3.2 Vegetation

Appendix 7 lists the results of the flora survey and includes all flora species identified within native patches and Degraded Treeless Vegetation as identified during the site inspection.

Native vegetation is represented by modified remnant patches of Coast Banksia Woodland, comprising mature canopy trees *Eucalyptus viminalis subsp. pryoriana* (Gipplsand Manna Gum) *and Banksia integrifolia* (Coast Banksia), along with *Allocasuarina verticillata* (Drooping Sheoak) understorey trees. The understorey ranged from highly degraded in the south-east, dominated by exotic species, to a dense cover of *Rhagodia candolleana* (Seaberry Salt-bush) in the north-west, which coincides with a very low weed cover.

Figure 2: Example of typical vegetation in the south-east of the study area

3.2.1 Ecological Vegetation Classes

Ecological Vegetation Classes (EVC) are a type of vegetation classification which aims to group plant communities according to common flora species, vegetation structure and common environmental factors such as elevation, soils and average rainfall.

The DELWP's *NatureKit* interactive map (DELWP, 2022a) assigns a single pre-1750's modelled EVC across the study areaand adjacent areas land, shown in *Figure 3*.

In its pre-1750's EVC modelling, the DELWP's *NatureKit* models *EVC 8: Wet Heathland* across the entire study area, with *EVC 53: Swamp Scrub* to the north.

In its extant EVC modelling, the DELWP's *NatureKit* shows *EVC 8: Wet Heathland* remaining to the south-west for the study area along the foreshore, particularly around the Pound Creek estuary, while the vast majority of *EVC 53: Swamp Scrub* has been cleared for farmland, with isolated fragments along the roadsides and watercourses.

EVC determination across the study area considered the position in the landscape of a location, the presence of floristics and typical life forms to an EVC, vegetation structure and soils and an inferred fidelity to particular environmental attributes identified in the benchmark.

The following key determinations were made:

- The site's vegetation did not conform to the mapped EVC, being more representative of *EVC 2: Coast Banksia* Woodland, due to the presence of *Eucalyptus viminalis* subsp. *pryoriana* (Rough-barked Manna Gum), *Banksia integrifolia* (Coast Banksia), *Leptospermum laevigatum* (Coastal Tea-tree) and *Rhagodia candolleana* (Seaberry Saltbush).

Figure 3 displays the DELWP modelled distribution and the assignment of EVC to the site. *Table 1* provides the DELWP's Bioregional Conservational Status and description for all assigned EVC) (DELWP, 2022).

Table 1: DELWP Bioregional Conservation Status and Descriptions for Assigned Ecological Vegetation Classes-

Bioregion	Ecological Vegetation Class	Bioregional Conservation Status	The DELWP's Ecological Vegetation Classes Description
Gippsland Plain	EVC 8: Wet Heathland	Depleted	A low, generally treeless heathland although sometimes emergent eucalypts may be present. Occurs on lower slopes, flats or depressions, which are infertile and subjected to prolonged water logging. Understorey is often dominated by a range of sedges, grasses and shrubs.
Gippsland Plain	EVC 2: Coast Banksia	Vulnerable	Restricted to near coastal localities on secondary or tertiary dunes behind Coastal Dune Scrub. Usually dominated by a woodland overstorey of Coast Banksia Banksia integrifolia to 15 m tall over a medium shrub layer. The understorey consists of a number of herbs and sedges, including scramblers.

(DELWP, 2022)

Figure 3: Distribution of the Department of Environment, Land, Water and Planning's assigned Ecological Vegetation Classes within the Study Area

3.2.2 Native Vegetation Quality Assessment

The vegetation quality assessment identified and GPS mapped native vegetation patches on site that were categorised into 16 distinct Habitat Zones, listed in *Table 2*. The Habitat Zones are all attributed to *EVC 2: Coast Banksia Woodland.*

A habitat hectare assessment was undertaken for each habitat zone (excepting the scattered trees) against the benchmarks for its assigned EVC.

Table 2 summarises the total area of native patches according to each habitat zone identified and assessed within the study area.

Table 2: Summary and breakdown of total area of native patches identified and assessed

Bioregion	Habitat Zone (HZ)	EVC	Total Area (hectares)
Gippsland Plain	1A	EVC 2: Coast Banksia Woodland	0.0669
	1B	EVC 2: Coast Banksia Woodland	0.0128
	1C	EVC 2: Coast Banksia Woodland	0.0019
	1D	EVC 2: Coast Banksia Woodland	0.0018
	1E	EVC 2: Coast Banksia Woodland	0.0038
	1F	EVC 2: Coast Banksia Woodland	0.0032
	1G	EVC 2: Coast Banksia Woodland	0.0030
	1H	EVC 2: Coast Banksia Woodland	0.0015
	1I	EVC 2: Coast Banksia Woodland	0.0055
	1J	EVC 2: Coast Banksia Woodland	0.0411
	1M	EVC 2: Coast Banksia Woodland	0.0015
	1N	EVC 2: Coast Banksia Woodland	0.0010
	1O	EVC 2: Coast Banksia Woodland	0.0026
	1P	EVC 2: Coast Banksia Woodland	0.0016
	1R	EVC 2: Coast Banksia Woodland	0.0010
	1S	EVC 2: Coast Banksia Woodland	0.0010
		TOTAL	0.1502

Map 1 display the location and extent of all native patches GPS mapped within the study area. *Table 3* provides the results of the habitat hectare assessment and the score attributed to each of the site condition components for each Habitat Zone, including landscape factors. Habitat Zone descriptions are provided below, and all flora species recorded in each zone are listed in *Appendix 7*.

Coast Banksia Woodland – Habitat Zone 1A

This zone consists of a patch of mature Coast Manna Gum in the south-east of the study area with an understory of Coast Tea-tree, Seaberry Salt-bush and *Banksia integrifolia* (Coast Banksia), along with a high cover of *Lycium ferocissimum* (African Boxthorn) and herbaceous and grassy weeds.

The vegetation quality assessment assigned an overall score of 25 points out of 100 (0.25) to the zone, indicative of the lack of diversity, high weed cover and lack of logs, recruitment, and remnant vegetation in the neighbourhood.

Figure 4 provides an example of remnant patch vegetation typical to Habitat Zone 1E.

Figure 4: Habitat Zone 1E

Coast Banksia Woodland – Habitat Zone 1B

This zone consists of a patch of *Allocasuarina verticillata* (Drooping Sheoak), Coast Banksia and *Eucalyptus ovata* (Swamp Gum), with a dense groundstorey of *Rhagodia candolleana* (Seaberry Salt-bush), and very low weed cover, comprising African Boxthorn and herbaceous and grassy weeds along the edges.

The vegetation quality assessment assigned an overall score of 26 points out of 100 (0.26) to the zone, indicative of the lack of diversity, low weed cover, and presence of logs, and lack of remnant vegetation in the neighbourhood.

Figure 5 provides an example of remnant patch vegetation typical to Habitat Zone 1B.

Figure 5: Habitat Zone 1B

Coast Banksia Woodland – Habitat Zone 1C, 1D, 1F, 1G, 1H, 1M, 1P & 1R

These zones represent mature Drooping Sheoaks on the east side of the study area, all of which are surrounded by exotic weed species.

The vegetation quality assessment assigned a score of 7 points out of 100 (0.07) to these zones, based on the lack of diversity and other ecological habitat characteristics.

Figure 6 provides an example of remnant patch vegetation typical to these zones.

Figure 6: Habitat Zones 1C and 1D

Coast Banksia Woodland – Habitat Zone 1E, 1N, 1O & 1S

These zones comprise single *Leptospermum continentale* (Coastal Tea-tree), surrounded by exotic weed species.

The vegetation quality assessment assigned an overall score of 7 points out of 100 (0.07) to the zone, indicative of the lack of other floral or habitat characteristics present.

Figure 7 provides an example of remnant patch vegetation typical to these zones.

Figure 7: Habitat Zone 1E

Coast Banksia Woodland – Habitat Zone 1I

This zone comprises a dense Seaberry Saltbush patch, with high threat weeds throughout, including African Boxthorn and *Cenchrus clandestinus* (Kikuyu).

The vegetation quality assessment assigned an overall score of 7 points out of 100 (0.07) to the zone, indicative of the lack of other floral or habitat characteristics present.

Figure 8 provides an example of remnant patch vegetation typical to these zones.

Figure 8: Habitat Zone 1I

Coast Banksia Woodland – Habitat Zone 1J

This zone comprises two remnant Gippsland Manna Gums, along with dense shrub layer of Coastal Tea Tree and Seaberry Saltbush, and high weed cover of high threat species.

The vegetation quality assessment assigned an overall score of 27 points out of 100 (0.27) to the zone, indicative of the lack of diversity, high weed cover and lack of logs, recruitment, and remnant vegetation in the neighbourhood.

Figure 9 provides an example of remnant patch vegetation typical to these zones.

Figure 9: Habitat Zone 1J

Table 3: Results of Vegetation Quality Assessments for all Remnant Patches

			Habitat Zone 1A	Habitat Zone 1B	Habitat Zone 1C	Habitat Zone 1D	Habitat Zone 1E	Habitat Zone 1F	Habitat Zone 1G
Bioregion - Victorian Volcanic Plain			**Coast Banksia Woodland**	**Coast Banksia Woodland**	**Coast Banksia Woodland**	**Coast Banksia Woodland**	**Coast Banksia Woodland**	**Coast Banksia Woodland**	**Coast Banksia Woodland**
EVC Name (initials)			**CBW**	**CBW**	**CBW**	**CBW**	**CBW**	**CBW**	**CBW**
EVC Number			**2**	**2**	**2**	**2**	**2**	**2**	**2**
Bioregional Conservation Status			**Vulnerable**	**Vulnerable**	**Vulnerable**	**Vulnerable**	**Vulnerable**	**Vulnerable**	**Vulnerable**
		Max Score	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Site Condition	Large Old Trees	10	9	0	0	0	0	0	0
	Canopy Cover	5	5	3	0	0	0	0	0
	Understorey	25	0	7	5	5	5	5	5
	Lack of Weeds	15	5	5	0	0	0	0	0
	Recruitment	10	1	0	0	0	0	0	0
	Organic Matter	5	3	5	0	0	0	0	0
	Logs	5	0	4	0	0	0	0	0
	Total Site Score	75	**23**	**24**	**5**	**5**	**5**	**5**	**5**
	Site score out of?	eg 55	75	75	75	75	75	75	75
	Adjusted Site Score		**23**	**24**	**5**	**5**	**5**	**5**	**5**
Landscape value	Patch Size	10	1	1	1	1	1	1	1
	Neighbourhood	10	0	0	0	0	0	0	0
	Distance to Core	5	1	1	1	1	1	1	1
Habitat points out of 100		**100**	**25**	**26**	**7**	**7**	**7**	**7**	**7**
Habitat Score (hab points/100)			**0.25**	**0.26**	**0.07**	**0.07**	**0.07**	**0.07**	**0.07**
Total area of the Zone (ha)			**0.0657**	**0.0143**	**0.0029**	**0.0018**	**0.0038**	**0.0032**	**0.003**
Total HHA in the zone			**0.0164**	**0.0037**	**0.0002**	**0.0001**	**0.0003**	**0.0002**	**0.0002**
Catchment			**West Gippsland CMA**						

Table 4: Results of Vegetation Quality Assessments for all Remnant Patches

			Habitat Zone 1H	Habitat Zone 1I	Habitat Zone 1J	Habitat Zone 1M	Habitat Zone 1N	Habitat Zone 1O	Habitat Zone 1P
Bioregion - Victorian Volcanic Plain			**Coast Banksia Woodland**	**Coast Banksia Woodland**	**Coast Banksia Woodland**	**Coast Banksia Woodland**	**Coast Banksia Woodland**	**Coast Banksia Woodland**	**Coast Banksia Woodland**
EVC Name (initials)			**CBW**	**CBW**	**CBW**	**CBW**	**CBW**	**CBW**	**CBW**
EVC Number			**2**	**2**	**2**	**2**	**2**	**2**	**2**
Bioregional Conservation Status			**Vulnerable**	**Vulnerable**	**Vulnerable**	**Vulnerable**	**Vulnerable**	**Vulnerable**	**Vulnerable**
		Max Score	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Site Condition	Large Old Trees	10	0	0	0	0	0	0	0
	Canopy Cover	5	0	0	5	0	0	0	0
	Understorey	25	5	5	5	5	5	5	5
	Lack of Weeds	15	0	0	0	0	0	0	0
	Recruitment	10	0	0	6	0	0	0	0
	Organic Matter	5	0	0	5	0	0	0	0
	Logs	5	0	0	4	0	0	0	0
	Total Site Score	75	**5**	**5**	**25**	**5**	**5**	**5**	**5**
	Site score out of?	eg 55	75	75	75	75	75	75	75
	Adjusted Site Score		**5**	**5**	**25**	**5**	**5**	**5**	**5**
Landscape value	Patch Size	10	1	1	1	1	1	1	1
	Neighbourhood	10	0	0	0	0	0	0	0
	Distance to Core	5	1	1	1	1	1	1	1
Habitat points out of 100		**100**	**7**	**7**	**27**	**7**	**7**	**7**	**7**
Habitat Score (hab points/100)			**0.07**	**0.07**	**0.27**	**0.07**	**0.07**	**0.07**	**0.07**
Total area of the Zone (ha)			**0.0015**	**0.0055**	**0.0411**	**0.0015**	**0.0010**	**0.0026**	**0.0016**
Total HHA in the zone			**0.0001**	**0.0004**	**0.0111**	**0.0001**	**0.0001**	**0.0002**	**0.0001**
Catchment			**West Gippsland CMA**						

			Habitat Zone 1R	Habitat Zone 1S
Bioregion - Victorian Volcanic Plain			**Coast Banksia Woodland**	**Coast Banksia Woodland**
EVC Name (initials)			**CBW**	**CBW**
EVC Number			**2**	**2**
Bioregional Conservation Status			**Vulnerable**	**Vulnerable**
		Max Score	**100**	**100**
Site Condition	Large Old Trees	10	0	0
	Canopy Cover	5	0	0
	Understorey	25	5	5
	Lack of Weeds	15	0	0
	Recruitment	10	0	0
	Organic Matter	5	0	0
	Logs	5	0	0
	Total Site Score	75	**5**	**5**
	Site score out of?	eg 55	75	75
	Adjusted Site Score		**5**	**5**
Landscape value	Patch Size	10	1	1
	Neighbourhood	10	0	0
	Distance to Core	5	1	1
Habitat points out of 100		**100**	**7**	**7**
Habitat Score (hab points/100)			**0.07**	**0.07**
Total area of the Zone (ha)			**0.0010**	**0.0010**
Total HHA in the zone			**0.0001**	**0.0001**
Catchment			**West Gippsland CMA**	

3.2.3 Native Trees

Map 1 shows the locations of all native trees which meet the definition of a 'scattered tree' (*Section 2.2.1*) and all trees categorised as a 'large tree' (LT) under the relevant EVC benchmark. Individual tree information including species, size and size class category is provided in *Appendix 9*. *Table 5* provides the tree size categories for each EVC within the study area.

Table 5: Tree Size Categories according to Ecological Vegetation Classes benchmarks

Bioregion	Ecological Vegetation Class	Canopy Species	Size (dbh)	Size Category
Gippsland Plain	EVC 2: Coast Banksia Woodland	*Banksia* spp.	**50cm +**	Large
			<50cm	Small
		Eucalyptus spp.	70cm +	Large
			<70cm	Small

3.2.4 Significant Vegetation Communities

The EPBC Act Protected Matters 5km radius search (*Appendix 3*) identified the possible presence of two listed threatened ecological communities within the study area:

- *Natural Damp Grassland of the Victorian Coastal Plains,* listed as Critically Endangered under the EPBC Act; and
- *Subtropical and Temperate Coastal Saltmarsh*, listed as Vulnerable under the EPBC Act.

Neither of these communities were found to be present within the study area.

3.3 Flora Species

3.3.1 Flora Species Recorded

A total of 37 vascular plants were found to occur on site during site assessments. Of these, 130 are considered to be taxa native to Victoria. *Appendix 7* provides the results of the flora survey.

3.3.2 Significant Flora Species

Atriplex paludosa (Marsh Salt-bush), listed as Endangered under the FFG Act, was identified immediately adjacent to the study area, on the foreshore.

Appendix 4 details the habitat requirements for all threatened flora species found in both the Protected Matters Search Tool (DoEE, 2022) and the Victorian Biodiversity Atlas (DELWP, 2022) within five kilometres of the study area.

Appendix 4 provides a summary of the assessment of likelihood of presence for all threatened flora species found in both the EPBC Act Protected Matters Search Tool and the Victorian Biodiversity Atlas within five kilometres of the study area.

In summary, the field survey and likelihood assessment found:

- No threatened flora species were identified on site, other than the non-indigenous, plant *Melaleuca armillaris subsp. armillaris* (Giant Honey-myrtle);
- *Atriplex paludosa* (Marsh Salt-bush), listed as Endangered under the FFG Act, was identified immediately adjacent to the study area, on the foreshore amongst blue-stone rock wall;
- *Prasophyllum spicatum* (Dense Leek-orchid) and *Pterostylis chlorogramma* (Green-striped Greenhood), both listed as Vulnerable under the EPBC Act, were considered to have a **low** likelihood of occurring on site;
- *Pterostylis alveata* (Coastal Greenhood), listed as Vulnerbale under the FFG Act, was considered to have a **low** likelihood of occurring on site; and
- All other threatened flora species identified in the database searches were unlikely to occur within the study area.

3.4 Fauna Species

3.4.1 Fauna Species Recorded

A total of 24 fauna species were incidentally observed on site during site assessments. *Appendix 8* lists all fauna observed on site. Fauna species observed included nine native bird species and 15 invertebrate species.

3.4.2 Significant Fauna Species

Survey of the study area did not identify any threatened fauna species on site.

A description of the range of vegetation types and potential habitats for threatened fauna species that are found within the study area are described in *Section 3.5*.

Appendix 6 provides a summary of the assessment of likelihood of presence for all threatened fauna species found in both the EPBC Act Protected Matters Search Tool and the Victorian Biodiversity Atlas within 5km of the study area.

In summary, the field survey and likelihood assessment found:

- No threatened fauna species were identified on site;
- *Haliaeetus leucogaster* (White-bellied Sea-Eagle), listed as Endangered under the FFG Act and a listed Marine species under the EPBC Act, was considered to have a **moderate** likelihood of occurring on site, due to the presence of tall trees, and many nearby records;
- *Hieraatus morphnoides* (Little Eagle) listed as Vulnerable under the FFG Act, was considered to have a **moderate** likelihood of occurring on site, due to the presence of tall trees, and a recent nearby record, and
- All other threatened fauna species identified in the database searches were deemed to have a low or unlikely chance of occurring within the study area.

3.5 Habitat Values

Native vegetation within the study area is comprised of mature remnant Gippsland Manna Gum on the western boundary and south-east of the study area, which may provide roosting and feeding potential to raptors and nectar-feeding birds, with *Elanus axillaris* (Black-shouldered Kite), a raptor, observed hunting in the area. Numerous nearby records of White-bellied Sea-Eagles show that the species potentially may use the areas canopy trees for roosting and nesting.

Smaller birds including *Malurus cyaneus* (Superb Fairy Wren) and *Rhipidura albiscapa* (Grey Fantail) were observed using the shrubby understorey in habitat zone 1A and vegetation on the western boundary. Non-indigenous vegetation, including planted *Eucalyptus leucoxylon* (Yellow Gum) and *Melaleuca marmillaris subsp. armillaris* (Giant Honey-myrtle), along with remnant Gippsland Manna Gum, also providing a canopy for roosting and browsing by *Gymnorhina tibicen* (Australian Magpie) and *Anthochaera carunculata* (Red Wattlebird). *Hirundo neoxena* (Welcome Swallow) were observed nesting in the current toilet block, catching food on the wing and returning to their nests.

Land that surrounds these sections of the study area has been mostly cleared for agricultural land use.

4 Policy and Legislative Implications

4.1 Commonwealth – *Environment Protection and Biodiversity Conservation Act 1999*

The EPBC Act establishes a Commonwealth process for assessment of proposed actions that are likely to have a significant impact on Matters of National Environmental Significance (MNES) or on Commonwealth land. An action (i.e. project, development, undertaking, activity, or series of activities), unless otherwise exempt, requires approval from the Commonwealth Environment Minister if they are considered likely to have an impact on any MNES. A referral under the EPBC Act is required if a proposed action is likely to have a 'significant impact' on any of the following MNES:

- World Heritage properties;
- National heritage places;
- Ramsar wetlands of international significance;
- Threatened species and ecological communities;
- Migratory and marine species;
- Commonwealth marine area;
- Nuclear actions (including uranium mining);
- Great Barrier Reef Marine Park; and
- A water resource, in relation to coal seam gas development and large coal mining development.

4.1.1 Implications (Significant Impact Criteria)

One MNES warrants further consideration under the proposal:

- The White-bellied Sea-eagle, a Marine listed species under the EPBC is considered to have a moderate likelihood of occurring or being reliant on habitat within the study area.

The habitat present on site consists of large canopy trees that may be used for roosting, nesting and / or hunting and form part of the species range which may be visited on occasion.

However, due to the small size of the projects footprint, absence of nests and the presence of canopy trees adjacent to and in the wider area, it is unlikely that the project would significantly impact this MNES. Consideration of specific mitigation measures for this MNES, above the implementation of the construction impact minimisation measures outlined in Section 5.1.2, is therefore not considered necessary despite the results of the likelihood assessment.

In summary, the database and field assessment determined:

- No threatened species or ecological communities were found to occur within the study area during the site inspection;
- All flora species identified in database searches, within a 5 km search radius, that are listed as threatened under the EPBC Act are considered to have a low likelihood or deemed unlikely to occur within the study area; and

- All other fauna species identified in database searches, within a 5 km search radius, that are listed as threatened under the EPBC Act are considered to have a low likelihood or deemed unlikely to occur within the study area; and
- The project is not expected to significantly impact on any Matters of National Environmental Significance (MNES).

4.2 State – *Flora and Fauna Guarantee Act 1988*

The *Flora and Fauna Guarantee Act 1988* (FFG Act) is the primary State legislation for the protection of native plants, native animals and ecological communities on public land and waters in Victoria. Species and ecological communities can be listed as threatened under the Act based on assessments by an independent Scientific Advisory Committee. Threatening processes may also be listed.

4.2.1 Implications

Two fauna species, being the White-bellied Sea-eagle and Little Eagle, listed as threatened under the EPBC or FFG Act, are considered to have a moderate likelihood of occurring or being reliant on habitat within the study area. Consideration of specific mitigation measures is unlikely despite the results of the likelihood assessment, due to the small size of the projects footprint, lack of nests and the presence of canopy adjacent to and in the wider area. The project is not expected to adversely impact these species across the range of habitat they occupy. However, it is recommended that a suitably qualified wildlife expert / zoologist with appropriate DELWP authorisations be present during removal of native vegetation to observe and salvage any fauna if found.

Under the FFG Act a permit is required from the DELWP to 'take' 'protected' flora species, 'listed communities' or 'threatened species' from public land. Removal of any protected flora taxa, listed flora species or listed communities may not be undertaken until this permit has been issued.

Only one flora species was identified adjacent to the site that is listed as protected under the FFG Act; *Atriplex paludosa* (Marsh Saltbush) (DELWP, 2020a). As long as works are undertaken within the study area and no encroachment beyond the study area takes place, this species is deemed protected.

An application for a 'Permit to Take Protected Flora' must be lodged with the DELWP for the removal any protected flora species where they occur on public land within the study area. Removal of any protected flora taxa may not be undertaken until this permit has been issued. *Table 6* provides the detail on flora protected under the FFG Act requiring removal.

Table 6: Details of flora taxa protected under Flora and Fauna Guarantee Act 1988

Scientific Name	Common Name	Number of individuals recorded	Estimated Numbers Impacted
Atriplex paludosa	Marsh Saltbush	2	0

4.3 State – *Catchment and Land Protection Act 1994*

In accordance with Section 20 of the CaLP Act, landholders and managers have a responsibility to take all reasonable steps to:

- Avoid causing or contributing to land degradation which causes or may cause damage to land of another land owner;
- Eradicate regionally prohibited weeds;
- Prevent the growth and spread of regionally controlled weeds on their land; and
- Prevent the spread of, and as far as possible, eradicate established pest animals.

4.3.1 Implications

Four weeds declared noxious under the Catchment and Land Protection Act 1994 (CaLP Act) were identified on site during assessments (*Table 7*). Two of these weeds are categorised within the West Gippsland Catchment Management Authority region as 'Regionally Controlled' and two are categorised as 'Restricted' (Agriculture Victoria, 2022).

Table 7: Declared noxious weeds proclaimed under the Catchment and Land Protection Act 1994

Scientific Name	Common Name	Classification
Allium triquetrum	Angled Onion	Restricted
Cirsium vulgare	Spear Thistle	Regionally controlled
Lycium ferocissimum	African Box-thorn	Regionally controlled
Oxalis pes-caprae	Soursob	Restricted

4.4 State - *Water Act 1987*

Catchment Management Authorities have statutory responsibilities under Section 67 of the Water Act to monitor, manage, enforce, and administer control over all works which may impact upon designated waterways to ensure works undertaken do not adversely affect the health of those waterways.

A permit is required to undertake works on a designated waterway and can include activities such as:

- Crossings – bridges, fords, culverts;
- Deviations – waterway realignments;
- Extractions – sand, silt or gravel;
- Stabilisation – bank protection, retaining structures;
- Vegetation – fallen timber and vegetation removal, revegetation projects;
- Works – stormwater outlets, service crossings; and
- Other – jetty, river mouth opening, boardwalks.

4.4.1 Implications

Provided the appropriate impact minimisation measures, outlined in *Section 5.1.2*, are implemented during construction no impacts to natural banksides, bankside vegetation or natural waterway flows are expected.

4.5 State – *Wildlife Act 1979*

The Wildlife Act 1975 provides the primary legislation for the protection and management of wildlife, the purposes of this Act are:

- To establish procedures in order to promote the protection and conservation of wildlife, the prevention of taxa of wildlife from becoming extinct and the sustainable use of and access to wildlife; and
- To prohibit and regulate the conduct of persons engaged in activities concerning or related to wildlife.

4.5.1 Implications

Persons engaged to remove, salvage, hold or relocate any native fauna species during proposed construction works must have a permit under this Act to undertake such actions and ensure any actions to manage wildlife must be undertaken in accordance with the requirements of the Act or at the direction of DELWP.

4.6 State – *Environmental Effects Act 1978*

In Victoria, environmental impact assessments of proposed development projects are conducted through the Environmental Effects Statement (EES) process under the *Environment Effects Act 1978* (EE Act). The Minister for Planning (the Minister) administers the EES process through the *Ministerial Guidelines for Assessment of Environmental Effects* (Ministerial Guidelines), whilst DELWP manages this process (Victorian Auditor Generals Report, 2017).

A proponent should ask the Minister administering the Act whether an EES is required for projects or amended projects that could have a significant effect on the environment. If the Minister decides that an Environment Effects Statement (EES) is required, the project proponent is responsible for preparing the EES and undertaking the necessary investigations (Victorian Government, the Department of Sustainaibility and Environment, 2006).

Referral criteria is based on either individual potential environmental effects or a combination of potential environmental effects.

4.6.1 Implications

Assessment of referral requirements for relevant criteria are outlined below.

Individual Potential Environmental Effects

Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria

- The likelihood assessment found the study area does not support any populations of threatened species within Victoria or represent known remaining habitat for any threatened species within Victoria. No referral is required under this criterion.

Potential clearing of 10 ha or more of native vegetation from an area that is of an EVC identified as endangered.

- Overall, approximately 0.278 hectares of native vegetation with a Bioregional Conservation Status of Vulnerable (EVC 2: Coast Banksia Woodland) was identified within the study area, all of which is deemed lost. As the EVC is classed as Vulnerable, and the amount is significantly under the referral threshold, no referral is required under this criterion.

4.7 State – *Planning and Environment Act 1987*

Planning Overlays

The study area is covered by the Environmental Significance Overlay (ESO1), Land Subject to Inundation Overlay (LSIO) and Significant Landscape Overlay (SLO5) under the Bass Coast Planning Scheme.

Under ESO1, a planning permit is due to the proposed removal of native vegetation. There are no exemptions for a permit to remove native vegetation that apply to this project under this overlay.

Under LSIO, a planning permit is required to undertake the proposed works, including detailed plans of the proposed construction plan.

Under SLO5, a planning permit is required to remove, destroy or lop native vegetation. There are no exemptions for a permit to remove native vegetation that apply to this project under this overlay.

Clause 52.17 -Native Vegetation

Under *Clause 52.17* of the Bass Coast Planning Scheme, a planning permit is required to clear or disturb native vegetation within the study area. Native vegetation will be impacted and or require removal under the proposal and as such, application of the '*Guidelines*' to obtain a planning permit for the works is necessary. The information provided within this report and summarised specifically within *Section 5* is considered to satisfy the information requirements of the Guidelines.

5 Victoria's Native Vegetation Removal Regulations

The purpose of the Guidelines is to set out and describe the application of Victoria's statewide policy in relation to assessing and compensating for the removal of native vegetation. The Guidelines implement Clause 12.01-2S (Biodiversity) of the Planning Provisions objective 'To ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation (DELWP, 2017).

The Guidelines also detail the three step approach of Avoid, Minimise and Offset as a key component of the policy. This approach aims to ensure that the removal of native vegetation is restricted to only what is reasonably necessary, and that biodiversity is appropriately compensated for any removal approved.

A combination of site-based and landscape information is used to calculate the biodiversity value (being a general or species habitat score) of native vegetation to be removed. This is calculated by the extent and condition score, combined to determine the site-based measure of biodiversity value.

The assessment pathway for an application to remove native vegetation reflects its potential impact on biodiversity and is determined by combining the location and extent of the native vegetation proposed to be removed, in accordance with Table 3 of the Guidelines.

The pathways are:

Basic - limited impacts on biodiversity.
Intermediate - could impact on large trees, endangered EVC's, and sensitive wetlands and coastal areas.
Detailed - could impact on large trees, endangered EVC's, sensitive wetlands and coastal area and could significantly impact on habitat for rare or threatened species. (DELWP, 2017)

5.1 Avoiding and minimising Impacts on Native Vegetation (and Significant Species or Communities)

The principles of avoidance and minimisation can be achieved in a Project by avoiding the removal of native vegetation via locating or designing the project works so that native vegetation is not removed. Minimising losses to native vegetation can be achieved via minimising the design construction footprint, restricting project works to areas of native vegetation that have the least biodiversity or other values or managing the works to minimise impacts on surrounding vegetation (DELWP, 2017).

5.1.1 Design

Better Boating Victoria are currently planning to upgrade the facilities at Mahers Landing boat ramp, including formalising the car park bays, constructing a new toilet block at a different location to where it is currently, and installing a new boat ramp.

The concept design has been developed attempting to balance the requirement of car and trailer unit parking / traffic flow and native vegetation removal. The available space has been used almost in its

entirety and there are no feasible opportunities to further avoid removal or minimise impacts to native vegetation without compromising the proposal and its objectives.

Whilst almost all vegetation is either to be directly removed or is indirectly lost due to TPZ impacts, where possible construction will prioritise retaining trees and shrubs. This primarily includes:

- Tree ID numbers 1, 2 and 33 along the western edge and number 36 along the eastern edge of the construction area, with designs for the swale drain in this area to allow for tree retention; and
- Tree ID number 12, 17 & 18 in the north east corner of the site , which has TPZ impacts from the proposed footpath. There is an opportunity for the pavement edge and walking path to be realigned immediately north of the disabled carpark in the vicinity of trees 12, 17 and 18 such that these trees may be retained. This possibility should be explored in the detailed design phase of works.

5.1.2 Construction

A number of measures are proposed to minimise construction impacts on retained native vegetation. These include the following:

No-go Zone Fencing / Limit of Works

- Prior to the commencement of any works,
    - The construction zone footprint and limit of works must be clearly defined on construction plans and should be physically delineated with fencing;
    - Native vegetation outside of the limit of works must be protected by the establishment of No-Go zones, with fencing and exclusion areas identified as part of contract conditions.
- All works and construction activities associated with the project (i.e. stack sites, temporary storage areas, parking areas, turn around points…etc.) should be located within degraded areas not containing native vegetation; and
- The fencing should be constructed of supported para-webbing or rope bunting and include signage identifying the area as ‘No-Go Zone - No Unauthorised Access’. The No-Go zone fence is to be erected prior to the commencement of construction works and be retained in place for the duration of construction activities, and then removed.

Vehicle Hygiene / Weed Management

- Vehicle / plant hygiene protocols should be implemented to prevent the importation and the spread of declared weeds, environmental weeds, pests and diseases (pathogens) within the construction works area and offsite.

Sedimentation / Erosion

Erosion and sediment controls should include but not be limited to:

- Installation and maintenance of erosion and sedimentation controls established in accordance with EPA best practice guidelines for the treatment of sediment laden run-off resulting from

construction activities. Sediment controls must be maintained in good order throughout the project and all materials removed from site at the completion of works;

- Adequately control and route runoff within the construction site to the appropriate sedimentation controls. Any controls installed should prevent any surface water run off;
- Appropriate control structures within the 'limits of works' should also be established where required to prevent surface water run-off from exiting construction works areas beyond the 'limit of works' or onto adjoining native vegetation to be retained / No Go Zones;
- Minimising the amount of exposed erodible surfaces during construction - i.e. through the staging of works and progressive reinstatement of earthworks;
- Prompt covering of exposed surfaces (including batters and stockpiles) that would otherwise remain bare for more than 28 days - cover may include mulch, erosion control mat or seeding with sterile grass.

Wildlife Management

- Should there be a likelihood that wildlife may be encountered on the site, directly impacted or potentially displaced by construction works, a suitability qualified wildlife expert / zoologist with appropriate DELWP authorisations is recommended be engaged to ensure the protection and management of any wildlife encountered during the works. Any displaced fauna should be salvaged and relocated at an appropriate time.

5.2 Determination of Losses to Native Vegetation

An updated digital file of the construction footprint was provided by BMT in December 2022, 'Carpark Concept' Drawing No. A11698-ML-01-05 Rev. A, which outlined a realignment of the lot and road boundaries.

The construction footprint was overlaid on the GPS mapped native vegetation layers and using the GIS program native vegetation impacts were determined following the methodology described in *Section 2.5*. *Appendix 9* provides information on the loss or retention determination and status of each individual tree within and adjacent to the construction footprint and *Table 8* summarises losses to native vegetation under the final designs. *Map 2* displays the location and extent of all native vegetation deemed lost under the final designs.

Table 8: Summary of Native Vegetation Impacts

Native Patch Losses	**EVC**	**Bioregional Conservation Significance**	**Full corridor native vegetation loss**
	EVC 2: Coast Banksia Woodland	Vulnerable	0.266 ha
Scattered and Large Tree Losses	Scattered / patch Trees (Small)		8
	Scattered Trees (Large)		1
	Large Trees in patches		2
	Total No. Large Trees		**3**

5.3 Offset requirements- Native Vegetation Removal Report

The clearing shapefile was submitted to the DELWP's native vegetation support, who processed and provided a Native Vegetation Removal (NVR) report. The NVR is provided as *Appendix 10*, which identified the following offset requirements that apply to the proposal:

- The proposal falls under the 'Intermediate Assessment Pathway';
- Offset requirements amount to 0.061 General Habitat Units (GHUs) with a minimum strategic biodiversity score of 0.351 and 3 large trees;
- No specific offsets apply; and
- Offsets must be located within the West Gippsland Catchment Management Authority (CMA) boundary or within the Bass Coast Shire Council municipality.

Previous Clearing

It is assumed that no previous native vegetation removal, based on site inspections, has taken place in the last 5 years.

Offset Statement

In accordance with the DELWP's Guidelines for the removal, destruction or lopping of native vegetation an offset statement must be provided that shows evidence that an offset that meets the offset requirements for the native vegetation to be removed has been identified and can be secured.

Offsets are available, as shown in *Appendix 11*.

6 Conclusion and Recommendations

Study Area- Ecological Values

The study area (*Figure 1*) is located approximately 7km east of the centre of the Inverloch township, approximately 145km south-east of Melbourne, and lies within the Gippsland Plain Bioregion.

Land surrounding Mahers Landing has been predominantly cleared for agriculture with scattered remnants of native vegetation remaining along some roadsides and waterways.

Vegetation present within the study area is comprised of planted indigenous and non-indigenous native trees in the north-east of the site, and remnant vegetation, including mature canopy trees, in the south-east, west and north of the study area, all classed as *EVC 2: Coast Banksia Woodland*.

38 trees were identified, including planted indigenous and non-indigenous species, which includes three large size-class canopy trees, one of which is dead.

Following assessment against the appropriate determination flowcharts, no individual native patches met the definition of a threatened ecological community listed under the EPBC Act or under Victoria's FFG Act.

No threatened fauna species were identified within the study area during the site survey. A likelihood assessment determined that all but two threatened fauna species identified in the database searches had a low or unlikely likelihood of occurring within or be reliant on any of the habitats within the study area, with White-bellied Sea Eagle and Little Eagle deemed to have a moderate likelihood, based on roosting potential in the remnant Gippsland Manna Gums on the east and west of the study area. However, no further measures are recommended due to the retention of canopy trees adjacent to and outside the study area.

No threatened flora species were identified within the study area. The likelihood assessment determined that all threatened flora species identified in the database searches were had an unlikely or low likelihood of occurring within the study area.

Based on the extent of the project's vegetation and habitat removal under final designs, no additional surveys are recommended in relation to the site's biodiversity values. This recommendation assumes that all construction works are contained within the designated 'limits of works' and that No-go zones are established and maintained. However, it is recommended that a suitably qualified wildlife expert / zoologist with appropriate DELWP authorisations be present during removal of native vegetation to observe and salvage any fauna if found.

Legislation / Policy Considerations

EPBC Act- Matters of National Environmental Significance

One threatened fauna species, listed under the EPBC Act, had a moderate likelihood of occurrence, White Bellied Sea Eagle. No other threatened flora, fauna or communities were identified on site or were determined to have a high likelihood of occurring. Due to the small size of the projects footprint, absence of nests and the presence of canopy adjacent to and in the wider area, it is unlikely that the project would significantly impact this MNES.

Flora and Fauna Guarantee Act

A 'Permit to Take Protected Flora' is not required.

Catchment and Land Protection Act

Four Declared Noxious Weeds were identified within the site, including two species categorised as 'Regionally Controlled' and two species categorised as 'Restricted'. These species must be controlled, and methods employed to prevent their spread as part of the project's construction.

Avoid/Minimise Principles

The concept design has been developed attempting to balance the requirement of car and trailer unit parking / traffic flow and native vegetation removal. The available space has been used almost in its entirety and there are no feasible opportunities to further avoid removal or minimise impacts to native vegetation without compromising the proposal and its objectives. Whilst almost all vegetation is either to be directly removed or is indirectly lost due to TPZ impacts, where possible construction will prioritise retaining trees and shrubs.

A native patch loss total of 0.266 hectares and 3 Large Old Tree deemed lost under the Concept Design Drawings.

Native Vegetation Removal

The proposed alignment was overlaid on the GIS mapped native vegetation layers and the GIS program was used to mark native vegetation losses under the proposal. Native vegetation deemed lost comprised:

- 0.266 hectares of native patches (including overlaps) comprising:
  - EVC 2: Coast Banksia Woodland - 0.266 ha.
- 3 large size - class and 8 small-class canopy trees.

Offset Requirements

A clearing shapefile outlining the extent of native vegetation deemed lost under the final design, was submitted to the DELWP's native vegetation support, who processed and provided a Native Vegetation Removal (NVR) report. The NVR identified the following offset requirements that apply to the proposal:

- 'Intermediate Assessment Pathway';
- Offset requirements are 0.061 General Habitat Units (GHUs) with a minimum strategic biodiversity score of 0.351 and 3 large trees;
- No specific offsets apply; and
- Offsets must be located within the West Gippsland Catchment Management Authority (CMA) boundary or within the Bass Coast Shire Council municipality.

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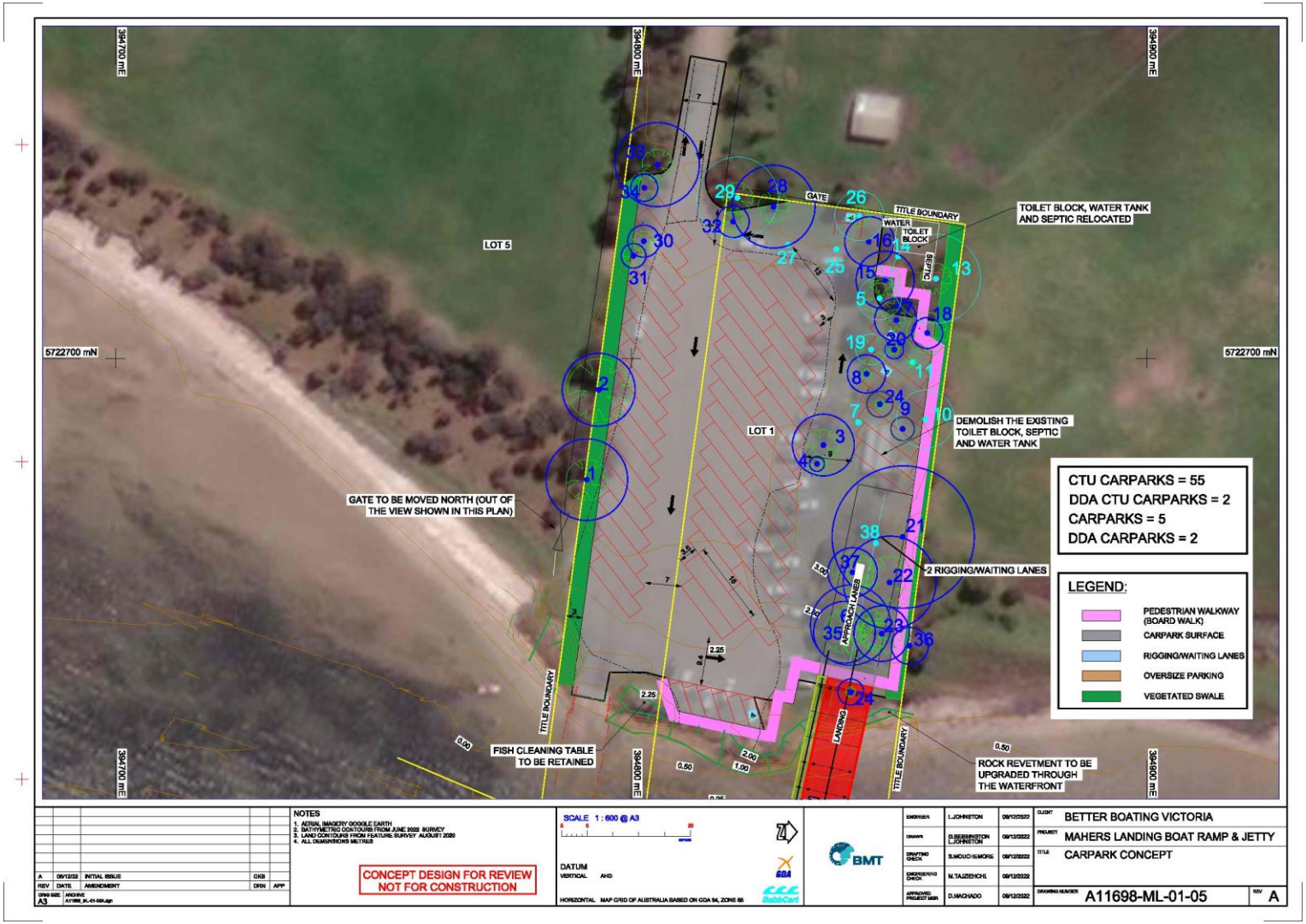
Appendices

Appendices commence on the next page.

Appendix 1: Detailed designs of the Mahers Landing Boat Ramp Upgrade- Updated 14/12/2022



Appendix 2: Results of VBA 5 kilometre radius search for threatened flora species

Scientific Name	Common Name	FFG Status	EPBC Status	Count of Sightings	Last Record
Adriana quadripartita	Coast Bitter-bush	Endangered		3	28/09/2011
Atriplex paludosa subsp. paludosa	Marsh Saltbush	Endangered		8	18/11/2019
Avicennia marina subsp. australasica	Grey Mangrove	Endangered		8	18/11/2019
Billardiera scandens s.s.	Velvet Apple-berry	Endangered		1	11/11/1989
Corybas fimbriatus	Fringed Helmet-orchid	Endangered		1	5/11/1983
Corybas sp. aff. diemenicus (Coastal)	Late Helmet-orchid	Critically Endangered	Endangered	1	1/05/2012
Eucalyptus fulgens	Green Scentbark	Endangered		1	30/07/2007
Heterozostera nigricaulis	Australian Grass-wrack	Endangered		3	17/03/2009
Juncus revolutus	Creeping Rush	Endangered		3	6/01/2009
Lawrencia spicata	Salt Lawrencia	Endangered		1	1/02/2007
Limonium australe var. australe	Yellow Sea-lavender	Endangered		3	18/02/2006
Melaleuca armillaris subsp. armillaris #	Giant Honey-myrtle	Endangered		1	17/04/2003
Oxalis rubens	Dune Wood-sorrel	Endangered		2	5/11/1983
Pterostylis alveata	Coastal Greenhood	Vulnerable		3	18/05/2010
Zoysia macrantha subsp. walshii	Walsh's Couch	Endangered		1	5/11/1983

Taxon Origin	
#	Native species that may be considered alien in some circumstances

Appendix 3: Results of EPBC Act Protected Matters 5 kilometre radius search

Australian Government
Department of Agriculture, Water and the Environment

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. Please see the caveat for interpretation of information provided here.

Report created: 07-Oct-2022

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment 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 (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	69
Listed Migratory Species:	59

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

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 Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	96
Whales and Other Cetaceans:	11
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	3
Regional Forest Agreements:	1
Nationally Important Wetlands:	1
EPBC Act Referrals:	6
Key Ecological Features (Marine):	None
Biologically Important Areas:	8
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

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.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community may occur within area	In feature area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In feature area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area	In feature area
FISH			
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Vulnerable	Species or species habitat may occur within area	In feature area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In feature area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
FROG			
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat likely to occur within area	In feature area
MAMMAL			
Antechinus minimus maritimus Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population)			
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area	In feature area
Eubalaena australis			
Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In feature area
Isoodon obesulus obesulus			
Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat likely to occur within area	In feature area
Mastacomys fuscus mordicus			
Broad-toothed Rat (mainland), Tooarrana [87617]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Petauroides volans			
Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area	In feature area
Petaurus australis australis			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Potorous tridactylus trisulcatus			
Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			
Amphibromus fluitans			
River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Caladenia orientalis			
Eastern Spider Orchid [83410]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat may occur within area	In feature area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
SHARK			
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat may occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Migratory Marine Species			
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caperea marginata			
Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In feature area
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In feature area
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis			
Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In feature area
Lagenorhynchus obscurus			
Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Lamna nasus			
Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In feature area
Megaptera novaeangliae			
Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca			
Killer Whale, Orca [46]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus			
White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area	In buffer area only
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area	In feature area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area	In feature area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area	In feature area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat may occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area overfly marine area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea antipodensis gibsoni as Diomedea gibsoni			
Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora			
Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans			
Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi			
Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago megala			
Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In feature area
Gallinago stenura			
Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster			
White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Halobaena caerulea			
Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Himantopus himantopus			
Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In buffer area only
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area overfly marine area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area	In buffer area only
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area	In feature area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area overfly marine area	In feature area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Stercorarius skua as Catharacta skua Great Skua [823]		Species or species habitat may occur within area	In buffer area only
Sternula albifrons as Sterna albifrons Little Tern [82849]		Species or species habitat may occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In feature area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area overfly marine area	In feature area
Fish			
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In feature area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area	In feature area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area	In feature area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area	In feature area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area	In feature area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area	In feature area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area	In feature area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area	In feature area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In feature area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In feature area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area	In feature area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area	In feature area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In feature area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In feature area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In feature area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area	In feature area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In feature area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In feature area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area	In feature area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Vanacampus phillipi			
Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In feature area
Mammal			
Arctocephalus forsteri			
Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In feature area
Arctocephalus pusillus			
Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area	In feature area
Reptile			
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In feature area
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area

Whales and Other Cetaceans		[Resource Information]	
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata			
Minke Whale [33]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Caperea marginata			
Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In feature area
Delphinus delphis			
Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In feature area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area	In feature area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Cape Liptrap Coastal Park	Conservation Park	VIC	In buffer area only
Drumdlemara H4 B.R	Natural Features Reserve	VIC	In buffer area only
Screw Creek N.C.R.	Natural Features Reserve	VIC	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
Gippsland RFA	Victoria	In feature area

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Anderson Inlet	VIC	In feature area

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
development of retirement resort	2004/1828	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Venus Bay Outfall Extension	2004/1555	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Referral decision				
All actions taken in response to the current severe bushfires in Victoria.	2009/4787	Referral Decision	Completed	In buffer area only

Biologically Important Areas			
Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur	In feature area
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur	In feature area
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur	In feature area
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur	In feature area
Whales			
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur	In buffer area only

Scientific Name	Behaviour	Presence	Buffer Status
Balaenoptera musculus brevicauda			
Pygmy Blue Whale [81317]	Foraging	Likely to be present	In feature area
Eubalaena australis			
Southern Right Whale [40]	Known core range	Known to occur	In feature area
Eubalaena australis			
Southern Right Whale [40]	Migration and resting on migration	Known to occur	In buffer area only

Bioregional Assessments			
SubRegion	BioRegion	Website	Buffer Status
Gippsland	Gippsland Basin	BA website	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and 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

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

Where little information is available for a 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 detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

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.

Appendix 4: Summary of the assessment of likelihood of presence for threatened flora species identified within 5km database searches.

Taxon Name	Taxon Common Name	Taxon Origin	FFG Status	EPBC Status	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
Wetlands of National Importance										
None										
Listed Threatened Ecological Communities										
Natural Damp Grassland of the Victorian Coastal Plains				Critically Endangered			The ecological community is a type of grassland ranging to open grassy woodland with scattered trees and shrubs that occurs in the South East Coastal Plain IBRA bioregion 1of Victoria. It is generally found on heavy grey silty–loamy soils, which are poorly drained and therefore often damp and sometimes waterlogged. The known distribution of the Victorian Coastal Plains Grassland is limited to the South East Coastal Plain IBRA bioregion in Victoria. Fragments including very small, isolated patches of native grassland along Bass Coast roads around Wonthaggi, Kilcunda and Anderson (DCCEEW, 2022a)	PMST	Not Present	No characteristics present.

Taxon Name	Taxon Common Name	Taxon Origin	FFG Status	EPBC Status	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
Subtropical and Temperate Coastal Saltmarsh				Vulnerable			The ecological community consists of organisms including and associated with saltmarsh in coastal regions of sub-tropical and temperate Australia. The ecological community spans six State jurisdictions: Queensland (southern), New South Wales, Victoria, Tasmania, South Australia and Western Australia (south-western). The physical environment for the ecological community is coastal areas under regular or intermittent tidal influence (DCCEEW, 2022b)	PMST	Not Present	May be present adjacent to the study area, but not within.
Flora										
Adriana quadripartita	Coast Bitter-bush		Endangered		3	28/09/2011	Confined to coastal and near coastal areas west from Wilsons Promontory (RBG 2022a)	VBA	Not Present	Aspects of habitat present but may be modified. Few records within the local area within the past 25 years
Amphibromus fluitans	River Swamp Wallaby-grass			Vulnerable			Natural and man-made water-bodies, including swamps, lagoons, billabongs and dams (DSEWPC 2022).	PMST	Not Present	No suitable habitat present. No records of the species within the local area in the last 25 years
Atriplex paludosa subsp. paludosa	Marsh Saltbush		Endangered		8	18/11/2019	Locally common on fringes of coastal and near-coastal saltmarshes west from Wilsons Promontory. Also known from the northwest where it has been collected twice. (RBG 2022b)	VBA	Present	Recorded during site visit immediately adjacent to study area, along foreshore. May be affected by works. Numerous records within the local area within the past 5 years.

Taxon Name	Taxon Common Name	Taxon Origin	FFG Status	EPBC Status	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
										Suitable habitat present beside site
Avicennia marina subsp. australasica	Grey Mangrove		Endangered		8	18/11/2019	Locally common on tidal mudflats (bays, estuaries and creek mouths) from the western half of Port Philip Bay to Corner Inlet (RBG 2022c)	VBA	Not Present	No suitable habitat present. Numerous records within the local area within the past 5 years
Billardiera scandens s.s.	Velvet Apple-berry		Endangered		1	11/11/1989	Naturally occurring plants in dry, shaded or cool positions often develop sparse foliage. (ANBG 2022)	VBA	Not Present	Aspects of habitat present but may be modified. No records of the species within the local area in the last 25 years
Caladenia orientalis	Eastern Spider Orchid			Endangered			Endemic to Victoria where found in coastal heathland and heathy woodlands between the Mornington Peninsula and Yarram, on well-drained soil. (VICFLR 2017e)	PMST	Unlikely	Aspects of habitat present but may be modified. No records of the species within the local area in the last 25 years
Caladenia tessellata	Thick-lipped Spider-orchid			Vulnerable			Apparently confined to eastern Victoria from near-coastal heathy woodlands to open forests on well-drained sandy soils (RBG 2022d)	PMST	Unlikely	Aspects of habitat present but may be modified. No records of the species within the local area in the last 25 years
Corybas fimbriatus	Fringed Helmet-orchid		Endangered		1	5/11/1983	Moist shaded forests and heathy woodlands, growing amongst leaf litter and under sedges and small shrubs. Dappled shade. (SoYR 2016h)	VBA	Unlikely	No suitable habitat present. No records of the species within the local area in the last 25 years

Taxon Name	Taxon Common Name	Taxon Origin	FFG Status	EPBC Status	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
Corybas sp. aff. diemenicus (Coastal)	Late Helmet-orchid		Critically Endangered	Endangered	1	1/05/2012	Scattered in near-coastal areas of Victoria west from Wilsons Promontory where found in swamps and watercourses dominated by Leptospermum lanigerum (RBG, 2022e).	VBA	Unlikely	No suitable habitat present. Few records within the local area within the past 25 years
Eucalyptus fulgens	Green Scentbark		Endangered		1	30/07/2007	Occurs east from Healesville and Woori Yallock to the Latrobe Valley near Driffield. (RBG 2022f).	VBA	Not Present	Few records within the local area within the past 25 year. Nearby record is an outlier, with most records in Latrobe Valley and Yarra Ranges
Eucalyptus strzeleckii	Strzelecki Gum			Vulnerable			Eucalyptus strzeleckii is a large forest tree component of Herb-rich Foothill Forest and Gippsland Plains Grassy Woodland Ecological Vegetation Classes (John Davies, DPI, pers. comm) of the Strzelecki Ranges. It also occurs on flatter terrain at the edges of the Strzelecki Ranges, where it is largely restricted to the banks of watercourses or on river flats where soils are seasonally waterlogged (DSE 2010b).	PMST	Not Present	No records of the species within the local area in the last 25 year. Nearest records from Koonwarra Black Spur, and isolated records around Wonthaggi.
Heterozostera nigricaulis	Australian Grass-wrack		Endangered		3	17/03/2009	Grows in submerged marine or estuarine habitats, rarely exposed at low tides (RBGSYD 2019a)	VBA	Not Present	No suitable habitat present within study area, although habitat may be present adjacent to study area. Few records within the local area within the past 25 years

Taxon Name	Taxon Common Name	Taxon Origin	FFG Status	EPBC Status	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
Juncus revolutus	Creeping Rush		Endangered		3	6/01/2009	Restricted to damp saline or subsaline communities near the coast, with a small number of outlying populations around saline lakes on the Volcanic Plain (RBG 2022g)	VBA	Not Present	No suitable habitat present within study area, although habitat may be present adjacent to study area. Few records within the local area within the past 25 years
Lawrencia spicata	Salt Lawrencia		Endangered		1	1/02/2007	An occasional component of saltmarsh communities along the coast, rare in saline depressions and around salt lakes of south-western Victoria (RBG 2022h)	VBA	Not Present	No suitable habitat present within study area, although habitat may be present adjacent to study area. Few records within the local area within the past 25 years
Limonium australe var. australe	Yellow Sea-lavender		Endangered		3	18/02/2006	In Victoria apparently confined to mangrove and saltmarsh communities near Point Lonsdale, Western Port, Shallow Inlet and Corner Inlet (RBG, 2022i).	VBA	Not Present	No suitable habitat present. Few records within the local area within the past 25 years
Melaleuca armillaris subsp. armillaris	Giant Honey-myrtle	#	Endangered		1	17/04/2003	Mainly confined to near-coastal sandy heaths, scrubs slightly raised above saltmarsh, riparian scrubs, rocky coastlines and foothill outcrops eastwards from about Marlo. Occurrences to the west are naturalized from cultivated stock (RBG, 2022j)	VBA	Present	Species is non-indigenous to the area, being planted.

Taxon Name	Taxon Common Name	Taxon Origin	FFG Status	EPBC Status	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
Oxalis rubens	Dune Wood-sorrel		Endangered		2	5/11/1983	Largely confined to near-coastal sites, often growing on stabilized sand dunes in Banksia integrifolia woodland and beaches amongst Spinifex sericeus (RBG 2022k)	VBA	Not Present	Aspects of habitat present but may be modified. No records of the species within the local area in the last 25 year, with nearby records being from Venus Bay
Prasophyllum spicatum	Dense Leek-orchid			Vulnerable			Grows in coastal heath and sandhills. Localised across southern Victoria in coastal heathland and near-coastal heathy forest on sandy soils (RBG 2022l)	PMST	Low	Limited aspects of habitat present or habitat highly modified. No records of the species within the local area in the last 25 years
Pterostylis alveata	Coastal Greenhood		Vulnerable		3	18/05/2010	Found mostly in near-coastal areas east of Melbourne in coastal woodland and scrub on stabilized dunes (RBG 2022m)	VBA	Low	Limited aspects of habitat present or habitat highly modified. Few records within the local area within the past 25 years
Pterostylis chlorogramma	Green-striped Greenhood			Vulnerable			Grows in moist areas of heathy and shrubby forest on well-drained soils (RBG 2022n)	PMST	Low	Limited aspects of habitat present or habitat highly modified. No records of the species within the local area in the last 25 years
Pterostylis cucullata var. cucullata	Leafy Greenhood			Vulnerable			Favours open forests and woodlands in well-drained sand and clay loams. It is a post-disturbance coloniser that is usually found in open areas around old quarries and gravel pits, on road verges, disused tracks and animal trails (DSE 2017)	PMST	Not Present	Limited aspects of habitat present or habitat highly modified. No records of the species within the local area in the last 25 years

Taxon Name	Taxon Common Name	Taxon Origin	FFG Status	EPBC Status	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
Xerochrysum palustre	Swamp Everlasting			Vulnerable			Swamp Everlasting grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils. (DEE 2022)	PMST	Not Present	No suitable habitat present. No records of the species within the local area in the last 25 years
Zoysia macrantha subsp. walshii	Walsh's Couch		Endangered		1	5/11/1983	Occurs in coastal saltmarsh and halophytic vegetation fringing salt lakes, mostly in Western Victoria (RBG 222o)	VBA	Not Present	No suitable habitat present. No records of the species within the local area in the last 25 years

References

Communities			
SPECIES	**TAG**	**Title**	**Detail**
Natural Damp Grassland of the Victorian Coastal Plains	(DCCEEW, 2022a)	Natural Damp Grassland of the Victorian Coastal Plains Conservation Advice	https://www.environment.gov.au/biodiversity/threatened/communities/pubs/133-conservation-advice.pdf
Subtropical and Temperate Coastal Saltmarsh	(DCCEEW, 2022b)	Subtropical and Temperate Coastal Saltmarsh Conservation Advice	https://www.environment.gov.au/biodiversity/threatened/communities/pubs/118-conservation-advice.pdf
Flora Species			
SPECIES	**TAG**	**Title**	**Detail**
Adriana quadripartita	RBG 2022a	Coast Bitter-bush	https://vicflora.rbg.vic.gov.au/flora/taxon/84cc5b9e-eb2e-4a58-8ec0-9266d3322584
Amphibromus fluitans	DSEWPC 2022	Amnphibromus fluitans- River Swamp Wallaby-grass	http://www.environment.gov.au/biodiversity/threatened/species/pubs/19215-conservation-advice.pdf
Atriplex paludosa subsp. paludosa	RBG 2022b	Marsh Saltbush	https://vicflora.rbg.vic.gov.au/flora/taxon/7dcbf312-8cb6-4530-8048-7c2c93ceabaa
Avicennia marina subsp. australasica	RBG 2022c	Grey Mangrove	https://vicflora.rbg.vic.gov.au/flora/taxon/596b8ce1-40d6-4e64-8e45-2318634e7c0e
Billardiera scandens s.s.	ANBG 2022	Billardiera scandens s.s.	http://www.anbg.gov.au/gnp/interns-2002/billardiera-scandens.html

Communities			
SPECIES	**TAG**	**Title**	**Detail**
Caladenia orientalis	VICFLRe	Eastern Spider Orchid	https://vicflora.rbg.vic.gov.au/flora/taxon/81160424-e10f-432a-af82-c9cdd681d30d
Caladenia tessellata	RBG 2022d	Thick-lipped Spider-orchid	https://vicflora.rbg.vic.gov.au/flora/taxon/bca2495d-3325-4c1b-b2c3-782566fb6bce
Corybas fimbriatus	SoYR 2016h	Fringed Helmet-orchid	http://fe.yarraranges.vic.gov.au/Residents/Trees_Vegetation/Yarra_Ranges_Plant_Directory/Yarra_Ranges_Local_Plant_Directory/Lower_Storey/Orchids/Corybas_fimbriatus
Corybas sp. aff. diemenicus (Coastal)	RBG, 2022e	Late Helmet-orchid	https://vicflora.rbg.vic.gov.au/flora/taxon/9c32688e-e04e-4d26-8ea2-27dd28120b5c
Eucalyptus fulgens	RBG 2022f	Green Scentbark	https://vicflora.rbg.vic.gov.au/flora/taxon/813261d1-5b47-4ed1-bfd0-4974356fd4af
Eucalyptus strzeleckii	DSE 2010b	National Recovery Plan for the Strzelecki Gum Eucalyptus strzeleckii	Oberon Carter
Heterozostera nigricaulis	RBGSYD 2019a	Australian Grass-wrack	https://vicflora.rbg.vic.gov.au/flora/taxon/206aa376-5c93-408d-9573-f8d13f48c13e
Juncus revolutus	RBG 2022g	Creeping Rush	https://vicflora.rbg.vic.gov.au/flora/taxon/82136440-232f-4c52-86d5-fa4a27c3f4e7
Lawrencia spicata	RBG 2022h	Salt Lawerncia	https://vicflora.rbg.vic.gov.au/flora/taxon/b514fa11-bd8a-4eaa-8e56-60f4fd648f37
Limonium australe var. australe	RBG, 2022i	Yellow Sea-lavender	https://vicflora.rbg.vic.gov.au/flora/taxon/58db641c-755d-468d-a5c8-fe43b637ec1d
Melaleuca armillaris subsp. armillaris	RBG 2022j	Giant Honey-myrtle	https://vicflora.rbg.vic.gov.au/flora/taxon/aee04d1d-f4a0-4714-9ece-08e5b6401e33
Oxalis rubens	RBG 2022k	Dune Wood-sorrel	https://vicflora.rbg.vic.gov.au/flora/taxon/6fef7757-e2e7-40e7-92c4-9d464a2c5d0e
Prasophyllum spicatum	RBG 2022l	Dense Leek-orchid	https://vicflora.rbg.vic.gov.au/flora/taxon/85788803-5305-482d-8092-0c8da8f9f89b
Pterostylis alveata	RBG 2022m	Coastal Greenhood	https://vicflora.rbg.vic.gov.au/flora/taxon/dca8d7de-8799-433a-9865-86bff9eb2a70
Pterostylis chlorogramma	RBG 2022n	Green-striped Greenhood	https://vicflora.rbg.vic.gov.au/flora/taxon/c78519e2-4099-4eb7-8007-35dde25e13e6
Pterostylis cucullata	DSE 2017	Leafy Greenhood	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=15459
Xerochrysum palustre	DEE 2022	Swamp Everlasting	https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=76215
Zoysia macrantha subsp. walshii	RBG 2022o	Walsh's Couch	https://vicflora.rbg.vic.gov.au/flora/taxon/e2146a44-112c-46ba-900a-eee7646abe3a

Key to Likely Occurrence

Likelihood	Comments
Present	Species has been confirmed as present on site during field work
High	Suitable habitat present on site
	Likely to be a resident population/s in the local area*
	Previously recorded on site
	Numerous records within the local area within the past 5 years
Moderate	Aspects of habitat present but may be modified
	Species may be resident in the local area or it forms part of the species' range
	May seasonally or opportunistically use resources within the local area
	Less than 10 year old records within local area
Low	Limited aspects of habitat present or habitat highly modified
	Species may occur rarely or as an opportunistic visitor in the area
	Few records within the local area within the past 25 years
Unlikely	No suitable habitat present
	Site is located outside of species natural range
	Considered locally extinct
	No records of the species within the local area in the last 25 years

* Local area = within a 5km range of the site.

Conservation Status Key

Origin	
#	Native but some stands may be alien

Appendix 5: Results of VBA 5 kilometre radius search for threatened fauna species

Migratory or Wader Birds	Scientific Name	Common Name	FFG Status	EPBC Status	Count of Sightings	Last Record
*	*Actitis hypoleucos*	Common Sandpiper	Vulnerable		16	11/09/2017
	Antechinus minimus maritimus	Swamp Antechinus	Vulnerable	Vulnerable	2	1/05/2012
*	*Ardea alba modesta*	Eastern Great Egret	Vulnerable		42	15/05/2019
*	*Ardea intermedia plumifera*	Plumed Egret	Critically Endangered		5	17/05/2003
*	*Arenaria interpres*	Ruddy Turnstone	Endangered		3	6/09/2003
	Biziura lobata	Musk Duck	Vulnerable		1	21/01/2001
*	*Botaurus poiciloptilus*	Australasian Bittern	Critically Endangered	Endangered	1	21/07/1975
*	*Calidris canutus*	Red Knot	Endangered	Endangered	10	30/08/2001
*	*Calidris ferruginea*	Curlew Sandpiper	Critically Endangered	Critically Endangered	87	15/09/2006
*	*Calidris tenuirostris*	Great Knot	Critically Endangered	Critically Endangered	3	15/09/2006
	Caretta caretta	Loggerhead Turtle		Endangered	1	26/11/2016
*	*Charadrius mongolus*	Lesser Sand Plover	Endangered	Endangered	2	6/09/2003
*	*Egretta garzetta*	Little Egret	Endangered		38	2/11/2019
	Gelochelidon macrotarsa	Australian Gull-billed Tern	Endangered		1	3/12/2002
	Haliaeetus leucogaster	White-bellied Sea-Eagle	Endangered		25	15/05/2019
	Hieraaetus morphnoides	Little Eagle	Vulnerable		1	9/07/2017
*	*Hirundapus caudacutus*	White-throated Needletail	Vulnerable	Vulnerable	6	22/02/2018
	Hydroprogne caspia	Caspian Tern	Vulnerable		67	23/03/2019
*	*Limosa lapponica*	Bar-tailed Godwit	Vulnerable	Vulnerable	25	9/01/2006
*	*Megaptera novaeangliae australis*	Southern Humpback Whale	Critically Endangered		1	12/12/2012
*	*Neophema chrysogaster*	Orange-bellied Parrot	Critically Endangered	Critically Endangered	3	5/06/1999
*	*Numenius madagascariensis*	Eastern Curlew	Critically Endangered	Critically Endangered	91	10/03/2019
*	*Numenius phaeopus*	Whimbrel	Endangered		22	23/11/2005
*	*Pluvialis fulva*	Pacific Golden Plover	Vulnerable		45	10/03/2019
	Pseudophryne semimarmorata	Southern Toadlet	Endangered		3	27/05/1977

Migratory or Wader Birds	Scientific Name	Common Name	FFG Status	EPBC Status	Count of Sightings	Last Record
	Spatula rhynchotis	Australasian Shoveler	Vulnerable		10	1/09/2018
	Sternula albifrons	Little Tern	Critically Endangered		1	16/10/1998
	Sternula nereis	Fairy Tern	Critically Endangered	Vulnerable	5	13/04/2019
*	*Thalassarche carteri*	Indian Yellow-nosed Albatross	Endangered	Vulnerable	1	27/02/2000
*	*Thalassarche melanophris*	Black-browed Albatross		Vulnerable	1	11/04/1999
	Thinornis cucullatus	Hooded Plover	Vulnerable	Vulnerable	83	12/04/2021
*	*Tringa brevipes*	Grey-tailed Tattler	Critically Endangered		1	4/11/2005
*	*Tringa nebularia*	Common Greenshank	Endangered		72	26/11/2018
	Varanus varius	Lace Monitor	Endangered		1	16/02/1998
*	*Xenus cinereus*	Terek Sandpiper	Endangered		7	6/09/2003

*	Species is a Migratory or Wader bird species and is excluded from likelihood assessment. These species have been assessed separately.

Appendix 6: Summary of the assessment of likelihood of presence for threatened fauna species identified within 5km database searches.

Scientific Name	Common Name	FFG Conservation Status	EPBC Conservation Status	Treaty	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
Birds										
Anthochaera phrygia	Regent Honeyeater		Critically Endangered				Occur mainly in dry box ironbark open-forest and woodland areas. feeding on the nectar from eucalypts such as the Mugga Ironbark, White Box and Yellow Box, and Blakeley's Red Gum on which they are reliant (DSEWPC 2016a).	PMST	Unlikely	No suitable habitat present. No records of the species within the local area in the last 25 years
Biziura lobata	Musk Duck	Vulnerable			1	21/01/2001	Found in deep freshwater lagoons, with dense reed beds (Birdlife 2016b).	VBA	Low	Limited aspects of habitat present. Few records within the local area within the past 25 years
Callocephalon fimbriatum	Gang-gang Cockatoo		Endangered				During summer, the Gang-gang Cockatoo is found in tall mountain forests and woodlands, with dense shrubby understoreys. In winter, Gang-gangs will move to lower altitudes into drier, more open forests and woodlands. At this time, they may be seen by roadsides and in parks and gardens of urban areas. They require tall trees for nest hollows (Birdlife. 2022)	PMST	Low	Limited aspects of habitat present. No records of the species within the local area in the last 25 years
Diomedea antipodensis	Antipodean Albatross		Vulnerable				The Antipodean Albatross nests in open patchy vegetation, such as among tussock grassland or shrubs on ridges, slopes and plateaus (DSEWPC 2016b)	PMST	Unlikely	No suitable habitat present. No records of the species within the local area in the last 25 years

Scientific Name	Common Name	FFG Conservation Status	EPBC Conservation Status	Treaty	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
Falco hypoleucos	Grey Falcon		Vulnerable				Found in shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey (NSW- OoEHb).	PMST	Low	Aspects of habitat present but may be modified. No records of the species within the local area in the last 25 years
Gelochelidon nilotica macrotarsa	Gull-billed Tern	Endangered			1	3/12/2002	Found in freshwater swamps, brackish and salt lakes, beaches and estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands. They are only rarely found over the ocean (BiB 2016k).	VBA	Low	No suitable habitat present. Few records within the local area within the past 25 years
Grantiella picta	Painted Honeyeater		Vulnerable				Found in dry open forests and woodlands, and is strongly associated with mistletoe. It may also be found along rivers, on plains with scattered trees and on farmland with remnant vegetation. It has been seen in urban parks and gardens where large eucalypts are available (BiB 2016m).	PMST	Unlikely	Limited aspects of habitat present or habitat highly modified. No records of the species within the local area in the last 25 years
Haliaeetus leucogaster	White-bellied Sea-Eagle	Endangered	Marine	CAMBA	25	15/05/2019	Usually seen high in a tree, or soaring over waterways and adjacent land. The nest can be located in a tree up to 30m above the ground, but may also be placed on the ground or on rocks (BiB 2016p).	VBA	Moderate	Aspects of habitat present, being tall Eucalyptuses for roosting and nesting, however, no nests observed on site. Numerous records within the local area within the past 5 years
Hieraatus morphnoides	Little Eagle	Vulnerable			1	9/07/2017	Found in most open forest, woodland and scrub types and open agricultural country (Day and Simpson 2010)	VBA	Moderate	Aspects of habitat present, being tall Eucalyptuses for roosting and nesting, however no nests observed on site. Less than 10 year old records within local area

Scientific Name	Common Name	FFG Conservation Status	EPBC Conservation Status	Treaty	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
Hydroprogne caspia	Caspian Tern	Vulnerable		CAMBA JAMBA	67	23/03/2019	Usually found near the coast, in extensive wetlands, on coastal and interior beaches and sheltered estuaries. Lives equally well in fresh water and saline environments (BiB 2016q).	VBA	Low	No suitable habitat present. Numerous records within the local area within the past 5 years
Pycnoptilus floccosus	Pilot Bird		Vulnerable				Pilotbirds are strictly terrestrial, living on the ground in dense forests with heavy undergrowth (Higgins & Peter 2002). Largely sedentary, they are typically seen hopping briskly over the forest floor and foraging on damp ground or among leaf-litter (DAWE	PMST	Unlikely	No suitable habitat present. No records of the species within the local area in the last 25 years
Spatula rhynchotis	Australasian Shoveler	Vulnerable			10	1/09/2018	All kinds of wetlands, preferring large undisturbed heavily vegetated freshwater swamps. It is also found on open waters and occasionally along the coast. Nests are built on the ground in dense vegetation, sometimes on a stump or hollow of a tree that is standing in water (Birdlife 2019a).	VBA	Low	No suitable habitat present. Numerous records within the local area within the past 5 years
Sternula albifrons	Little Tern	Critically Endangered		CAMBA JAMBA ROKAMBA BONN	1	16/10/1998	Mainly coastal, being found on beaches, sheltered inlets, estuaries, lakes, sewage farms, lagoons, river mouths and deltas. Nesting sites are usually located where humans swim, walk, exercise dogs, picnic and drive off-road vehicles (NSW-OoEHd).	VBA	Unlikely	No suitable habitat present. No records of the species within the local area in the last 25 years

Scientific Name	Common Name	FFG Conservation Status	EPBC Conservation Status	Treaty	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
Sternula nereis	Fairy Tern	Critically Endangered	Vulnerable		5	13/04/2019	Almost exclusively coastal however may occur several kilometres from the sea in harbours, inlets and rivers. Nests in small, scattered colonies in low dunes or on sandy beaches just above high tide mark (DSEWPC 2016c).	VBA, PMST	Low	No suitable habitat present. Numerous records within the local area within the past 5 years
Thalassarche bulleri platei	Northern Buller's Albatros		Vulnerable				In Australia, the species occurs over inshore, offshore and pelagic waters (DSEWPC 2017d)	PMST	Unlikely	No suitable habitat present. No records of the species within the local area in the last 25 years
Thalassarche carteri	Indian Yellow-nosed Albatross	Endangered	Vulnerable	BONN	1	27/02/2000	Marine and pelagic, though occurs inshore in places (HBW 2019)	VBA, PMST	Unlikely	No suitable habitat present. Few records within the local area within the past 25 years
Thalassarche melanophris	Black-browed Albatross		Vulnerable		1	11/04/1999	Oceanic, coastal, wide bays, follows ships (Day and Simpson 2010).	VBA, PMST	Unlikely	No suitable habitat present. Few records within the local area within the past 25 years
Amphibians and Reptiles										
Litoria raniformis	Growling Grass Frog		Vulnerable				Need still or slow moving water with emergent vegetation around the edges and mats of floating and submerged plants (DSE 2007).	PMST	Unlikely	No suitable habitat present. No streams within or adjacent to study area. No records of the species within the local area in the last 25 years

Scientific Name	Common Name	FFG Conservation Status	EPBC Conservation Status	Treaty	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
Pseudophryne semimarmorata	Southern Toadlet	Endangered			3	27/05/1977	Frequent dry forest, woodland, shrubland, grassland, and heaths. They shelter under leaf litter and other debris in moist soaks and depressions (Frogs.Org 2016).	VBA	Unlikely	Limited aspects of habitat present, with fragmented modified woodland. No records of the species within the local area in the last 25 years
Varanus varius	Lace Monitor	Endangered			1	16/02/1998	The calculated mean home range for the Lace Goanna is 64 +/- 34 ha and it utilises large hollow bearing trees for such activities as night time shelter and resting (Weavers 1993). Routes of low dispersal probability relate to the upperalpine slopes and plateux and flat grassy plains of western Victoria	VBA	Unlikely	No suitable habitat present. Large patches of bushland absent within or adjacent to study area. Few records of the species within the local area in the last 25 years
Mammals										
Antechinus minimus maritimus	Swamp Antechinus	Vulnerable	Vulnerable		2	1/05/2012	This species occurs in damp habitats with dense understorey vegetation. It has been found in forest, woodland, heathland, tussock grassland, and sedgeland. It prefers lower elevation areas, with a southerly aspect and moderate slope (IUNC 2016a)	VBA, PMST	Low	Limited aspects of habitat present, being the woodland patches of Manna Gum. Few records of the species within the local area in the last 25 years
Dasyurus maculatus maculatus	Spot-tailed Quoll		Endangered				Home range 100 to 200 ha. Trees with hollows, hollow logs on the ground, rocky outcrops, caves or rock crevices (Menkhorst, Knight 2010).	PMST	Unlikely	No suitable habitat present. Large patches of bushland absent within or adjacent to study area absent. No records of the species within the local area in the last 25 years
Isoodon obesulus obesulus	Southern Brown Bandicoot		Endangered				Home range 1 to 6 ha. Eucalypt woodlands and forests that have a dense shrubby understorey.	PMST	Unlikely	No suitable habitat present. Large patches of bushland absent within or adjacent to

Scientific Name	Common Name	FFG Conservation Status	EPBC Conservation Status	Treaty	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
							Bandicoots often inhabit blackberry thickets (Menkhorst, Knight 2010).			study area absent. No records of the species within the local area in the last 25 years
Mastacomys fuscus mordicus	Broad-toothed Rat		Vulnerable				Occur in a wide range of environments from alpine herbfields to coastal tussock grassland (Menkhorst, Knight 2010)	PMST	Unlikely	Aspects of habitat present but may be modified. No records of the species within the local area in the last 25 years
Petauroides volans	Greater Glider		Endangered				Arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands (Kehl & Borsboom 1984; Kavanagh & Lambert 1990; van der Ree et al., 2004). Typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows (Andrews et al., 1994; Smith et al., 1994, 1995; Kavanagh 2000; Eyre 2004; van der Ree et al., 2004; Vanderduys et al., 2012). The greater glider favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species (Kavanagh 1984) (Menkhorst, Knight 2010).	PMST	Unlikely	No suitable habitat present. No records of the species within the local area in the last 25 years
Petaurus australis australis	Yellow-bellied Glider		Vulnerable				The yellow-bellied glider (south-eastern) occurs in eucalypt-dominated woodlands and forests, including both wet and dry sclerophyll forests (Kavanagh et al. 1995; Rees et al. 2007). Abundance is highly dependent on habitat suitability, which is in turn	PMST	Unlikely	No suitable habitat present. No records of the species within the local area in the last 25 years

Scientific Name	Common Name	FFG Conservation Status	EPBC Conservation Status	Treaty	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
							determined by forest age and floristics (DAWE			
Potorous tridactylus trisulcatus	Long-nosed Potoroo		Vulnerable				Home range 2 to 4 ha. Requires open, floristically diverse areas for foraging in conjunction with dense, complex shrubby vegetation for shelter from predators (Menkhorst, Knight 2010).	PMST	Unlikely	No suitable habitat present. Large patches of bushland absent within or adjacent to study area absent. No records of the species within the local area in the last 25 years
Pteropus poliocephalus	Grey-headed Flying-fox		Vulnerable				Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy (Menkhorst, Knight 2010).	PMST	Unlikely	No suitable habitat present. No records of the species within the local area in the last 25 years
Fish										
Galaxiella pusilla	Dwarf Galaxias		Vulnerable				Dwarf Galaxias has broad habitat requirements and occurs in slow flowing and still, shallow, permanent and temporary freshwater habitats such as swamps, drains and the backwaters of streams and creeks, often (but not always) containing dense aquatic macrophytes and emergent plants (Cadwallader & Backhouse 1983; McDowall 1996; Hammer 2002a).	PMST	Unlikely	No suitable habitat present. No streams within or adjacent to study area. No records of the species within the local area in the last 25 years

Scientific Name	Common Name	FFG Conservation Status	EPBC Conservation Status	Treaty	Count of Sightings	Date of Last Record	Preferred Habitat Notes	Database Source	Likelihood of occurrence	Comments
Galeorhinus galeus	School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark		Conservation Dependent				Recorded in Australia from Moreton Bay (Qld) to Perth (WA), including Tasmania and Lord Howe Island. A widespread mainly coastal and bottom associated shark found in temperate areas over the continental shelf to about 800 m on the continental slope (FoA, 2022a)	PMST	Unlikely	Marine species. No records of the species within the local area in the last 25 years
Prototroctes mareana	Australian Grayling		Vulnerable				Inhabit cool, clear, freshwater streams with gravel substrate and areas alternating between pools and riffle zones. The species has been found over 100 km upstream from the sea (DSEWPC 2016f)	PMST	Unlikely	No suitable habitat present. No streams within or adjacent to study area. No records of the species within the local area in the last 25 years
Seriolella brama	Blue Warehou		Conservation Dependent				Portland, Queensland, to the Great Australian Bight, Western Australia, including northern and eastern Tasmania, and possibly to east of Albany, Western Australia. Blue Warehou mostly occur in offshore waters, although juveniles may be found in bays, estuaries and coastal waters. (FoA, 2022b)	PMST	Unlikely	Marine species. No records of the species within the local area in the last 25 years
Thunnus maccoyii	Southern Bluefin Tuna		Conservation Dependent				Recorded from every Australian state, but absent from the coasts of the Northern Territory and northern Queensland, and very rare in central and western Bass Strait along the south coast (FoA, 2022c)	PMST	Unlikely	Marine species. No records of the species within the local area in the last 25 years

References

SPECIES	TAG	Title	Detail
Birds			
Anthochaera phrygia	DSEWPC 2016a	Regent Honeyeater	https://www.environment.gov.au/biodiversity/threatened/publications/factsheet-regent-honeyeater-xanthomyza-phrygia
Biziura lobata	Birdlife 2016b	Musk Duck	http://www.birdlife.org/datazone/speciesfactsheet.php?id=363
Callocephalon fimbriatum	DAWE	Gang-gang Cockatoo	http://www.environment.gov.au/biodiversity/threatened/species/pubs/768-conservation-advice-02032022.pdf
Diomedea antipodensis	DSEWPC 2016b	Antipodean Albatross	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64458
Falco hypoleucos	NSW- OoEHb	Grey Falcon	http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10330
Gelochelidon nilotica macrotarsa	Day and Simpson 2010	Field Guide to the Birds of Australia	
Grantiella picta	Day and Simpson 2010	Field Guide to the Birds of Australia	
Haliaeetus leucogaster	Day and Simpson 2010	Field Guide to the Birds of Australia	
Hieraatus morphnoides	Day and Simpson 2011	Little Eagle	
Hydroprogne caspia	Day and Simpson 2010	Field Guide to the Birds of Australia	
Pycnoptilus floccosus	DAWE	Pilotbird	http://www.environment.gov.au/biodiversity/threatened/species/pubs/525-conservation-advice-02032022.pdf
Spatula rhynchotis	Birdlife 2019a	Australasian Shoveler	http://datazone.birdlife.org/species/factsheet/22680243
Sternula albifrons	NSW- OoEHd	Little Tern	http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10769
Sterna nereis	DSEWPC 2016c	Australian Fairy Tern	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=82950
Thalassarche bulleri platei	DSEWPC 2017d	Northern Bullers Albtross	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64460
Thalassarche carteri	HBW 2019	Indian Yellow-nosed Albatross	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64464
Thalassarche melanophris	Day and Simpson 2010	Black-browed Albatross	
Amphibians and Reptiles			
Litoria raniformis	DSE 2007	Growling Grass Frog	http://www.dse.vic.gov.au/__data/assets/pdf_file/0016/103408/GGF_fact_sheet.pdf
Pseudophryne semimarmorata	SWIFFT 2016	Southern Toadlet	http://www.swifft.net.au/cb_pages/southern_toadlet.php
Varanus varius	VEAC	Lace Monitor - Statewide Modelling of Native Vegetation (unpublished web document)	
Mammals			
Antechinus minimus maritimus	IUNC 2016a	Swamp Antechinus	http://www.iucnredlist.org/details/40525/0
Dasyurus maculatus maculatus	Menkhorst, Knight 2010	A Field Guide to the Mammals of Australia, Third Edition, 2010. Oxford University Press.	
Isoodon obesulus obesulus	Menkhorst, Knight 2010	A Field Guide to the Mammals of Australia, Third Edition, 2010. Oxford University Press.	
Mastacomys fuscus mordicus	Menkhorst, Knight 2010	A field Guide to the Mammals of Australia, Third Edition, 2010. Oxford University Press.	
Petauroides volans	Menkhorst, Knight 2010	A Field Guide to the Mammals of Australia, Third Edition, 2010. Oxford University Press.	
Petaurus australis australis	DAWE	Yellow-bellied Glider	https://www.environment.gov.au/biodiversity/threatened/species/pubs/87600-conservation-advice-02032022.pdf
Potorous tridactylus tridactylus	Menkhorst, Knight 2010	A Field Guide to the Mammals of Australia, Third Edition, 2010. Oxford University Press.	
Pteropus poliocephalus	Menkhorst, Knight 2010	A Field Guide to the Mammals of Australia, Third Edition, 2010. Oxford University Press.	
Fish			
Galaxiella pusilla	DSEWPC 2016e	Dwarf Galaxias	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=56790
Galeorhinus galeus	FoA, 2022a	School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark	https://fishesofaustralia.net.au/home/species/1960#moreinfo

SPECIES	TAG	Title	Detail
Seriolella brama	FoA, 2022b	Blue Warehou	https://fishesofaustralia.net.au/home/species/747
Thunnus maccoyii	FoA, 2022c	Southern Bluefin Tuna	https://fishesofaustralia.net.au/home/species/732
Prototroctes mareana	DSEWPC 2016f	Australian Grayling	http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=26179

Key to Likely Occurrence

Likelihood	Comments
Present	Species has been confirmed as present on site during field work
High	Suitable habitat present on site
	Likely to be a resident population/s in the local area*
	Previously recorded on site
	Numerous records within the local area within the past 5 years
Moderate	Aspects of habitat present but may be modified
	Species may be resident in the local area or it forms part of the species' range
	May seasonally or opportunistically use resources within the local area
	Less than 10 year old records within local area
Low	Limited aspects of habitat present or habitat highly modified
	Species may occur rarely or as an opportunistic visitor in the area
	Few records within the local area within the past 25 years
Unlikely	No suitable habitat present
	Site is located outside of species natural range
	Considered locally extinct
	No records of the species within the local area in the last 25 years

* Local area = within a 5km range of the site.

Appendix 7: Flora survey results

Origin	Scientific Name	Common Name	FFG Act Status	Habitat Zones	Degraded Areas
#	*Acacia longifolia*	Sallow Wattle		+	
*	*Allium triquetrum*	Angled Onion			+
	Allocasuarina verticillata	Drooping Sheoak		+	
*	*Anthoxanthum odoratum*	Sweet Vernal Grass		+	
*	*Arctotheca calendula*	Cape Weed		+	+
***	*Atriplex paludosa*	Marsh Saltbush	Endangered		
	Banksia integrifolia subsp. integrifolia	Coast Banksia		+	
*	*Bellis perennis*	English Daisy			+
*	*Brassica spp.*	Turnip			
*	*Bromus catharticus*	Prairie Grass		+	+
*	*Bromus diandrus*	Great Brome		+	
*	*Cenchrus clandestinus*	Kikuyu		+	+
*	*Cerastium glomeratum s.l.*	Common Mouse-ear Chickweed		+	+
#	*Chenopodium glaucum*	Glaucous Goosefoot		+	
*	*Cirsium vulgare*	Spear Thistle		+	+
*	*Coprosma repens*	Mirror Bush			
*	*Conyz sp.*	Fleabane		+	
	Dichondra repens	Kidney-weed			
*	*Ehrharta erecta*	Panic Veldt-grass		+	
*	*Ehrharta longiflora*	Annual Veldt-grass		+	
*	*Erigeron bonariensis*	Flaxleaf Fleabane			
#	*Eucalyptus leucoxylon*	Yellow Gum		+	
	Eucalyptus viminalis subsp. pryoriana	Coast Manna-gum		+	
*	*Fumaria spp.*	Fumitory		+	+
*	*Galium aparine*	Cleavers		+	+

Origin	Scientific Name	Common Name	FFG Act Status	Habitat Zones	Degraded Areas
*	*Geranium molle*	Dove's Foot		+	
*	*Holcus lanatus*	Yorkshire Fog			
*	*Hordeum marinum*	Sea-Barley Grass		+	
*	*Hypochaeris radicata*	Flatweed		+	+
*	*Lepidium spp.*	Peppercress			+
#	*Leptospermum laevigatum*	Coast Tea-tree		+	
*	*Lycium ferocissimum*	African Box-thorn		+	+
*	*Malva parviflora*	Small-flower Mallow		+	
*	*Medicago polymorpha*	Burr Medic			+
#	*Melaleuca armillaris subsp. armillaris*	Giant Honey-myrtle	Endangered		
*	*Myosotis sp.*	Forget-me-not			
*	*Oxalis pes-caprae*	Soursob		+	
*	*Oxalis spp. (naturalised)*	Wood Sorrel		+	
*	*Plantago coronopus*	Buck's-horn Plantain			+
*	*Poa annua s.l.*	Annual Meadow-grass			+
	Poa labillardierei	Common Tussock-grass			
*	*Poa pratensis*	Kentucky Blue-grass			+
	Pteridium esculentum	Austral Bracken		+	
	Rhagodia candolleana subsp. candolleana	Seaberry Saltbush		+	
*	*Romulea rosea*	Onion Grass			+
	Rubus parvifolius	Small-leaf Bramble			
*	*Solanum nigrum s.l.*	Black Nightshade		+	
*	*Sonchus oleraceus*	Common Sow-thistle		+	+
*	*Stellaria media*	Chickweed		+	+
*	*Stenotaphrum secundatum*	Buffalo Grass			
*	*Trifolium repens var. repens*	White Clover			+
*	*Urtica urens*	Small Nettle		+	

Origin	
*	Exotic species
#	Native but some stands may be alien
***	Recorded Adjacent to Study Area

Appendix 8: Fauna survey results

Origin	Scientific Name	Common Name
	Anthochaera carunculata	Red Wattlebird
	Apis (Apis) mellifera	European Honey Bee
	Chroicocephalus novaehollandiae	Silver Gull
	Conoderus sp.	Click Beetle
	Culicidae sp.	Mosquito
	Dindymus versicolor	Harlequin Bug
	Elanus axillaris	Black-shouldered Kite
	Eristalis tenax	Drone Fly
	Formicidae sp.	Ant
	Grallina cyanoleuca	Magpie-lark
	Gymnorhina tibicen	Australian Magpie
	Hirundo neoxena	Welcome Swallow
	Hypoblemum albovittatum	jumping spider
	Leptotarsus sp.	Crane Fly
	Larus pacifica	Pacific Gull
	Malurus cyaneus	Superb Fairy-wren
	Maratus pavonis	Peacock Spider
	Muscidae sp.	Bush Fly
	Myrmecia croslandi	Jumping Jack Ant
	Nematocera sp.	Gnat
	Nexara viridula	Shield Beetle
	Pieris rapae	Cabbage White Butterfly
	Poodytes gramineus	Little Grassbird
	Porcellio scaber	Slater
	Rhipidura albiscapa	Grey Fantail

Origin	
	Species indigenous to Australia and the local area

Appendix 9: Scattered / Large Tree (LT) and Native Tree recordings

Id	Scientific Name	Common Name	DBH	Size	Origin	Loss Determination
1	*Eucalyptus viminalis subsp. pryoriana*	Gippsland Manna Gun	66	Small	Indigenous. Remnant	Indirect - TPZ
2	*Eucalyptus viminalis subsp. pryoriana*	Gippsland Manna Gun	59	Small	Indigenous. Remnant	Indirect - TPZ
3	*Allocasuarina verticillata*	Drooping Sheoak	50	-	Indigenous. Remnant	Lost
4	*Allocasuarina verticillata*	Drooping Sheoak	12	-	Indigenous. Remnant	Lost
5	*Melaleuca armillaris subsp. armillaris*	Giant Honey-myrtle	35	-	Non-indigenous	Lost
6	*Eucalyptus viminalis subsp. pryoriana*	Gippsland Manna Gun	65	Small	Indigenous. Remnant	Lost
7	*Banksia integrifolia*	Coast Banksia	5	-	Indigenous. Planted	Lost
8	*Leptospermum laevigatum*	Coastal Tea-tree	31	-	Indigenous. Remnant	Lost
9	*Allocasuarina verticillata*	Drooping Sheoak	19	-	Indigenous. Remnant	Lost
10	*Eucalyptus leucoxylon*	Yellow Gum	47	-	Non-indigenous	Indirect - TPZ
11	*Banksia integrifolia*	Coast Banksia	2	-	Indigenous. Planted	Lost
12	*Allocasuarina verticillata*	Drooping Sheoak	59	-	Indigenous. Remnant	Lost
13	*Eucalyptus leucoxylon*	Yellow Gum	72	-	Non-indigenous	Lost
14	*Banksia integrifolia*	Coast Banksia	2	-	Indigenous. Planted	Lost
15	*Allocasuarina verticillata*	Drooping Sheoak	47	-	Indigenous. Remnant	Lost
16	*Allocasuarina verticillata*	Drooping Sheoak	40	-	Indigenous. Remnant	Lost
17	*Eucalyptus ovata*	Swamp Gum	34	Small	Indigenous. Remnant	Lost
18	*Leptospermum laevigatum*	Coastal Tea-tree	25	-	Indigenous. Remnant	Lost
19	*Melaleuca armillaris subsp. armillaris*	Giant Honey-myrtle	25	-	Non-indigenous	Lost
20	*Leptospermum laevigatum*	Coastal Tea-tree	15	-	Indigenous. Remnant	Lost
21	*Eucalyptus viminalis subsp. pryoriana*	Gippsland Manna Gun	115	Large	Indigenous. Remnant. Dead	Lost
22	*Eucalyptus viminalis subsp. pryoriana*	Gippsland Manna Gun	75	Large	Indigenous. Remnant	Lost
23	*Eucalyptus viminalis subsp. pryoriana*	Gippsland Manna Gun	45	Small	Indigenous. Remnant	Lost
24	*Allocasuarina verticillata*	Drooping Sheoak	21	-	Indigenous. Remnant	Lost
25	*Banksia integrifolia*	Coast Banksia	3	-	Indigenous. Planted	Lost
26	*Melaleuca armillaris subsp. armillaris*	Giant Honey-myrtle	40	-	Non-indigenous	Lost
27	*Banksia integrifolia*	Coast Banksia	5	-	Indigenous. Planted	Lost
28	*Eucalyptus ovata*	Swamp Gum	67	Small	Indigenous. Remnant	Indirect - TPZ
29	*Eucalyptus leucoxylon*	Yellow Gum	68	-	Non-indigenous	Indirect - TPZ
30	*Eucalyptus ovata*	Swamp Gum	20	Small	Indigenous. Remnant	Lost

Id	Scientific Name	Common Name	DBH	Size	Origin	Loss Determination
31	*Banksia integrifolia*	Coast Banksia	20	Small	Indigenous. Remnant	Lost
32	*Leptospermum laevigatum*	Coast Tea-tree	26	-	Indigenous. Remnant	Lost
33	*Banksia integrifolia*	Coast Banksia	68	Large	Indigenous. Remnant	Indirect - TPZ
34	*Allocasuarina verticillata*	Drooping Sheoak	22	-	Indigenous. Remnant	Lost
35	*Allocasuarina verticillata*	Drooping Sheoak	50	-	Indigenous. Remnant	Lost
36	*Allocasuarina verticillata*	Drooping Sheoak	30	-	Indigenous. Remnant	Indirect - TPZ
37	*Allocasuarina verticillata*	Drooping Sheoak	40	-	Indigenous. Remnant	Lost
38	*Eucalyptus leucoxylon*	Yellow Gum	20	-	Non-indigenous	Lost

Appendix 10: DELWP ENSYM Test Scenario

Scenario test – native vegetation removal

This report provides offset requirements for internal testing of different proposals to remove native vegetation. **This report DOES NOT support an application to remove, destroy or lop native vegetation under Clause 52.16 or 52.17 of planning schemes in Victoria.** A report must be obtained from the Department of Environment, Land, Water and Planning (DELWP).

Date of issue: 16/12/2022
Time of issue: 11:54 am

Report ID: Scenario Testing

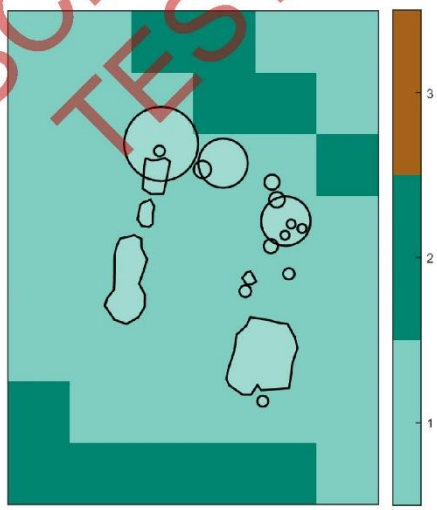
Project ID	22151BMT_VegRemoval_

Assessment pathway

Assessment pathway	**Intermediate Assessment Pathway**
Extent including past and proposed	0.266 ha
Extent of past removal	0.000 ha
Extent of proposed removal	0.266 ha
No. Large trees proposed to be removed	3
Location category of proposed removal	Location 2 The native vegetation is in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map). Removal of less than 0.5 hectares of native vegetation in this location will not have a significant impact on any habitat for a rare or threatened species.

SCENARIO TESTING

1. Location map



Page 1

Scenario test – native vegetation removal

Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

General offset amount[1]	0.061 general habitat units
Vicinity	West Gippsland Catchment Management Authority (CMA) or Bass Coast Shire Council
Minimum strategic biodiversity value score[2]	0.351
Large trees	3 large trees

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix 2 includes information about the rare or threatened species mapped at the site.

Appendix 3 includes maps showing native vegetation to be removed and extracts of relevant species habitat importance maps

SCENARIO TESTING

1 The general offset amount required is the sum of all general habitat units in Appendix 1.

2 Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required

Scenario test – native vegetation removal

Next steps

Any proposal to remove native vegetation must meet the application requirements of the Intermediate Assessment Pathway and it will be assessed under the Intermediate Assessment Pathway.

This report DOES NOT support an application to remove, destroy or lop native vegetation under Clause 52.16 or 52.17 of planning schemes in Victoria.

If you wish to remove the mapped native vegetation you must submit the related shapefiles to the Department of Environment, Land, Water and Planning (DELWP) for processing, by email to ensymnvrtool.support@delwp.vic.gov.au. DELWP will provide a *Native vegetation removal report* that is required to meet the permit application requirements in accordance with *Guidelines for the removal, destruction or lopping of native vegetation* (Guidelines).

SCENARIO TESTING

Appendix 1: Description of native vegetation to be removed

All zones require a general offset, the general habitat units each zone is calculated by the following equation in accordance with the Guidelines:

General habitat units = extent x condition x general landscape factor x 1.5, where the general landscape factor = 0.5 + (strategic biodiversity value score/2)

The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
1-F	Patch	gipp0002	Vulnerable	0	no	0.070	0.003	0.003	0.460		0.000	General
1-G	Patch	gipp0002	Vulnerable	0	no	0.070	0.003	0.003	0.460		0.000	General
1-I	Patch	gipp0002	Vulnerable	0	no	0.070	0.005	0.005	0.460		0.000	General
1-J	Patch	gipp0002	Vulnerable	0	no	0.270	0.041	0.041	0.342		0.011	General
1-N	Patch	gipp0002	Vulnerable	0	no	0.070	0.001	0.001	0.460		0.000	General
1-O	Patch	gipp0002	Vulnerable	0	no	0.070	0.003	0.003	0.460		0.000	General
1-P	Patch	gipp0002	Vulnerable	0	no	0.070	0.002	0.002	0.460		0.000	General
1-H	Patch	gipp0002	Vulnerable	0	no	0.070	0.002	0.002	0.460		0.000	General
1-A	Patch	gipp0002	Vulnerable	2	no	0.250	0.067	0.067	0.460		0.018	General
1-B	Patch	gipp0002	Vulnerable	0	no	0.260	0.013	0.013	0.460		0.004	General
1-E	Patch	gipp0002	Vulnerable	0	no	0.070	0.004	0.004	0.460		0.000	General
1-C	Patch	gipp0002	Vulnerable	0	no	0.070	0.002	0.002	0.460		0.000	General
1-D	Patch	gipp0002	Vulnerable	0	no	0.070	0.002	0.002	0.460		0.000	General
1-M	Patch	gipp0002	Vulnerable	0	no	0.070	0.001	0.001	0.460		0.000	General
1-L	Scattered Tree	gipp0002	Vulnerable	1	no	0.200	0.070	0.061	0.449		0.013	General

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
1-K	Scattered Tree	gipp0002	Vulnerable	0	no	0.200	0.031	0.029	0.460		0.006	General
1-Q	Scattered Tree	gipp0002	Vulnerable	0	no	0.200	0.031	0.026	0.460		0.006	General
1-R	Patch	gipp0002	Vulnerable	0	no	0.070	0.001	0.001	0.460		0.000	General
1-S	Patch	gipp0002	Vulnerable	0	no	0.070	0.001	0.001	0.460		0.000	General

SCENARIO TESTING

SCENARIO TESTING

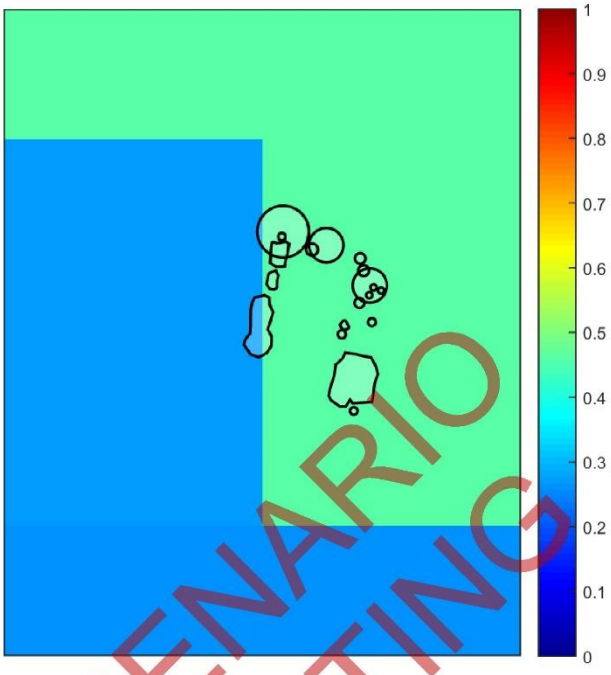
Appendix 2: Information about impacts to rare or threatened species' habitats on site

This is not applicable in the Intermediate Assessment Pathway.

SCENARIO TESTING

Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map



SCENARIO TESTING

Page 7

Appendix 11: Proof of Native Vegetation Offset Availability

Report of available native vegetation credits

This report lists native vegetation credits available to purchase through the Native Vegetation Credit Register.

This report is **not evidence** that an offset has been secured. An offset is only secured when the units have been purchased and allocated to a permit or other approval and an allocated credit extract is provided by the Native Vegetation Credit Register.

Date and time: 14/12/2022 03:34 **Report ID: 17106**

What was searched for?

General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
0.063	0.353	3	CMA	West Gippsland
			or LGA	Bass Coast Shire

Details of available native vegetation credits on 14 December 2022 03:34

These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
BBA-0119	3.052	73	West Gippsland	South Gippsland Shire	Yes	Yes	No	VegLink
BBA-0138	24.007	1605	West Gippsland	Wellington Shire	Yes	Yes	No	Ecocentric
BBA-0759	18.868	659	West Gippsland	Wellington Shire	Yes	Yes	No	Contact NVOR
BBA-2321	0.881	141	West Gippsland	Wellington Shire	Yes	Yes	No	Bio Offsets, VegLink
BBA-2623	23.877	873	West Gippsland	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2810	7.758	613	West Gippsland	Latrobe City	Yes	Yes	No	VegLink
BBA-2833	5.001	17	West Gippsland	Wellington Shire	Yes	Yes	No	Ethos
BBA-2839	0.929	14	West Gippsland	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2845	27.551	1069	West Gippsland	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2855	3.158	10	West Gippsland	Wellington Shire	Yes	Yes	No	VegLink
BBA-2875	33.014	1052	West Gippsland	Wellington Shire	Yes	Yes	No	Abezco
TFN-C0977	2.959	54	West Gippsland	Baw Baw Shire	Yes	Yes	No	TFN
TFN-C1442	2.726	58	West Gippsland	Baw Baw Shire	Yes	Yes	No	TFN
TFN-C1692	0.618	284	West Gippsland	South Gippsland Shire	Yes	Yes	No	Ecocentric, Ethos, VegLink
TFN-C1893	2.005	82	West Gippsland	Wellington Shire	Yes	Yes	No	Ecocentric, Ethos, VegLink
VC_CFL-2320_02	4.818	14	West Gippsland	Wellington Shire	Yes	Yes	No	VegLink
VC_CFL-3696_01	1.564	257	West Gippsland	Bass Coast Shire	Yes	Yes	No	Ethos
VC_TFN-C2078_01	1.182	69	West Gippsland	Wellington Shire	Yes	Yes	No	Contact NVOR

These sites meet your requirements using alternative arrangements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)

There are no sites listed in the Native Vegetation Credit Register that meet your offset requirements when applying the alternative arrangements as listed in section 11.2 of the Guidelines for the removal, destruction or lopping of native vegetation.

These potential sites are not yet available, land owners may finalise them once a buyer is confirmed.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)

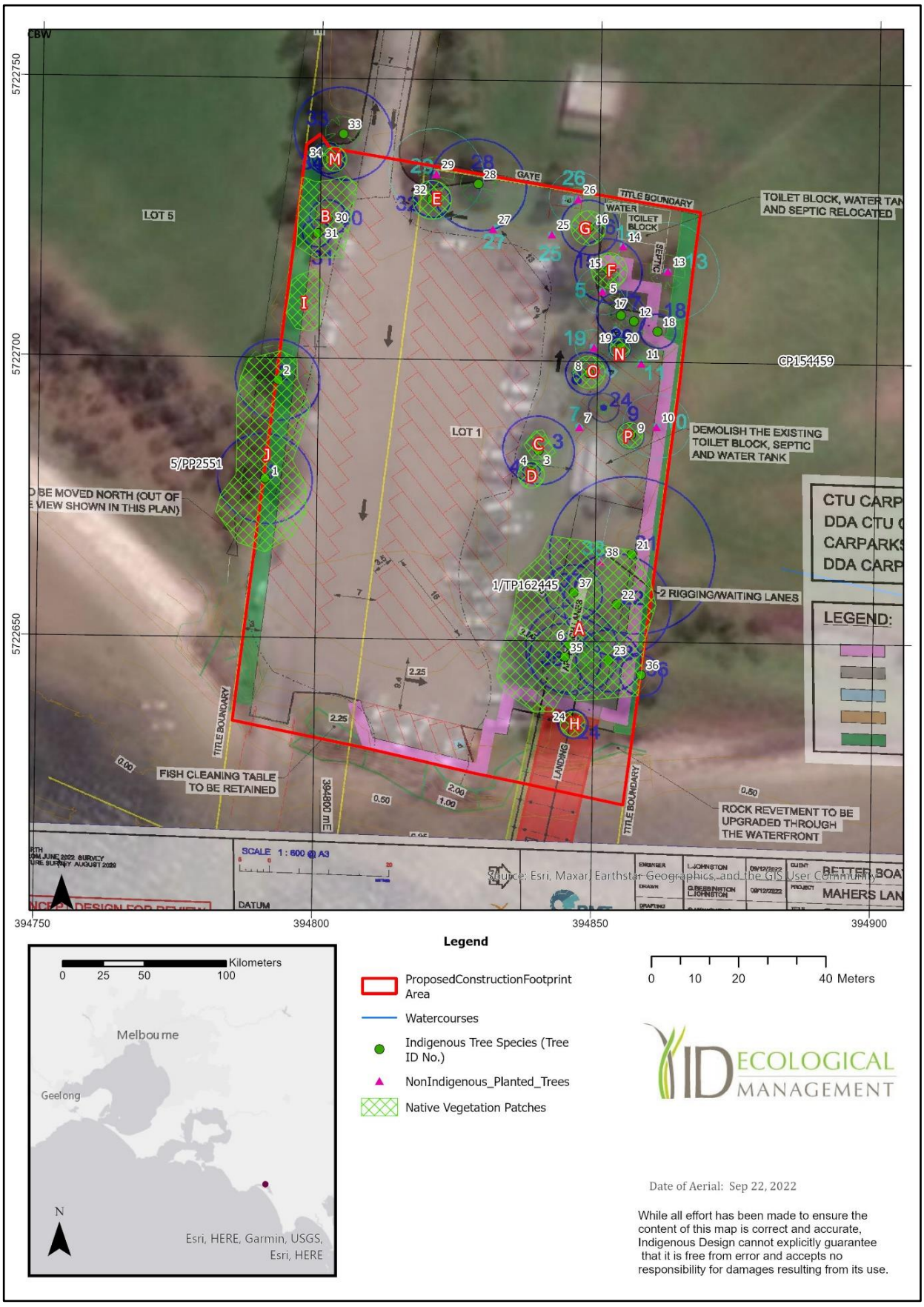
There are no potential sites listed in the Native Vegetation Credit Register that meet your offset requirements.

LT - Large Trees *CMA - Catchment Management Authority* *LGA - Municipal District or Local Government Authority*

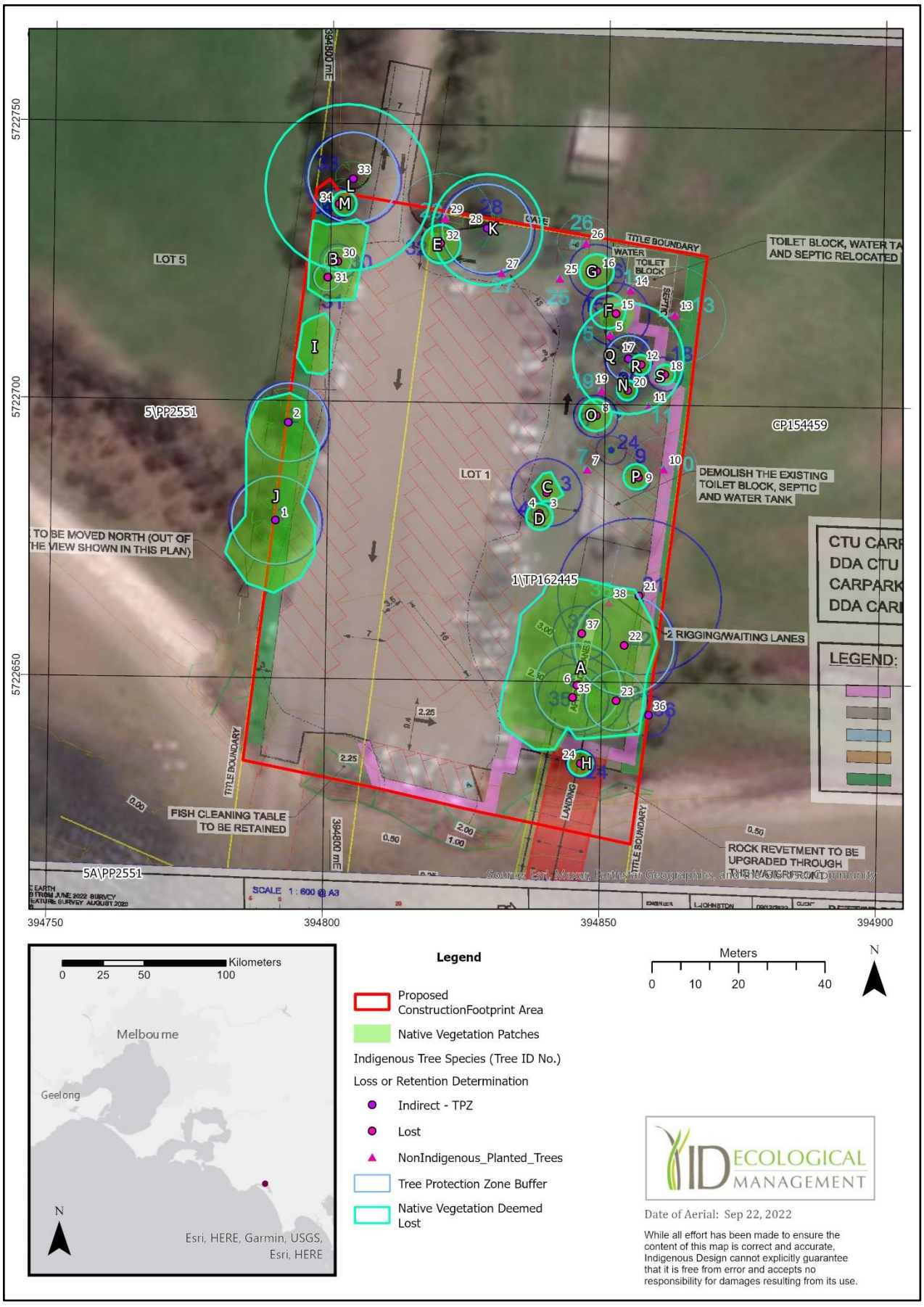
Maps

Maps commence on the next page.

Map 1– Location and extent of native vegetation and all trees within the study area

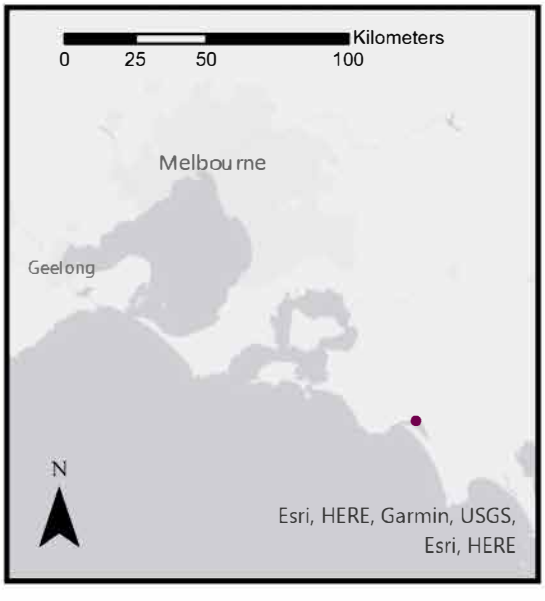


Map 2– Location and extent of native vegetation and canopy tree losses



ID Ecological Management
1635 Main Rd, Research VIC 3095 (PO Box 2020, Research DC VIC 3095) **P** (03) 9437 0555
Melbourne I Morwell l Wonthaggi **E** nicole@iddesign.com.au

ABN: 64 081 044 144 **W** www.idecological.com.au



Legend

- Proposed ConstructionFootprint Area
- Native Vegetation Patches
- Native Vegetation Patches to be Removed
- Tree Protection Zone Buffer
- Non Indigenous Planted Trees to be Removed

Indigenous Tree Species (Tree ID No.) to be removed

- Direct
- Indirect - TPZ

Meters
0 10 20 40

N

BMT
www.bmt.org

ID ECOLOGICAL MANAGEMENT

Date of Aerial: Sep 22, 2022

While all effort has been made to ensure the content of this map is correct and accurate, Indigenous Design cannot explicitly guarantee that it is free from error and accepts no responsibility for damages resulting from its use.

BMT Commercial Australia Pty Ltd
Level 5, 99 King Street,
Melbourne, VIC, 3000
Australia

ABN: 54 010 830 421

Our ref: L.A11698.300.002_Addendum_Marine_Vegetation_Impact_BMT_Response.docx

24 February 2023

Better Boating Victoria
Level 19, 1 Spring Street
Melbourne VIC 3000
Attention: Duncan Hill

Dear Duncan,

RE: Use and development of land for boat launching facility and vegetation removal – Mahers Landing Boating Facility Upgrade Project

In relation to the potential impact on seagrass patches, i.e., consequential loss, from the proposed works for the subject line project, and in response to Request for Further Information (RFI) from the Department of energy, Environment and Climate Action (DEECA), we understand from correspondence received from DEECA (received via Nick Robins of Ricardo Energy Environment & Planning on 13 February 2023) that:

> *"BMT stated in their response that while seagrass was present it did not warrant inclusion in the NVR or offsets required because the impact was very low (6.5 m^2).*
>
> *Native Vegetation Regulations Team have advised that the seagrass needs to be treated as a patch of native vegetation. There is no minimum patch size and the seagrass should be accounted for, with a condition score of 0.8 applied (as outlined in the Assessor's handbook, p.10).*
>
> *The seagrass regenerating post-impact (BMT stated that there will be temporary impact to seagrass during construction but that it will re-grow and recover after installation of the piles). The NV regulations team responded that the regulations take a conservative approach in that native vegetation is either impacted or not.*
>
> *Consequently, the areas where the piles will be located as well as the construction footprint that will impact on the seagrass needs to be included in the extent of native vegetation removal – see green outline in attached diagram."*

The project design and approval teams have actioned DEECA's comment and have now included the referred seagrass patches that may be impacted in the extent of the native vegetation removal.

This present letter is provided as an addendum to the technical reports on the Terrestrial Ecological Assessment of Mahers Landing (by *ID Ecological Management, 2022*) and Coastal Processes and Marine Ecology Impact Assessment (by *BMT, 2022*).

Attached to this letter are the following documents:

- A cover letter written by Indigenous Design – the ecology consultants responsible for detailing vegetation impacts. This includes a statement on impacts, a summary of the required offsets for the proposed works, and basic information requirement in the relevant guidelines.

BMT Commercial Australia Pty Ltd
Level 5, 99 King Street,
Melbourne, VIC, 3000
Australia

ABN: 54 010 830 421

- Updated combined Native Vegetation Removal Report (NVRR) created by the DEECA NVR team including terrestrial ecology to be removed, and seagrass patches predicted to be impacted by the proposed works.

- A previous letter written by BMT summarising the predicted impacts from the works on seagrass patches in the intertidal zone (by BMT dated 2 February 2023).

These documents combined describe the ways in which potential impacts from the proposed works to terrestrial and marine vegetation have been taken into account through the design process with impacts avoided, minimised as low and reasonably practicable (ALARP) to deliver the objectives of the overarching project; and how in future these impacts will be offset according to the *Guidelines for the removal, destruction or lopping of native vegetation (Department of Environment, Land, Water and Planning, 2017)*.

BMT remains open to assist and discuss this matter as required. Please do not hesitate to contact the undersigned if you need any further information.

Yours sincerely,

BMT

Dr Daniel Machado
Associate Principal
Environmental and Civil Engineer, MIEAust

Annex A Updated NVR report with Indigenous Design cover letter

24th February 2023

Taylor Rubinstein
Coastal Engineer
BMT
E taylor.rubinstein@bmtglobal.com
P 0490763956

Dear Taylor,

RE: Mahers Landing, Inverloch – Production of an NVR for Seagrass Removal and associated Terrestrial Vegetation Loss

Project Background

ID Ecological Management has been commissioned by BMT to submit combined spatial data to the Department of Energy, Environment and Climate Action (DEECA) detailing native vegetation removal and required offsets for terrestrial and aquatic vegetation removal, relating to boat ramp upgrades at Mahers Landing, Inverloch.

The scope of this assessment was to prepare a brief summary document that includes:

- An updated NVR report for the combined terrestrial and aquatic vegetation removal;
- A summary of required offsets for the project.

Native Vegetation Removal

In total, 0.287 hectares of native vegetation are proposed to be removed.

Details of the terrestrial native vegetation removal including maps and descriptions, can be found in the report by ID Ecological Management (Bowler, 2022) completed in December 2022. Spatial data for the terrestrial vegetation removal component was submitted to DEECA and an NVR Report (ID: Gen_2022_277) for the native vegetation removal issued on the 21/12/2022. The attached NVR (*Appendix 1*) supersedes that original NVR report.

Details regarding the aquatic vegetation impacts can be found in the Marine Ecology Impact Assessment report (Rubinstein & Tamizi, 2022), along with a revised letter sent to Better Boating Victoria on 2nd February 2023 (Machado, 2023), which includes updated impact areas. The aquatic native vegetation removal (seagrass) has been included in the attached NVR (*Appendix 1*), identified as Zone 2A.

Offsets Requirements

The results of vegetation quality assessments undertaken on terrestrial vegetation, combined with spatial data detailing the extent of sea-grass meadow loss, were forwarded to DEECA to provide a combined NVR report in relation to the boat ramp upgrade proposal. This report utilised the site based vegetation quality condition scores (terrestrial) (Bowler, 2022) and modelled condition scores for the

aquatic native vegetation loss (seagrass) into Habitat Units (HUs) and specified any applicable additional species-based offset requirements. *Table 1* provides the details of all native patch / large or scattered tree losses according to the relevant habitat zone and the subsequent offset requirements.

The revised NVR is provided in *Appendix 1* which details the required offsets, while *Appendix 2* shows proof that the required native vegetation credits are available for purchase.

Table 1 – Summary of losses and offset targets for clearing patches of native vegetation.

Target #	Vicinity	Offset type	Habitat for species	Minimum SBV score	Large trees	Offset target summary (HUs)
Terrestrial	West Gippsland CMA or Bass Coast Shire	General	N/A	0.347	1	0.047
Aquatic		General	N/A	0.368		0.071
Total		**General**	**N/A**	**0.353**	**1**	**0.118**

Regards,

Tim Bowler
Environmental Consultant

References

Bowler, T. (2022). *Ecological Assessment of Mahers Landing.* ID Ecological Management.

Machado, D. (2023). *L.A11698.300.001_Marine_Vegetation_Impact_BMT_Response.docx.* BMT.

Rubinstein, T., & Tamizi, A. (2022). *Mahers Landing Boat Ramp Design: Coastal Processes and Marine Ecology Impact Assessment.* BMT.

Appendix 1: Native Vegetation Removal Report

Native vegetation removal report

This report provides information to support an application to remove, destroy or lop native vegetation in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation*. The report **is not an assessment by DELWP** of the proposed native vegetation removal. Native vegetation information and offset requirements have been determined using spatial data provided by the applicant or their consultant.

Date of issue: **24/02/2023**
Time of issue: **12:51 pm**

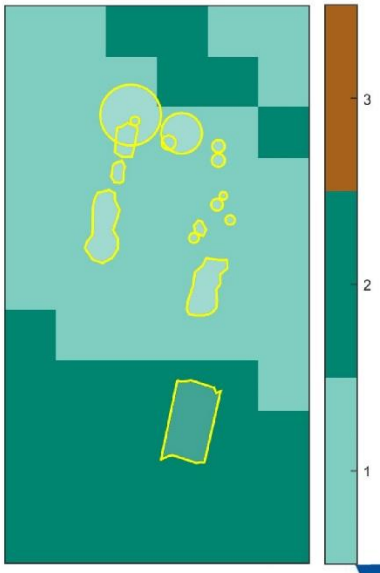
Report ID: IDE_2023_004

Project ID	22151BMT_VegRemoval_Combined

Assessment pathway

Assessment pathway	**Intermediate Assessment Pathway**
Extent including past and proposed	0.287 ha
Extent of past removal	0.000 ha
Extent of proposed removal	0.287 ha
No. Large trees proposed to be removed	1
Location category of proposed removal	Location 2 The native vegetation is in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map); and a wetland listed in the Directory of Important Wetlands of Australia. Removal of less than 0.5 hectares of native vegetation in this location will not have a significant impact on any habitat for a rare or threatened species.

1. Location map



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Native vegetation removal report

Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

General offset amount[1]	0.118 general habitat units
Vicinity	West Gippsland Catchment Management Authority (CMA) or Bass Coast Shire Council
Minimum strategic biodiversity value score[2]	0.353
Large trees	1 large tree

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix 2 includes information about the rare or threatened species mapped at the site.

Appendix 3 includes maps showing native vegetation to be removed and extracts of relevant species habitat importance maps

1 The general offset amount required is the sum of all general habitat units in Appendix 1.

2 Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required

Native vegetation removal report

Next steps

Any proposal to remove native vegetation must meet the application requirements of the Intermediate Assessment Pathway and it will be assessed under the Intermediate Assessment Pathway.

If you wish to remove the mapped native vegetation you are required to apply for a permit from your local council. Council will refer your application to DELWP for assessment, as required. **This report is not a referral assessment by DELWP.**

This *Native vegetation removal report* must be submitted with your application for a permit to remove, destroy or lop native vegetation.

Refer to the *Guidelines for the removal, destruction or lopping of native* vegetation (the Guidelines) for a full list of application requirements This report provides information that meets the following application requirements:

- The assessment pathway and reason for the assessment pathway
- A description of the native vegetation to be removed (met unless you wish to include a site assessment)
- Maps showing the native vegetation and property
- The offset requirements determined in accordance with section 5 of the Guidelines that apply if approval is granted to remove native vegetation.

Additional application requirements must be met including:

- Topographical and land information
- Recent dated photographs
- Details of past native vegetation removal
- An avoid and minimise statement
- A copy of any Property Vegetation Plan that applies
- A defendable space statement as applicable
- A statement about the Native Vegetation Precinct Plan as applicable
- An offset statement that explains that an offset has been identified and how it will be secured.

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Authorised by the Victorian Government, 8 Nicholson Street, East Melbourne.

For more information contact the DELWP Customer Service Centre 136 186

www.delwp.vic.gov.au

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Obtaining this publication does not guarantee that an application will meet the requirements of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes or that a permit to remove native vegetation will be granted.

Notwithstanding anything else contained in this publication, you must ensure that you comply with all relevant laws, legislation, awards or orders and that you obtain and comply with all permits, approvals and the like that affect, are applicable or are necessary to undertake any action to remove, lop or destroy or otherwise deal with any native vegetation or that apply to matters within the scope of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes.

Appendix 1: Description of native vegetation to be removed

All zones require a general offset, the general habitat units each zone is calculated by the following equation in accordance with the Guidelines:

General habitat units = extent x condition x general landscape factor x 1.5, where the general landscape factor = 0.5 + (strategic biodiversity value score/2)

The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
1-C	Patch	gipp0002	Vulnerable	0	no	0.070	0.003	0.003	0.460		0.000	General
1-A	Patch	gipp0002	Vulnerable	0	no	0.250	0.036	0.036	0.460		0.010	General
1-K	Scattered Tree	gipp0002	Vulnerable	0	no	0.200	0.031	0.028	0.460		0.006	General
1-B	Patch	gipp0002	Vulnerable	0	no	0.260	0.014	0.014	0.460		0.004	General
1-E	Patch	gipp0002	Vulnerable	0	no	0.070	0.004	0.004	0.460		0.000	General
1-F	Patch	gipp0002	Vulnerable	0	no	0.070	0.003	0.003	0.460		0.000	General
1-G	Patch	gipp0002	Vulnerable	0	no	0.070	0.003	0.003	0.460		0.000	General
1-D	Patch	gipp0002	Vulnerable	0	no	0.070	0.002	0.002	0.460		0.000	General
1-I	Patch	gipp0002	Vulnerable	0	no	0.070	0.005	0.005	0.460		0.000	General
1-J	Patch	gipp0002	Vulnerable	0	no	0.270	0.041	0.041	0.346		0.011	General
1-L	Scattered Tree	gipp0002	Vulnerable	1	no	0.200	0.070	0.060	0.449		0.013	General
1-M	Patch	gipp0002	Vulnerable	0	no	0.070	0.001	0.001	0.460		0.000	General
1-N	Patch	gipp0002	Vulnerable	0	no	0.070	0.001	0.001	0.460		0.000	General
1-O	Patch	gipp0002	Vulnerable	0	no	0.070	0.003	0.003	0.460		0.000	General

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Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
1-P	Patch	gipp0002	Vulnerable	0	no	0.070	0.002	0.002	0.460		0.000	General
2-A	Patch	gipp0845	Depleted	0	no	0.800	0.082	0.082	0.460		0.071	General

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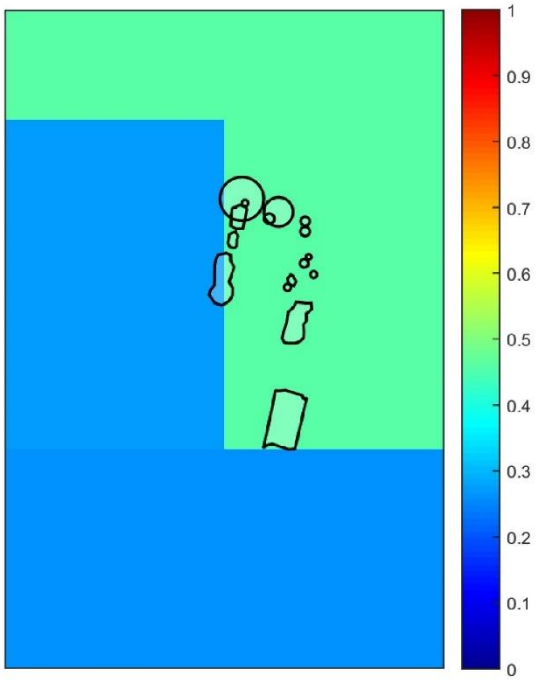
Appendix 2: Information about impacts to rare or threatened species' habitats on site

This is not applicable in the Intermediate Assessment Pathway.

Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map



3. Aerial photograph showing mapped native vegetation

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4. Map of the property in context

Yellow boundaries denote areas of proposed native vegetation removal.

Appendix 2: Proof of Native Vegetation Credit Availability

Report of available native vegetation credits

This report lists native vegetation credits available to purchase through the Native Vegetation Credit Register.

This report is **not evidence** that an offset has been secured. An offset is only secured when the units have been purchased and allocated to a permit or other approval and an allocated credit extract is provided by the Native Vegetation Credit Register.

Date and time: 20/02/2023 04:24 **Report ID: 17791**

What was searched for?

General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
0.118	0.353	1	CMA	West Gippsland
			or LGA	Bass Coast Shire

Details of available native vegetation credits on 20 February 2023 04:24

These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
BBA-0119	3.052	73	West Gippsland	South Gippsland Shire	Yes	Yes	No	VegLink
BBA-0138	24.007	1605	West Gippsland	Wellington Shire	Yes	Yes	No	Ecocentric
BBA-0759	18.868	659	West Gippsland	Wellington Shire	Yes	Yes	No	Contact NVOR
BBA-2321	0.533	138	West Gippsland	Wellington Shire	Yes	Yes	No	Bio Offsets, VegLink
BBA-2623	23.877	873	West Gippsland	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2810	7.758	613	West Gippsland	Latrobe City	Yes	Yes	No	VegLink
BBA-2833	5.001	17	West Gippsland	Wellington Shire	Yes	Yes	No	Ethos
BBA-2839	0.929	14	West Gippsland	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2845	27.551	1069	West Gippsland	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2855	3.044	9	West Gippsland	Wellington Shire	Yes	Yes	No	VegLink
BBA-2875	33.014	1052	West Gippsland	Wellington Shire	Yes	Yes	No	Abezco
TFN-C0977	2.959	54	West Gippsland	Baw Baw Shire	Yes	Yes	No	TFN
TFN-C1442	2.726	58	West Gippsland	Baw Baw Shire	Yes	Yes	No	TFN
TFN-C1692	0.618	284	West Gippsland	South Gippsland Shire	Yes	Yes	No	Ecocentric, Ethos, VegLink
TFN-C1734	0.425	1	West Gippsland	Wellington Shire	Yes	Yes	No	Ecocentric, Ethos, VegLink
TFN-C1893	2.005	82	West Gippsland	Wellington Shire	Yes	Yes	No	Ecocentric, Ethos, VegLink
VC_CFL-2320_02	4.818	14	West Gippsland	Wellington Shire	Yes	Yes	No	VegLink
VC_CFL-3696_01	1.564	257	West Gippsland	Bass Coast Shire	Yes	Yes	No	Ethos

VC_TFN-C2078_01	1.182	69	West Gippsland	Wellington Shire	Yes	Yes	No	Contact NVOR

These sites meet your requirements using alternative arrangements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)

There are no sites listed in the Native Vegetation Credit Register that meet your offset requirements when applying the alternative arrangements as listed in section 11.2 of the Guidelines for the removal, destruction or lopping of native vegetation.

These potential sites are not yet available, land owners may finalise them once a buyer is confirmed.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)

There are no potential sites listed in the Native Vegetation Credit Register that meet your offset requirements.

LT - Large Trees *CMA - Catchment Management Authority* *LGA - Municipal District or Local Government Authority*

Next steps

If applying for approval to remove native vegetation
Attach this report to an application to remove native vegetation as evidence that your offset requirement is currently available.

If you have approval to remove native vegetation
Below are the contact details for all brokers. Contact the broker(s) listed for the credit site(s) that meet your offset requirements. These are shown in the above tables. If more than one broker or site is listed, you should get more than one quote before deciding which offset to secure.

Broker contact details

Broker Abbreviation	Broker Name	Phone	Email	Website
Abezco	Abzeco Pty. Ltd.	(03) 9431 5444	offsets@abzeco.com.au	www.abzeco.com.au
Baw Baw SC	Baw Baw Shire Council	(03) 5624 2411	bawbaw@bawbawshire.vic.gov.au	www.bawbawshire.vic.gov.au
Bio Offsets	Biodiversity Offsets Victoria	0452 161 013	info@offsetsvictoria.com.au	www.offsetsvictoria.com.au
Contact NVOR	Native Vegetation Offset Register	136 186	nativevegetation.offsetregister@delwp.vic.gov.au	www.environment.vic.gov.au/native-vegetation
Ecocentric	Ecocentric Environmental Consulting	0410 564 139	ecocentric@me.com	Not avaliable
Ethos	Ethos NRM Pty Ltd	(03) 5153 0037	offsets@ethosnrm.com.au	www.ethosnrm.com.au
Nillumbik SC	Nillumbik Shire Council	(03) 9433 3316	offsets@nillumbik.vic.gov.au	www.nillumbik.vic.gov.au
TFN	Trust for Nature	8631 5888	offsets@tfn.org.au	www.trustfornature.org.au
VegLink	Vegetation Link Pty Ltd	(03) 8578 4250 or 1300 834 546	offsets@vegetationlink.com.au	www.vegetationlink.com.au
Yarra Ranges SC	Yarra Ranges Shire Council	1300 368 333	biodiversityoffsets@yarraranges.vic.gov.au	www.yarraranges.vic.gov.au

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For more information contact the DELWP Customer Service Centre 136 186 or the Native Vegetation Credit Register at nativevegetation.offsetregister@delwp.vic.gov.au

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Obtaining this publication does not guarantee that the credits shown will be available in the Native Vegetation Credit Register either now or at a later time when a purchase of native vegetation credits is planned.

Notwithstanding anything else contained in this publication, you must ensure that you comply with all relevant laws, legislation, awards or orders and that you obtain and comply with all permits, approvals and the like that affect, are applicable or are necessary to undertake any action to remove, lop or destroy or otherwise deal with any native vegetation or that apply to matters within the scope of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes

Annex B BMT letter detailing marine vegetation impacts from proposed works

BMT Commercial Australia Pty Ltd
Level 5, 99 King Street,
Melbourne, VIC, 3000
Australia

ABN: 54 010 830 421

Our ref: L.A11698.300.001_Marine_Vegetation_Impact_BMT_Response.docx

2 February 2023

Better Boating Victoria
Level 19, 1 Spring Street
Melbourne VIC 3000
Attention: Duncan Hill

Dear Duncan,

RE: Use and development of land for boat launching facility and vegetation removal – Mahers Landing Boating Facility Upgrade Project

In response to DEECA's request for further information relating to marine vegetation removal as a referral of the Planning Permit application for the above referred project (DEECA Ref No. SP483057, dated on 24 January 2023), please see herein our response to the *Application Requirement 1 – Information about the native vegetation to be removed.*

The Coastal and Marine Ecology Impact Assessment report (BMT 2022) estimated the potential disturbance of an area of 1,400 m^2 of Anderson Inlet seabed, due to the proposed works. This area includes the total footprint of the proposed marine structures regardless the presence of seagrass. BMT has now more specifically mapped the seagrass patches around the project area, based on field observation and the most recent aerial images which were provided by DELWP. The mapped marine vegetation and plan of the proposed structures are shown in Annex A of this letter.

Field observation and reviewing the aerial images showed that the seagrass patches occur, with varying density, at a distance of 10-20 m from the existing revetment and extending further to the bed level of approximately -1.0 m AHD.

As it can be seen in the attached plan, the footprint of the existing boat ramp and boat operation have impacted an area of approximately 400 m^2 of the seagrass patches. In contrast, the proposed boat ramp and the jetty have been designed to be piled and suspended deck structures, thus minimising the potential impact on the existing seagrass, inlet environment and naturally occurring coastal processes.

The suspended decks of the ramp and the jetty are supported by (nominally) 457 mm (~0.5m) diameter CHS steel piles that will be driven through the seabed. The driven piles will directly impact only an aggregated area of 6.5 m^2 where seagrass patches currently exist. This area of direct impact, i.e., consequential loss, is a very small area with respect to the total area of seagrass in the project area, representing only 0.001% of the area of seagrass within Anderson Inlet, which estimated from previous studies equates to 460,000 m^2 (Blake, Roob & Patterson, 2000).

The installation of pile will be carried out from a barge which may have temporary impact on the vegetation. It is fair to assume that pile installation will disturb the vegetation temporarily, within the footprint and 5 m either side of the proposed structures. BMT has quantified the total area of the temporarily impacted seagrass patches due to construction and operation of the boat ramp and the jetty using the most recent aerial images. The total temporarily disturbed area is now better estimated at

1,200 m^2 (including area covered by seagrass patches and not), it is expected that seagrass that may be disturbed beyond the piles will tend to re-grow and recover after installation of the piles. It is worth noting that installation of the headstocks, decks and ancillary components on the marine structures will be carried out from the land, therefore no disturbance of the seabed should occur after installation of the piles.

As previously mentioned, the proposed boat ramp and jetty have been designed to minimise the impact on marine ecology and vegetation in many ways, with key aspects summarised as follows:

1. The decks of the proposed ramp and the jetty are supported by piles which significantly reduce the area of seabed disturbance and potential vegetation loss. The total direct impact area (6.5 m2) was estimated based on the size and the number of piles which are located within the existing seagrass patches.

2. The toe of the ramp is designed at a level of -1.8 m AHD where no seagrass is presents, therefore, the operation of the boat ramp should not have any negative direct impact on the existing vegetation. It is expected that on the contrary the area of the existing boat ramp where there is visible loss of seagrass at present will recover as the frequency of boat launching and retrieving reduces once the new ramp and jetty are operational.

3. The levels of the berthing decks were designed to maintain at least 300 mm clearance between the hull of the design vessel and the seabed, which minimise the potential impact of boating activities on the existing marine vegetation in the vicinity of the jetty.

Given the above, BMT believes that the potential impacts of the proposed works on the marine vegetation are very low and does not warrant to be included in the Native Vegetation Removal Report (NVRR), nor offset. In saying this, avoiding vegetation removal and minimising impact during construction works shall be prescribed in the Construction Environmental Management Plan (CEMP) in line with the Marine and Coastal Act (MACA) Consent, which has been now obtained for the project from DEECA in letter dated 24 January 2023.

BMT remains open to assist conducting further investigation and provide more supportive information and details, if required by DEECA. Please do not hesitate to contact the undersigned if you need any further information.

Yours sincerely,

BMT

Dr Daniel Machado
Associate Principal
Environmental and Civil Engineer, MIEAust

Annex A Marine Vegetation Plan

Pile
Jetty
Ramp
Seagrass Patch
Construction disturbance area
0
10
20 m
BMT