REVIEW OF ENVIRONMENTAL FACTORS (REF)
CARTERS CORNER JETTY REFURBISHMENT
RIVER RD, SHOALHAVEN HEADS

Contents

Document control

Item	Details
Project	Review of Environmental Factors – Carters Corner Jetty Refurbishment – River Rd, Shoalhaven Heads
Client	Shoalhaven City Council
Prepared By	City Services, Shoalhaven City Council

Document status

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*Review and endorsement statement:

"I certify that I have reviewed and endorsed the contents of this REF document and, to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under clause 170 of the EP&A Regulation, and the information it contains is neither false nor misleading".

Assessment and approvals overview

Item	Details
Assessment type	Division 5.1 (EP&A Act) - Review of Environmental Factors (REF)
Proponent	Shoalhaven City Council
Determining authority / authorities	Shoalhaven City Council
Required approvals (consents, licences and permits)	Nil
Required publication	Yes: this REF must be published on the determining authority's (Council's) website or the NSW planning portal, in accordance with clause 171(4) EP&A Regulation 2021 (as a matter of "public interest").

1. PROPOSAL AND LOCATION

1.1 Overview

This Review of Environmental Factors (REF) addresses the potential environmental impacts of – and provides mitigation measures for – the refurbishment of an existing jetty at River Rd, Shoalhaven Heads.

The proposal involves the replacement of existing deteriorated timber decking, framework bearers and hand-railing.

The piles supporting the jetty were assessed as being in good condition and will not require replacement or upgrade (e.g. with jackets and grouting) as part of the works.

Note that the fishing platform which the jetty adjoins has been upgraded in the past and does not require any works as part of the current proposal.

Works would include:

- Demolition and removal of existing timber decking, bearers and hand-railing;
- Construction of new bearers (hardwood treated to H6 standard) and hand-railing (recycled plastic composite);
- Installation of 24.5 m length x 2.0 m width (approx.) (fibreglass reinforced plastic 7mm anti-slip micro-mesh decking (or similar) with kick rail (recycled plastic composite);
- Works would be undertaken by hand from the existing structure or from Class 2 vessel if required;
- Demolition and construction works may require the cutting of timber, bolts and brackets;
- Like-for-like replacement of existing plumbing (water supply) associated with a fish cleaning table.
- Safeguards and mitigation measures would be implemented (refer to Section 7 of this REF).

The existing jetty at Carters Corner was constructed in 1989. The current condition of the structure includes dilapidated timber decking with surface decay and cracks. Fixings including bolts and brackets are rusted.

The jetty is a busy and popular location for recreational activities, particularly on weekends and school holidays.

The proposal would improve the safety and comfort of use of the jetty by visitors and local members of the public.

Figure 2 below shows the site with approximate location of works.

Shoalhaven City Council (SCC) is the proponent and the determining authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This Review of Environmental Factors (REF) provides an assessment of the proposed activity and associated impacts on the environment, in the context of Division 5.1 of the Act and section 171 of the *Environmental Planning and Assessment Regulation 2021*, and in doing so, satisfies the requirement of section 5.5 of the Act, that SCC examines and takes into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

1.2 Location

The proposed works would occur within the Shoalhaven River waterway (refer to Figures 1 and 2). Details of affected land are provided in Table 1.

Table 1. Property affected by the proposal

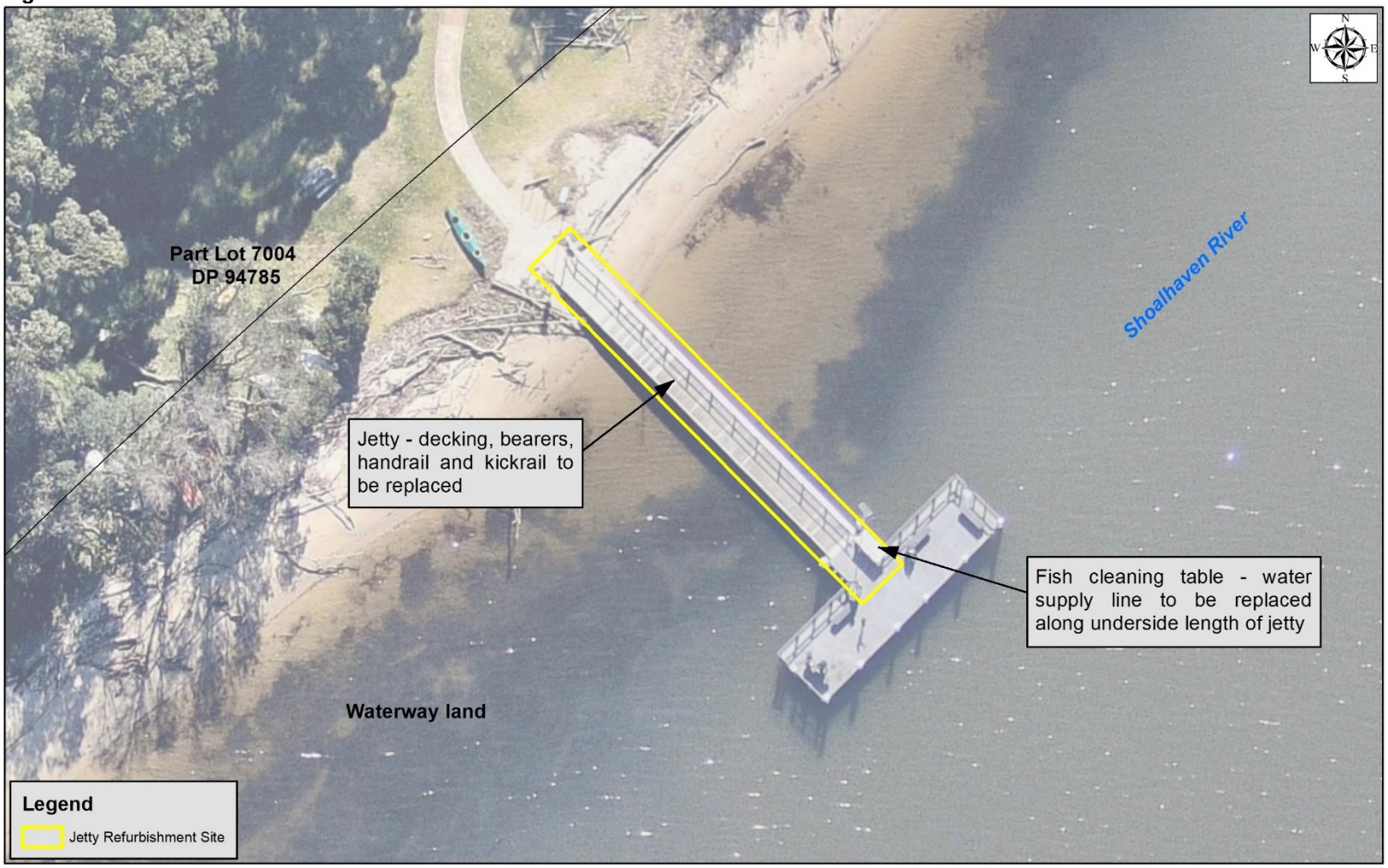
Lot / DP	Description	Land owner / manager	Other pertinent information
-	Shoalhaven River waterway	Crown Lands	Crown Licence or other authorisation may be required for works in this area

Photo 1. Site showing existing jetty (facing south approx.). Note that no works are proposed for the fishing platform at the end of the jetty.

Figure 1. Site location

Figure 2. Site overview

Figure 3. Site



Carters Corner Jetty, River Rd, Shoalhaven Heads

2. EXISTING ENVIRONMENT

2.1 Habitat and vegetation assessment

The site was assessed by a Council Environmental Officer on 17th May and 2nd December 2022 in consideration of the current proposal.

Site investigations involved vegetation and habitat assessment, recording all flora species within and immediately adjacent to the subject site, determination of vegetation communities, targeted survey for potentially occurring threatened flora species (including *Euphorbia psammogeton* syn. *Chamaesyce psammogeton*) and investigation of habitat availability on site.

The site comprises a cleared and modified foreshore access with a jetty and fishing platform extending into the Shoalhaven River estuary, on the north side of the Shoalhaven River, approximately 1.1 km to the west of the river's entrance.

The reserve in proximity to the site comprises a cleared and modified parkland containing a shared-user path connecting the jetty to a carpark on the corner of River Rd and Jerry Bailey Rd. The parkland area is covered with managed turf of Kikuyu (*Cenchrus clandestinus*) and contains scattered native trees including *Banksia integrifolia* (Coastal Banksia), *Eucalyptus botryoides* (Bangalay) and *Casuarina glauca* (Swamp She-oak), and occasional exotic ornamental trees including *Araucaria heterophylla* (Norfolk Island Pine).

A sandy, river foreshore beach occurs either side of the jetty, containing no vegetation, but with variable, patchy areas of shore wrack (predominantly Seagrass) and woody debris.

No naturally occurring native terrestrial vegetation occurs in close proximity to the site.

The sandy beach slopes gently to shallow sand-flats / mud-flats, which are partially exposed at low tide and appear to be of a finer sediment grain size than the beach material. In some locations there are sparse pebble or shell deposits over the sand-flats.

The sand-flats give way to a deeper channel, generally occurring approximately 21m from the top of the beach in the vicinity of the jetty.

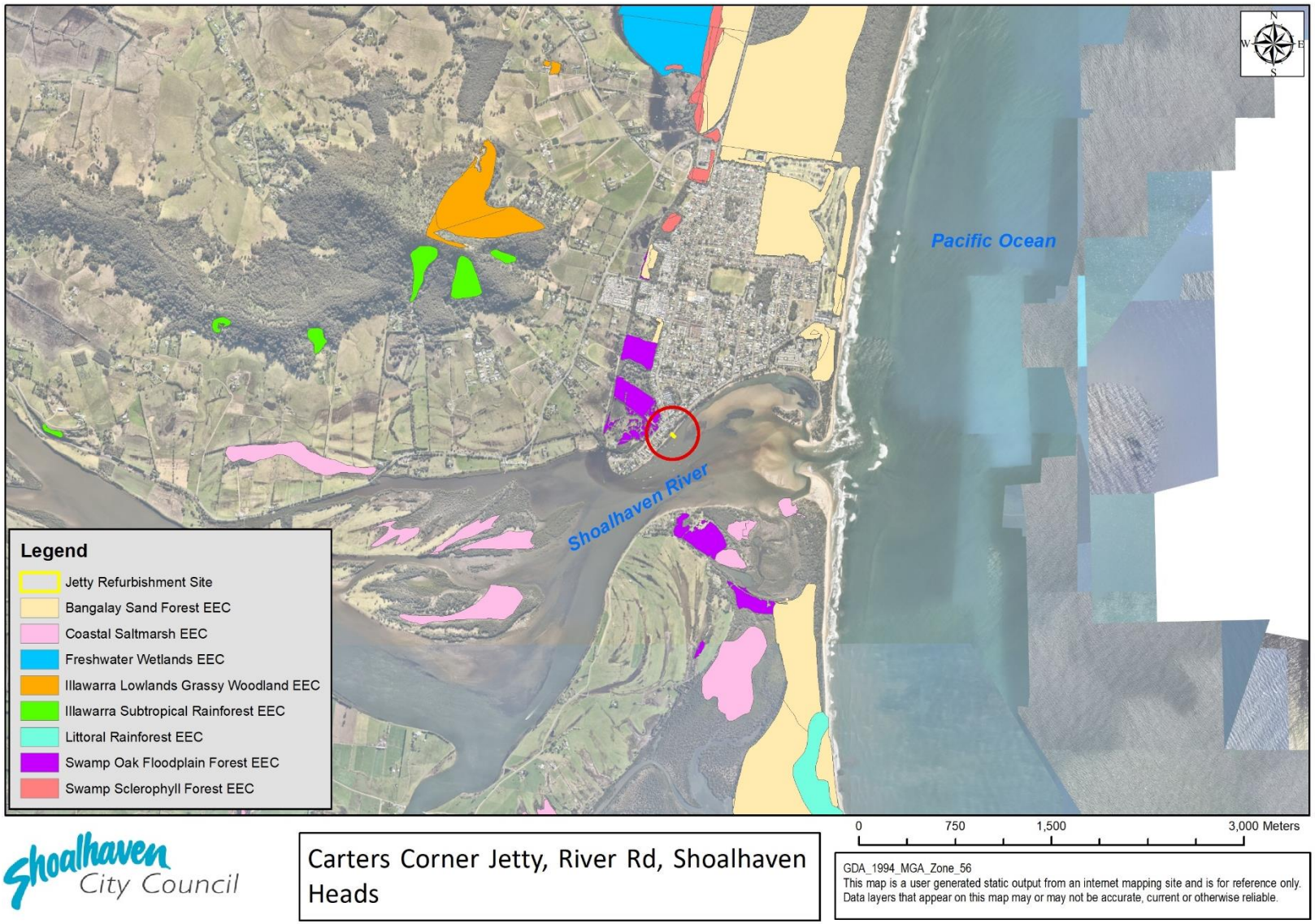
The edges of the deeper channel support extensive areas of Seagrass – Eelgrass (*Zostera capricorni*) which extends sparsely onto the sand-flats and mud-flats in some locations (refer to Figure 4).

Seagrass was visible during site investigations, either side of the jetty from approximately 15.5m along, through to the fishing platform connection.

No endangered ecological communities (EECs) occur in close proximity to the site such that there is any risk of impact as a result of the proposal (refer to Figure 5 and Appendix A).

Figure 4. Estuarine macrophytes mapped in proximity to the site

Figure 5. Endangered ecological communities (EECs) mapped in proximity to the site



Threatened species and habitat resources on site

No threatened flora including *Chamaesyce psammogeton*, or suitable habitat for other locally occurring threatened flora species (including *Solanum celatum*) was identified on site during vegetation surveys.

No hollow-bearing trees, Glossy Black Cockatoo (*Calyptorhynchus lathami*) feed tree species (i.e. *Allocasuarina littoralis*), Glider feed tree species (e.g. *Corymbia gummifera* or *Eucalyptus punctata*) occurs within or in proximity to the site.

The mudflats of the Shoalhaven River estuary edges around the embayment approximately 1.0 km to the east and around to the entrance spit, are known to be important habitat for numerous shorebirds, with resident and migratory species utilising the area for foraging and Pied Oystercatchers (*Haematopus longirostris*) and Little Terns (*Sternula albifrons*) nesting on the shoals and dunes in proximity to the entrance.

The site of the current proposal is not considered to contain important foraging habitat for shorebirds and has no records of threatened shorebirds utilising the area for nesting.

The underside of the jetty provides potential habitat for structure roosting microbats including Yellow-bellied Sheath-tail Bat (refer to Photo 6). No microbats or signs of their roosting were detected during site investigations.

Photos 1 through 6 show the site, available habitat and relevant features.

Photo 2. Existing jetty facing east (approx.)

Photo 3. Existing jetty showing deteriorated timber railing and rusted fittings

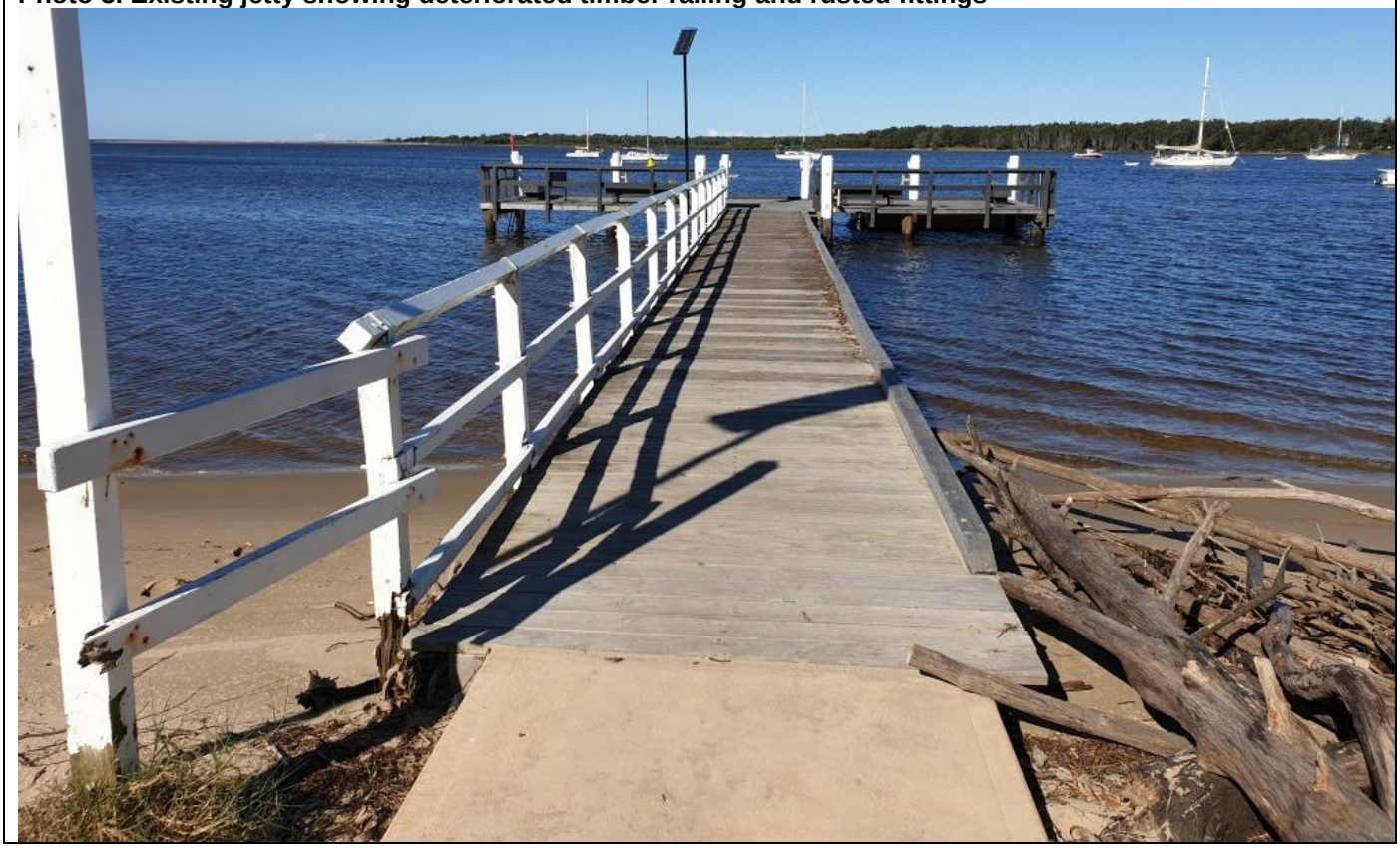


Photo 4. Fishing platform adjoining jetty with fish cleaning table

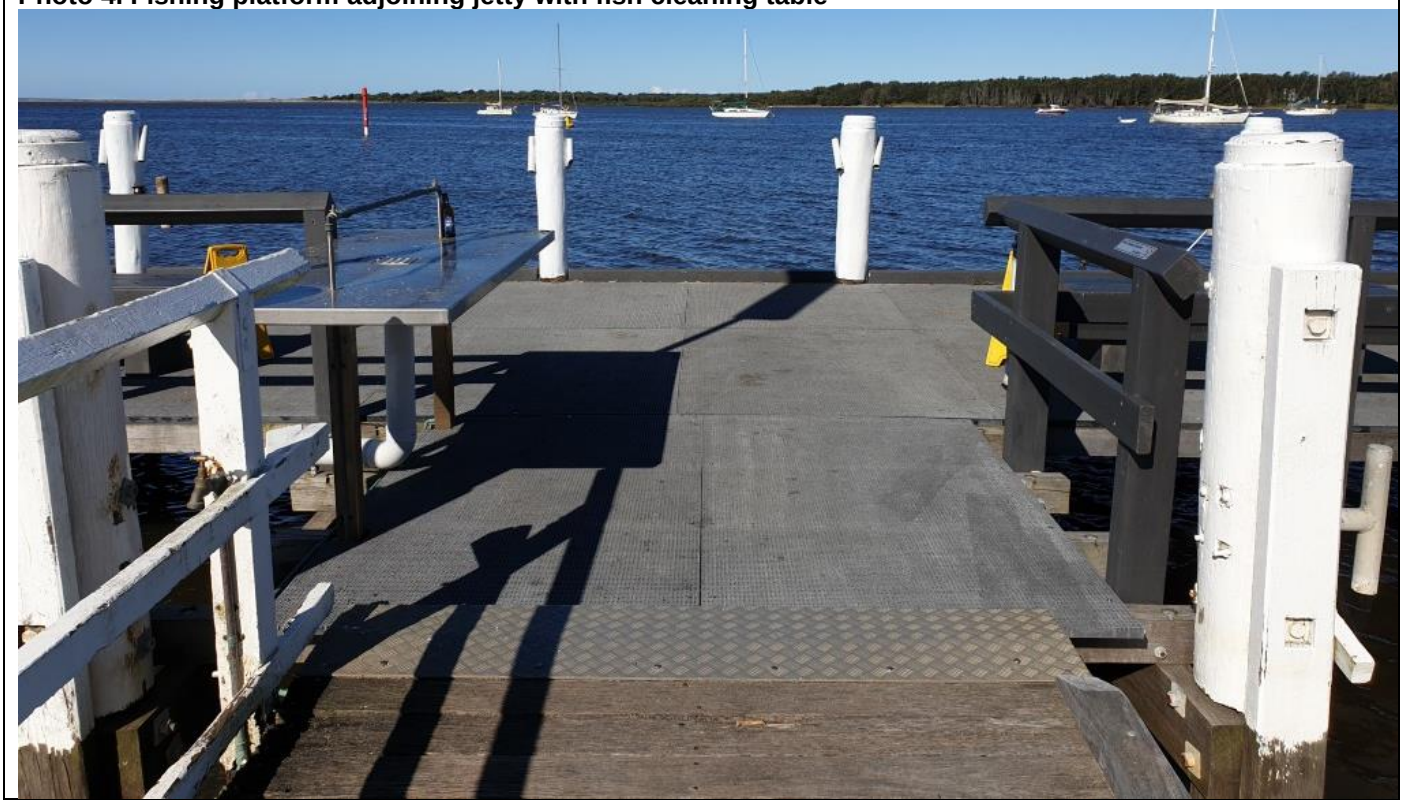
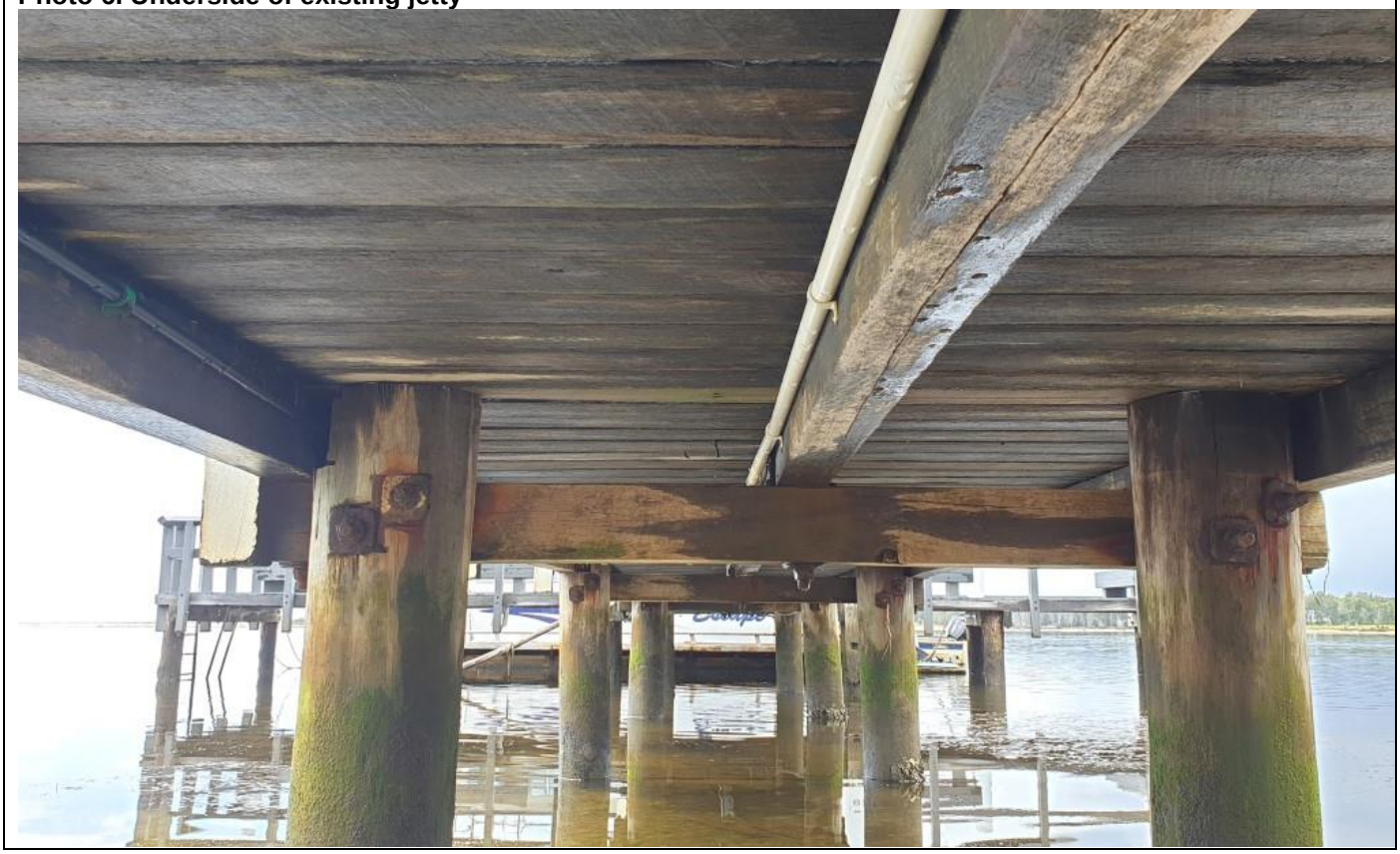


Photo 5. Existing jetty showing deteriorated timber and fixings, and water supply line hanging below

Photo 6. Underside of existing jetty



3. ASSESSMENT OF LIKELY IMPACTS ON THE ENVIRONMENT

3.1 Impacts associated with the proposal

Direct and indirect impacts on vegetation and other habitat as a result of the proposal

The proposal involves replacement of existing framework, decking and other ancillary components of the jetty.

The existing piles would not be replaced, supplemented, repaired or upgraded.

No excavation would be involved, and no construction works would occur in the water.

Works are anticipated to be undertaken by hand from the existing structure or beach / sand-flats, but may occur if required from a small Class 2 vessel.

No impact on seagrass would occur during works or as a result of the proposal. Seagrass habitat is anticipated to be improved by the proposal as a result of decreased shading with replacement of timber decking with micro-mesh decking.

Demolition and construction works may require the cutting of timber, bolts and brackets over water or water land. If this is required, tarps or similar shall be placed, floated or carried in the vessel – beneath works – to capture potential contaminants including oil, saw-dust and metal shavings.

Treated timber used for bearers shall comply with NSW EPA regulations, i.e. H6 treated wood with CCA (copper, chromium and arsenic) is acceptable for use in marine environments to protect against marine wood borers and decay, refer: https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/household-building-and-renovation/treated-timber-chart.pdf , noting that this treated timber shall not be used for the decking or handrails where human contact is likely.

CCA use as a timber treatment in Australia is restricted due to the carcinogenic effect of arsenic on humans, but is approved by the Australian Pesticides and Veterinary Medicines Authority (APVMA) for certain applications, expressed as hazard classes (H1 to H6) referring to the hazard to which the timber would be exposed. CSIRO (2011) notes that there are alternative timber treatments available, but currently none which are registered for H6 (marine use) hazard class.

The arsenic used in CCA is in a form (arsenate or pentavalent arsenic) that is five to ten times less toxic than the most toxic form, arsenite (trivalent arsenic). Fixation with the chromium component modifies the arsenate into metal-metal complexes and organo-complexes with wood ensuring that virtually all the CCA becomes chemically bonded within the wood structure (CSIRO 2011).

The bearers of the jetty would be elevated from the river most of the time and only occasionally submerged during flooding events, when any potential trace leachate would rapidly become extremely diluted.

Waste material shall be reused in accordance with any relevant *Protection of Environment Operations Act 1999* resource recovery orders and exemptions, or otherwise disposed of at a licenced waste facility. Treated timber shall be disposed of at a licenced waste facility.

The construction stockpile area would be located on existing, level, cleared and disturbed land, away from the beach, such as the car park or adjacent grassed areas.

No removal or disturbance of native vegetation would occur as a result of the proposed works.

3.2 Threatened species impact assessment (NSW)

Section 1.7 of the EP&A Act 1979 applies the provisions of Part 7 of the NSW *Biodiversity Conservation Act 2016* and Part 7A of the *NSW Fisheries Management Act 1994* that relate to the operation of the Act in connection with the terrestrial and aquatic environment. Each are addressed below.

3.2.1 Part 7A *Fisheries Management Act 1994*

Part 7A relates to threatened species conservation.

No direct or indirect impacts on marine fauna or habitat are considered likely.

No direct impacts on marine vegetation (including seagrass) would occur.

Seagrass habitat is anticipated to be improved by the proposal as a result of decreased shading with replacement of timber decking with micro-mesh decking.

Safeguards including use of tarps to capture sawdust, oil and metal shavings would minimise impacts associated with water contamination.

Marine environments would therefore not be directly impacted by the proposal and mitigation measures would ensure that the risk of indirect impacts, including as a result of contamination, would be minimal.

The proposal is therefore unlikely to result in any impact on threatened species or their habitat; or contribute significantly to key threatening processes, as listed under Part 7A of the Act.

Consideration of criteria under the 'seven-part' test of significance under Section 221ZV of the Act is not warranted.

3.2.2 Part 7 *Biodiversity Conservation Act 2016*

An assessment of the potential for NSW threatened flora and fauna species occurring on-site or otherwise being impacted by the proposal was undertaken (refer to Appendix A). The following species and endangered ecological communities are known to occur on-site or are considered to have some potential to occur on-site or be otherwise impacted by the proposal, and therefore required further assessment under Part 7 of the NSW *Biodiversity Conservation Act 2016*:

- Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris*

Section 7.3 of the Act provides a 'five-part' test to determine whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. Each Part is addressed below:

Part A - In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the lifecycle of the species such that a viable local population of the species is likely to be place at risk of extinction.

Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris*

The Yellow-bellied Sheathtail-bat roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects,

it flies high and fast over the forest canopy, but lower in more open country. The species forages in most habitats across its very wide range, with and without trees and appears to defend an aerial territory. Breeding has been recorded from December to mid-March, when a single young is born. Seasonal movements of the species are unknown; there is speculation about a migration to southern Australia in late summer and autumn (OEH 2022).

The site is considered to contain potential roosting habitat for structure-roosting microbats including Yellow-bellied Sheathtail-bat, on the underside of the existing jetty structure.

Inspection of the underside of the jetty on 2nd December 2022 did not detect any microbats or signs of their use of the structure as habitat (e.g. guano or staining at crevices).

The proposal would replace the existing bearers and framework with similarly constructed timber.

The replacement of the existing decking with micro-mesh would increase the exposure of much of the underside of the structure and would likely reduce the suitability of the structure as roosting habitat for microbats.

Given that there was no evidence of use of the structure as roosting habitat, it is considered that microbats including Yellow-bellied Sheathtail-bat, do not rely on the structure as habitat.

The jetty would remain in place and continue to offer potential roosting habitat with sheltered nooks within the framework.

Pre-demolition inspection of the underside of the jetty shall be undertaken to ensure no impacts on roosting animals.

It is therefore considered unlikely that Yellow-bellied Sheathtail-bat would be impacted by the proposed works, and the proposed activity is unlikely to have an adverse effect on the lifecycle of this species such that a viable local population is likely to be placed at risk of extinction.

Part B - In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

- ***(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or***
- ***(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction***

Eight (8) endangered ecological communities (EECs) are mapped as occurring in the landscape surrounding the site (Refer to Appendix A) .

Each of the EECs mapped as occurring in the surrounding locality was confirmed through vegetation survey as not occurring within the site, nor in close proximity such that there is any risk of impact as a result of the proposal.

Part C - In relation to the habitat of a threatened species or ecological community:

- ***(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity***
- ***(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and***
- ***(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.***

No important habitat for threatened species would be removed or otherwise significantly impacted (see Part A).

No EEC would not be fragmented or isolated, nor removed or modified to an extent that would affect the long-term survival of the EEC occurring in the locality (refer to Part B).

The proposal will therefore not affect the long-term survival of any threatened species or endangered ecological community in the locality.

Part D – Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).

No "*areas of outstanding biodiversity values"* have been declared in the City of Shoalhaven.

Part E – Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

No key threatening processes under Schedule 4 of the Act are considered relevant to the proposal.

3.3 Threatened species impact assessment (Commonwealth EPBC Act 1999)

A Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Report was generated on 15th September 2022. An EPBC Protected Matters Report provides general guidance on matters of national significance and other matters protected by the EPBC Act in the area selected. Of those threatened species and endangered ecological communities reported as likely occurring or having habitat within the area of the report, none were considered to have potential habitat on the site, or are likely to occur on-site or be otherwise impacted by the proposal.

The proposal would not impact directly or indirectly on any threatened flora or fauna species or their habitats.

Refer also to Likelihood of Occurrence Table in Appendix A.

Additional species listed under the Act, including marine species, may occur occasionally within the vicinity of the proposed activity but would not be affected by the proposal.

Additionally, the four principal threats determined by DEWHA (2009) to be most relevant to judgements on significance of impact on migratory shorebirds, i.e. habitat loss; habitat degradation; disturbance; and direct mortality; would not be caused or exacerbated by the proposal.

Further assessment and referral to the Commonwealth under the Act is therefore not required.

3.4 Indigenous heritage

Under Section 86 of the NSW *National Parks and Wildlife Act 1974* (NPW Act) it is an offence to disturb, damage, or destroy any Aboriginal object without an Aboriginal Heritage Impact Permit (AHIP). The Act, however, provides that if a person who exercises 'due diligence' in determining

that their actions will not harm Aboriginal objects has a defence against prosecution if they later unknowingly harm an object without an AHIP (Section 87(2) of the Act). To effect this, the NSW Department of Environment, Climate Change and Water have prepared the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wale*s (hereafter referred to as the 'Due Diligence Guidelines') to assist individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects and to determine whether they should apply for an AHIP.

The proposal does not involve any disturbance of the ground surface, nor culturally modified trees or other landscape features.

As the proposal would not involve any disturbance of the ground surface or culturally modified trees, the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECC 2010) requires no further assessment, an AHIP is not required and the activity can proceed with caution.

3.5 Non-indigenous heritage

No items of local heritage significance or any items on the State Heritage Register or listed in the Shoalhaven Local Environmental Plan occur in close proximity to the site such that the proposed works might impact them.

3.6 Acid Sulfate Soils

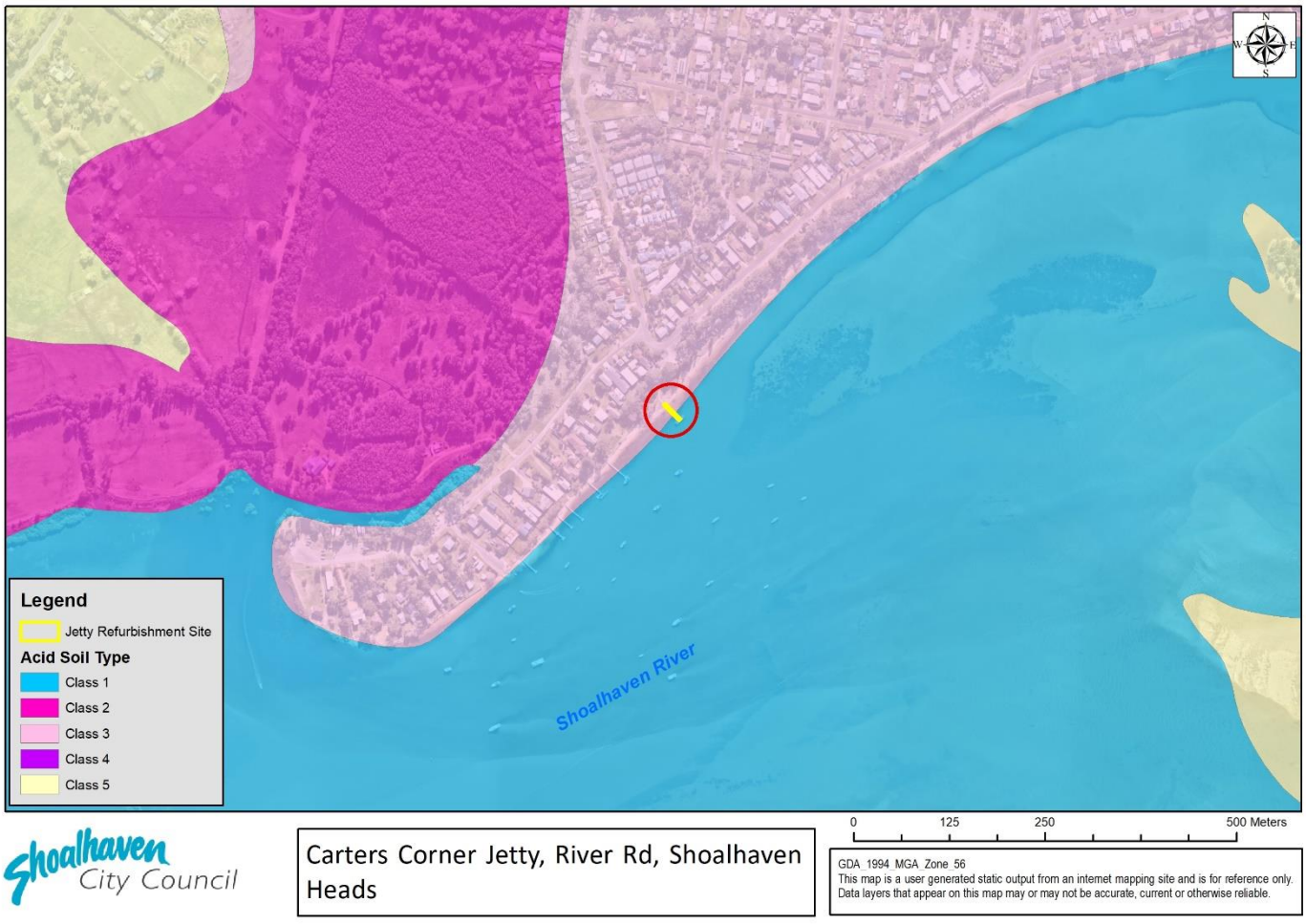
The site is mapped as containing Class 3 Acid Sulfate Soils (refer to Figure 6).

The Shoalhaven Local Environment Plan 2014 indicates that a risk of exposure of Class 3 Acid Sulfate Soils exists where works would occur more than 1 metre below the natural ground surface or where the watertable is likely to be lowered more than 1 metre below the natural ground surface.

The proposal does not involve any excavation of the ground surface.

No further consideration is required.

Figure 6. Acid Sulfate Soils mapped as occurring in proximity to the site



3.7 Riparian corridors

A Category 1 riparian corridor is associated with Shoalhaven River in the vicinity of the proposal, occurring along the river embankment, through and adjacent to the site (refer to Figure 7 below).

No naturally occurring, terrestrial native vegetation occurs in proximity to the site.

No terrestrial vegetation would be removed or otherwise impacted as a result of the proposal and no activities would occur which are likely to destabilise the foreshore or river embankment.

The proposal would therefore not result in impacts on riparian corridors

3.8 Key Fish Habitat and Protected Marine Habitat

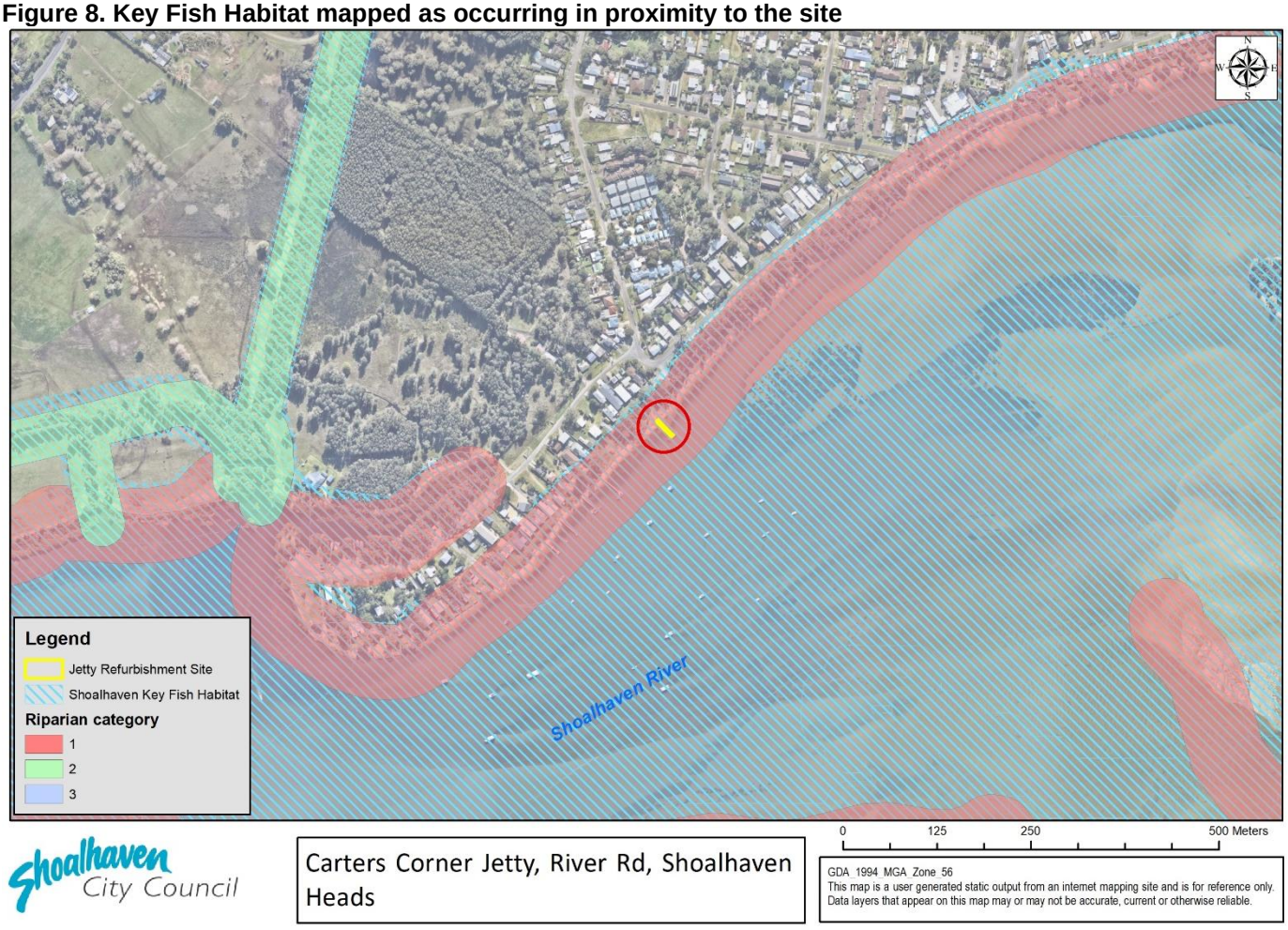
The site is mapped as containing Key Fish Habitat. Protected marine habitat (Eelgrass *Zostera capricorni*) occurs in proximity to the site and as shore wrack (refer to Figure 4 above and Figure 7 below).

No excavation would be involved, and no construction works would occur in the water.

Works are anticipated to be undertaken by hand from the existing structure or beach / sand-flats, but may occur, if required, from a small Class 2 vessel.

The construction stockpile area would be located on existing, level, cleared and disturbed land, away from the beach, such as the car park or adjacent grassed areas.

Figure 8. Key Fish Habitat mapped as occurring in proximity to the site



No impact on seagrass would occur during works or as a result of the proposal. Seagrass habitat is anticipated to be improved by the proposal as a result of decreased shading with replacement of timber decking with micro-mesh decking.

Contamination of the water is not anticipated to be more than negligible: tarps or similar shall be placed, floated or carried in the vessel – beneath works – to capture potential contaminants including oil, saw-dust and metal shavings from demolition and construction works; potential leachate from treated (CCA) timber would be negligible (refer to Section 3.1 of this REF for more information).

A Permit for harm to marine vegetation under the *Fisheries Management Act 1994* is therefore not required.

3.9 Potentially Contaminated Land (PCL)

A potentially contaminated land record (PCL452) exists over Part Lot 7004 DP 94785, west of and adjacent to Part Lot 7005 DP 1075719, for exposed asbestos fragments noted as occurring over the river foreshore, related to uncontrolled land-fill dumping occurring on the embankment opposite 51 River Rd and just west of Renown Ave.

As the proposal would not involve any excavation or other disturbance of the ground surface, further consideration is not warranted.

3.10 Flood liable land

The site occurs on land and within a waterway which is mapped as flood-liable, however the proposal would not adversely affect flood behaviour other than to a negligible extent and would not exacerbate flooding risks.

The proposal would involve replacement of existing framework, decking, handrailing and other ancillary components of an existing jetty structure within Shoalhaven River. No extension of the jetty footprint or introduction of new materials or fixtures that would obstruct flow is proposed.

The impact of the proposal on flow regimes of the river would therefore be negligible.

Further consideration is not required or warranted.

3.11 EP&A Regulation – Section 171 matters of consideration

Section 171(2) of the *Environmental Planning and Assessment Regulation 2021* lists the factors to be taken into account when consideration is being given to the likely impact of an activity on the environment under Part 5 of the EP&A Act. The following assessment in Table 2 deals with each of the factors in relation to the proposed activity.

Table 2. Section 171 Matters of consideration

Does the proposal:	Assessment	Reason
a) Have any environmental impact on a community?	Positive	The proposal involves the replacement of deteriorated framework, decking, handrailing and other ancillary components of an existing jetty structure within Shoalhaven River. The proposal would improve the safety and comfort of use of the jetty by visitors and local members of the public. Temporary closure of the boat ramp would be required for the construction process, but adjacent foreshore access areas would remain open and accessible to the public. The proposed activity would not have any impact on other community services and infrastructure such as wastewater, waste management, educational, medical or social services.

b) Cause any transformation of a locality?	Positive	The locality's current use would remain unchanged, with enhanced access, safety and aesthetic appeal.
c) Have any environmental impact on the ecosystem of the locality?	Negligible	No endangered ecological communities occur in close proximity to the site. The proposal would not involve or result in impact on terrestrial or aquatic habitat or flora and fauna. Refer to Sections 3.1 and 3.2 for more information. No important habitat features would be removed or otherwise impacted. No food resources critical to the survival of a particular species would be removed. Aquatic ecosystems are not likely to be affected by the proposed activity and there is not likely to be any long-term or long-lasting impact through the input of sediment, nutrient or contaminants into the ecosystem. Environmental safeguards and mitigation measures (Section 7) would be employed to minimise risk of impacts.
d) Cause a diminution of the aesthetic, recreational, scientific or other environmental quality or value of a locality?	Positive	Aesthetic and recreational values would be enhanced. Scientific and environmental qualities of the site would not be affected. The proposed activity would have no impact on these values.
e) Have any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific, or social significance or other special value for present or future generations?	Positive	The site of the proposed activity has no significant architectural, cultural, historical, scientific values, but is highly valued regionally for aesthetic and social values. Social values are anticipated to be enhanced and would have improved access and safety as a result of the proposal. No items in the vicinity of the work site which are listed on the State Heritage Register and the Shoalhaven Local environmental Plan would be impacted by the proposal. The site is not within an Aboriginal Place declared under the *National Parks and Wildlife Act 1974.* In accordance with the NSW Department of Environment, Climate Change and Water's Due Diligence Code of Practice, the proposed activity does not require an Aboriginal Heritage Impact Permit as the activity is unlikely to harm an Aboriginal artefact (refer to Section 3.4 of this REF).
f) Have any impact on the habitat of	Negligible	No terrestrial vegetation would be removed or otherwise impacted.

protected fauna (within the meaning of the Biodiversity Conservation Act 2016)?		No habitat will be removed or otherwise impacted. Assessment provided in Section 3.2 of this REF, concludes that the proposed activity would not have a significant impact upon threatened fauna. The specified environmental mitigation measures (Section 7 of this REF) would mitigate indirect impacts to fauna and habitat including through control of sediment.
g) Cause any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?	Negligible	The assessment provided in Section 3.2 of this REF, concludes that the proposed activity would not have a significant impact upon threatened fauna or habitat. There are no species likely to rely on the site of the proposed works to the extent that modification would put them further in danger.
h) Have any long-term effects on the environment?	Low-adverse	Works would be relatively short term and the noise generated will occur during normal working hours. Treated timber used for bearers shall comply with NSW EPA regulations. Contamination from leachate would be negligible (refer to Section 3.1 of this REF). The proposal would involve replacement of existing framework, decking, handrailing and other ancillary components of an existing jetty structure within Shoalhaven River. No extension of the jetty footprint or introduction of new materials or fixtures that would obstruct flow is proposed. The impact of the proposal on flow regimes of the river would therefore be negligible. The possible impacts have been discussed in detail under Section 3 of this REF.
i) Cause any degradation of the quality of the environment?	Negligible	Aquatic ecosystems are not likely to be affected by the proposed activity and there is not likely to be any long-term or long-lasting impact through the input of sediment, nutrient or contaminants into the ecosystem. The proposal would not intentionally introduce noxious weeds, vermin, or feral animals into the area or contaminate the soil. Environmental safeguards and mitigation measures (Section 7 of this REF) would be employed to minimise risk of impacts.
j) Cause any risk to the safety of the environment?	Negligible	The proposed activity would not involve hazardous wastes and would not lead to increased bushfire or landslip risks. The proposal would not adversely affect flood or tidal regimes, or exacerbate flooding risks.

k) Cause any reduction in the range of beneficial uses of the environment?	Negligible	The proposal is consistent with the existing site use. The site and local environment will remain relatively unchanged.
l) Cause any pollution of the environment?	Low adverse	It is unlikely that the activity (including the environmental impact mitigation measures) would result in water or air pollution, spillages, dust, odours, vibration or radiation. Treated timber used for bearers shall comply with NSW EPA regulations. Contamination from leachate would be negligible. Tarps or similar shall be placed, floated or carried in the vessel – beneath works – to capture potential contaminants including oil, saw-dust and metal shavings from demolition and construction works. Refer to Section 3.1 of this REF for more information.
m) Have any environmental problems associated with the disposal of waste?	Low adverse	Waste material shall be reused in accordance with any relevant *Protection of Environment Operations Act 1999* resource recovery orders and exemptions, or otherwise disposed of at a licenced waste facility. Treated timber shall be disposed of.
n) Cause any increased demands on resources (natural or otherwise) which are, or are likely to become, in short supply?	Low adverse	The resources that would be used are not considered significant and would not increase demands on current resources such that they would become in short supply.
o) Have any cumulative environmental effect with other existing or likely future activities?	Negligible	The assessed low adverse or negligible impacts of the proposal are not likely to interact.
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	Negligible	The proposed activity would have no effect on coastal processes including those projected under climate change conditions. The site is not located in a coastal hazard area.
q) Any applicable local strategic planning	Positive	The proposed activity meets Planning Priority 2 (Delivering Infrastructure) of the *Shoalhaven 2040* Strategic Land-use Planning Statement

statement, regional strategic plan or district strategic plan made under Division 3.1 of the Act		https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D20/437277 The proposed activity is not inconsistent with the Illawarra Shoalhaven Regional Plan 2041 (ISRP): https://www.planning.nsw.gov.au/-/media/Files/DPE/Plans-and-policies/Plans-for-your-area/Regional-plans/Illawarra-Shoalhaven-Regional-Plan-05-21.pdf
r) Any other relevant environmental factors	N/A	

4. PERMISSIBILITY

4.1 Environmental Planning & Assessment Act 1979

Section 4.1 (Development that does not need consent) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) states that:

> *"If an environmental planning instrument provides that specified development may be carried out without the need for development consent, a person may carry the development out, in accordance with the instrument, on land to which the provision applies."*

In this regard, clause 2.80(2) of the NSW *State Environmental Planning Policy (Transport and Infrastructure) 2021* (TISEPP) provides that (emphasis underlined):

> *"The following development may be carried out by or on behalf of a public authority without consent on any land—*
>
> *(a) development for the purposes of navigation and emergency response facilities,*
>
> *(b) environmental management works associated with a port facility or a wharf or boating facility,*
>
> *(c) emergency works associated with a navigation and emergency response facility or a port facility"*
>
> [Where *navigation and emergency response facilities* means facilities for—
>
> (a) water traffic control, safe navigation and other safety purposes (such as beacons, navigation towers, radar towers, communication facilities, vessel monitoring facilities, lighthouses, buoys, marine markers, pilot stations, jetties, breakwaters or training walls), and…]
>
> *(7) In this section, a reference to development for the purpose of port facilities, navigation and emergency response facilities, wharf or boating facilities or associated public transport facilities for a public ferry wharf includes a reference to the operation of such a facility and to development for any of the following purposes if the development is in connection with such facilities—*
>
> *(a) construction works (including dredging or land reclamation, if the dredging or land reclamation is required for the construction of those facilities),*
>
> *(b) routine maintenance works,*
>
> *(c) environmental management works,*
>
> *(d) alteration, demolition or relocation of a local heritage item,*
>
> *(e) alteration or relocation of a State heritage item.*

The proposed jetty refurbishment constitutes an 'activity' for the purposes of Part 5 of the EP&A Act, and can be carried out by (or on behalf of) a public authority as development without consent. Environmental impact assessment under Part 5 of the EP&A Act is required, including consideration of matters outlined in Section 171 of the EP&A Regulation 2021. This REF provides this assessment and ensures that Council as determining authority in consideration of the activity, meets its obligation under s5.5 of the EP&A Act, to examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

4.2 Crown Land Management Act 2016

Works would be undertaken over the Shoalhaven River waterway which is regulated by NSW Planning, Industry & Environment – Crown Lands.

As such, SCC is required to obtain a licence (or other lawful authorisation) from NSW Planning, Industry & Environment – Crown Lands prior to the commencement of works.

4.3 Fisheries Management Act 1994

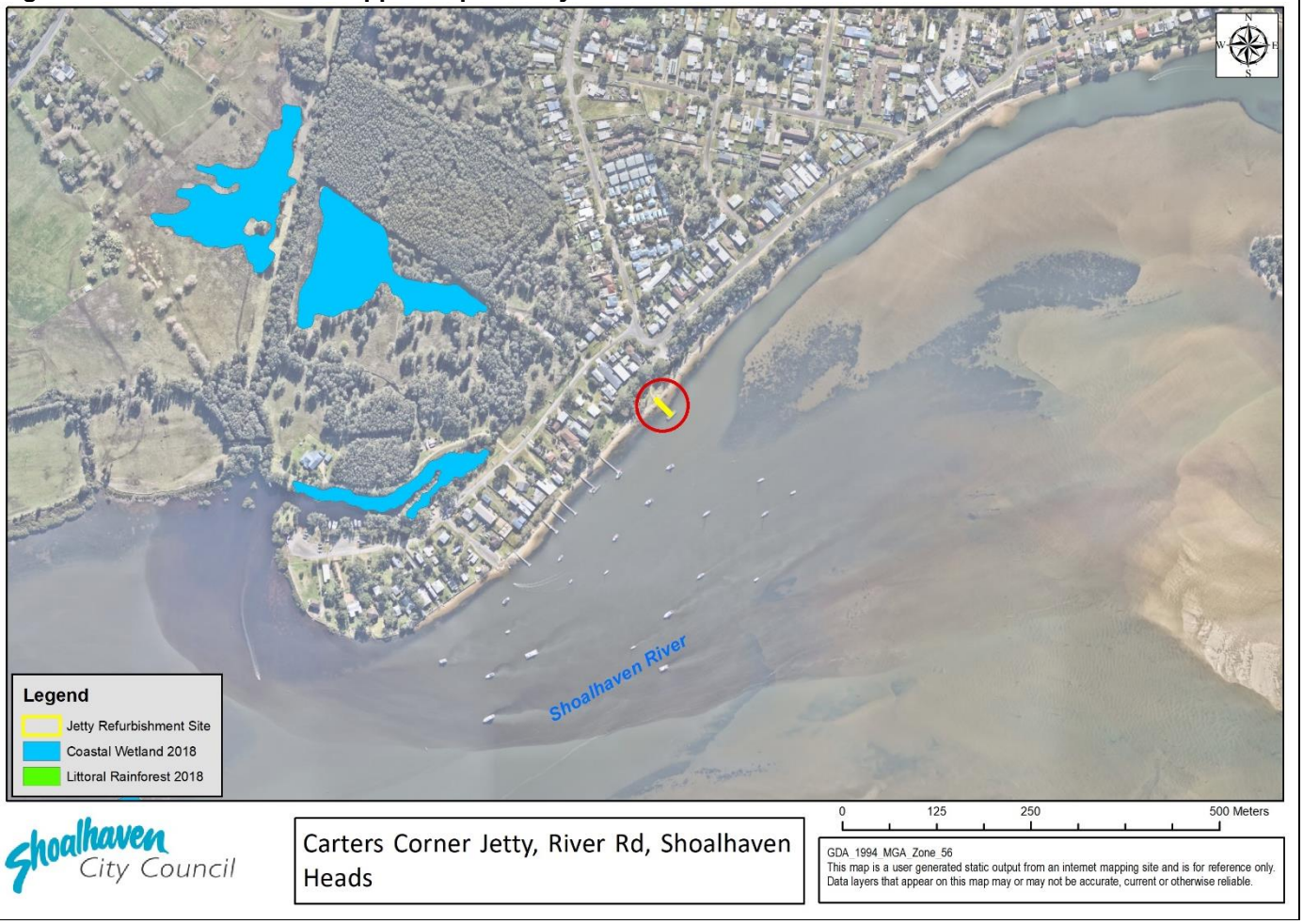
The proposed works would not involve dredging or reclamation on water land, nor impact on protected marine vegetation as regulated under Part 7 of the *Fisheries Management Act 1994*.

A permit issued under section 200 of the Act by NSW Department of Primary Industries (Fisheries) is therefore not required.

4.4 State Environmental Planning Policy (Resilience and Hazards Management) 2021

The proposed activity would be undertaken in an area mapped for the purposes of this SEPP as "Coastal Use Area" and "Coastal Environment Area". The provisions of the SEPP for these areas

Figure 9. Coastal Wetlands mapped in proximity to the site



relate to development consent considerations. As the proposed activity does not require development consent, these provisions do not need addressing.

There are no areas of Coastal Wetland or Littoral Rainforest mapped in the vicinity of the works (refer to Figure 9).

Other considerations of the SEPP are not relevant to the proposal.

4.5 Other

A summary of other relevant legislation and permissibility is provided in Table 3 below.

Table 3. Summary of other relevant legislation and permissibility

NSW STATE LEGISLATION
***Environmental Planning and Assessment Act 1979* (EP&A Act)**
Permissible √ Not permissible ☐
Justification: The Transport and Infrastructure SEPP provides for the proposed works to be undertaken without development consent (refer above). In circumstances where development consent is not required, the environmental assessment provisions outlined in Part 5 of the Act are required to be complied with. This REF fulfils this requirement.
Shoalhaven Local Environmental Plan 2014 (SLEP)
Permissible √ Not permissible ☐
Justification: Under the SLEP the proposed activity may have required development consent. The provisions of SEPP Infrastructure, however, prevail over the SLEP where there is an inconsistency by virtue of Section 3.28 of the EP&A Act. Consequently, development consent is not required.
Protection of the Environment Operations Act 1997
Permissible √ Not permissible ☐
Justification: The proposed activity does not constitute scheduled development work or scheduled activities as listed in Schedule 1 of the Act. The proposed activity therefore does not require an environmental protection licence.
***National Parks and Wildlife Act 1974* (NP&W Act)**
Permissible √ Not permissible ☐
Justification: • The proposed activity would not encroach into National Park estate. • The Act provides the basis for the legal protection and management of Aboriginal sites in NSW. Under Sections 86 and 90 of the Act it is an offence to disturb an Aboriginal object

or knowlingly destroy or damage, or cause the destruction or damage to, an Aboriginal object or place, except in accordance with a permit of consent under section 87 and 90 of the Act.

- As there are no recorded sites or visible objects and as the site is on 'disturbed land', the Due Diligence Guidelines requires no further assessment as it is reasonable to conclude that there is a low probability of objects occurring in the area of the proposed activity and an AHIP is not required. Refer to Section 3.4 for more information.

Fisheries Management Act 1994

Permissible √ Not permissible ☐

The proposed activity:

- would not affect declared aquatic reserves (Part 7, Division 2 of the Act);
- would not involve dredging or reclamation in Key Fish Habitat (Part 7, Division 3);
- would not involve or result in the blocking the passage of fish (s.219);
- would not impact mangroves and marine vegetation (Part 7, Division 4);
- would not involve disturbance to gravel beds where salmon or trout spawn (s.208 of the Act);
- does not involve the release of live fish (Part 7, Division 7);
- does not involve the construction of dams and weirs (s.218);
- would not impact declared threatened species of endangered ecological communities (Part 7A);
- does not constitute a declared key threatening process (Part 7A); and
- would not use explosives in a watercourse (Clauses 70 and 71 of the *Fisheries Management (General) Regulation 2019).*

A Fisheries Permit would therefore not be required. Refer to Section 4.3 for more information.

Heritage Act 1977

Permissible √ Not permissible ☐

Justification:

- The proposed activity would not disturb an item of state heritage significance.
- The Act also provides statutory protection to relics, archaeological deposits, artefacts or deposits. Section 139 to 146 of the Act require that excavation that is likely to contain, or is believed may contain, archaeological relics is undertaken in accordance with an excavation permit issued by the Heritage Council. The Act defines an archaeological relic as "*any deposit, artefact, object or material evidence that:*

  a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement; or
  b) *is of state and local heritage significance"*

  As the site has little to no archaeological potential, a permit is not required.

Biodiversity Conservation Act 2016

Permissible √ Not permissible ☐

Justification:

- The proposed activity is unlikely to have a significant impact on species and communities listed in the schedules of the Act (refer to Section 3.2).
- The proposed development is not within an area declared to be of "outstanding biodiversity value" as defined in the Act.
- The design and mitigation measures (Section 7) would ensure that no *serious and irreversible impacts on biodiverstiy values* (as defined by the BC Act) occur at the site of the proposed activity.

The proposed activity therefore is not deemed to be *likely to significantly affect threatened species* and an environmental impact statement (EIS) or a Biodiversity Development Assessment Report (BDAR) is not required.

It is also a defence to a prosecution for an offence under Part 2 of the Act (harming animals, picking plants, damaging the habitat of threatened species or ecological communities *etc*) if the work was essential for the carrying out of an activity by a determining authority within the meaning of Part 5 of the Environmental Planning and Assessment Act 1979 after compliance with that Part. The activity will not remove vegetation that is listed under Schedule 1 Threatened Species, Schedule 2 Threatened ecological communities and Schedule 6 Protected Plants. Therefore the activity is considered permissible as this REF has been prepared and determined in accordance with the EP&A Act.

Water Management Act 2000

Permissible √ Not permissible ☐

Justification:

- Local councils are exempt from s.91E(1) of the Act in relation to all controlled activites that they carry out in, on or under waterfront land by virtue of clause 41 of the *Water Management (General) Regulation 2018.*
- The proposal would not interfere with the aquifer and therefore an interference licence is not required (s.91F).

COMMONWEALTH LEGISLATION

Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EP&BC Act)

Permissible √ Not permissible ☐

Justification:

The proposed activity would not be undertaken on Commonwealth land and no matters of National Environmental Significance are likely to be significantly impacted by the proposed activity (Section 3.3). The proposed activity is therefore not a controlled action and does not require commonwealth referral.

Commonwealth *Native Title Act 1993*

Permissible √ Not permissible ☐

Justification:

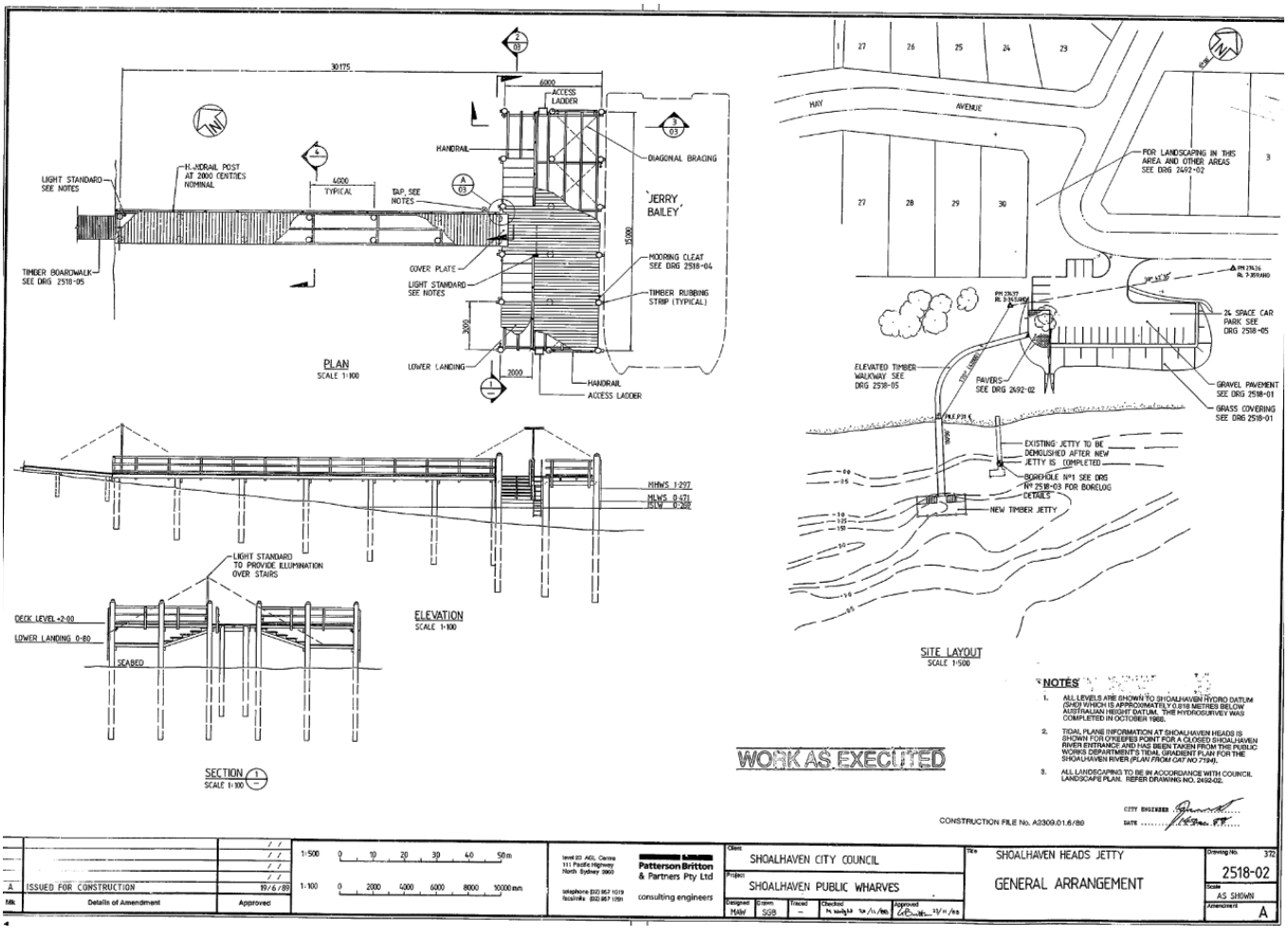
Works would occur over the Shoalhaven River waterway to which Native Title applies.

The existing jetty is a public works which was constructed before 1 January 1994 (reported as constructed in 1989) and appears to have been constructed validly with development consent (DA88/2079). It is therefore assumed that Native Title has been extinguished over the footprint of the existing jetty.

Regardless, the proposal involves refurbishment of the elevated components of an existing structure and would therefore have no effect on the land, would not prevent access would not extinguish or otherwise affect Native Title more than what has already occurred.

Further consideration is not required.

No procedural rights are applicable.



5. CONSULTATION WITH GOVERNMENT AGENCIES

5.1 Transport & Infrastructure SEPP

Clause 2.10 – Development with impacts on council-related infrastructure or services

The proposal would not involve changes to or impacts on: stormwater; traffic generation; the sewerage system; or the water supply system; and would not involve excavation of a footpath or public road.

The proposal would involve the temporary closure of a public place (i.e. the jetty) that is under a council's management and control. The proponent of the proposal (Works & Services, Shoalhaven City Council) is also the asset custodian.

Consultation under clause 2.10 is therefore not required.

Clause 2.11 – Development with impacts on local heritage

No impacts to any local heritage item would occur. Consultation under Clause 2.11 is therefore not required.

Clause 2.12 – Development with impacts on flood liable land

The site occurs on land and within a waterway which is mapped as flood-liable, however the proposal would not change flood patterns other than to a minor extent and would not exacerbate flooding risks.

Consultation under clause 2.13 is therefore not required.

Clause 2.13 – Consultation with State Emergency Service—development with impacts on flood liable land

The proposal does not constitute a relevant provision for the purposes of cl. 2.13.

Consultation under Clause 2.13 is therefore not required.

Clause 2.14 – Development with impacts on certain land within the coastal zone

The proposal would not occur within a coastal vulnerability area. Consultation is therefore not required.

Clause 2.15 – Consultation with public authorities other than councils

In consideration of the consultation requirements specified under Clause 2.15 of the Infrastructure SEPP, the proposed activity:

- would not be undertaken on adjacent to land reserved under the *National Parks and Wildlife Act 1974* or in Zone E1 or in equivalent zones.
- **does comprise a fixed or floating structure in or over navigable waters**

- would not increase the amount of artificial light in the night sky and located on land within the dark sky region as identified on the dark sky region map
- would not be undertaken within Defence communications facility buffer (only relevant to the defence communications facility near Morundah)
- would not be undertaken on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*

Consultation with Transport for New South Wales (TfNSW) Maritime Division is required. A notification has been provided on 5th December 2022 (Council reference D22/506622). Consideration must be given to any response to the notification which is received within 21 days. Refer to Section 7 *Environmental Safeguards and Mitigation Measures.*

Clause 2.16 – Consideration of Planning for Bush Fire Protection (PBP)

The proposed activity is not a type applicable to this clause *i.e.* health services facilities, correctional centres and residential accommodation. Consideration of PBP is therefore not required.

Summary

Consultation with Transport for New South Wales (TfNSW) Maritime Division is required pursuant to clause 2.15 for development in or over navigable waters (refer to Section 7 *Environmental Safeguards and Mitigation Measures*).

No other consultation with government agencies under Part 2.2, Division 1 of the Transport & Infrastructure SEPP is required.

6. COMMUNITY ENGAGEMENT

During the initial project concept and grant application process, the following community groups were identified and engaged as stakeholders: Shoalhaven Heads Community Forum, Shoalhaven Heads Fishing Club, Shoalhaven Heads Chamber of Commerce & Tourism and Holiday Haven Tourist Park. These groups shall be kept informed during planning and development of the project.

Signage shall be installed on site (minimum 4 weeks prior to works commencing), advising of the project, timing of works, required closures, and advising of alternative public jetty facilities along the Shoalhaven River and Crookhaven River.

7. ENVIRONMENTAL SAFEGUARDS AND MEASURES TO MINIMISE IMPACTS

Note that safeguards are prescribed unless stated otherwise.

Safeguard / Measure	Responsibility
Works planning, approvals, consultation & notification	
1. Council shall obtain a licence (or other lawful authorisation) from NSW Planning, Industry & Environment – Crown Lands prior to the commencement of works.	Project Manager; SCC Environmental Officer
2. Consultation with Transport for New South Wales (TfNSW) Maritime Division is required. A notification has been provided on 5th December 2022 (Council reference D22/506622). Consideration must be given to any response to the notification which is received within 21 days.	Project Manager; SCC Environmental Officer
3. The following stakeholder groups shall be kept informed during planning and development of the project: Shoalhaven Heads Community Forum, Shoalhaven Heads Fishing Club, Shoalhaven Heads Chamber of Commerce & Tourism and Holiday Haven Caravan Park.	Project Manager;
4. Signage shall be installed on site (minimum 4 weeks prior to works commencing), advising of the project, timing of works, required closures, and advising of alternative jetty facilities along the Shoalhaven River and Crookhaven River.	Project Manager;
5. This REF must be published on the determining authority's (Council's) website or the NSW planning portal, in accordance with clause 171(4) EP&A Regulation 2021 (as a matter of "public interest").	SCC Environmental Officer
Site Establishment	
6. Construction stockpiles shall be located in existing cleared areas away from the beach, and shall not encroach into native vegetation, including the drip zone of trees.	Site Manager; Construction Contractor
Construction works	
7. Pre-demolition inspection of the underside of the jetty shall be undertaken to ensure no impacts on roosting animals.	Council Environmental Officer or ecologist
8. No impact to terrestrial or aquatic vegetation shall occur. Care shall be taken to avoid trampling or other damage to seagrass. Use of a vessel or scaffolding as a work platform from the waterway or to transport material must not involve anchors or props on seagrass.	Site Manager; Construction Contractor

Safeguard / Measure	Responsibility
9. Works shall be undertaken by hand from the existing structure or beach / sand-flats to every practical extent, but may occur if required from the waterway, including the use of a small Class 2 vessel.	Site Manager; Construction Contractor
10. Where cutting of timber, bolts or brackets is required over water or water land, tarps or similar shall be placed, floated or carried in the vessel – beneath works – to capture potential contaminants including oil, saw-dust and metal shavings. If this approach is considered impractical or likely to be ineffective, a combination hydrocarbon boom and silt curtain shall be installed in the waterway, encompassing the works area.	Site Manager; Construction Contractor
11. Staff working at the site will be instructed to stop work immediately on identification of any suspected Aboriginal heritage artefact. If any objects are found, Heritage NSW (ph:131 555) shall be contacted.	Site Manager; Construction Contractor
12. In the event that any wildlife be significantly disturbed or injured during works, Council's Environmental Officers are to be contacted on 4429 3405, or if unavailable, Wildlife Rescue – South Coast should be contacted on 0418 427 214, to rescue and relocate the animal(s).	Site Supervisor; Contractor;
Post construction	
13. An asset form shall be trimmed to file 44574E on commissioning of the assets in Accordance with POL15/8 Asset Accounting Policy section 3.1.4 and POL16/79 Asset Management Policy section 3.3.	Project Manager

8. SIGNIFICANCE EVALUATION & DECISION STATEMENT

This Review of Environmental Factors has assessed the likely environmental impacts, in the context of Part 5 of the Environmental Planning and Assessment Act 1979, of a proposal by Shoalhaven City Council for the the refurbishment of the existing Carters Corner jetty at River Rd, Shoalhaven Heads.

In consideration of the proposal as described in Section 1, in accordance with any design plans referred to in this report, and assuming the implementation of all proposed safeguards and mitigation measures (Section 7), it is determined that:

1. It is unlikely that there will be any significant environmental impact as a result of the proposed activity and an Environmental Impact Statement is not required.
2. The proposed activity will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats, and a Species Impact Statement / BDAR is not required.
3. The following statutory approvals, licences, permits and external government consultations are required:
    a. Crown Licence for works in the Crown-managed waterway
    b. Consultation with TfNSW Maritime Division
4. The proposed activity may proceed.

In accepting and adopting this REF, Shoalhaven City Council commits to ensuring the implementation of the proposed safeguards and mitigation measures identified in this report (Section 7) to minimise and/or prevent detrimental environmental impacts.

Determined by:

Trevor Dando
Manager – Works and Services
Shoalhaven City Council Date: 16/12/2022

9. REFERENCES

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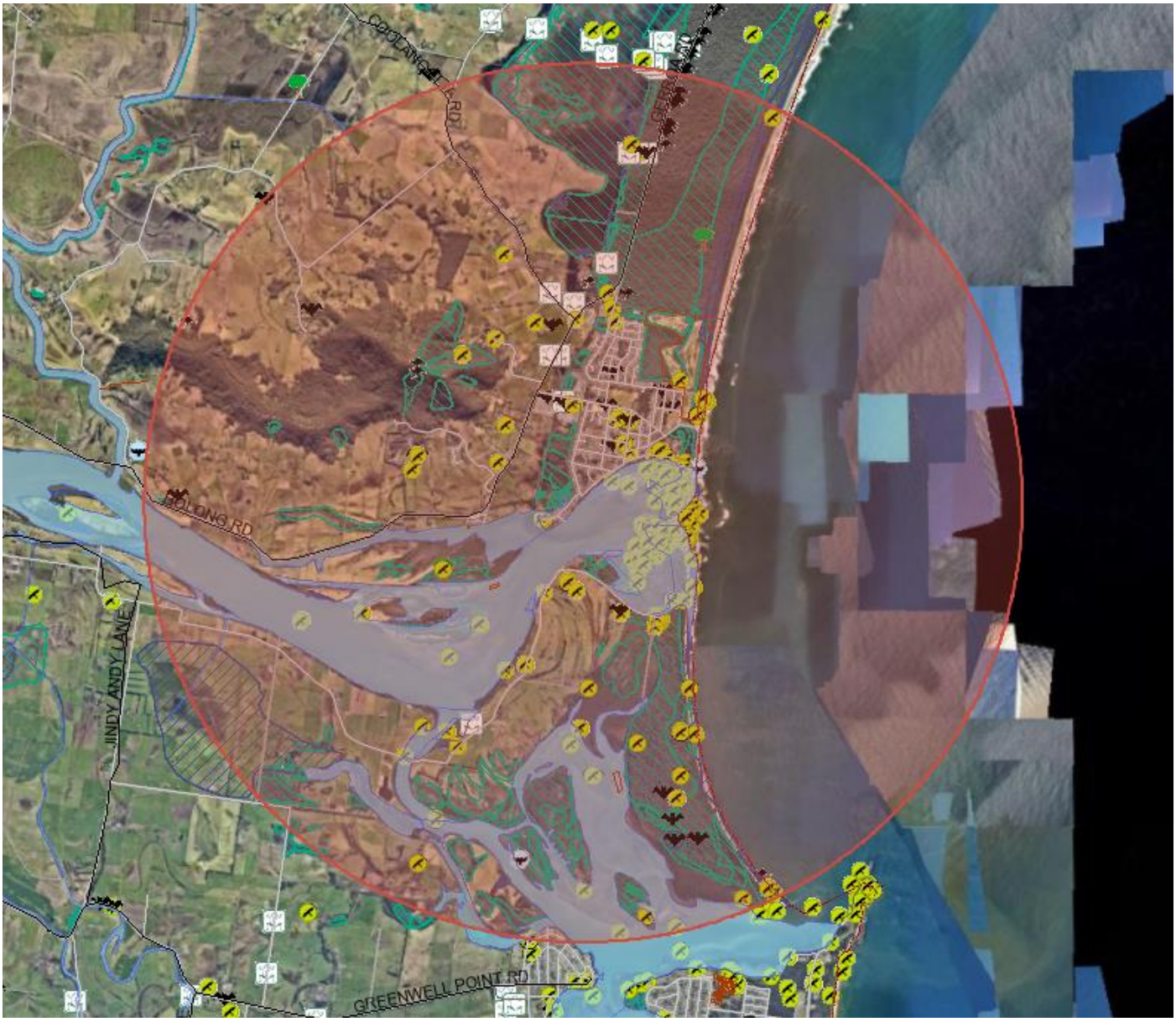
APPENDIX A – Threatened Species Likelihood of Occurrence



NSW Threatened Species Likelihood of Occurrence Table

The table of likelihood of occurrence evaluates the likelihood of threatened species to occur on the subject site. This list is derived from previously recorded species within a 5 km radius (taken from NSW BioNet Atlas) around the subject site. Ecology information unless otherwise stated, has been obtained from the *Threatened Biodiversity Profile Search* on the NSW OEH (Office of Environment & Heritage) online database (https://www.environment.nsw.gov.au/threatenedspeciesapp/).

Likelihood of occurrence in study area

1. Unlikely – Species, population or ecological community is not likely to occur. Lack of previous recent (<25 years) records and suitable potential habitat limited or not available in the study area.
2. Likely – Species, population or ecological community could occur and study area is likely to provide suitable habitat. Previous records in the locality and/or suitable potential habitat in the study area.
3. Present – Species, population or ecological community was recorded during the field investigations.

Possibility of impact

1. Unlikely – The proposal would be unlikely to impact this species or its habitats. No NSW *Biodiversity Conservation Act 2016* “Test of Significance” or EPBC Act significance assessment is necessary for this species.
2. Likely – The proposal could impact this species, population or ecological community or its habitats. A NSW *Biodiversity Conservation Act 2016* “Test of Significance” and/or EPBC Act significance assessment is required for this species, population or ecological community.

Note that where further assessment is deemed required, this is undertaken within the REF as a Test of Significance (in the case of NSW listed species) or an EPBC Significant Impact Assessment (in the case of Commonwealth listed species).

Endangered Ecological Community name	***Status***	***Likelihood of presence within areas impacted by the activity***
Bangalay Sand Forest of the Sydney Basin and South East Corner Bioregions	Endangered - *NSW* BC *Act*	Does not occur on-site and is not mapped as occurring in close proximity to the site (nearest records are approx. 700m to the north of the site).
Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered - *NSW* BC *Act* Vulnerable - Commonwealth *EPBC Act*	Does not occur on-site and is not mapped as occurring in close proximity to the site (nearest records are approx. 800m to the south-east of the site).
Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered - *NSW* BC *Act*	Does not occur on-site and is not mapped as occurring in close proximity to the site (nearest records are approx. 2.79km to the north of the site).
Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion	Endangered - *NSW* BC *Act* Critically Endangered - Commonwealth *EPBC Act*	Does not occur on-site and is not mapped as occurring in close proximity to the site (nearest records are approx. 1.88km to the north-west of the site).
Illawarra Subtropical Rainforest in the Sydney Basin Bioregion	Endangered - *NSW* BC *Act* Critically Endangered - Commonwealth *EPBC Act*	Does not occur on-site and is not mapped as occurring in close proximity to the site (nearest records are approx. 1.81km to the north-west of the site).
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Endangered - NSW BC Act Critically Endangered - Commonwealth EPBC Act	Does not occur on-site and is not mapped as occurring in close proximity to the site (nearest records are approx. 2.43km to the south-south-east of the site).

Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered - *NSW* BC *Act* Endangered - Commonwealth *EPBC Act*	Mapped as occurring in the surrounding area (approx. 110m to the north-west of the site), but site surveys confirmed that this EEC does not occur within the site or in close proximity such that it is at risk of being impacted by the proposal.
Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered - NSW BC Act	Does not occur on-site and is not mapped as occurring in close proximity to the site (nearest records are approx. 1.57km to the north of the site).

Species name	***Status***	***Habitat requirements (www.environment.nsw.gov.au)***	***Likelihood of presence within areas impacted by the activity***
FLORA			
Chamaesyce psammogeton Sand Spurge	Endangered NSW BC Act	Grows on fore-dunes, pebbly strandlines and exposed headlands, often with Spinifex (Spinifex sericeus) and Prickly Couch (Zoysia macrantha). Sand Spurge seeds float, so some dispersal between beaches may occur.	Unlikely to occur. No suitable habitat present within the site. Surrounding beach area is disturbed.
Solanum celatum	NSW BC Act Endangered	Grows in rainforest clearings or in wet sclerophyll forests. Flowers August to October and produces fruit between December and January. Normally recorded in disturbed margins and clearings.	Unlikely to occur. No suitable habitat present within the site.
AMPHIBIANS			

Green and Golden Bell Frog *Litoria aurea*	Vulnerable *EPBC Act* Endangered *NSW* BC *Act*	Marshes, dams and stream-sides, particularly those containing bullrushes (*Typha* spp.) or spikerushes (*Eleocharis* spp.). Optimum habitat for the species includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), with a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas (OEH 2017).	Unlikely to occur. No suitable habitat present within the site.
MICRO-CHIROPTERAN BATS			
Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris*	Vulnerable *NSW* BC *Act*	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. Breeding has been recorded from December to mid-March, when a single young is born. Seasonal movements are unknown; there is speculation about a migration to southern Australia in late summer and autumn	Possibly occurring transiently over or in proximity to the site. Potential utilisation of the existing jetty structure underside for roosting habitat. Further assessment has been undertaken in Section 3.2.2.
BIRDS			
Arctic Jaeger *Stercorarius parasiticus*	Migratory EPBC Act	An inhabitant of oceans, coastal regions, boreal forest, grassland and tundra, the artic jaeger shows a great ability to live in windy, wet climates as well as extremely dry and cold ones. The arctic jaeger breeds both on islands and on mainland coasts, and outside of the breeding season is found mostly at sea.	Possibly occurring transiently in proximity to the site. Unlikely to use habitat within the site or be affected by proposal.
Australasian Bittern *Botaurus poiciloptilus*	*NSW* BC *Act* Endangered *EPBC Act* Endangered	Occurs in terrestrial freshwater wetlands and, rarely, estuarine habitats. It favours wetlands with tall, dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. The species favours permanent and seasonal freshwater habitats,	Unlikely to occur within the site. No suitable habitat present.

		particularly those dominated by sedges, rushes and/or reeds (e.g. Phragmites, Cyperus, Eleocharis, Juncus, Typha, Baumea, Bolboschoenus) or cutting grass (Gahnia) growing over muddy or peaty substrate. Knowledge of the breeding ecology of the Australasian Bittern is relatively poor. Available data indicate that the Australasian Bittern breeds in relatively deep, densely vegetated freshwater swamps and pools, building its nests in deep cover over shallow water. In rushland, it may avoid breeding in the densest areas; alternatively, this may simply reflect the accessibility of the few nests that have been found. If population density is high, it may resort to open wetlands for nesting, e.g. in stunted Acacia, but this may be exceptional behaviour. It is clear that a complexity of habitat is required in order for foraging and breeding to occur in one location. The species requires shallow water, less than 30 cm deep with medium to low density reeds, grasses or shrubs for foraging and needs deeper water, with medium to high density reeds, rushes or sedges for nesting.	
Bar-tailed Godwit *Limosa lapponica*	Migratory EPBC Act	The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh. It has been sighted in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. It is rarely found on inland wetlands or in areas of short grass, such as farmland, paddocks and airstrips, although it is commonly recorded in paddocks at some locations overseas. Forages near the edge of water or in shallow water, mainly in tidal estuaries and harbours. They appear not to forage at high tide and prefer exposed sandy substrates on intertidal flats, banks and beaches. The also prefer soft mud; often with beds of eelgrass Zostera or other seagrasses. Occasionally	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.

		they have been known to forage among mangroves, or on coral reefs or rock platforms among rubble, crevices and holes. They rarely forage in grassy or vegetated areas. On Heron Island they have been seen feeding on insect larvae among the roots of Casuarina. Roosts on sandy beaches, sandbars, spits and also in near-coastal saltmarsh. In some conditions, waders may choose roost sites where a damp substrate lowers the local temperature.	
Beach Stone-curlew *Esacus magnirostris*	Critically endangered NSW BC Act	They are found exclusively along the coast, on a wide range of beaches, islands, reefs and in estuaries, and may often be seen at the edges of or near mangroves. They forage in the intertidal zone of beaches and estuaries, on island, flats, banks and spits of sand, mud, gravel or rock, and among mangroves. Beach stone curlews breed above the littoral zone, at the backs of beaches, or on sandbanks and islands, among low vegetation of grass, scattered shrubs or low trees; also among open mangroves.	Unlikely to occur within the site. No suitable habitat present.
Black Bittern *Ixobrychus flavicollis*	*Vulnerable NSW BC Act*	Terrestrial and estuarine wetlands generally in areas of permanent water and dense vegetation that may comprise grassland, woodland forest rainforest and mangroves. Roosts in trees or on ground amongst dense reeds, nests in branches overhanging water	Unlikely to occur within the site. No suitable habitat present.
Black-tailed Godwit *Limosa limosa*	Vulnerable *NSW* BC *Act*	Primarily a coastal species. Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps. Individuals have been recorded in wet fields and sewerage treatment works. Forages for insects, crustaceans, molluscs, worms, larvae, spiders, fish eggs, frog eggs and tadpoles in soft mud or shallow water. Roosts and loafs on low banks of mud, sand and shell bars.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Blue-billed Duck *Oxyura australis*	Vulnerable *NSW* BC *Act*	Prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely	Unlikely to occur within the site. No suitable habitat present.

		aquatic, swimming low in the water along the edge of dense cover. It will fly if disturbed, but prefers to dive if approached. Blue-billed Ducks will feed by day far from the shore, particularly if dense cover is available in the central parts of the wetland. They feed on the bottom of swamps eating seeds, buds, stems, leaves, fruit and small aquatic insects such as the larvae of midges, caddisflies and dragonflies. Blue-billed Ducks are partly migratory, with short-distance movements between breeding swamps and overwintering lakes with some long-distance dispersal to breed during spring and early summer. Blue-billed Ducks usually nest solitarily in Cumbungi over deep water between September and February. They will also nest in trampled vegetation in Lignum, sedges or Spike-rushes, where a bowl-shaped nest is constructed.	
Broad-billed Sandpiper *Limicola falcinellus*	Vulnerable *NSW* BC *Act*	Broad-billed Sandpipers favour sheltered parts of the coast such as estuarine sandflats and mudflats, harbours, embayments, lagoons, saltmarshes and reefs as feeding and roosting habitat. Occasionally, individuals may be recorded in sewage farms or within shallow freshwater lagoons. Broad-billed Sandpipers roost on banks on sheltered sand, shell or shingle beaches. The species is an active forager, typically feeding by rapidly and repeatedly jabbing its bill into soft wet mud. Feeding also occurs while wading, often in water so deep that they have to submerge their heads and necks in order to probe the underlying mud. Their diet includes insects, crustaceans, molluscs, worms and seeds.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Caspian Tern Hydroprogne caspia	Migratory EPBC Act	Occur along the Australian coastline, and also occur inland along major rivers, especially in the Murray-Darling and Lake Eyre drainage basins, preferring wetlands with clear water to allow easy prey detection.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Common Greenshank Tringa nebularia	Migratory EPBC Act	Found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh,	Possibly occurring transiently in proximity to the site. Unlikely to

		mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores. The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves, thickets of rushes, and dead or live trees. It was once recorded with Black-winged Stilts (Himantopus himantopus) in pasture, but are generally not found in dry grassland. This species is known to forage at edges of wetlands, in soft mud on mudflats, in channels, or in shallows around the edges of water often among pneumatophores of mangroves or other sparse, emergent or fringing vegetation, such as sedges or saltmarsh. It will occasionally feed on exposed seagrass beds. Roosts and loafs round wetlands, in shallow pools and puddles, or slightly elevated on rocks, sandbanks or small muddy islets. Occasionally the species will perch and roost on stakes (Higgins & Davies 1996). The species is known to have roosted on an inland claypan near Roebuck Bay, Western Australia; this site may be an important roost site for this species at least during the non-breeding season.	occur within the site. No suitable habitat present.
Common Sandpiper *Actitis hypoleucos*	Migratory EPBC Act	The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The Common Sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.

		jetties. The muddy margins utilised by the species are often narrow, and may be steep. The species is often associated with mangroves, and sometimes found in areas of mud littered with rocks or snags. Generally the species forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. Birds sometimes venture into grassy areas adjoining wetlands. Roost sites are typically on rocks or in roots or branches of vegetation, especially mangroves. The species is known to perch on posts, jetties, moored boats and other artificial structures, and to sometimes rest on mud or 'loaf' on rocks.	
Common Tern *Sterna hirundo*	Migratory EPBC Act	Common Terns are marine, pelagic and coastal. In Australia, they are recorded in all marine zones, but are commonly observed in near-coastal waters, both on ocean beaches, platforms and headlands and in sheltered waters, such as bays, harbours and estuaries with muddy, sandy or rocky shores. Occasionally they are recorded in coastal and near-coastal wetlands, either saline or freshwater, including lagoons, rivers, lakes, swamps and saltworks. Sometimes they occur in mangroves or saltmarsh and, in bad weather, in coastal sand-dunes or coastal embayments. Common Terns forage in marine environments, often close to the shore, including sheltered embayments and in the surf-zone, but also well out to sea. They also forage in near-coastal terrestrial wetlands, including estuaries, rivers and swamps. Common Terns roost on unvegetated, intertidal sandy ocean beaches, sandy islands, shores of estuaries or lagoons, and sandbars, as well as on rocky shores, rock platforms or rocks protruding above the surface of the water Common Terns nest on the ground in the open, usually on bare substrates, occasionally near vegetation or in it, or on a floating mat of vegetation. They usually nest on islands, either marine or in lakes, only sometimes on mainland beaches or promontories or salt or freshwater marshes.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.

Crested Tern *Thalasseus bergii*	Migratory EPBC Act	Crested Terns inhabit coastal areas, offshore waters, beaches, bays, inlets, tidal rivers, salt swamps, lakes and larger rivers. The species breeds during Sep-Jan in the south and Mar-Jun in the north in large, dense colonies on small islands. Nesting occurs on sand or shingle among low vegetation behind the beaches (Pizzey & Knight 2012; Morcombe 2011)	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Curlew Sandpiper *Calidris ferruginea*	*EPBC Act:* Migratory *NSW BC Act:* Endangered	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Forages on mudflats and nearby shallow water. In non-tidal wetlands, they usually wade, mostly in water 15–30 mm, but up to 60 mm, deep. They forage at the edges of shallow pools and drains of intertidal mudflats and sandy shores. At high tide, they forage among low sparse emergent vegetation, such as saltmarsh, and sometimes forage in flooded paddocks or inundated saltflats. Occasionally they forage on wet mats of algae or waterweed, or on banks of beachcast seagrass or seaweed. They rarely forage on exposed reefs. In Roebuck Bay, northern Western Australia, they are also said to feed on part of the mudflats that have been exposed for a longer period, foraging in small groups. Roosts on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands, occasionally roosting in dunes during very high tides and sometimes in saltmarsh. They have also been recorded roosting in mangroves in Inverloch, Victoria.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Eastern Curlew *Numenius madagascariensis*	Critically Endangered *EPBC Act*	Most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of	Possibly occurring transiently in proximity to the site. Unlikely to

		seagrass. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes use the mangroves. The birds are also found in saltworks and sewage farms (Marchant & Higgins 1993). The numbers of Eastern Curlew recorded during one study were correlated with wetland areas. Mainly forages on soft sheltered intertidal sandflats or mudflats, open and without vegetation or covered with seagrass, often near mangroves, on saltflats and in saltmarsh, rockpools and among rubble on coral reefs, and on ocean beaches near the tideline. The birds are rarely seen on near-coastal lakes and in grassy areas. Roosts on sandy spits and islets, especially on dry beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves. It occasionally roosts on reef-flats, in the shallow water of lagoons and other near-coastal wetlands. Eastern Curlews are also recorded roosting in trees and on the upright stakes of oyster-racks. At Roebuck Bay, Western Australia, birds fly from their feeding areas on the tidal flats to roost 5 km inland on a claypan. In some conditions, waders may choose roost sites where a damp substrate lowers the local temperature. This may have important conservation implications where these sites are heavily disturbed beaches. It may be possible to create artificial roosting sites to replace those destroyed by development. Eastern Curlews typically roost in large flocks, separate from other waders.	occur within the site. No suitable habitat present.
Eastern Hooded Dotteral (Hooded Plover) *Thinornis cucullatus cucullatus*	*NSW* BC *Act:* Critically Endangered *EPBC Act:* Vulnerable	In south-eastern Australia Hooded Plovers prefer sandy ocean beaches, especially those that are broad and flat, with a wide wave-wash zone for feeding, much beachcast seaweed, and backed by sparsely vegetated sand-dunes for shelter and nesting. Occasionally Hooded Plovers are found on tidal bays and estuaries, rock platforms and rocky or sand-	Unlikely to occur within the site. No suitable habitat present.

(syn*Thinornis rubricollis*)		covered reefs near sandy beaches, and small beaches in lines of cliffs. They regularly use near-coastal saline and freshwater lakes and lagoons, often with saltmarsh. Hooded Plovers forage in sand at all levels of the zone of wave wash during low and mid-tide or among seaweed at high-tide, and occasionally in dune blowouts after rain. At night they favour the upper zones of beaches for roosting. When on rocks they forage in crevices in the wave-wash or spray zone, avoiding elevated rocky areas and boulder fields. In coastal lagoons they forage in damp or dry substrates and in shallow water, depending on the season and water levels. In eastern Australia, Hooded Plovers usually breed from August to March on sandy ocean beaches strewn with beachcast seaweed, in a narrow strip between the high-water mark and the base of the fore-dunes. They often nest within 6 m of the fore-dune, mostly within 5 m of the high-water mark, but occasionally among or behind dunes.	
Eastern Osprey *Pandion cristatus*	*NSW* BC *Act* Vulnerable	Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water. Breed from July to September in NSW. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.
Gang-gang Cockatoo *Callocephalon fimbriatum*	*Vulnerable NSW* BC *Act*	Tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas. preferring more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. Favours old growth attributes for nesting and roosting	Unlikely to occur within the site. No suitable habitat present.
Glossy Black-cockatoo *Calyptorhynchus lathami*	Vulnerable *NSW* BC *Act*	The GBC inhabits open forest and woodlands of the coast where stands of she-oak occur. In the Jervis Bay region they feed almost exclusively on the seeds of the black she-oak *Allocasuarina littoralis*, shredding the cones with their bill	Unlikely to occur within the site. No suitable habitat present.

Great Knot *Calidris tenuirostris*	*NSW BC Act:* Vulnerable *EPBC Act:* Migratory	In Australasia, the species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats. This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, saltlakes and non-tidal lagoons. The Great Knot rarely occurs on inland lakes and swamps. Typically, the Great Knot roosts in large groups in open areas, often at the waters edge or in shallow water close to feeding grounds. It is known that in hot conditions, waders prefer to roost where a damp substrate lowers the local temperature.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Greater Sand-plover *Charadrius leschenaultii*	*NSW* BC *Act:* Vulnerable *EPBC Act:* Vulnerable	Almost entirely restricted to coastal areas in NSW, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks. Roosts during high tide on sandy beaches and rocky shores; begin foraging activity on wet ground at low tide, usually away from the edge of the water; individuals may forage and roost with other waders. Diet includes insects, crustaceans, polychaete worms and molluscs. Prey is detected visually by running a short distance, stopping to look, then running to collect the prey	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Grey Plover Pluvialis squatarola	*EPBC Act: Migratory*	Grey Plovers usually forage on large areas of exposed mudflats and beaches of sheltered coastal shores such as inlets, estuaries and lagoons. They also occasionally feed in pasture and at the muddy margins of inland wetlands such as lakes, swamps and bores. They usually roost in sandy areas, such as on unvegetated sandbanks or sand-spits on sheltered beaches or other sheltered environments such as estuaries or lagoons. In Port Phillip Bay, they roost on artificial sand islands created by dredge spoil. They less often roost on the muddy edges of estuaries or water storages such as reservoirs and salt-lakes. The species has also been recorded roosting in claypans 2 km from the sea.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.

		Grey Plovers breed in tundra, often at higher elevations (up to the tree-line), and generally in dry positions, such as on low ridges or bluffs, in areas vegetated with sedges, moss, lichen and stunted trees, and interspersed with large wetlands and patches of snow and unmelted ice. They may avoid moist areas, though they have been recorded breeding in the deltas of large rivers and in other lowland or coastal.	
Grey-tailed Tattler Tringa brevipes	*Migratory* *EPBC Act*	Often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. It can also be found at intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide. It has been found around shores of rock, shingle, gravel or shells and also on intertidal mudflats in embayments, estuaries and coastal lagoons, especially fringed with mangroves. In Moreton Bay, Queensland, it is most abundant in areas with dense beds of seagrass. In Tasmania it is also abundant in areas with seagrass beds. It is less often on open flat sandy beaches or sandbanks, especially around accumulated seaweed or isolated clumps of dead coral. It is occasionally found around near-coastal wetlands, such as lagoons and lakes and ponds in sewage farms and saltworks. Inland records for the species are rare with sightings on river banks and the edges of rock pools. Usually forages in shallow water, on hard intertidal substrates, such as reefs and rock platforms, in rock pools and among rocks and coral rubble, over which water may surge. It has also been recorded foraging on exposed intertidal mudflats, especially with mangroves and possibly seagrass nearby. Occasionally it forages on intertidal sandflats, around banks of seaweed or protruding rocks or lumps of coral. Usually roosts in the branches of mangroves or, rarely, in dense stands of other shrubs, or on snags or driftwood. Where mangroves are not present, it roosts on rocks that are sometimes partly submerged. It is also known to roost on beaches and reefs; however, it is rarely reported roosting on	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.

		bare sandy beaches or sandbanks. It occasionally roosts among beds of Samolus. Sightings also indicate it roosts on sand-dunes. It often perches on artificial structures. It is occasionally found in near-coastal saltworks and sewage ponds and once recorded at a bore-drain. It may roost on or feed among oyster-racks and other artificial structures, such as seawalls, rocky causeways and boats. It breeds in montane taiga and the forest tundra of northern Siberia, along rivers and streams and on the stone or pebble shorelines of lakes.	
Gull-billed Tern Gelochelidon nilotica	*EPBC Act: Migratory*	Gull-billed Terns are 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	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Latham's Snipe Gallinago hardwickii	*EPBC Act: Migratory*	In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity. In Australia, Latham's Snipe occurs in a wide variety of permanent and ephemeral wetlands. They usually occur in open, freshwater wetlands that have some form of shelter (usually low and dense vegetation) nearby. They generally occupy flooded meadows, seasonal or semi-permanent swamps, or open waters, but various other freshwater habitats can be used including bogs, waterholes, billabongs, lagoons, lakes, creek or river margins, river pools and floodplains. The structure and composition of the vegetation that occurs around these wetlands is not important in determining the suitability of habitat. As such, snipe may be found in a variety of vegetation types or communities including tussock grasslands with rushes, reeds and sedges,	Unlikely to occur. No suitable habitat present

		coastal and alpine heathlands, lignum or tea-tree scrub, button-grass plains, alpine herbfields and open forest. Latham's Snipe sometimes occur in habitats that have saline or brackish water, such as saltmarsh, mangrove creeks, around bays and beaches, and at tidal rivers. These habitats are most commonly used when the birds are on migration. They are regularly recorded in or around modified or artificial habitats including pasture, ploughed paddocks, irrigation channels and drainage ditches, ricefields, orchards, saltworks, and sewage and dairy farms. They can also occur in various sites close to humans or human activity (e.g. near roads, railways, airfields, commercial or industrial complexes). The foraging habitats of Latham's Snipe are characterized by areas of mud (either exposed or beneath a very shallow covering of water) and some form of cover (e.g. low, dense vegetation). The snipe roost on the ground near (or sometimes in) their foraging areas, usually in sites that provide some degree of shelter, e.g. beside or under clumps of vegetation, among dense tea-tree, in forests, in drainage ditches or plough marks, among boulders, or in shallow water if cover is unavailable.	
Lesser Sand-plover *Charadrius mongolus*	*EPBC Act:* Migratory *NSW BC Act:* Vulnerable	In non-breeding grounds in Australia, this species usually occurs in coastal littoral and estuarine environments. It inhabits large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. It also sometime occurs in short saltmarsh or among mangroves. The species feeds mostly on extensive, freshly-exposed areas of intertidal sandflats and mudflats in estuaries or beaches, or in shallow ponds in saltworks. hey roost near foraging areas, on beaches, banks, spits and banks of sand or shells and occasionally on rocky spits, islets or reefs.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.

		The species does not breed in Australia.	
Little Eagle *Hieraaetus morphnoides*	Vulnerable *NSW* BC Act	Occupies open eucalypt forest, woodland or open woodland. She-oak or acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.
Little Lorikeet *Glossopsitta pusilla*	Vulnerable NSW BC ACT	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). These nest sites are often used repeatedly for decades, suggesting that preferred sites are limited. Riparian trees often chosen, including species like Allocasuarina	Unlikely to occur within the site. No suitable habitat present.
Little Tern *Sternula albifrons*	Endangered NSW BC Act Migratory EPBC Act	Mostly exclusively coastal, preferring sheltered environments; however may occur several kilometres from the sea in harbours, inlets and rivers (with occasional offshore islands or coral cay records). Nests in small, scattered colonies in low dunes or on sandy beaches just above the high tide mark near estuary mouths or adjacent to coastal lakes and islands. Nests in a scrape in the sand, which may be lined with shell grit, seaweed or small pebbles.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Orange-bellied Parrot *Neophema chrysogaster*	Critically endangered NSW BC Act Critically Endangered EPBC Act	On the mainland, the Orange-bellied Parrot spends winter mostly within 3 km of the coast in sheltered coastal habitats including bays, lagoons, estuaries, coastal dunes and saltmarshes. The species also inhabits small islands and peninsulas and occasionally saltworks and golf courses. Birds	Unlikely to occur within the site. No suitable habitat present.

		forage in low samphire herbland or taller coastal shrubland. Diet mainly comprises seeds and fruits of sedges and salt-tolerant coastal and saltmarsh plants. Occasionally, flowers and stems are eaten. Orange-bellied Parrots are known to forage among flocks of Blue-winged Parrots. Recent records from unexpected places, including Shellharbour and Maroubra suggest that the species may be expanding their selection of habitats and foraging plant species. Birds seen in NSW in 2003 were foraging on weed species several hundred metres from the coast.	
Oriental Plover *Charadrius veredus*	Migratory EPBC Act	Oriental Plovers usually forage among short grass or on hard stony bare ground, but also on mudflats or among beachcast seaweed on beaches. Oriental Plovers sometimes roost on soft wet mud or in shallow water of beaches and tidal mudflats, and also occasionally in dry, open habitats, such as saltmarsh or paddocks. The species does not breed in Australia. The secies breeds in western, northern and eastern Mongolia, with some irregular breeding grounds in Russia, close to the Mongolian border. Oriental Plovers usually breed in arid elevated areas on extensive open upland flats, mountain ridges or plateaux where sparse vegetation such as moss, lichen or short grass is interspersed with patches of bare rock .The species does not rely on a listed threatened ecological community.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Pacific Golden Plover *Pluvialis fulva*	Migratory EPBC Act	This species usually forages on sandy or muddy shores (including mudflats and sandflats) or margins of sheltered areas such as estuaries and lagoons, though it also feeds on rocky shores, islands or reefs. In addition, Pacific Golden Plovers occasionally forage among vegetation, such as saltmarsh, mangroves or in pasture or crops. They usually roost near foraging areas, on sandy beaches and spits or rocky points, islets or exposed reefs, occasionally among or beneath vegetation including mangroves or low saltmarsh, or among beachcast seaweed. They sometimes	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.

		also roost on levee banks and islands in evaporation ponds in saltworks. Breeding occurs in dry areas of tundra away from the coast, including upland and montane tundra, usually on slopes of low hills, knolls or foothills vegetated with lichen and moss, or in bare, stony areas. Some sites are near vegetated areas with shrubs, and although usually above the treeline, they very occasionally breed in forest tundra. After the young hatch, they move to moister habitats, such as Sphagnum swamps.	
Pied Oystercatcher *Haematopus longirostris*	Endangered *NSW* BC *Act*	Favours intertidal flats of inlets and bays, open beaches and sandbanks. Forages on exposed sand, mud and rock at low tide, for molluscs, worms, crabs and small fish. Nests mostly on coastal or estuarine beaches although occasionally they use saltmarsh or grassy areas. Nests are shallow scrapes in sand above the high tide mark, often amongst seaweed, shells and small stones.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Powerful Owl *Ninox strenua*	Vulnerable NSW BC Act	Coastal Woodland, Dry Sclerophyll Forest, wet sclerophyll forest and rainforest- Can occur in fragmented landscapes Roosts in dense vegetation comprising species such as Turpentine *Syncarpia glomulifera*, Black She-oak *Allocasuarina littoralis*, Blackwood *Acacia melanoxylon*, Rough-barked Apple *Angophora floribunda,* Cherry Ballart Exocarpus cupressiformis and a number of eucalypt species. requires old growth elements-hollow bearing tree resources for nesting and prey resource. Nests in large tree hollows in large eucalypts that are at least 150yrs old. Often in riparian areas. Large home range	Unlikely to occur within the site. No suitable habitat present.
Red Knot *Calidris canutus*	Migratory *EPBC Act*	Inhabits intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.

		freshwater swamps. They rarely use inland lakes or swamps. Forages in soft substrate near the edge of water on intertidal mudflats or sandflats exposed by low tide. At high tide the may feed at nearby lakes, sewage ponds and floodwaters. They have also been recorded foraging on beds of eelgrass on tidal sandflats, on a thick algal mat in shallow water, and in shallow pools on crest of coral reef. Roosts on sandy beaches, spits and islets, and mudflats; also in shallow saline ponds of saltworks. They like to roost in open areas far away from potential cover for predators, but close to feeding grounds. In hot conditions, waders prefer to roost where a damp substrate lowers the local temperature.	
Red-necked Stint *Calidris ruficollis*	Migratory EPBC Act	The Red-necked Stint mostly forages on bare wet mud on intertidal mudflats or sandflats, or in very shallow water; mostly in areas with a film of surface water and mostly close to edge of water. During high tides they sometimes forage in non-tidal wetlands. Red-necked Stints may also forage in samphire, generally avoid beds of seagrass, but may feed along edges. On Lake Reeve, Victoria, they have been reported to occasionally feed on algal mats. On sandy ocean beaches they sometimes forage in beachcast seaweed. They have been recorded foraging in flooded paddocks and in a freshly cropped lucerne paddock near lagoons. Roosts on sheltered beaches, spits, banks or islets, of sand, mud, coral or shingle, sometimes in saltmarsh or other vegetation. They occasionally roost on exposed reefs or shoals. Large numbers sometimes roost on ocean beaches, though it is probably not a preferred habitat and use of this habitat may increase when high numbers of birds are present. They were once recorded roosting c. 1.5 km from an inland lake, in close-cropped grass. They also roost among beachcast seaweed or clods of mud or dried cow-pats. During very high tides they may use sand dunes or claypans. Large numbers (an estimated 7967 birds) were recorded	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.

		roosting at an inland claypan near Roebuck Bay in north-west Western Australia.	
Ruddy Turnstone Arenaria interpres	Migratory EPBC Act	In Australasia, the Ruddy Turnstone is mainly found on coastal regions with exposed rock coast lines or coral reefs. It also lives near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches. It can, however, be found on sand, coral or shell beaches, shoals, cays and dry ridges of sand or coral. It has occasionally been sighted in estuaries, harbours, bays and coastal lagoons, among low saltmarsh or on exposed beds of seagrass, around sewage ponds and on mudflats. In southern Australia the Ruddy Turnstone prefers rockier coastlines and is less numerous on large embayments with extensive mudflats. The Ruddy Turnstone mainly forages between lower supralittoral and lower littoral zones of foreshores, from strand-line to wave-zone. They often forage among banks of stranded seaweed or other tide-wrack. They are also known to forage on exposed rocky platforms, coral reefs and mudflats. In the south-east Gulf of Carpentaria they feed only on mangrove mudflats, especially those near shingle beaches. Sometimes they feed around coastal lagoons and sewage treatment ponds, occasionally among low vegetation in saltmarsh, on exposed beds of seagrass, or among dunes on coral cays. The have sometimes been known to forage in grassy areas above the tideline, in short pasture, or in ploughed paddocks. The Ruddy Turnstone roosts on beaches, above the tideline, among rocks, shells, beachcast seaweed or other debris. They have also been observed roosting on rocky islets among grassy tussocks, and on mudflats and sandflats. They sometimes fly around, or land on, ships at sea	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.

Sanderling *Calidris alba*	Vulnerable *NSW* BC *Act*	Often found in coastal areas on low beaches of firm sand, near reefs and inlets, along tidal mudflats and bare open coastal lagoons; individuals are rarely recorded in near-coastal wetlands. Generally occurs in small flocks, however may associate freely with other waders. Individuals run behind receding waves, darting after insects, larvae and other small invertebrates in the sand, then dart back up the beach as each wave breaks. Also feeds on plants, seeds, worms, crustaceans, spiders, jellyfish and fish, foraging around rotting heaps of kelp, at the edges of shallow pools on sandspits and on nearby mudflats. Roosts on bare sand, behind clumps of beach-cast kelp or in coastal dunes. Breeding occurs in the Northern Hemisphere.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Scarlet Robin *Petroica boodang*	Vulnerable *NSW* BC *Act*	The Scarlet Robin is primarily a resident in dry forests and woodlands, but some adults and young birds disperse to more open habitats after breeding.	Unlikely to occur within the site. No suitable habitat present.
Sharp-tailed Sandpiper *Calidris acuminata*	Migratory EPBC Act	Prefers grassy edges of shallow inland freshwater wetlands. It is also found around sewage farms, flooded fields, mudflats, mangroves, rocky shores and beaches. Breeds in Siberia in the peat-hummock	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Short-tailed Shearwater *Ardenna tenuirostris*	Migratory EPBC Act	Coastal, oceanic.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Shy Albatross *Thalassarche cauta*	NSW BC Act Vulnerable EPBC Act Vulnerable	This pelagic or ocean-going species inhabits subantarctic and subtropical marine waters, spending the majority of its time at sea. While at sea, it soars on strong winds and when calm, individuals may rest on the ocean, in groups during the breeding season or as individuals at other times. Occasionally the species occurs in continental shelf waters, in bays and harbours. The species feeds on fish, crustaceans, offal and squid and may forage in mixed-species flocks. Food may be caught by seizing prey from the water's surface while swimming, by landing on top of prey, diving for prey beneath	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.

		the water and by scavenging behind fishing vessels. Known breeding locations include Albatross Island off Tasmania, Auckland Island, Bounty Island and The Snares, off New Zealand, where nesting colonies of 6-500 nests occur and may contain other species such as the Australian Gannet. Located on sheltered sides of islands, on cliffs and ledges, in crevices and slopes, nests are used annually and consist of a mound of mud, bones, plant matter and rocks.	
Sooty Oystercatcher *Haematopus fuliginosus*	Vulnerable *NSW* BC *Act*	Shore bird. Found around the entire Australian coast, including offshore islands, being most common in Bass Strait. Small numbers of the species are evenly distributed along the NSW coast. The availability of suitable nesting sites may limit populations. Favours rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries. Forages on exposed rock or coral at low tide for foods such as limpets and mussels. Breeds in spring and summer, almost exclusively on offshore islands, and occasionally on isolated promontories. The nest is a shallow scrape on the ground, or small mounds of pebbles, shells or seaweed when nesting among rocks.	Possibly occurring in proximity to the site, but unlikely to utilise available habitat within the site.
Sooty Shearwater *Ardenna grisea*	Migratory EPBC Act	The Sooty Shearwater is a large, robust sea bird, with a wingspan up to 105 cm and a weight of up to 1 kg. The head, upper body, upper wing and tail of the Sooty Shearwater are uniformly dark brown-grey. The Sooty Shearwater forages in pelagic (open ocean) sub-tropical, sub-Antarctic and Antarctic waters. The species migrates and forages in the North Pacific and Atlantic Oceans during the non-breeding season. Sooty Shearwaters may forage inshore occasionally, especially during rough weather. The Sooty Shearwater breeds mainly on subtropical and sub-Antarctic islands around southern Australia and southern South America, as well as on the mainland of New Zealand. Birds nest in burrows or rock crevices on coastal slopes, ridges and cliff tops, in herbfields, tussock grassland or forest. In Australia, the Sooty Shearwater breeds on islands off New South Wales (NSW)	Unlikely to occur within the site. No suitable habitat is present.

		and Tasmania (http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=82651)	
Square-Tailed Kite *Lophoictinia isura*	*Vulnerable NSW* BC *Act*	Summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses large hunting ranges of more than 100km2. Breeding is from July to February, with nest sites generally located along or within 200m of riparian areas, near watercourses, in a fork or on large horizontal limbs.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.
Swift Parrot *Lathamus discolour*	Endangered *EPBC Act* Endangered *NSW* BC *Act*	Migrates to the Australian south-east mainland between March and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany (*Eucalyptus robusta*), Spotted Gum (*Corymbia maculata*), Red Bloodwood (*C. gummifera*), Mugga Ironbark (*E. sideroxylon*), and White Box (E. albens). Commonly used lerp infested trees include Inland Grey Box E. microcarpa, Grey Box E. moluccana and Blackbutt E. pilularis. Return to some foraging sites on a cyclic basis depending on food availability. Following winter they return to Tasmania where they breed from September to January, nesting in old trees with hollows and feeding in forests dominated by Tasmanian Blue Gum Eucalyptus globulus.	Unlikely to occur within the site. No suitable habitat present.
Terek Sandpiper *Xenus cinereus*	*NSW BC Act:* Vulnerable *EPBC Act:* Migratory	The Terek Sandpiper mostly forages in the open, on soft wet intertidal mudflats or in sheltered estuaries, embayments, harbours or lagoons. The species has also been recorded on islets, mudbanks, sandbanks and spits, and near mangroves and occasionally in samphire (*Halosarcia* spp.). Birds are seldom near the edge of water, however, birds may wade into the water.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.

		Occasionally, on sandy beaches, among seaweed and other debris and in rocky areas, Terek Sandpipers will use the supralittoral or upper littoral zone, where a film of water covers the sand. However, on exposed rock platforms, the species forages in the lower littoral zone and not the supralittoral or upper littoral zones. Less often seen on sandy or shingle beaches, or on rock or coral reefs or platforms, Terek Sandpipers are occasionally sighted around drying sewage ponds and saltpans if surrounded by mudflats. The species is also found around brackish coastal swamps, lagoons and dune-lakes; and also on gravel or rocky edges of estuarine pools and freshwater river-pools. Very occasionally, birds use swampy, grassy or cultivated paddocks near the coast. Preferring to roost in or among mangroves, birds may perch in branches or roots up to 2 m from the ground, or beneath them in the shade on hot days. Occasionally, they roost in dead trees or among tangled driftwood.	
Wedge-tailed Shearwater *Ardenna pacificus*	Migratory EPBC Act	A pelagic, marine bird known from tropical and subtropical waters. The species tolerates a range of surface-temperatures and salinities, but is most abundant where temperatures are greater than 21 °C and salinity is greater than 34.6 %. In tropical zones the species may feed over cool nutrient-rich waters. The species has been recorded in offshore waters of eastern Victoria and southern NSW, mostly over continental slope with sea-surface temperatures of 13.9–24.4 °C and usually off the continental shelf in north-west Australia.	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.
Whimbrel *Numenius phaeopus*	Migratory EPBC Act	Often found on the intertidal mudflats of sheltered coasts. It is also found in harbours, lagoons, estuaries and river deltas, often those with mangroves, but also open, unvegetated mudflats. It is occasionally found on sandy or rocky beaches, on coral or rocky islets, or on intertidal reefs and platforms. It has been infrequently recorded using saline or brackish lakes near coastal areas. It also used saltflats with saltmarsh, or	Possibly occurring transiently in proximity to the site. Unlikely to occur within the site. No suitable habitat present.

		saline grasslands with standing water left after high spring-tides, and in similar habitats in sewage farms and saltfields. There are a small number of inland records from saline lakes and canegrass swamps. It has also been recorded in coastal dunes and on a football field. Forages on intertidal mudflats, along the muddy banks of estuaries and in coastal lagoons, either in open unvegetated areas or among mangroves. They sometimes forage on sandy beaches or among rocks. It has occasionally been sighted feeding on exposed coral or rocky reefs and rock platforms. It is known to probe holes and crevices among rubble and on reef flats, but not on reef crests. It was once recorded feeding on a grassy football field. Regularly roost in mangroves and other structures flooded at high tide. They often roost in the branches of mangroves around mudflats and in estuaries and occasionally in tall coastal trees. They have also been observed to roost on the ground (sometimes under mangroves or in shallow water), on muddy, sandy or rocky beaches; rocky islets and coral cays. They were once recorded perched on upright stakes attached to oyster racks. On Rottnest Island, they have been seen perched on cliff-tops at high tide. Whimbrels were also recorded roosting at high tide on a claypan 2 km inland of Roebuck Bay, Western Australia. In some conditions, waders may choose roost sites where a damp substrate lowers the local temperature. This may have important conservation implications where these sites are heavily disturbed beaches.	
White-bellied Sea-Eagle *Haliaeetus leucogaster*	*NSW* BC *Act* Vulnerable Migratory *EPBC Act*	Found in coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands in tropical and temperate regions of mainland Australia and its offshore islands. The habitats occupied by the sea-eagle are characterized by the presence of large areas of open water (larger rivers, swamps, lakes, the sea). Birds have been recorded in (or flying over) a variety of terrestrial habitats. The species is mostly recorded in coastal lowlands, but can	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.

		occupy habitats up to 1400 m above sea level on the Northern Tablelands of NSW and up to 800 m above sea level in Tasmania and South Australia. Birds have been recorded at or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs, saltmarsh and sewage ponds. They also occur at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves.	
White-fronted Chat *Epthianura albifrons*	Vulnerable NSW BC Act	Commonly occurring in the saltmarshes of southern Australia, the White-fronted Chat is often seen foraging for insects and their larvae among the succulent leaves and stems of stunted saltmarsh plants.	Unlikely to occur within the site. No suitable habitat present.
White-throated Needletail *Hirundapus caudacutus*	Migratory *EPBC Act*	Almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable, but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks. In coastal areas, they are sometimes seen flying over sandy beaches or mudflats, and often around coastal cliffs and other areas with prominent updraughts, such as ridges and sand-dunes. They are sometimes recorded above islands well out to sea.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.
MAMMALS			

Greater Glider *Petauroides Volans*	Vulnerable EPBC Act	Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelter during the day in tree hollows and will use up to 18 hollows in their home range. Occupy a relatively small home range with an average size of 1 to 3 ha. Give birth to a single young in late autumn or early winter which remains in the pouch for approximately 4 months and is independent at 9 months of age. Usually solitary, though mated pairs and offspring will share a den during the breeding season and until the young are independent. Can glide up to a horizontal distance of 100m including changes of direction of as much as 90 degrees. Very loyal to their territory.	Unlikely to occur within the site. No suitable habitat present.
Grey-headed Flying-fox *Pteropus poliocephalus*	Vulnerable *EPBC Act* Vulnerable *NSW* BC *Act*	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Unlikely to occur within the site. No suitable habitat present.
Humpback Whale *Megaptera novaeangliae*	Vulnerable EPBC Act Vulnerable NSW BC Act	The population of Australia's east coast migrates from summer cold-water feeding grounds in Subantarctic waters to warm-water winter breeding grounds in the central Great Barrier Reef. They are regularly observed in NSW waters in June and July, on northward migration and October and November, on southward migration	Unlikely to occur within the site. No suitable habitat present.
Koala *Phascolarctos cinereus*	Vulnerable NSW BC Act	Eucalypt woodland and forest Home range sizes vary with quality of habitat ranging from less than two ha to several hundred ha. Preferred tree species on the south coast are *Eucalyptus amplifolia, E.viminalis, & E.tereticornis* but numerous other species also known food trees.	Unlikely to occur within the site. No suitable habitat present.
Spotted-tailed Quoll *Dasyurus maculatus*	Endangered *EPBC Act* Vulnerable *NSW* BC *Act*	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. Mostly	Unlikely to occur within the site. No suitable habitat present.

		nocturnal, although will hunt during the day; spends most of the time on the ground, although also an excellent climber and will hunt possums and gliders in tree hollows and prey on roosting birds. Use communal ‘latrine sites’, often on flat rocks among boulder fields, rocky cliff-faces or along rocky stream beds or banks. Such sites may be visited by multiple individuals and can be recognised by the accumulation of the sometimes characteristic ‘twisty-shaped’ faeces deposited by animals. Females occupy home ranges up to about 750 hectares and males up to 3500 hectares. Are known to traverse their home ranges along densely vegetated creeklines.	