REVIEW OF ENVIRONMENTAL FACTORS (REF)
SHARED USER PATH, KERB & STORMWATER
STAGE 2 and 4
RIVER RD, SHOALHAVEN HEADS

Contents

Document control

Item	Details
Project	Review of Environmental Factors – Shared User Path, Kerb and Stormwater Stage 2 and 4 – River Rd, Shoalhaven Heads
Client	Shoalhaven City Council
Prepared By	City Services, Shoalhaven City Council

Document status

Version	Author / Reviewer*	Name	Signed	Date
V1.0	Author	Jeff Bryant	[redacted]	03/06/2022
	Reviewer	Geoff Young		09/06/2022
	Amended	Jeff Bryant		01/07/2022

*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 addresses the potential environmental impacts of – and provides mitigation measures for – the construction of a shared-user path (SUP), kerb & gutter, associated stormwater and raised pedestrian crossing on River Rd, Shoalhaven Heads between Jerry Bailey Rd and River Road Reserve.

Stage 1 of the proposal, between Renown Ave and Mathew St (approx.) is complete (Council reference for associated REF: D21/412097).

The currently proposed Stage 2 and 4 works would occur on River Rd from Mathew St to Jerry Bailey Reserve (Stage 2 – 300m approx.), and between Renown Ave and Mathew St (Stage 4 – raised pedestrian crossing).

Note that Stage 3 of the proposal (Jerry Bailey Rd to Renown Ave. approx.) will be the subject of a separate, subsequent REF assessment.

The proposed activity would include:

- Construction of 304m (approx. total) 2.0m wide shared-user path (SUP) (Stage 2).
- Reconstruction of 43m kerb and gutter at eastern end of site (Stage 2).
- Construction of road pavement to new kerb and gutter (Stage 2).
- Construction of 24m stormwater connection between new gutter and existing stormwater at eastern end of project, with custom poured connection pit (2700mm x 930mm approx. and to depth of existing twin pipes: 0.97m to 2.15m approx.) (Stage 2).
- Construction of 4.2m long, raised pedestrian crossing with grated trench drain over existing kerb and gutter, footpath infill to existing SUP to south, and 2.5m path landing to north (Stage 4).
- Clearing and pruning of native and planted ornamental vegetation would be required (Stage 2).

Refer to Figures 3 and 4 and 80% drawing set (Appendix A) for further information.

The proposal would require the relocation of power poles however, this would be undertaken separately from the current proposal and does not form part of the current assessment.

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 Stage 2 and 4 works would occur on River Rd, Shoalhaven Heads between Jerry Bailey Rd and River Road Reserve (refer to Figures 1 and 2).

Works would occur within the River Rd road reserve, for which Council is the road authority, and within Part Lot 7005 DP 1075719, a Crown Land lot for which Shoalhaven City Council is the appointed Land Manager.

Details of affected land is provided in Table 1.

Table 1. Property affected by the proposal

Lot / DP	Description	Land owner / manager	Other pertinent information
-	River Rd road reserve	Shoalhaven City Council	
Part Lot 7005 DP 1075719	River Road Reserve	Crown Land - Shoalhaven City Council is Land Manager	Crown Reserve R52855 - Community Land: General Community Use / Natural Area / Park

Photo 1. Existing Stage 1 shared-user path from Renown Ave to Mathew St, which the current proposal would adjoin. Approx. location of Stage 4 shown

Figure 1. Site location

Figure 2. Site and Staging Plan (MI Engineers 2022: DN210046-C220 Rev.A – refer to Appendix A for complete drawing set)

Figure 3. Stage 2 General Arrangement Plan (Drawing C230 Rev.F from *Proposed Shared User Pathway River Road – Jerry Bailey Rd to River Rd Reserve Shoalhaven Heads, NSW 2535 – DN210046* – refer to Appendix A for complete drawing set)

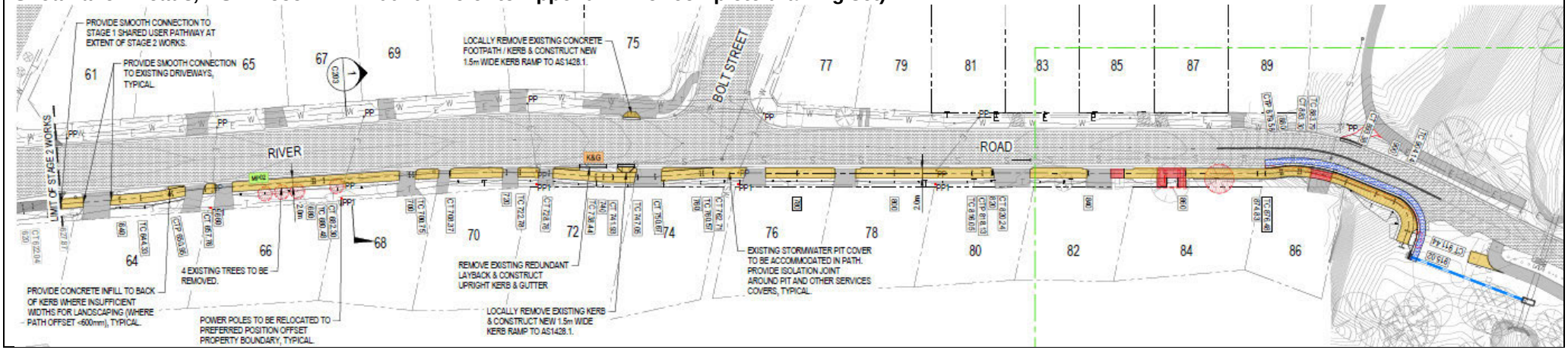
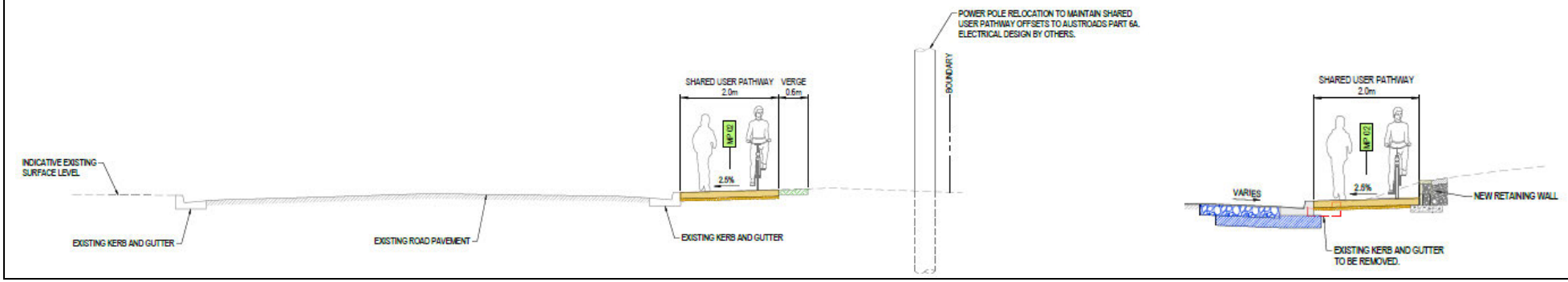


Figure 4. Typical cross sections of proposed SUP and kerb & gutter (Drawing C203 Rev.A from *Proposed Shared User Pathway River Road – Jerry Bailey Rd to River Rd Reserve Shoalhaven Heads, NSW 2535 – DN210046* – refer to Appendix A for complete drawing set)



2. EXISTING ENVIRONMENT

2.1 Habitat and vegetation assessment

The site was assessed by a Council Environmental Officer on 16 September 2021 in consideration of the current proposal and has been previously assessed on 4 March 2019 and 6 May 2019 in relation to other projects affecting the site.

The surveys 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 and investigation of habitat availability on site.

The eastern portion of the site (Stage 2) consists of a highly modified road reserve with residential properties and associated access driveways. Vegetation is limited to turf grass with occasional street trees and shrubs of planted ornamental species (including Bottlebrush *Callistemon* spp. and Broad-leaved Paperbark *Melaleuca quinquinerva*) and occasional endemic species (including Coastal Banksia *Banksia integrifolia*).

At the eastern end of the site is a gravel car-park associated with River Road Reserve. The car-park is surrounded by Coral Tree (*Erythrina x sykesii*), with a small patch of Swamp She-oak Oak (*Casuarina glauca*) and Coastal Banksia occurring adjacent to River Rd.

No threatened flora or suitable habitat for locally occurring threatened flora species (including *Chamaesyce psammogeton* or *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*) or Glider feed tree species (e.g. *Corymbia gummifera* or *Eucalyptus punctata*) occur within the site. No signs of potential threatened fauna use of the site (e.g. bandicoot diggings) were noted.

Photos 1 through 4 show the site, available habitat and relevant features.

Photo 2. Stage 2 site at approx. CH660m (facing east-north-east approx.).

Photo 3. Stage 2 site at approx. CH860m (facing east-north-east approx.).

Photo 4. Stage 2 eastern end of the site at approx. CH900m (facing south-east approx.).

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

Most disturbance would occur in previously cleared and disturbed areas.

Likely vegetation removal is shown in Figure 5 (below), comprising:

- Pruning of native vegetation edges 35m^2 (Swamp She-Oak and Coastal Banksia)
- Clearing or pruning of planted ornamental vegetation 63.4m^2

Excavation would occur along the road edge; for construction of the SUP; and for the stormwater connection at the eastern of the site in Stage 2.

Excavation for the SUP and most of the road edge box-out would be to approx. depths of 200mm and 400mm respectively, within previously disturbed soil.

Excavation for construction of a 24m length of stormwater pipe and custom connection pit (2700mm x 930mm approx.) would occur between proposed new gutter and to the depth of existing stormwater pipes (0.97m to 2.15m approx.), at the eastern end of project. This excavation would occur in proximity to exotic Coral Trees.

On the southern side of River Rd, the eastern 60-65m (approx.) of the Stage 2 site would flow in an easterly direction, previously not captured by stormwater infrastructure, with the rest of the Stage 2 site footprint currently captured. The additional stormwater captured by this area would be negligible and is therefore unlikely to impact on, or exacerbate impacts associated with, foreshore erosion and deposition.

Earth-fill and creation of smooth verge transitions between kerb, SUP and upper river embankment would utilise excavated material where Excavated Natural Material (ENM) is available. Imported ENM or Virgin Excavated Natural Material (VENM) shall otherwise be used.

Proposed excavation, in addition to earth fill and compaction, would occur within the tree root protection zones of some trees.

Sediment and erosion controls shall be installed and maintained to prevent indirect associated impacts.

The proposed raised pedestrian crossing to be constructed as Stage 4 would occur entirely within disturbed and modified areas (road pavement footprint and immediate verges) and would not impact on any native vegetation.

Figure 5. Likely impacts – Stage 2

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 habitat for marine or freshwater species protected under the Act will be directly impacted by the proposal. Sediment and erosion control measures will be utilised to prevent movement of sediment into waterways. No marine or freshwater species listed as threatened under the Act are at risk of being impacted by the proposal.

No further consideration is required.

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 C). 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*
- Grey-headed Flying-fox *Pteropus poliocephalus*
- *Bangalay Sand Forest of the Sydney Basin and South East Corner Bioregions* EEC

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 2017b).

The site is considered to contain potential foraging habitat for microbats including Yellow-bellied Sheathtail-bat, within and in proximity to the site.

No hollow-bearing trees (HBTs) were recorded within or in close proximity to the site.

The proposal would involve pruning of approx. 35m^2 of native vegetation edges. This vegetation is unlikely to be important foraging habitat.

The proposal would not result in removal of any HBTs, would not result in the removal of significant foraging habitat, would not result in the fragmentation of habitat, and would not create barriers to movement that would affect breeding and foraging. The site would retain a treed canopy and significant areas of suitable foraging habitat would remain in the broader locality including protected areas of Comerong Island NR, Cullunghutti Mountain Reserve and Seven Mile Beach NP.

Works would occur during normal construction hours, so would not affect the nocturnal foraging activities of these species.

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.

Grey-headed Flying-fox *Pteropus poliocephalus* (GHFF)

The Grey-headed Flying-fox (*Pteropus poliocephalus*) is the largest Australian bat, with a head and body length of 23 - 29 cm. It has dark grey fur on the body, lighter grey fur on the head and a russet collar encircling the neck. The wing membranes are black and the wingspan can be up to 1 m. It can be distinguished from other flying-foxes by the leg fur, which extends to the ankle. Grey-headed Flying-foxes are generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. In times of natural resource shortages, they may be found in unusual locations. This species occurs 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 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Individual camps may have tens of thousands of animals and are used for mating, and for giving birth and rearing young. Annual mating commences in January and conception occurs in April or May; a single young is born in October or November. Site fidelity to camps is high; some camps have been used for over a century. GHFF can travel up to 50 km from the camp to forage; commuting distances are more often <20 km. They feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines, also foraging in cultivated gardens and fruit crops (OEH 2017a).

No GHFF camps occur in close proximity to the site. The nearest recorded camps occur at Comerong Island, approx. 3.7km south of the site, and Illowra Wetlands, approx. 12.1km to the west of the site[1].

The site contains suitable foraging habitat for GHFF including flowering Eucalypt and Banksia trees.

The proposal would involve pruning of approx. 35m^2 of native vegetation edges.

The site would retain a treed canopy and extensive treed areas would remain around the site. Significant areas of suitable foraging habitat would remain in the broader locality including protected areas of Comerong Island NR, Cullunghutti Mountain Reserve and Seven Mile Beach NP. The removal of some trees within the site would represent only a negligible reduction in

[1] National Flying-fox Monitoring Viewer http://www.environment.gov.au/webgis-framework/apps/ffc-wide/ffc-wide.jsf

available foraging habitat in the locality. The proposal would not result in fragmentation of habitat or severing of movement corridors.

Works would occur in normal construction hours and are therefore unlikely to impact on the primarily nocturnal foraging activities of this species.

It is therefore considered unlikely that the Grey-headed Flying-fox would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of this species 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***

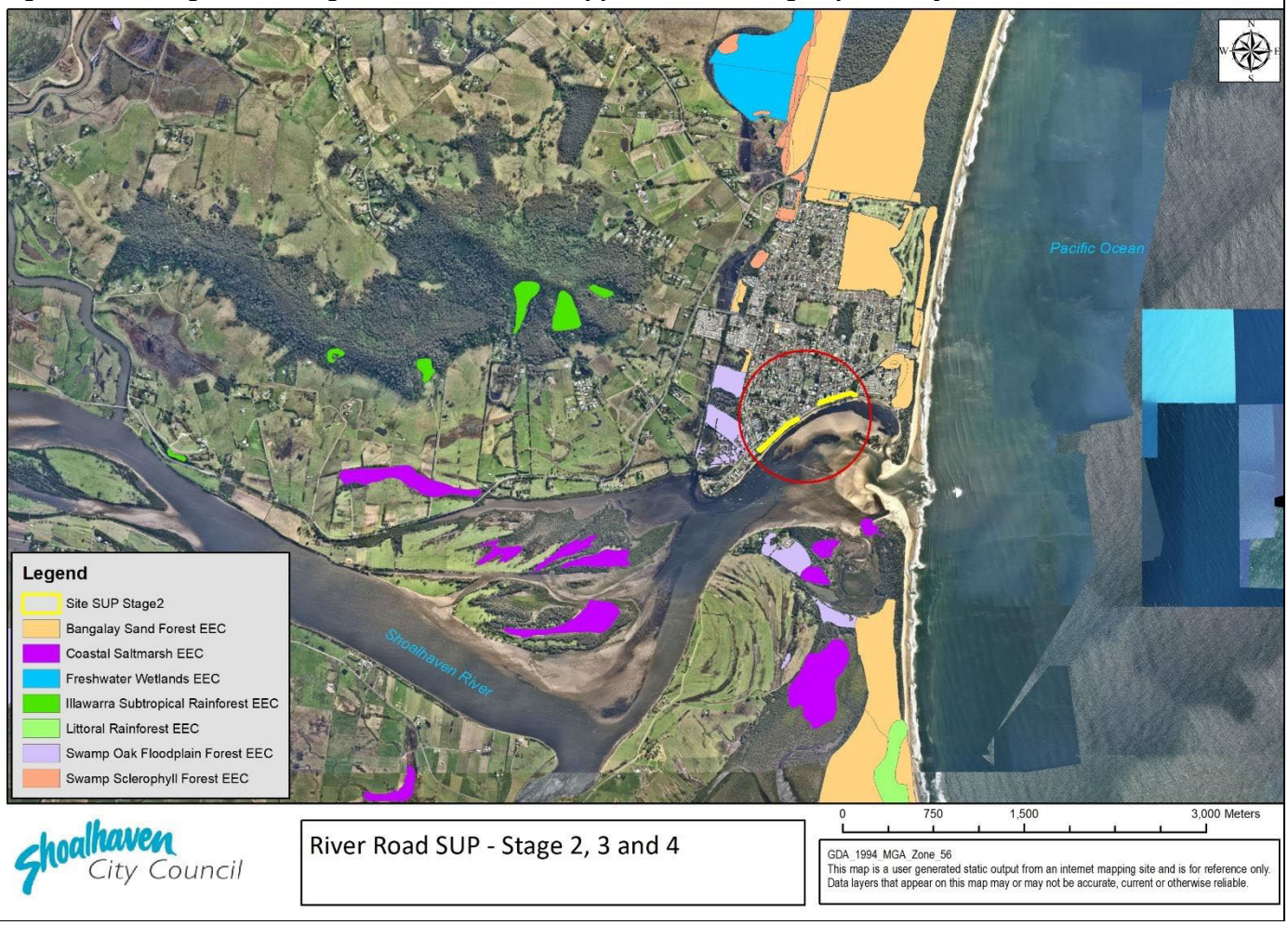
Seven (7) endangered ecological communities (EECs) are mapped as occurring in the landscape surrounding the site (refer to Figure 6 below).

Of these, *Bangalay Sand Forest of the Sydney Basin and South East Corner Bioregions* is mapped as occurring approx. 290m to the east of the site, with indicative species and habitat occurring within and adjacent to the site. Each of the other 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.

Bangalay Sand Forest is the name given to the ecological community associated with coastal sand plains of marine or Aeolian origin. It occurs on deep, freely draining to damp sandy soils on flat to moderate slopes within a few kilometres of the sea and at altitudes below 100 metres. The community is characterised by an assemblage of species specified in the Scientific Committee's determination (NSW Scientific Committee 2011), typically with a relatively dense or open tree canopy dominated by Bangalay (*Eucalyptus botryoides*) and Coast Banksia (*Banksia integrifolia*), an understorey of mesophyllous or sclerophyllous small trees and shrubs, and a variable groundcover dominated by sedges, grasses or ferns.

The riparian vegetation occurring along the deep sandy soils of the Shoalhaven River embankment, adjacent to the site (primarily the Stage 3 area) is dominated by Bangalay and Rough-barked Apple, with Coastal Banksia and Saw-tooth Banksia occurring, and a variably disturbed understorey containing Coastal Wattle, Cheese Tree, Sweet Pittosporum and Spiny Mat-rush. This vegetation is consistent with Bangalay Sand Forest EEC.

Figure 6. Endangered ecological communities mapped as occurring in proximity to the site



In the locality there is over 300 ha of Bangalay Sand Forest comprised of disconnected patches including areas at Seven Mile Beach (approx. 243.3 ha), adjacent to Coomonderry Swamp (34.4 ha), Seven Mile Beach Golf Course (29.4 ha), hind dunes adjacent to Seven Mile Beach Golf Course (8.5 ha), East of Caravan Park (6.9 ha), and small patches North-West of the site (0.79 ha and 2 ha). The Bangalay Sand Forest occurring on site is not mapped.

The Bangalay Sand Forest vegetation represented on and adjacent to the site is moderately to highly degraded and modified, with poor connectivity, high levels of weed infestation in the understorey and is a narrow, patchy strip with poor or non-existent vegetated buffers.

The proposal would involve pruning of approx. 35m^2 of native vegetation edges, representing a negligible area of the EEC in the locality.

It is concluded that the proposal is unlikely to adversely affect the extent or composition of the EEC such that a local occurrence of the EEC will be placed at risk of extinction for the following reasons:

- Vegetation removal would represent a negligible area (35m^2) of the EEC in the locality
- Only pruning of existing vegetation edges would occur
- No fragmentation of vegetation would occur

- Mitigation measures would be implemented to minimise indirect impacts to retained vegetation.

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.

Clearing of native vegetation is listed as a key threatening process, defined by the Scientific Committee's determination as

> *the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long-term modification, of the structure, composition and ecological function of a stand or stands.*

Clearing of native vegetation has been shown to:

- cause widespread fragmentation of ecological communities;
- reduce the viability of ecological communities by disrupting ecological functions;
- result in the destruction of habitat and loss of biological diversity;
- lead to soil and bank erosion, increased salinity and loss of productive land.

The proposal would involve pruning of approx. 35m^2 of native vegetation edges.

No fragmentation of vegetation would occur and no vegetation occurring on the sloped river embankment would be removed or otherwise impacted.

The impact of the proposal with regard to clearing of native vegetation, is not considered to be significant as it is unlikely to lead to:

- destruction of habitat causing a loss of biological diversity and extinction of species or loss or local genotypes

- fragmentation of populations resulting in limited gene flow between small, isolated populations, reduced potential to adapt to environmental change and loss or severe modification of the interactions between species
- riparian zone degradation such as bank erosion leading to sedimentation that affects aquatic communities
- disturbance of habitat which may permit the establishment and spread of exotic species which may displace native species
- loss of leaf litter, removing habitat for a wide variety of vertebrates and invertebrates.
- significant reduction of habitat for threatened species or ecological communities

The impacts of the key threatening process of clearing of native vegetation would therefore be minimised and managed as part of 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 31 May 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, Grey-headed Flying-fox was considered to have potential habitat on the site, requiring of further assessment. Highly mobile species including migratory birds may occur occasionally and transiently within the vicinity of the proposed activity but would not be affected by the proposal.

Refer also to Likelihood of Occurrence Table in Appendix C.

Table 2. EPBC Significant impact assessment

Vulnerable species - Significant impact criteria Species to consider: **Grey-headed Flying-fox (*Pteropus poliocephalus*) – (GHFF)**	
Criteria	***Assessment***
lead to a long-term decrease in the size of an important population of a species	Direct impact to individual GGBF shall be avoided through timing and pre-works surveys. No habitat considered significant for the species shall be removed or otherwise impacted. No fragmentation of important habitat or severing of habitat corridors will occur as a result of the proposal. The proposal would not impose barriers to movement of the species. No GHFF camps occur in close proximity to the site. The nearest camp currently occurs approximately 3.7km south of the site. The proposal would therefore not impact any known population of these species.
reduce the area of occupancy of an important population	No
fragment an existing important population into two or more populations	No

adversely affect habitat critical to the survival of a species	A relatively minor area of degraded, sub-optimal foraging habitat (approx. 35m^2) for GHFF would be removed. Extensive, high quality foraging habitat occurs in the surrounding landscape, including including Comerong Island NR, Cullunghutti Mountain Reserve and Seven Mile Beach NP. The proposal would therefore result in a negligible loss of potential foraging habitat.
disrupt the breeding cycle of an important population	No
modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No. See above
result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No invasive species will be introduced
introduce disease that may cause the species to decline	No disease is likely to be introduced
interfere substantially with the recovery of the species	No
Summary	It is considered unlikely that Grey-headed Flying-fox would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

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.

Landscape features that are regarded as indicating a higher potential for Aboriginal objects include:

- within 200m of waters, or
- located within a sand dune system, or
- located on a ridge top, ridge line or headland, or
- located within 200m below or above a cliff face, or
- within 20m of or in a cave, rock shelter, or a cave mouth.

A search on the Aboriginal Heritage Information Management System (AHIMS) on 31 May 2022 returned one record (Site 52-5-0950), occurring [redacted]

[redacted] to the south-west of the western end of the site, within private land on Hay Avenue.

The site is described as [redacted]

Navin Officer Heritage Consultants have previously provided advice to Council (reference D20/240726) that the entire spit formation along Hay Ave (from the western end of River Rd) forms [redacted]

[redacted]

The description by Navin Officer suggests [redacted] may occur immediately west of the western end of the proposal.

The Due Diligence Guidelines define disturbed land as follows:

> *"Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable. Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks."*

Figure 7. Results of AHIMS Aboriginal heritage search

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : River Rd SUP
Client Service ID : 687027

Shoalhaven City Council - Nowra
PO Box 42 Bridge Rd
Nowra New South Wales 2541
Attention: Jeff Bryant
Email: jeff.bryant@shoalhaven.nsw.gov.au

Date: 31 May 2022

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -34.8602, 150.732 - Lat, Long To : -34.8514, 150.7474, conducted by Jeff Bryant on 31 May 2022.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

1	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

The location of the proposed SUP is entirely within land which has been previously disturbed and modified as a result of road construction, vegetation clearing and maintenance of the road verge and associated parkland reserve.

A higher degree of existing disturbance and modification is considered to have occured for the Stage 2 area (where the SUP would be constructed along residential road verge frontage) and Stage 4 area (within the existing River Rd footprint and immediate disturbed verges).

It is reasonable to conclude that there is a low probability of objects occurring in the impact footprint of the proposal generally, with even less likelihood along the residential road frontage of Stage 2 and within the site of Stage 4.

Excavation for the SUP and most of the road edge box-out would be to approx. depths of 200mm and 400mm respectively, within previously disturbed soil, while excavation for construction of a 24m length of stormwater pipe and custom connection pit (2700mm x 930mm approx.) would occur between proposed new gutter and to the depth of existing stormwater pipes (0.97m to 2.15m approx.), at the eastern end of project.

As the proposal would occur on disturbed land and would not impact any recorded Aboriginal sites or places, the Due Diligence Guidelines requires no further assessment, an AHIP is not required and the activity can proceed with caution.

However, due to the known presence [redacted] west of the site in addition to the proposal site being associated with landscape features which indicate a higher potential for Aboriginal objects, it is recommended that an Aboriginal Heritage Site Officer is engaged from Jerrinja Local Aboriginal Land Council to monitor excavation for the stormwater pipe at the eastern end of the Stage 2 area.

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 (Figure 8).

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

Excavation for the SUP and most of the road edge box-out would be to approx. depths of 200mm and 400mm respectively and is therefore unlikely to disturb Acid Sulfate Soils.

Excavation for the stormwater pipe at the eastern end of the site under Stage 2 works, would be to approx. 0.97m and is therefore unlikely to disturb Acid Sulfate Soils.

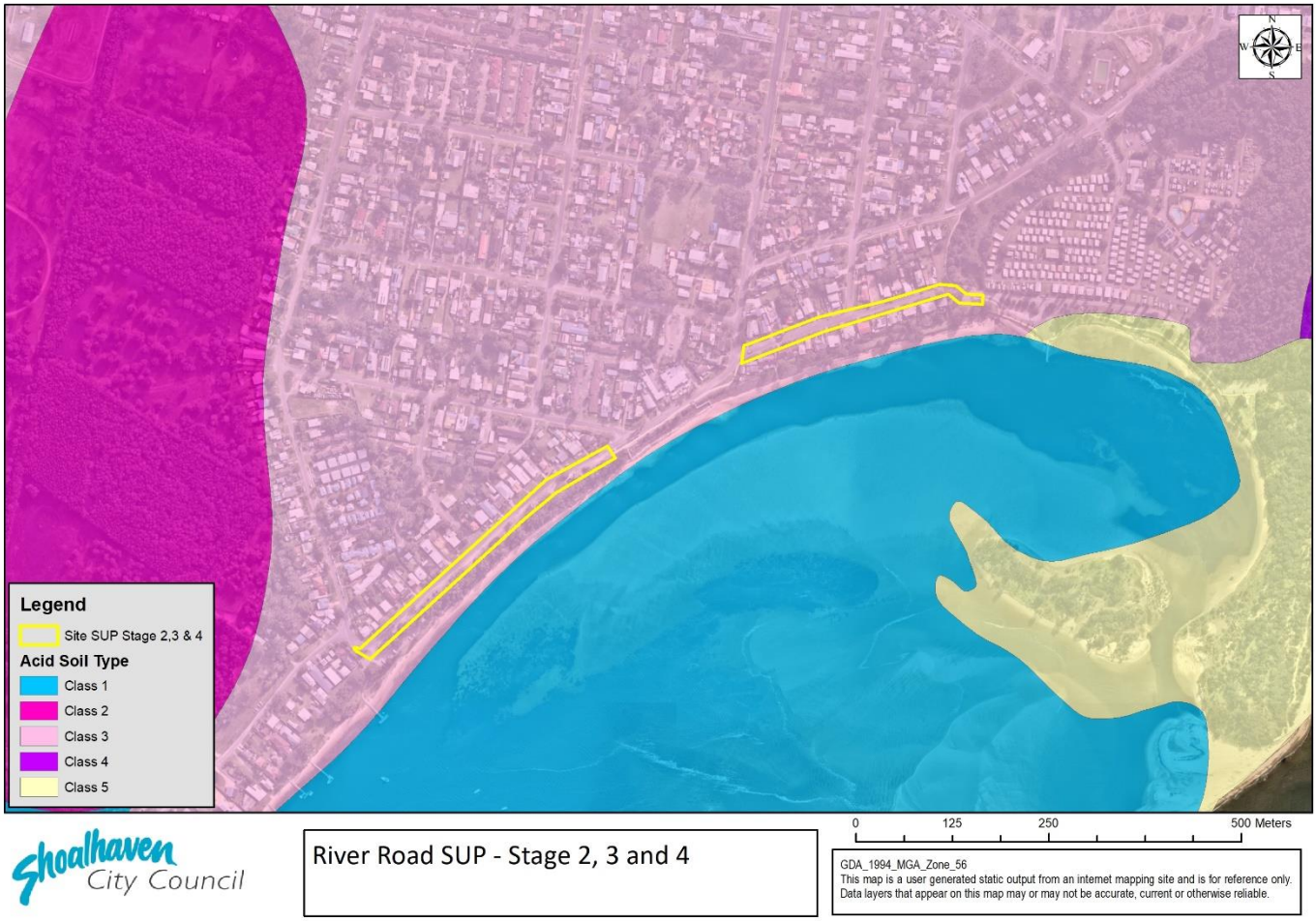
Excavation for the custom connection pit (2700mm wide x 930mm long approx.) at the eastern end of the site under Stage 2 works, would be to approx. depth of 2.15m and occurring in previously disturbed soil (i.e. for construction of existing stormwater pipes) at approx. 2m AHD.

Previous acid sulfate soil investigations were undertaken in mid-2019 along the beach foreshore of the river, between the areas of Stage 2 and Stage 3 of the current project, at approx. 2m AHD or lower, associated with a rock revetment project. Sampling and analysis at three locations along

the foreshore between Renown Ave and Mitchel St found coarse marine sands occurred to the maximum investigation depth of 1.5 m below the existing ground surface level of the embankment toe, with no visual or olfactory evidence of Acid Sulfate Soil conditions, and all samples having oxidised pH values greater than pH4 (ENRS 2019).

It is considered unlikely that Acid Sulfate Soils would be exposed as a result of the proposed works, however, it is recommended that a suitably qualified environmental consultant be engaged to monitor excavation for the custom connection pit at the eastern end of the site under Stage 2 works, for evidence of Acid Sulfate Soil conditions and advise on management if required.

Figure 8. 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, adjacent to the eastern end of the site.

The riparian vegetation along the foreshore is dominated by Bangalay and Rough-barked Apple, with Coastal Banksia and Saw-tooth Banksia occurring, and a variably disturbed understorey containing Coastal Wattle, Cheese Tree, Sweet Pittosporum and Spiny Mat-rush. In proximity to the site, the vegetation includes Swamp She-Oak, Coastal Banksia and exotic Coral Tree.

Pruning of approx. 35m^2 (Swamp She-Oak and Coastal Banksia) would occur along native vegetation edges of the riparian corridor, but would not require removal of vegetation absolutely.

No fragmentation of vegetation would occur and no vegetation occurring on the sloped river embankment would be removed or otherwise impacted.

Mitigation measures including to avoid compaction of tree root protection zones are proposed to minimise indirect impacts affecting vegetation to be retained.

Likely direct impacts on the riparian corridor is therefore considered minimal.

Potential indirect impacts associated with edge effects including weed infestation, exposure to wind and destabilisation of soil, are possible where pruning and tree removal would remove existing vegetation buffers.

3.8 Potentially Contaminated Land (PCL)

A potentially contaminated land record (PCL452) exists over Part Lot 7004 DP 94785 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, within the previously constructed Stage 1 site.

Laboratory analysis of the material confirmed the fragments were non-friable asbestos.

A licensed asbestos removal contractor was engaged to remove visible cement sheeting fragments, in conjunction with relevant NSW Government and Safe Work Australia legislative requirements, on 30 May 2019. A clearance certificate (Optera 2019b – D19/185904) stating that no residual/remnant asbestos was identified within the outlined area at the time of the inspection was issued and an Ongoing Management Plan (Optera 2019a – D19/196540), including an unexpected finds protocol was developed.

Further clean-up works occurred in May and September 2020 in proximity to the transition between Stage 3 and Stage 1, immediately west of Renown Ave, with clearance certificates issued (ENRS 2020a; ENRS 2020b).

Stage 1 works included scraping and removal of bonded asbestos to a depth of 0.2m below ground surface in two areas in November 2021, one area being approximately 36m to the east of the Stage 1 – Stage 3 junction (ENRS 2021).

There is no evidence to suggest that asbestos is present through the Stage 2 and Stage 4 sites where the road and verge have been constructed and maintained.

However, in the event that any residual asbestos is found to occur in the soil, the unexpected finds protocol (Appendix B, D19/19654) shall be enacted, remediation by a suitably licenced hygiene specialist and/or development of a management plan or shall be undertaken.

Any residual asbestos present within the site shall therefore be managed appropriately.

3.9 Flood liable land

The eastern-most 30m of the site (Stage 2) occurs on land which is mapped as flood liable (refer to Figure 9 below), however the activity would not adversely affect flood behaviour or exacerbate flooding risks.

No land-forming would be carried out in this location. No impediments to runoff would be introduced.

Further consideration is not required or warranted.

Figure 9. Flood liable land mapped as occurring in proximity to the proposal

3.10 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 3 deals with each of the factors in relation to the proposed activity.

Table 3. Section 171 Matters of consideration

Does the proposal:	Assessment	Reason
a) Have any environmental impact on a community?	Positive / Low-adverse	The purpose of the proposed activity is to construct a shared-user path, in addition to kerb & gutter, to enhance a popular walking and tourist destination in Shoalhaven Heads for the local community and visitors.

		Temporary inconvenience would result through the construction process, but the site would remain largely accessible. The proposal would require the relocation of power poles (undertaken separately from the current proposal and not part of the current assessment) resulting in temporary disruption to power. 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?	Low adverse	The five-part test of significance (Section 3.2) concludes that the proposed activity would not have a significant impact upon threatened species or endangered ecological communities. No significant 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 and nutrient 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	In the context of the locality, the visual impact of the proposal is anticipated to be enhanced. Removal of vegetation and habitat will be minimal. 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	Positive	The site of the proposed activity has no significant architectural, cultural, historical, scientific or social values, but is highly valued regionally for aesthetic values. These 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

or future generations?		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). Jerrinja site officers would be engaged to monitor excavations in areas with higher propensity for heritage objects.
f) Have any impact on the habitat of protected fauna (within the meaning of the Biodiversity Conservation Act 2016)?	Negligible	Removal of vegetation and habitat will be minimal. No fragmentation of vegetation would occur and no vegetation occurring on the sloped river embankment would be removed or otherwise impacted. No important habitat will be removed or otherwise impacted. The potential impact is therefore considered to be insignificant or inconsequential. The five-part test of significance, provided in Section 3.2 above, concludes that the proposed activity would not have a significant impact upon threatened fauna. The specified environmental mitigation measures (Section 7 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 five-part test of significance, provided in Section 3.2 above, concludes that the proposed activity would not have a significant impact upon threatened fauna. 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?	Negligible	Works would be relatively short term and the noise generated will occur during normal working hours. The proposed activity would not use hazardous substances or use or generate chemicals which may build up residues in the environment. The possible impacts have been discussed in detail under Section 3. Refer also to the conclusions and recommendations in Section 7.
i) Cause any degradation of the quality of the environment?	Low-adverse	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 and nutrient 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) would be employed to minimise risk of impacts.

j) Cause any risk to the safety of the environment?	Low-adverse	The proposed activity would not involve hazardous wastes and would not lead to increased bushfire or landslip risks. The activity is not going to 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 site and local environment will remain relatively unchanged.
l) Cause any pollution of the environment?	Low adverse	The proposal would involve a temporary and local increase in noise during the construction phase due to the use of machinery. However, this will not affect any sensitive receivers such as residential areas, schools, childcare centres and hospitals. Sediment and erosion control in accordance with the Blue Book will be implemented to minimise movement of sediment into waterways. 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. The proposal does not involve the use, storage or transportation of hazardous substances or the generation of chemicals which may build up residues in the environment. The risk of contamination and spills from machinery including fuel and hydraulic fluids would be minimised through safeguards and mitigation measures (Section 7).
m) Have any environmental problems associated with the disposal of waste?	Negligible	There would be no trackable waste, hazardous waste, liquid waste, or restricted solid waste as described in the NSW *Protection of the Environment Operations Act 1997*.
n) Cause any increased demands on resources (natural or otherwise) which are, or are likely to become, in short supply?	Low adverse	The amount of 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?	Low adverse	The assessed low adverse or negligible impacts of the proposal are not likely to interact. Additional stormwater capture and discharge would be negligible (s3.1) and is unlikely to result in or exacerbate impacts associated with foreshore erosion and deposition.

		Mitigation measures (Section 7) shall be implemented to minimise the risk of cumulative environmental effects. The current proposal would not significantly affect habitat connectivity or reduce any significant vegetation.
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	Low adverse	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 statement, regional strategic plan or district strategic plan made under Division 3.1 of the Act	Positive	The proposed activity meets Planning Priority 2 (Delivering Infrastructure) of the *Shoalhaven 2040* Strategic Land-use Planning Statement https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D20/437277 The proposed activity is not inconsistent with the Illawarra Shoalhaven Regional Plan 2041 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 2.108(1) of the NSW *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Infrastructure SEPP) provides that:

> *"Development for the purpose of a road or road infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land*…"

Clause 2.73(3) of the Infrastructure SEPP provides that:

> *"Any of the following development may be carried out by or on behalf of a council without consent on a public reserve under the control of or vested in the council-*
>
> *(a) development for any of the following purposes—*
>
> *(i) roads, pedestrian pathways, cycleways, single storey car parks, ticketing facilities, viewing platforms and pedestrian bridges,*
>
> *…"*

Clause 2.136(1) of the Infrastructure SEPP states:

> *"Development for the purpose of stormwater management systems may be carried out by or on behalf of a public authority without consent on any land*".

Additionally, clause 2.112(1) of the Transport & Infrastructure SEPP provides that:

> *"Development for any of the following purposes is exempt development if it is carried out by or on behalf of a public authority or the Minister responsible for Crown roads (within the meaning of the Roads Act 1993) in connection with a road or road infrastructure facilities and complies with section 2.20—*
>
> *(a) erection, installation, maintenance, reconstruction or replacement of any of the following, and any associated landscaping works—*
>
> *…*
>
> *(iv) pedestrian and cyclist facilities (such as <u>footpaths</u>, street lighting, <u>kerb adjustments and ramps</u>, <u>pedestrian fences</u>, refuges, holding rails, and bollards),*
>
> *…*
>
> *(xi) <u>pavement and road surface markings</u> (such as bus lane markings), lane delineators, electric pavement lights, detection loops and traffic counters,*
>
> *(xii) <u>kerb and guttering</u>,*
>
> *(xiii) culverts, drains and other works to improve the quality or control of stormwater runoff,*
>
> *…"*

The road construction and stormwater components of the proposal each constitute 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.

The EP&A Act provides that exempt development can be carried out without requirement for environmental impact assessment under Division 5.1 (EP&A Act Section 1.6).

Exempt development components are included in this Environmental Impact Assessment to ensure that the proposal is carried out in a manner which considers and minimises potential impacts to the environment, and that Council satisfies all obligations with regard to environmental assessment and authorisation.

4.2 Other

A summary of other relevant legislation and permissibility is provided in Table 4 below.

Table 4. 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 is therefore not required.

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).
State Environmental Planning Policy (Resilience and Hazards) 2021
Permissible √ Not permissible ☐
Justification: The site is mapped as Coastal Use Area and Coastal Environment Area for the purpose of the SEPP. The development controls relevant to these mapped areas do not apply to development that can be carried out without consent.
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 primarily within the existing River Road road reserve, for which Council is the authority. For this area, it is anticipated that Native Title has been extinguished as a Previous Exclusive Possession Act – Freehold Title. No procedural rights are applicable.

At the eastern end of the site (Stage 2 area), the proposed SUP and stormwater works would occur within Crown Part Lot 7005 DP 1075719.

Native Title applies to the Crown Land areas of the site.

Native Title assessment as a Future Act under Subdivision J has been undertaken (D22/232677). A 28-day notification and opportunity for comment period applies as a procedural obligation to Subdivision J.

5. CONSULTATION WITH GOVERNMENT AGENCIES

5.1 Transport & Infrastructure SEPP

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

No impacts to roads, existing sewerage systems or water use, would occur.

On the southern side of River Rd, the eastern 60-65m (approx.) of the Stage 2 site would flow in an easterly direction, previously not captured by stormwater infrastructure, with the rest of the Stage 2 site footprint currently captured. The additional stormwater captured by this area would be negligible and is therefore unlikely to impact on, or exacerbate impacts associated with, foreshore erosion and deposition.

The proposal would temporarily impact the form and function of a public road, in addition to affecting a relatively minor addition to the stormwater system for which Council who is undertaking the works, is the road authority and stormwater infrastructure 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 eastern-most 30m of the site (Stage 2) occurs on land which is mapped as flood liable (refer to Figure 12), however the activity would not adversely affect flood behaviour or exacerbate flooding risks.

Refer to Section 3.9 for more information.

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 eastern-most 30m of the site (Stage 2) occurs on land which is mapped as flood liable (refer to Figure 12), however the activity would not adversely affect flood behaviour or exacerbate flooding risks.

While part of the proposal in this location constitutes a “relevant provision” (i.e. the proposed stormwater connection at the eastern end of the site), subclause (3) provides that: “*This section does not apply in relation to the carrying out of minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance.*”

The proposed stormwater connection is considered a minor addition.

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 not 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*

The consultation requirements specified under Clause 2.15 of the Infrastructure SEPP therefore do not apply.

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

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

6. COMMUNITY ENGAGEMENT

The currently proposed shared-user path, kerb & guttering and stormwater works are part of the Shoalhaven Heads River Road Foreshore Precinct upgrade project, which aims to improve access, manage erosion and stormwater issues and enhance tourism value of the area.

These works have involved ongoing consultation with the Shoalhaven Heads Community Forum and have involved updates on Councils webpage:

https://www.shoalhaven.nsw.gov.au/Projects-Engagement/Major-Projects-Works/Shoalhaven-Heads-River-Road-Foreshore-Precinct-project .

An appropriate traffic management plan shall be developed and implemented to minimise the risk of inconvenience and incident during works.

7. ENVIRONMENTAL SAFEGUARDS AND MEASURES TO MINIMISE IMPACTS

<table>
<tr><th>Safeguard / Measure</th><th>Responsibility</th></tr>
<tr><td colspan="2">Works planning, approvals, consultation & notification</td></tr>
<tr><td>1. Aboriginal Heritage Site Officers shall be engaged from Jerrinja Local Aboriginal Land Council to monitor excavation for the stormwater pipe at the eastern end of the Stage 2 area</td><td>Site Manager;
Construction Contractor</td></tr>
<tr><td>2. A suitably qualified environmental consultant shall be engaged to monitor excavation for the custom connection pit at the eastern end of the site under Stage 2 works, for evidence of Acid Sulfate Soil conditions and advise on management if required.</td><td>Site Manager;
Construction Contractor</td></tr>
<tr><td colspan="2">Site Establishment</td></tr>
<tr><td>3. An appropriate traffic management plan shall be developed and implemented to minimise disruption and reduce risk of incident along River Rd during works.</td><td>Site Manager;
Construction Contractor</td></tr>
<tr><td>4. Construction compounds, machinery, vehicles and stockpiles shall be located within the construction footprint, or otherwise in existing cleared areas, and shall not encroach into native vegetation, including the drip zone of trees.</td><td>Site Manager;
Construction Contractor</td></tr>
<tr><td>5. Staff working on site shall be notified of the potential for residual asbestos fragments in the soil and shall be advised of management processes / unexpected finds protocol as appropriate.</td><td>Site Manager;</td></tr>
<tr><td>6. Erosion and sediment controls in accordance with the ‘Blue Book’ (Landcom 2004) shall be installed and maintained to prevent the entry of sediment into waterways. Erosion and sediment controls shall be maintained in good working order for the duration of the works and subsequently until the site has been stabilised and the risk of erosion is minimal.</td><td>Site Manager;
Construction Contractor</td></tr>
<tr><td colspan="2">Construction works</td></tr>
<tr><td>7. Construction works shall be within the times shown below with works generating high noise and/or vibration levels scheduled during less sensitive time periods.
<table>
<tr><th>Construction hours</th><th>Monday to Friday</th><th>Saturday</th><th>Sunday and public holidays</th></tr>
<tr><td>Standard construction hours</td><td>7:00 am to 6:00 pm</td><td>8:00 am to 1:00 pm</td><td>No work[1]</td></tr>
</table>
</td><td>Site Manager,
Construction contractor</td></tr>
</table>

Safeguard / Measure	Responsibility
<table><tr><td>Construction activities with impulsive or tonal noise emissions</td><td>8:00 am to 5:00 pm[2]</td><td>9:00 am to 1:00 pm[2]</td><td>No work[1]</td></tr></table> *[1] Emergency works to protect persons, property and the environment permitted* *[2] Works may be carried out in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block. 'Continuous' includes any period during which there is less than a one hour respite between ceasing and recommencing any of the work the subject of this condition.*	
8. All machinery to be used shall be cleaned, degreased and in good working order prior to entering the site.	Site Supervisor; Construction Contractor
9. The contractor shall keep an emergency spill kit on-site at all times with procedures to contain and collect any leakage or spillage of fuels, oils and greases from plant and equipment.	Construction Contractor
10. No major equipment maintenance works shall be undertaken on-site.	Construction Contractor
11. To avoid the risk of pollution from machinery, refuelling shall generally be done off site, however if refuelling on site is required, due care shall be taken to avoid spilling fuel and a tray shall be used to catch any accidentally spilt fuel.	Construction Contractor
12. If engineering fill is imported to the site, all conditions prescribed in the applicable Resource Recovery Exemptions shall be complied with, including: • ensuring the producer of the waste has complied with the applicable Order such as testing and validation • ensuring the material has met all chemical and other material requirements specified in the applicable Order • keeping a written record of the following for a period of six years: ○ the quantity of material received ○ the name and address of the supplier	Site Manager; Construction Contractor
13. If Virgin Excavated Natural Material (VENM) is taken to the site (*i.e.* without chemical testing and validation): a. the material must meet the definition of VENM (refer to Section **Error! Reference source not found.**) b. the supplier must fill out and complete the *VENM Certificate* (http://www.epa.nsw.gov.au/waste/virgin-material.htm) c. The completed *VENM Certificate* shall be kept for at least six years and provided to the EPA upon any request.	Site Manager; Construction Contractor

Safeguard / Measure	Responsibility
14. 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
15. In the event that any residual asbestos is found to occur in the soil, the unexpected finds protocol (Appendix B, D19/19654) shall be enacted, remediation by a suitably licenced hygiene specialist and/or development of a management plan or shall be undertaken.	Site Manager; Construction Contractor
16. Removal of all trees of 10cm DBH (diameter at breast height) or greater shall be documented, including species, approx. size and location coordinates. Records shall be provided to the Project Manager and Council's Environmental Officer.	Site Manager; Construction Contractor
17. Tree protection measures in accordance with AS4970 – *Protection of trees on development sites* shall be implemented to minimise the risk of impact to the structural root zones of trees to be retained.	Site Manager; Contractor
18. Pruning of trees where required is to be undertaken in accordance with AS 4373-1996 "Pruning of Amenity Trees".	Contractor;
19. 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	
20. 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 & CONCLUSION

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 construction of Stages 2 and 4 of proposed kerb and gutter, stormwater infrastructure, a shared-user path and raised pedestrian crossing, on River Rd, Shoalhaven Heads, between Jerry Bailey Rd and River Road Reserve.

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. No additional statutory approvals, licences, permits and external government consultations are required.
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:

[redacted]

Andrew McVey
Acting Manager – Works and Services
Shoalhaven City Council Date: 05/07/2022

9. REFERENCES

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APPENDIX A – Design Plans

"PROPOSED SHARED USER PATHWAY

SHOALHAVEN HEADS, NSW 2535

RIVER ROAD - JERRY BAILEY RD TO RIVER RD RESERVE"

Drawing Set DN210046

MI Engineers

(Council reference D22/221742; D22/221755; D22/221769)

APPENDIX B – Asbestos Unexpected Finds Protocol

"Asbestos Management Plan – River Road Foreshore, Shoalhaven Heads NSW"

Opterra, June 2019

Council reference: D19/196540

APPENDIX C – 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/).

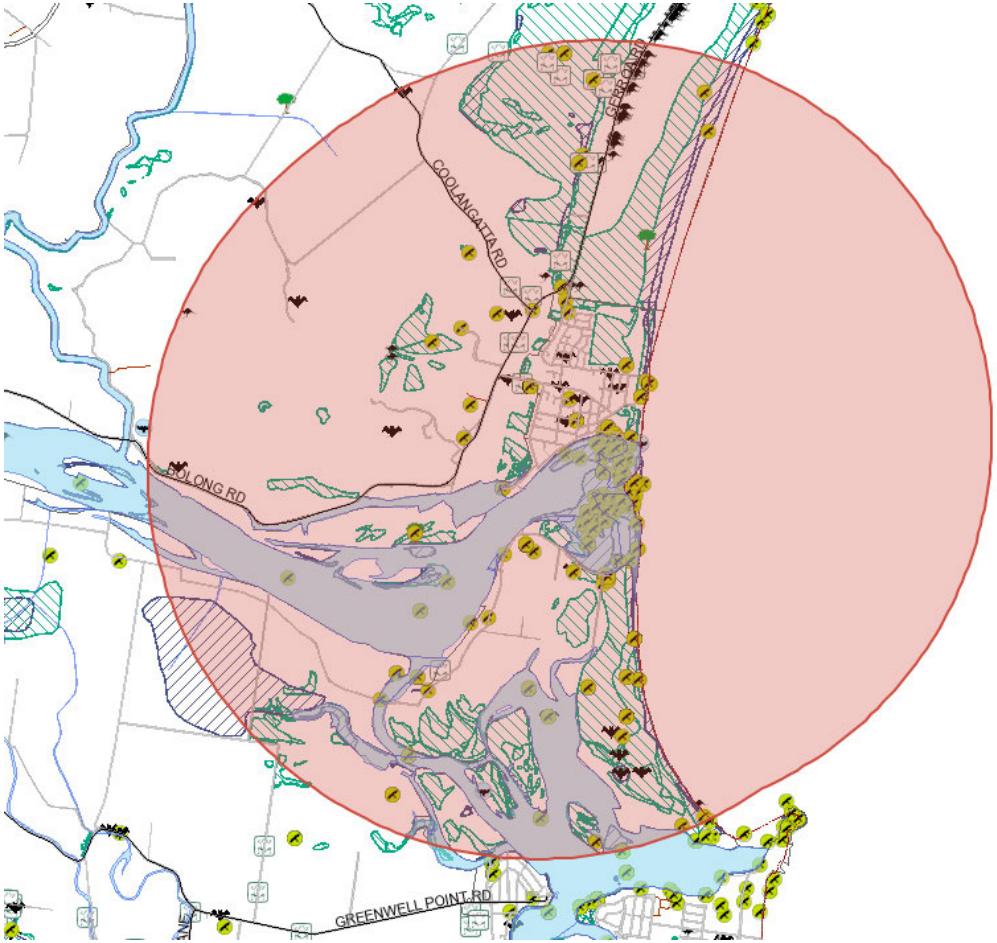
Likelihood of occurrence in study area

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).


COOLANGATTA RD
BOLONG RD
GREENWELL POINT RD

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*	Mapped as occurring approx. 290m to the east of the site. Indicative species and habitat occurs within the site. Further assessment required – refer to Section 3.2.2.
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. 885m 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. 2.3km to the north 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. 1.79km 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. 2.5km to the south 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*	Occurs in the surrounding area (within 100m to the north-west of the site, across Jerry Bailey Rd), 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. 1.2km 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.
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.
REPTILES			

Loggerhead Turtle *Caretta caretta*	Endangered *EPBC Act* Endangered *NSW* BC *Act*	Loggerhead Turtles are ocean-dwellers, foraging in deeper water for fish, jellyfish and bottom-dwelling animals. The female comes ashore to lay her eggs in a hole dug on the beach in tropical regions during the warmer months.	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 within or in proximity to the site. May use available habitat. Further assessment required – refer to Section 3.2.2.
BIRDS			
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, 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	Unlikely to occur within the site. No suitable habitat present.

		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.	
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-necked Stork *Ephippiorhynchus asiaticus*	Endangered *NSW* BC *Act*	Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries. Storks usually forage in water 5-30cm deep for vertebrate and invertebrate prey. Eels regularly contribute the greatest biomass to their diet, but they feed on a wide variety of	Unlikely to occur within the site. No suitable habitat present.

		animals, including other fish, frogs and invertebrates (such as beetles, grasshoppers, crickets and crayfish). Black-necked Storks build large nests high in tall trees close to water. Trees usually provide clear observation of the surroundings and are at low elevation (reflecting the floodplain habitat). In NSW, breeding activity occurs May - January; incubation May - October; nestlings July - January; fledging from September. Parents share nest duties and in one study about 1.3-1.7 birds were fledged per nest. The NSW breeding population has been estimated at about 75 pairs. Territories are large and variable in size. They have been estimated to average about 9,000ha, ranging from 3,000-6,000ha in high quality habitat and 10,000-15,000ha in areas where habitat is poor or dispersed.	
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 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.	Unlikely to occur within the site. No suitable habitat present.
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	Unlikely to occur within the site. No suitable habitat present.

		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.	
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.	Unlikely to occur within the site. No suitable habitat present.

Dusky Woodswallow *Artamus cyanopterus cyanopterus*	Vulnerable NSW BC Act	The Dusky Woodswallow is often reported in woodlands is eastern, southern and southwestern Australia. In New South Wales it is widespread from coast to inland, including the western slopes of the great Diving Range and farther west. It is often reported in woodlands and dry open sclerophyll forests, usually dominated by eucalyptus, including mallee associations. It have also been recorded in shrublands and heathlands and various modified habitats including regenerating forests; very occasionally in moist forests of rainforests. At sites where Dusky Woodswallows are recorded the understorey is typically open with sparse eucalypt saplings, acacias and other shrubs, including heath. The ground cover may consist of grasses, sedges or open ground, often with course woody debris. Birds are often observed in farmland usually at the edges of forests, woodlands or in roadside remnants or wind breaks with dead timber. Nesting occurs from late September to late February, with eggs present between October and early December. They nest in an open shallow untidy cup, frequently in an open hollow, crevice or stump.	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 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	Unlikely to occur within the site. No suitable habitat present.

		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.	
Eastern Hooded Dotteral (Hooded Plover) *Thinornis cucullatus cucullatus* (syn*Thinornis rubricollis*)	*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-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	Unlikely to occur within the site. No suitable habitat present.

		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	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site. No suitable hollows or feed trees are 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	Unlikely to occur within the site. No suitable habitat present.

		prefer to roost where a damp substrate lowers the local temperature.	
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	Unlikely to occur within the site. No suitable habitat present.
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. The species does not breed in Australia.	Unlikely to occur within the site. No suitable habitat present.
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	Possibly occurring over or in proximity to the site, but unlikely to utilise

		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	available habitat within the site.
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.	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 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.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.

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.	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 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	Unlikely to occur within the site. No suitable habitat present.

		grounds. In hot conditions, waders prefer to roost where a damp substrate lowers the local temperature.	
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.	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.
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 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.	Unlikely to occur within the site. No suitable habitat present.

		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.	Unlikely to occur within the site. No suitable habitat present.
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	Unlikely to occur within the site. No suitable habitat present.

		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.	
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. 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.	Unlikely to occur within the site. No suitable habitat present.
Varied Sittella *Daphoenositta chrysoptera*	Vulnerable *NSW* BC *Act*	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland	Unlikely to occur within the site. No suitable habitat present.

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 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.	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.
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	Possibly occurring over or in proximity to the site, but unlikely to utilise available habitat within the site.

		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.	
MAMMALS			
Australian Fur-seal *Arctocephalus pusillus doriferus*	Vulnerable *NSW* BC *Act*	Prefers rocky parts of islands with flat, open terrain. They occupy flatter areas than do New Zealand Fur-seals where they occur together.	Unlikely to occur within the site. No suitable habitat present.
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.	Possibly occurring and utilising habitat within the site. Further assessment required – refer to Section 3.2.2.
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 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.	Unlikely to occur within the site. No suitable habitat present.