REVIEW OF ENVIRONMENTAL FACTORS (REF)

REALIGNMENT – ST GEORGE FIRE TRAIL (AKA MURRAY STREET FIRE TRAIL)

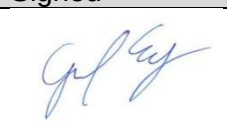
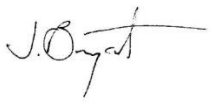
VINCENTIA

Contents

Document control

Item	Details
Project	St George Fire Trail Realignment - Vincentia
Client/Proponent	City Services - Shoalhaven City Council
Prepared By	City Services - Shoalhaven City Council

Document status

Version	Author / Reviewer*	Name	Signed	Date
V1.0	Author	Geoff Young		20/01/2025
	Review	Jeff Bryant		25/02/2025

*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 – City Services
Determining authority / authorities	Shoalhaven City Council – City Services
Required approvals (consents, licences and permits)	Nil
Required publication	Yes – The determining authority considers that the publishing of this REF is in the public interest (Section 171(4)(c) of the NSW *Environmental Planning and Assessment Regulation 2021).*

1. BACKGROUND AND PURPOSE

1.1 Overview

The proposed activity is the realignment of an approximate 80 metre section of St George Fire Trail, Vincentia from private land Lot 1 DP 1301691 to within an undeveloped Council road reserve (Figure 1). *NB: The fire trail is also known, and signposted, as "Murray Street Fire Trail". However, to remain consistent with the Shoalhaven Fire Access and Fire Trail plan, the fire trail shall, for the purpose of this assessment, be referred to as "St George Fire Trail".*

The realigned section would be constructed in accordance with the NSW Rural Fire Service's *NSW Fire Trail Standards* (https://www.rfs.nsw.gov.au/__data/assets/pdf_file/0009/69552/RFS-Fire-Trail-Standards-Nov2023.pdf) for Category 1 firefighting appliances, including, but not limited to:

- a minimum trail width of 4 metres
- a cleared corridor of 4 metres vertical clearance and a horizontal clearance of 3 metres from the trafficable surface centreline
- crossfall of no more than 6 degrees
- use of all-weather pavement materials

Works would include vegetation clearing and earthworks to construct the fire trail to this standard and closing of the existing, realigned fire trail through the use of material sourced from the works (vegetation, soil and rocks).

The proposed activity would also involve the implementation of safeguards and mitigation measures prescribed in Section 7 of this Review of Environmental Factors (REF).

Shoalhaven City Council (SCC) is the proponent and the determining authority under Part 5 of the EP&A Act. The environmental assessment of the proposed activity and associated environmental impacts has been undertaken in the context of Clause 171 of the *Environmental Planning and Assessment Regulation 2021*. In doing so, this REF helps to fulfil the requirements of Section 5.5 of the Act that SCC examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

1.2 Purpose

The purpose of the activity is to realign the fire trail so that it is entirely within Council managed public land to allow more regular maintenance to occur and ensure eligibility for funding under the State Government's Fire Access and Fire Trail program.

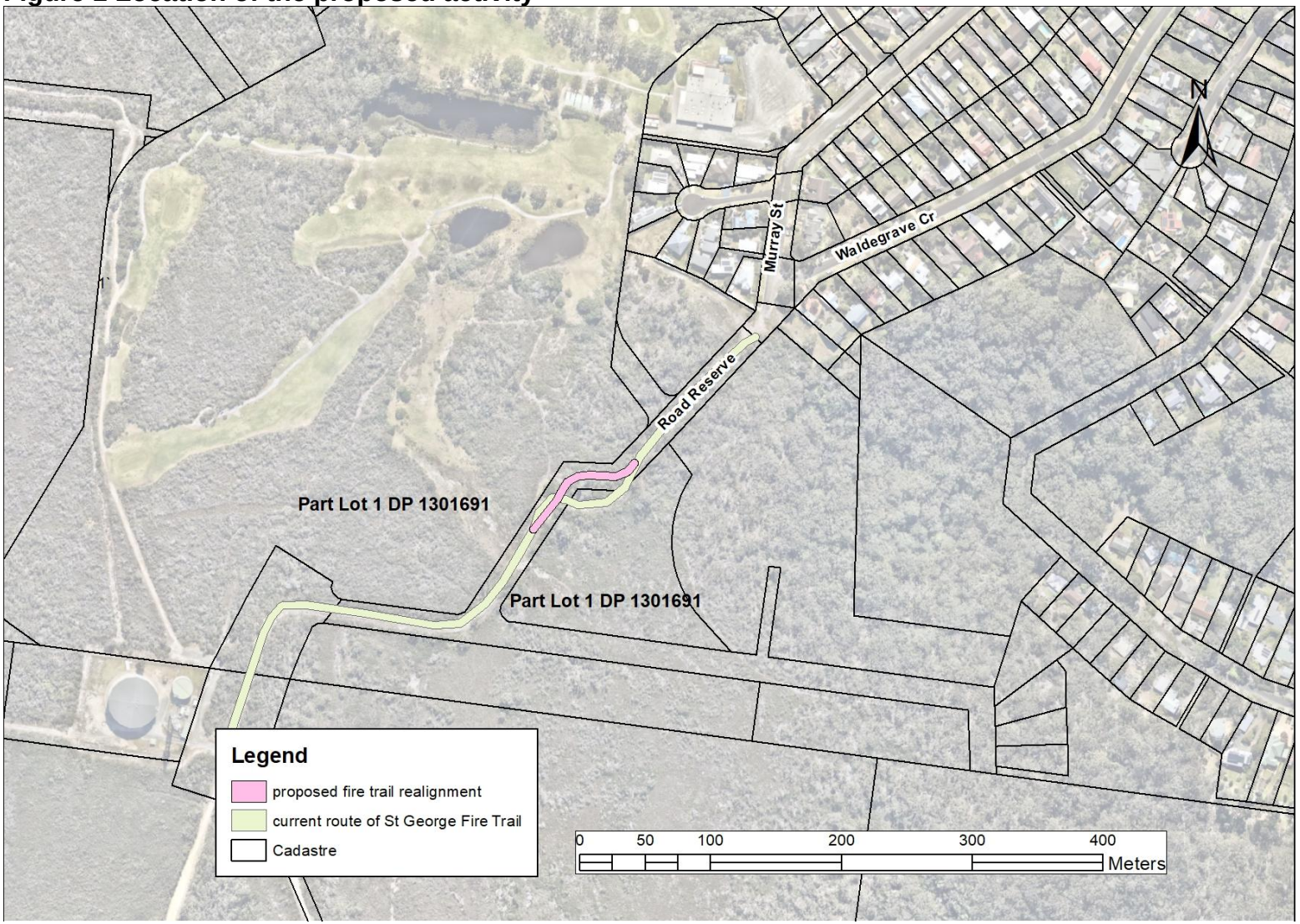
1.3 Location

The proposed activity would be undertaken within the undeveloped section of a Council road reserve and Lot 1 DP1301691, Vincentia as shown in Figure 1 below and described in Table 1 below.

Table 1: Lands affected by the proposed activity

Location	Proposed Activity	Pertinent Information
Undeveloped road reserve	Construction of Fire Trail and associated drainage elements	Resumed and dedicated as Public Road (Gazetted 20/7/1923)
Lot 1 DP 1301691 Louisa Grove	Closing off the existing fire trail using material sourced from the realignment works (vegetation, soil and rocks)	Privately owned

Figure 1 Location of the proposed activity



2. Site Description

2.1 General

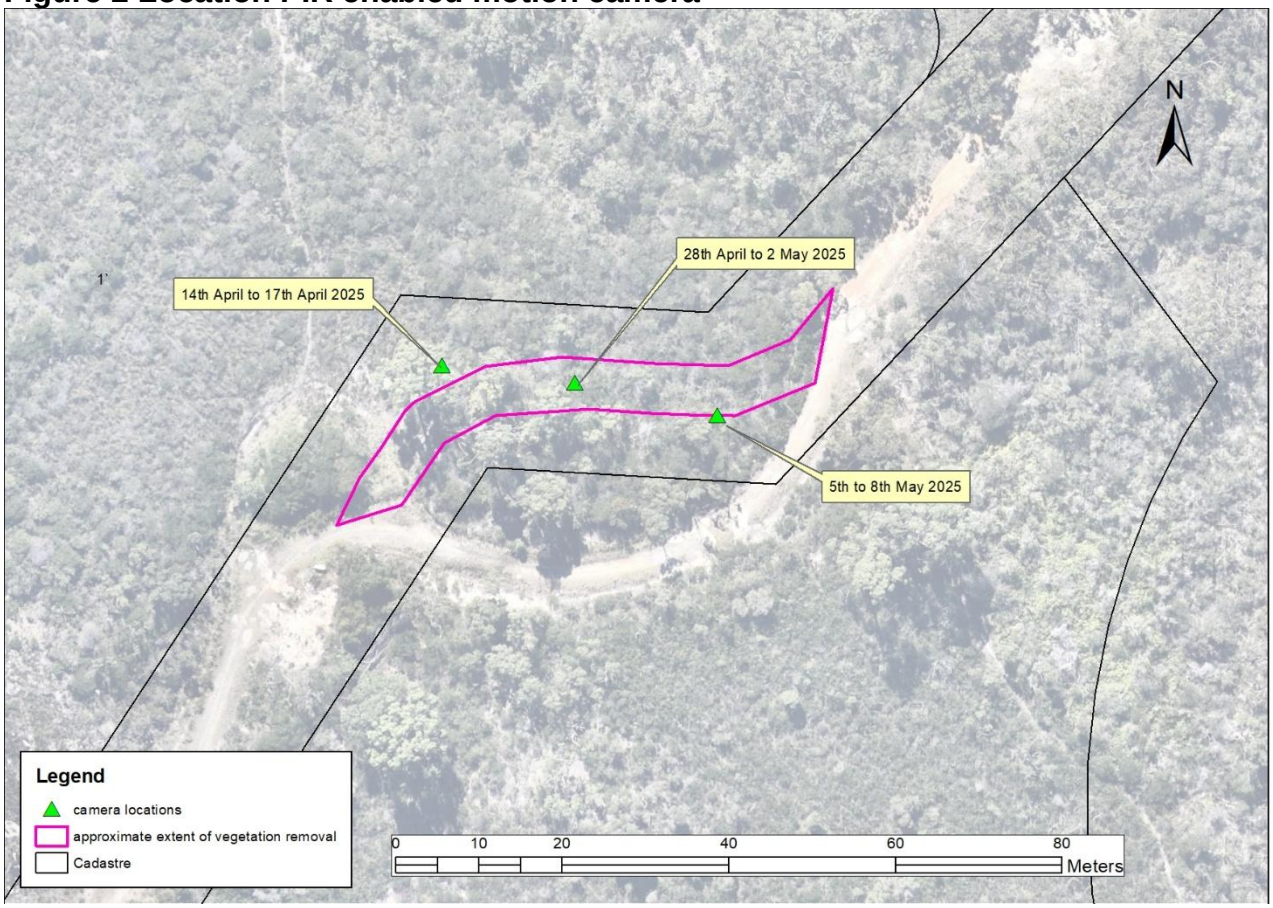
Photos of the site are provided in Section 2.5 below.

The site of the proposed activity was assessed by a SCC Environmental Operations Officer on 22 January 2025. Investigations involved vegetation and habitat assessment, targeted surveys for Ettrema Mallee *Eucalyptus sturgissiana,* recording flora species within and immediately adjacent to the proposed activity, determination of vegetation communities including the presence of threatened ecological communities, and investigation of habitat availability for threatened flora and fauna species. A search for Aboriginal heritage objects was also conducted.

A targeted survey for the Leafless Tongue Orchid *Cryptostylis hunteriana,* was previously conducted on the 2 January 2025 after confirming flowering at a reference site (Turpentine Road).

A 120 degree passive infrared (PIR) enabled motion camera was installed at 3 sites along and adjacent to the proposed realignment in April and May 2025 (Figure 2 below). The purpose of the camera was to pick up the presence of threatened species. Unfortunately, nothing discernible to (species level) was captured by the camera. The density of the vegetation was a limiting factor. No inferences on the presence, or lack of, of threatened species can be made.

Figure 2 Location PIR enabled motion camera



2.2 Terrestrial Habitat and Features

The area of vegetation that would be affected by the proposed works is mapped as SR557 Hairpin Banksia – Slender Tea-tree on Coastal Sandstone Plateau. This does not correspond with any State or Commonwealth declared threatened ecological communities.

The site has a sparse overstory comprising Red Bloodwood *Corymbia gummifera,* Silvertop Ash *Eucalyptus sieberi,* and Port Jackson Mallee *E. obstans* while the under- and mid-storey is generally dominated by heath species such as *Banksia ericifolia, Banksia oblongifolia,* Old Man Banksia *Banksia serrata,* Dagger Hakea *Hakea teretifolia, Acacia longifolia,* Slender Tea-tree *Leptospermum trinervium,* Wallum Heath *Epacris pulchella,* Coral Fern *Gleichenia dicarpa, Lomandra longifolia,* Grass Tree *Xanthorrhoea resinosa,* Narrow-leaved Geebung *Persoonia linearis,* Smooth Geebung *P. levis,* Black Sheoak *Allocasuarina littoralis,* Conestick *Petrophile pulchella, Petrophile sessilis,* Broad-leaved Drumstick *Isopogon anemonifolius,* and *Lepyrodia scariosa.*

Habitat assessments for threatened fauna species and cryptic threatened flora, and targeted surveys for non-cryptic threatened species were conducted on 01 November 2024. The assessment / survey indicated that, in the area of the proposed activity:

- Leafless Tongue Orchid is not present,
- no hollow bearing trees are present,

- there is no evidence of feeding by Southern Brown Bandicoots,
- there are no trees displaying glider incision scars, and
- there is no evidence of feeding by Glossy Black Cockatoos (*i.e.* chewed *Allocasuarina* cones).

2.3 Heritage

There are no Aboriginal heritage sites or objects known to occur in the area of the proposed activity. Refer to Section 3.4 of this REF for assessment of potential impact.

The proposed activity would not affect a site listed on the State Heritage List or a site listed in the heritage schedules of the *Shoalhaven Local Environmental Plan 2014*. Underground 'relics' (as defined in the NSW Heritage Act) are also not anticipated.

2.4 Geology and Geomorphology

The site of the proposed activity is predominantly comprised of a veneer of ferruginous (iron-rich) residual deposits and locally iron-indurated lags and crusts above Snapper Point Formation – Sandstone. This material is unlikely to be acid sulfate soil (ASS) and is mapped as low risk (Class 5) for ASS in the Shoalhaven Local Environmental Plan 2014.

2.5 Photos

Photo 1: The vegetation community typical of the site

Photo 2: The vegetation community typical of the site

Photo 3: The existing fire trail subject of the proposed realignment

3. ASSESSMENT OF LIKELY IMPACTS ON THE ENVIRONMENT

3.1 Impacts associated with the proposed activity

The proposal would involve the following disturbances and direct impacts:

- Impact (including removal) to approximately 380m^2 of predominantly native vegetation.

Other impacts on the environment, including indirect impacts have been considered, including:

- indigenous heritage
- threatened species

Each is discussed below.

3.2 Vegetation Removal

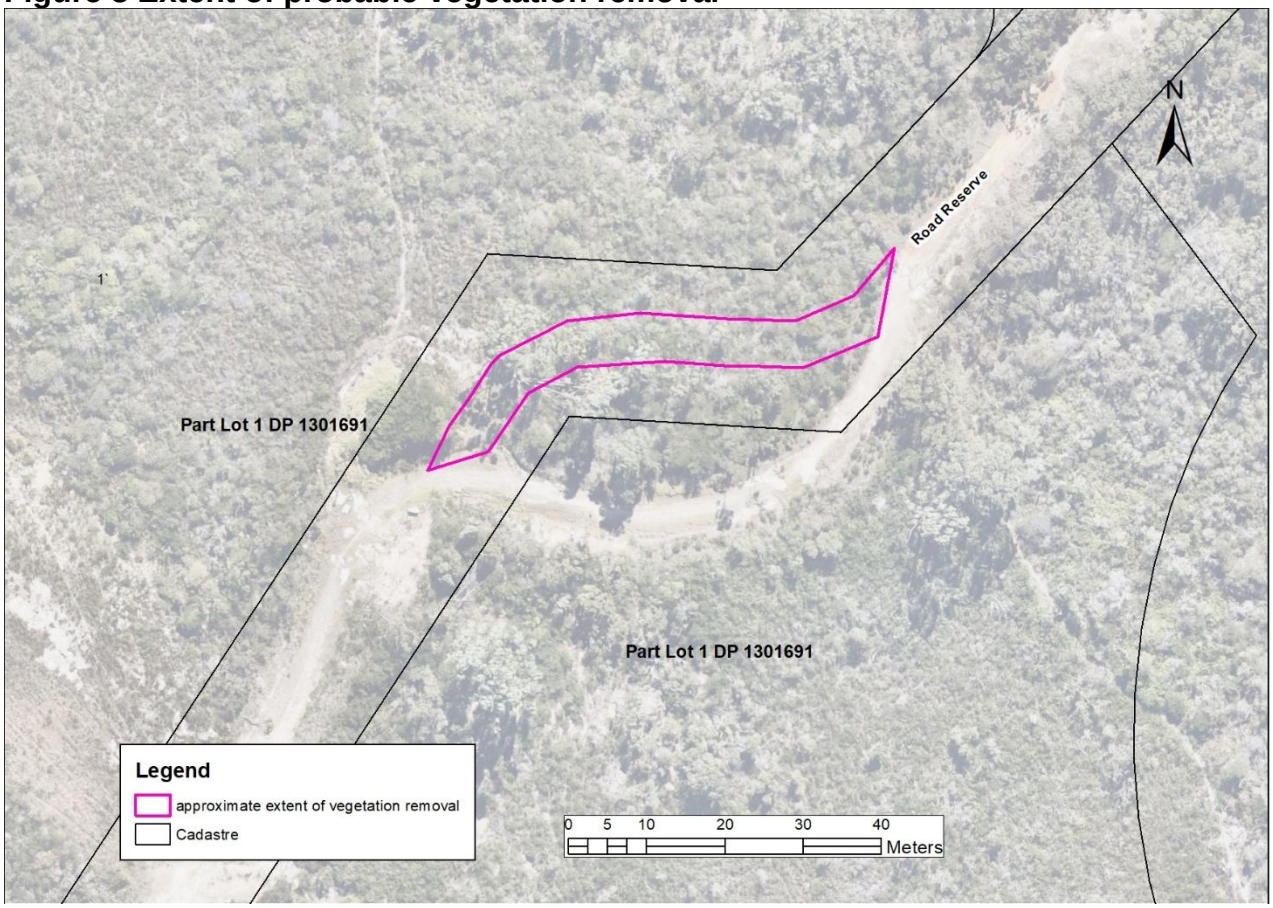
The proposed activity would involve the removal of approximately 380m^2 of native vegetation (Figure 3 below). A description of the vegetation is provided in Section 2.2 of this REF.

The removal of the vegetation is not considered a significant impact for the following reasons:

- The species to be impacted are common and are not on the threatened species schedules of the NSW *Biodiversity Conservation Act 2016* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.*
- The trees and other vegetation do not provide significant fauna habitat or food or breeding resources, particularly for threatened fauna.
- The activity is unlikely to have a significant impact on Threatened Ecological Communities. Refer to Section 3.3.2 of this REF for details.

Environmental impact mitigation measures and safeguards listed in Section 7 of this REF do, however, apply to limit clearing and off-site impacts.

Figure 3 Extent of probable vegetation removal



3.3 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.

3.3.1 Part 7A *Fisheries Management Act 1994*

The works are not anticipated to harm threatened species, endangered populations, endangered ecological communities and critical habitat listed in the Act. Nor does it comprise a listed Key Threatening Process.

Further consideration of the threatened species assessment criteria is not warranted.

3.3.2 Part 7 Biodiversity *Conservation Act 2016*

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.

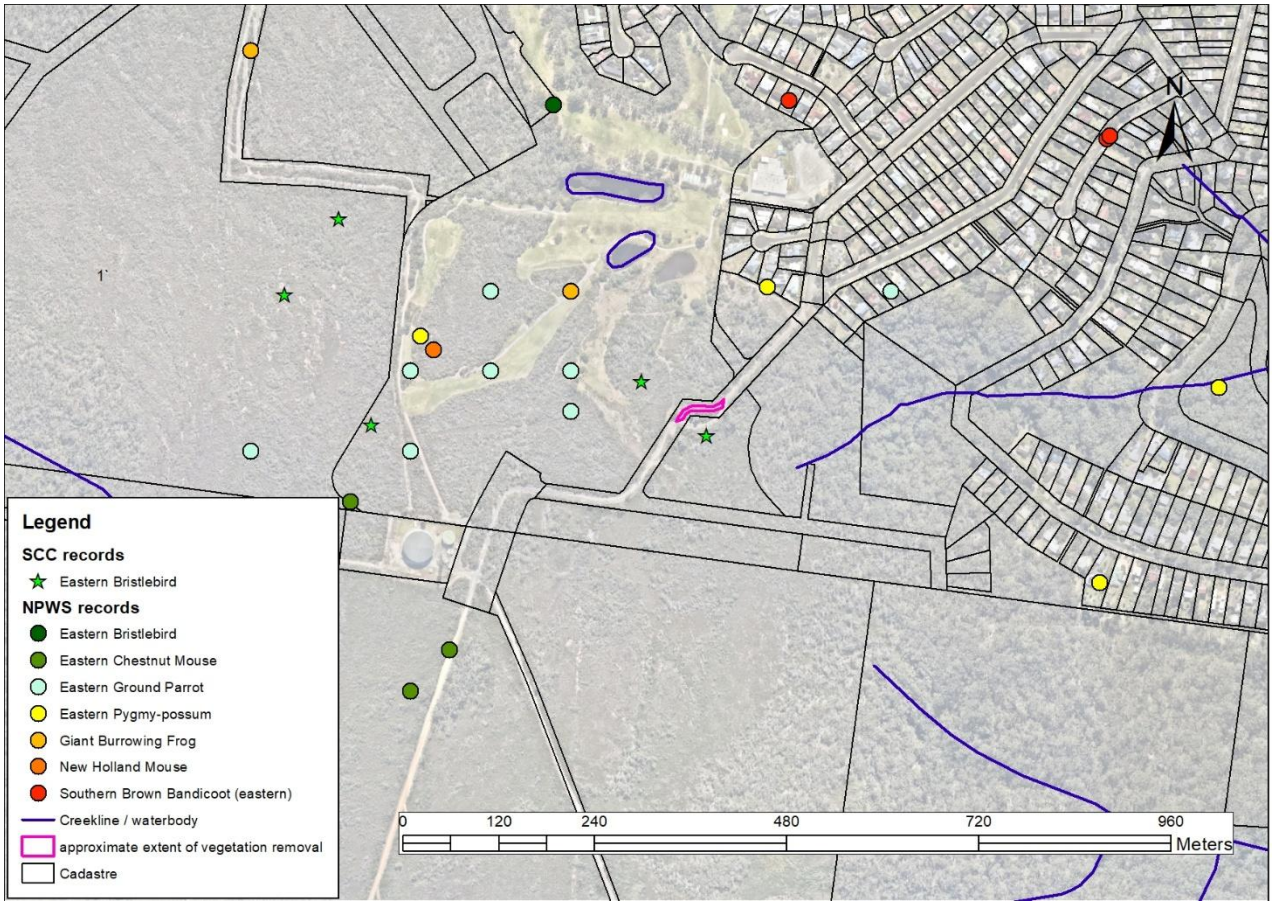
Part A - In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the lifecycle of the species such that a viable local population of the species is likely to be place at risk of extinction.

A search on Council's and the Office of Environment and Heritage's database and a site investigation / survey / assessment (Appendix A) indicates that the following species warrant further assessment:

- Giant Burrowing Frog *Heleioporus australiacus*
- Eastern Ground Parrot *Pezoporus wallicus wallicus*
- Eastern Bristlebird *Dasyornis brachypterus*
- Southern Brown Bandicoot *Isoodon obesulus obesulus*
- Eastern Pygmy-possum *Cercatetus nanus*
- Eastern Chestnut Mouse *Pseudomys gracillicaudatus*
- New Holland Mouse *Pseudomys novaehollandiae*
- White-footed Dunnart *Sminthopsis leucopus*

Recorded locations are shown in Figure 4 below.

Figure 4 Threatened species recorded locations



An assessment of each is provided below:

Giant Burrowing Frog

The Giant Burrowing Frog (GBF) is distributed in south-eastern NSW and Victoria, and appears to exist as two distinct populations: a northern population largely confined to the sandstone geology of the Sydney Basin and extending as far south as Ulladulla, and a southern population occurring from north of Narooma through to Walhalla, Victoria (OEH 2024).

GBF is found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. It spends more than 95% of its time in non-breeding habitat in areas up to 300 m from breeding sites. Whilst in non-breeding habitat it burrows below the soil surface or in the leaf litter. Individual frogs occupy a series of burrow sites, some of which are used repeatedly. The home ranges of both sexes appear to be non-overlapping suggesting exclusivity of non-breeding habitat. Home ranges are approximately 0.04 ha in size (OEH 2024).

Breeding habitat of this species is generally soaks or pools within first or second order streams. They are also commonly recorded from 'hanging swamp' seepage lines and where small pools form from the collected water. When breeding, frogs will call from open spaces, under vegetation or rocks or from within burrows in the creek bank. Males show strong territoriality at breeding sites. This species breeds mainly in autumn, but has been recorded calling throughout the year. Egg masses are foamy with an average of approximately 500-800 eggs and are laid in burrows or under vegetation in small pools. After rains, tadpoles are washed into larger pools where they complete their development in ponds or ponded areas of the creekline.

Although the species has been recorded within five kilometres of the proposed activity (Figure 4 above);

- the site does not comprise breeding habitat,
- the area that would be affected by the proposal is insignificant to the area of available habitat in the immediate vicinity of the site,
- the area of the proposed activity does not contain resources critical for the species for food, shelter, or breeding, and
- the proposed activity is unlikely to change hydrology of the catchment to an extent that it would impact breeding habitat.

The presence of this species at the proposed activity site is possible from time to time as they are mobile. The site however is not considered useful or important or critical to the survival of the species. As a result, a species impact statement (SIS) or entry into the Biodiversity Offset Scheme (BOS) is not required for this species.

Eastern Ground Parrot

The Eastern Ground Parrot occurs in high rainfall coastal and near coastal low heathlands and sedgelands, generally below one metre in height and very dense (up to 90% projected foliage cover). These habitats provide a high abundance and diversity of

food, adequate cover and suitable roosting and nesting opportunities for the Ground Parrot, which spends most of its time on or near the ground. When flushed, birds fly strongly and rapidly for up to several hundred metres, at a metre or less above the ground (OEH 2018).

Home ranges of adult birds is typically 10 hectares and overlapping with other birds, while juveniles have a significantly larger home range. There is no evidence of regular long-distance dispersal or migration events (OEH 2018).

Ground Parrots breed from September to December. Breeding is thought to be triggered by increasing seed availability in spring. 2-7 eggs are laid in a shallow bowl of fine sticks and grass, well hidden under overhanging tall, coarse grass, sedge or low, heathy shrubs. The nest is usually screened from above and sides, often with a tunnel in the surrounding dense plants (OEH 2018).

Although the species has been recorded within five kilometres of the proposed activity (Figure 4 above);

- the area that would be affected by the proposal is insignificant to the area of available habitat in the immediate vicinity of the site,
- pre-clearance surveys are to be undertaken and if found to be nesting the proposed activity would be postponed,
- the area of the proposed activity does not contain resources critical for the species for food, shelter, or breeding, and
- works would be undertaken outside the breeding season (September to December).

The presence of this species at the proposed activity site is possible from time to time as they are mobile. The site however is not considered useful or important or critical to the survival of the species. As a result, a species impact statement or entry into the Biodiversity Offset Scheme is not required for this species.

Eastern Bristlebird

Habitat for central and southern populations is characterised by dense, low vegetation including heath and open woodland with a heathy understorey (OEH 2024b). Nests are elliptical domes constructed on or near the ground amongst dense vegetation. Two eggs are laid during August to February; producing more than one clutch a year is rare, and recruitment into the population is low (OEH 2024b).

Although the species has been recorded within five kilometres of the proposed activity (Figure 4 above);

- the area that would be affected by the proposal is insignificant to the area of available habitat in the immediate vicinity of the site,
- pre-clearance surveys are to be undertaken and if found to be nesting the proposed activity would be postponed,

- the area of the proposed activity does not contain resources critical for the species for food, shelter, or breeding, and
- works would be undertaken outside the breeding season (August to February).

The presence of this species at the proposed activity site is possible from time to time as they are mobile. The site however is not considered useful or important or critical to the survival of the species. As a result, a species impact statement or entry into the Biodiversity Offset Scheme is not required for this species.

White-footed Dunnart

The White-footed Dunnart occurs in Tasmania and along the Victoria and southern NSW coast. The Shoalhaven area is the species northern-most limit (OEH 2023). The species is found in a range of different habitats across its distribution, including coastal dune vegetation, coastal forest, tussock grassland and sedgeland, heathland, woodland and forest.

In NSW, the species seems to favour vegetation communities with an open understorey structure. It is patchily distributed across these habitats and, where present, typically occurs at low densities (OEH 2023). Home ranges and movement patterns of this species vary according to sex. Adult females usually have small discrete home range, approximately 80 metres in length. Adult males have overlapping home ranges, approximately 100 metres in length, but are capable of making regular exploratory movements of up to 1 km (OEH 2023).

The species appear to have only one short breeding season during their lifetime. In NSW mating occurs in late July and August. From August to September, up to ten young are born. At two months, the young detach from the mothers' teats and are suckled in the nest for about a month before dispersing (OEH 2023).

The species shelter in bark nests in hollows under standing or fallen timber, burrows in the ground, piles of logging debris, in the 'skirts' of grass trees *Xanthorrhoea spp,* and *Macrozamia spp.* and rock crevices (OEH 2023).

Although the species has been recorded within five kilometres of the proposed activity (Figure 4 above);

- the area that would be affected by the proposal is insignificant to the area of available habitat in the immediate vicinity of the site,
- pre-clearance surveys are to be undertaken and if found to be nesting the proposed activity would be postponed,
- works would be undertaken outside the breeding season (August to February)

The presence of this species at the proposed activity site is possible from time to time as they are mobile. The site however is not considered useful or important or critical to the survival of the species. As a result, a species impact statement or entry into the Biodiversity Offset Scheme is not required for this species.

Southern Brown Bandicoot

Southern Brown Bandicoots are generally only found in heath or open forest with a heathy understorey on sandy or friable soils. They feed on a variety of ground-dwelling invertebrates and the fruit-bodies of hypogeous (underground-fruiting) fungi. Their searches for food often create distinctive conical holes in the soil. Males have a home range of approximately 5-20 hectares whilst females forage over smaller areas of about 2-3 hectares. Nest during the day in a shallow depression in the ground covered by leaf litter, grass or other plant material. Nests may be located under Grass trees Xanthorrhoea spp., blackberry bushes and other shrubs, or in rabbit burrows. The upper surface of the nest may be mixed with earth to waterproof the inside of the nest. Mating occurs any time of the year, usually following heavy rain (OEH 2024c).

Although the species has been recorded within five kilometres of the proposed activity (Figure 4 above);

- the area that would be affected by the proposal is insignificant to the area of available habitat in the immediate vicinity of the site,
- pre-clearance surveys are to be undertaken and if found to be nesting the proposed activity would be postponed,
- there are no visible signs of feeding in the area (distinctive conical holes in the soil).

The presence of this species at the proposed activity site is possible from time to time as they are mobile. The site however is not considered useful or important or critical to the survival of the species. As a result, a species impact statement or entry into the Biodiversity Offset Scheme is not required for this species.

Eastern Pygmy Possum

The Eastern Pygmy Possum is found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. They may occupy small patches of vegetation in fragmented landscapes and although the species prefers habitat with a rich shrub understory, they are known to occur in grassy woodlands and the presence of Eucalypts alone is sufficient to support populations in low densities (OEH 2022).

Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes; an important pollinator of heathland plants such as banksias; soft fruits are eaten when flowers are unavailable. Also feeds on insects throughout the year; this feed source may be more important in habitats where flowers are less abundant such as wet forests (OEH 2022).

Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum *Pseudocheirus peregrinus* dreys or thickets of vegetation, (e.g. grass-tree skirts); nest-building appears to be restricted to breeding females; tree hollows are

favoured but spherical nests have been found under the bark of eucalypts and in shredded bark in tree forks.

Appear to be mainly solitary, each individual using several nests, with males having non-exclusive home-ranges of about 0.68 hectares and females about 0.35 hectares.

Young can be born whenever food sources are available, however most births occur between late spring and early autumn (OEH 2022).

Although the species has been recorded within five kilometres of the proposed activity (Figure 4 above);

- the area that would be affected by the proposal is insignificant to the area of available habitat in the immediate vicinity of the site, and
- pre-clearance surveys are to be undertaken and if found to be nesting the proposed activity would be postponed,
- pre-clearance surveys are to be undertaken and if found to be sheltering (not breeding) they are to be relocated elsewhere away from harm,
- works would be undertaken outside the breeding season, and
- the area of the proposed activity does not contain resources critical for the species for shelter or breeding such as tree hollows, rotten stumps, abandoned bird-nests, and dreys.

The presence of this species at the proposed activity site is possible from time to time as they are mobile. The site however is not considered useful or important or critical to the survival of the species. As a result, a species impact statement or entry into the Biodiversity Offset Scheme is not required for this species.

Eastern Chestnut Mouse

In NSW the Eastern Chestnut Mouse mainly occurs north from the Hawkesbury River area as scattered records along to coast and eastern fall of the Great Dividing Range extending north into Queensland. There are however isolated records in the Jervis Bay area (OEH 2024d).

In NSW the Eastern Chestnut Mouse is mostly found, in low numbers, in heathland and is most common in dense, wet heath and swamps. In the tropics it is more an animal of grassy woodlands. Optimal habitat appears to be in vigorously regenerating heathland burnt from 18 months to four years previously. By the time the heath is mature, the larger Swamp Rat becomes dominant, and Eastern Chestnut Mouse numbers drop again (OEH 2024d).

Although the species has been recorded within five kilometres of the proposed activity (Figure 4 above);

- the area of the proposed activity would be considered sub-optimal habitat being long-unburnt and not wet heath or swamp.

- the area that would be affected by the proposal is insignificant to the area of available habitat in the immediate vicinity of the site,
- the area of the proposed activity does not contain resources critical for the species for food, shelter, or breeding.

The presence of this species at the proposed activity site is possible from time to time as they are mobile. The site however is not considered useful or important or critical to the survival of the species. As a result, a species impact statement or entry into the Biodiversity Offset Scheme is not required for this species.

New Holland Mouse

The New Holland Mouse is known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. It is a social animal, living predominantly in burrows shared with other individuals. Distribution is patchy in time and space, with peaks in abundance during early to mid-stages of vegetation succession typically induced by fire (OEH 2022b).

Although the species has been recorded within five kilometres of the proposed activity (Figure 4 above);

- the area of the proposed activity would be considered sub-optimal habitat being long-unburnt,
- the area that would be affected by the proposal is insignificant to the area of available habitat in the immediate vicinity of the site, and
- the area of the proposed activity does not contain resources critical for the species for food, shelter, or breeding.

The presence of this species at the proposed activity site is possible from time to time as they are mobile. The site however is not considered useful or important or critical to the survival of the species. As a result, a species impact statement or entry into the Biodiversity Offset Scheme is not required for this species.

Part 2 - In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(a) 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

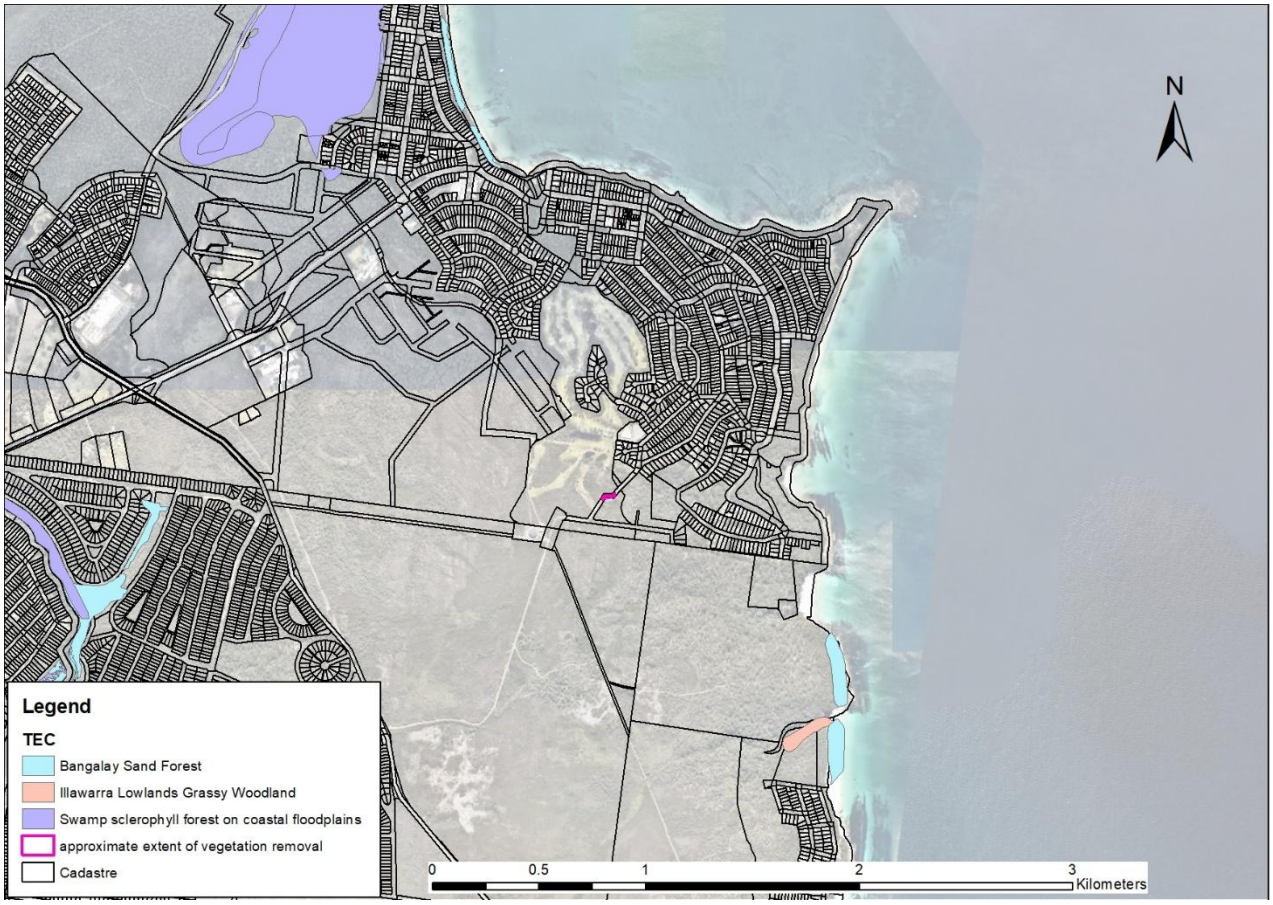
(b) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

The vegetation to be impacted does not constitute a threatened ecological community (TEC).

There are no TECs mapped in the vicinity of the proposed activity (Figure 5 below).

Entry into the Biodiversity Offset Scheme or Species Impact Statement is not required.

Figure 5 Mapped occurrences of threatened ecological communities in the vicinity of the proposed activity



Part 3 - In relation to the habitat of a threatened species of 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.

Refer to responses in Part 1 and Part 2 above. A species impact statement is not required for this Part.

Part 4 – 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 5 – 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.

Key threatening processes listed in the NSW *Biodiversity Conservation Act 2016* considered relevant to the proposed activity include:

- Clearing native vegetation

Clearing of native vegetation is listed as a key threatening process, defined by the Scientific Committee's determination (OEH 2021) 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, and
- lead to soil and bank erosion, increased salinity and loss of productive land.

The proposed activity may involve the clearing of approximately 380m^2 native vegetation. 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,
- a significant impact to local populations of threatened species and threatened ecological communities,
- 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 – the riparian corridor would be stabilised as a result of the works,
- 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, and
- significant reduction of habitat for threatened species or ecological communities.

A SIS and/or entry into the Biodiversity Offset Scheme is therefore not warranted.

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 Code') (DECCW 2010) 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.

A search on the Aboriginal Heritage Information Management System (AHIMS) indicated that there are no recorded sites or objects near the site of the proposed activity (Figure 6 below).

No objects were seen during site investigations associated with this REF.

The site of the proposed activity is not within a landscape that has a propensity for artefacts as prescribed in the Due Diligence Code, *i.e.:*

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

As such it is reasonable to conclude that there are no known Aboriginal objects and a low probability of objects occurring in the area of the proposed activity and the proposed activity can proceed with caution without applying for an AHIP. Cautionary measures are prescribed in the Environmental Mitigation Measures and Safeguards listed in Section 7 of this REF.

Figure 6 AHIMS Search record

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : St George FT
Client Service ID : 968197

Shoalhaven City Council - Nowra
PO Box 42 Bridge Rd
Nowra New South Wales 2541
Attention: Geoffrey Young

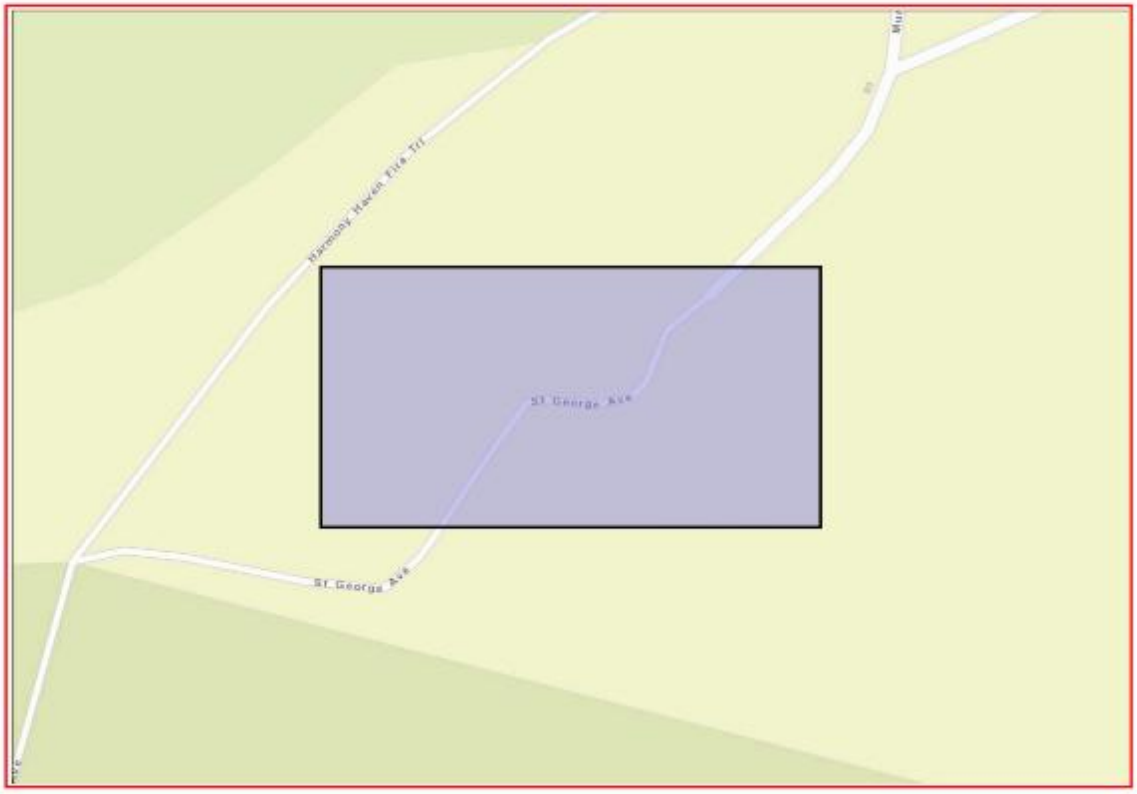
Email: geoff.young@shoalhaven.nsw.gov.au

Date: 23 January 2025

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 288532.0 - 288775.0, Northings : 6115165.0 - 6115289.0 with a Buffer of 0 meters, conducted by Geoffrey Young on 23 January 2025.

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:

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

3.5 EP&A Regulation – Section 171 matters of consideration

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

Table 2: Section 171(2) Factors

Does the proposal:	Assessment	Reason
a) Have any environmental impact on a community?	Positive – long term	The proposed activity would allow better management of an important fire trail to utilise for bushfire suppression and management. The proposed activity would not have any impact on community services and infrastructure such as water, waste management, educational, medical or social services.
b) Cause any transformation of a locality?	Low adverse	The locality is heathland with numerous fire trails and other management vehicle tracks. The proposed activity would not change the nature and use of the site.
c) Have any environmental impact on the ecosystem of the locality?	Low adverse	An assessment provided in Section 3 of this REF 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 significantly 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?	Low adverse / positive	Aesthetically, the locality would essentially remain the same – heathland impacted by numerous vehicle tracks and clearings associated with golf course. Access to the trails beyond the proposed activity site would be retained for recreation.
e) Have any effect on a locality, place or building having aesthetic,	Negligible	The proposed activity would not affect a site listed on the State Heritage List or a site listed in the heritage schedules of the SLEP 2014. Underground 'relics' (as defined in the NSW Heritage Act) are also not anticipated.

Does the proposal:	Assessment	Reason
anthropological, archaeological, architectural, cultural, historical, scientific, or social significance or other special value for present or future generations?		The site is not within an Aboriginal Place declared under the *National Parks and Wildlife Act 1974*. In accordance with the NSW Department of Environment, Climate Change and Water's Due Diligence Code of Practice, the proposed activity does not require an Aboriginal Heritage Impact Permit as the activity is unlikely to harm an Aboriginal artefact (refer to Section 3.4). Unexpected Finds Protocol would be in place (refer to Section 7).
f) Have any impact on the habitat of protected fauna (within the meaning of the Biodiversity Conservation Act 2016)?	Low adverse	No important habitat will be removed or otherwise impacted. The potential impact is therefore considered to be insignificant or inconsequential. There are no hollow-bearing trees to be impacted. The proposed activity would not have a significant impact upon threatened fauna (refer to Section 3.3 of this REF). The specified environmental mitigation measures (Section 7) would mitigate indirect impacts to fauna and habitat.
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	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. The prescribed environmental safeguards and mitigation measures (Section 7 of this REF) would minimise the risk of impact on resident fauna, fish, and flora.
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. In the long-term, the construction area will stabilise and revegetate and long term effects are considered unlikely. 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 significantly 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.

Does the proposal:	Assessment	Reason
		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?	Negligible	The proposed activity would not involve hazardous wastes and would not lead to increased bushfire or landslip risks. The activity is not anticipated to adversely affect flood behaviour or exacerbate flooding risks.
k) Cause any reduction in the range of beneficial uses of the environment?	Positive	The site and local environment will remain relatively unchanged. The site and local environment will remain relatively unchanged. The proposal is consistent with the existing land use. The proposal is not anticipated to result in further degradation of the site or surrounding land. The proposed activity would assist in the bushfire management.
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 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.
m) Have any environmental problems associated with the disposal of waste?	Negligible	The waste that would be disposed off-site can be recycled or re-used in accordance with resource recovery exemptions or taken to a licensed waste facility. 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?	Negligible	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.

Does the proposal:	Assessment	Reason
o) Have any cumulative environmental effect with other existing or likely future activities?	Negligible	The assessed low adverse or negligible impacts of the proposal are not likely to interact. 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. No further construction activities are planned for this location.
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	Negligible	The proposed activity would have no effect on coastal processes including those projected under climate change conditions. The proposed activity would contribute to reducing the impact of stormwater erosion on the coastal foreshore.
q) applicable local strategic planning statements, regional strategic plans or district plans made under the Act, Division 3.1	Positive	The proposed activity is consistent with the *Shoalhaven 2040* Strategic Land-use Planning Statement, including Planning Priority 2 *Delivering infrastructure*, Planning Priority 10 *Protecting the Environment,* and Planning Priority 11 *Adapting to natural hazards through building resilience* https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D20/437277. The 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) other relevant environmental factors	n/a	Environmental factors have been addressed in Section 3 of this REF.

4. PERMISSIBILITY AND APPROVALS

4.1 NSW 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."*

Section 2.52(8) of the NSW *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) states that "*Development for the purpose of bush fire hazard reduction may be carried out by any persons without consent on any land not within the coastal wetlands and littoral rainforests area if the development is consistent with the applicable bush fire management plan or the direction or agreement relating to the applicable designated fire trail" (https://legislation.nsw.gov.au/view/html/inforce/current/epi-2021-0732#sec.2.52).* In this regard, "*bush fire hazard reduction"* can include "*the establishment or maintenance of fire breaks and fire trails on land"* (https://legislation.nsw.gov.au/view/html/inforce/current/act-1997-065#dict). As the proposed activity would for be for bush fire hazard reduction consistent with the Shoalhaven Bush Fire Management Plan, Section 2.52(8) of the T&I SEPP applies, and the proposed activity does not require development consent.

As the proposed activity does not require development consent, and as it constitutes an 'activity' for the purposes of Part 5 of the EP&A Act, being carried out by (or on behalf of) a public authority, environmental assessment under Part 5 of the EP&A Act is required. This REF provides this assessment.

4.2 NSW Rural Fires Act 1997

Part 3B of the Act provides for the establishment, maintenance, protection, certification and registration of fire trails.

Section 62K provides for Fire Trail Standards to which the proposed realigned fire trail shall comply with (https://www.rfs.nsw.gov.au/__data/assets/pdf_file/0009/69552/RFS-Fire-Trail-Standards-Nov2023.pdf). Section 62W states that it is the duty of the owner or occupier of the land on which a designated fire trail or registered fire trail is situated to construct and to maintain the fire trial in accordance with the Fire Trail Standards.

4.3 Other

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

Table 3: Summary of other relevant legislation and permissibility

NSW STATE LEGISLATION	
***Environmental Planning and Assessment Act 1979* (EP&A Act)**	
Permissible √	Not permissible ☐

Justification:

The T&I 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.

State Environmental Planning Policy (Hazards and Resilience) 2021

Permissible √ Not permissible ☐

Justification:

The proposed activity is not mapped as comprising coastal wetlands or littoral rainforest for the purpose of this SEPP. Other considerations of the SEPP are not applicable to the proposed activity.

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.

Fisheries Management Act 1994

Permissible √ Not permissible ☐

Justification:

The proposed activity would not:

- comprise dredging or reclamation (Part 7, Division 3 of the Act)
- involve blocking the passage of fish (s.219)
- impact mangroves and certain other marine vegetation (Part 7, Division 4)
- involve disturbance to gravel beds where salmon or trout spawn (s.208 of the Act)
- involve the release of live fish (Part 7, Division 7)
- involve the construction of dams and weirs (s.218)
- use explosives in a watercourse (Clauses 70 and 71 of the *Fisheries Management (General) Regulation 2019).*

A Fisheries Permit would therefore not be required.

Local Land Services Act 2013

Permissible √ Not permissible ☐

Justification:

Any clearing of vegetation would be of a kind authorised under Section 60O(b)(ii) of the Local Land Services Act 2016 (“an activity carried out by a determining authority within the meaning of

Part 5 of the Act after compliance with that Part."). No separate authorisation under the Act is required.

***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 knowingly 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' and not in a landscape that would have a higher propensity for heritage objects, the Due Diligence Guidelines (DECCW 2010) 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 of this REF for more information.

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 3.3.2 of this REF).
- 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 biodiversity 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.

Aboriginal Land Rights Act 1983
Permissible √ Not permissible ☐
Justification: There are no Aboriginal Land Rights Claims on any of the lands subject of the proposed activity.
Water Management Act 2000
Permissible √ Not permissible ☐
Justification: • Local councils are exempt from s.91E(1) of the Act in relation to all controlled activities that they carry out in, on or under waterfront land by virtue of clause 41 of the *Water Management (General) Regulation 2018.* • The proposal would not interfere with the aquifer and therefore an interference licence is not required (s.91F).
COMMONWEALTH LEGISLATION
Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EP&BC Act)
Permissible √ Not permissible ☐
Justification: The proposed activity would not be undertaken on Commonwealth land and no matters of National Environmental Significance are likely to be significantly impacted by the proposed activity. The proposed activity is therefore not a controlled action and does not require Commonwealth referral.
Commonwealth *Native Title Act 1993*
Permissible √ Not permissible ☐
Justification: It can be reasonably assumed that Native Title has been extinguished as a “Past Act” with the granting of freehold title and gazettal of the road reserve in 1923.

5. CONSULTATION WITH GOVERNMENT AGENCIES

5.1 Transport and Infrastructure SEPP 2021 requirements

Section 2.10 – Consultation with councils - development with impacts on council-related infrastructure or services

The proposed activity would:

(a) not have an impact on stormwater management services

(b) unlikely generate traffic to an extent that it would strain the capacity of the road system

(c) not involve connection to, or have a substantial impact on the capacity of the sewerage system

(d) not involve connection to, and use of a substantial volume of water from the water supply system

(e) not involve the installation of a temporary structure on, or the enclosing of, or a public place that is under a council's management or control that is likely to cause a disruption to pedestrian or vehicular traffic that is not minor or inconsequential

(f) not involve the excavation of, or a footpath adjacent to, a road for which the proponent is not responsible for the maintenance of the road or footpath.

The proponents of the proposed activity are City Services who are asset custodians of the Fire Trail. No consultation with other departments of SCC is therefore required.

Section 2.11 – Consultation with councils - development with impacts on local heritage

There would be no heritage objects or places affected by the proposed activity.

Section 2.12 – Consultation with councils - development with impacts on flood liable land

The proposed activity would not be undertaken on flood liable land. Consultation with Shoalhaven City Council is therefore not required.

Section 2.13 – Consultation with State Emergency Service (SES) - development with impacts on flood liable land

The proposed activity would not be undertaken on flood liable land. Consultation with SES is therefore not required.

Section 2.14 – Consultation with councils - development with impacts on certain land within the coastal zone

The proposal would not occur within a coastal vulnerability area as defined in the Coastal Management Act 2016. Consultation is therefore not required.

Section 2.15 – Consultation with public authorities other than councils

In consideration of the other consultation requirements specified under Section 2.15 of the Transport and Infrastructure SEPP, the proposed activity:

- would not be undertaken adjacent to land reserved under the *National Parks and Wildlife Act 1974* or land acquired under that Act
- would not be undertaken on land in Zone E1 National Parks and Nature Reserves on in an equivalent land use zone.
- 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*
- would not have an impact on the Willandra Lakes Region World Heritage Property
- would not occur in a Western City operational area specified in the *Western Parkland City Authority Act 2018.*

These prescribed consultation requirements therefore do not apply.

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

The proposed activity would not be undertaken on Bushfire Prone Land and is not a development prescribed in this section (health services facilities, correctional centres, residential accommodation). Consideration of PBP is therefore not required.

6. COMMUNITY ENGAGEMENT

With regards to SCC's community engagement policy (http://doc.shoalhaven.nsw.gov.au/Displaydoc.aspx?Record=POL12/31) the proposed activity is considered to be a "local area/low impact" development. There are no mandatory engagement activities specified in the Policy's Engagement Matrix for this type of development.

The owner of the affected land, Lot 1 DP1301691, shall be informed of the proposed activity prior to commencement. This requirement is reflected in the environmental safeguards prescribed in Section 7 of this REF.

7. ENVIRONMENTAL SAFEGUARDS AND MEASURES TO MINIMISE IMPACTS

Note that safeguards / measures are prescribed unless otherwise stated.

Safeguard / Measure
1. This REF shall be published on the NSW Planning Portal.
2. The road reserve as well as the extent of the new fire trail shall be surveyed and pegged.
3. The owner of the affected land, Lot 1 DP1301691, shall be informed of the proposed activity prior to commencement.
4. Vegetation clearing works are to be undertaken outside of the breeding season for Eastern Bristlebird (August to February), Eastern Ground Parrot (September to December), and Eastern Pygmy Possum (October to April), *i.e.* clearing works to be undertaken during the months of May, June and July.
5. Any machinery, vehicles and stockpiles utilised during construction shall be stored and / or operated within the project footprint and existing cleared areas within the road reserve. Works, machinery and vehicles shall not encroach into the canopies of trees and native vegetation that are to be retained and protected.
6. Vegetation removal shall be undertaken only to the extent required to carry out the works.
7. Preclearance threatened species surveys shall be undertaken immediately prior to the clearing of vegetation and: a. if young in nests are observed, the proposed activity shall be delayed b. if species are observed to be sheltering, they shall (if possible) be relocated to a nearby area away from direct impact.
8. In the event that any wildlife be significantly disturbed or injured during works, Council's Environmental Officers are to be contacted or if unavailable, Wildlife Rescue – South Coast should be contacted on 0418 427 214, to rescue and relocate the animal(s).
9. 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, NSW Environment and Heritage (ph:131 555) shall be contacted.
10. An emergency spill kit shall be always kept on-site with procedures to contain and collect any leakage or spillage of fuels, oils, greases, *etc* .
11. No major equipment maintenance works shall be undertaken on-site.
12. 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.
13. The existing track shall be closed off utilising soil, rock and vegetation material sourced from the construction of the new fire trail.
14. Stockpiles of any excavated earthen material shall be in existing cleared areas.
15. Any waste taken from the site shall be managed, transported, stored, collected and disposed of in an environmentally satisfactory manner pursuant to NSW *Protection of the Environment Operations Act 1997*, and that all reasonable measures regarding the

Safeguard / Measure
control and prevention of pollution and waste from being introduced into waterways and on land are implemented.
16. An asset form shall be trimmed to file 44574E on commissioning of the new realigned fire trail in accordance with POL15/8 Asset Accounting Policy section 3.1.4 and POL16/79 Asset Management Policy section 3.3.

8. SIGNIFICANCE EVALUATION & DECISION STATEMENT

This Review of Environmental Factors has assessed the likely environmental impacts, in the context of Part 5 of the *Environmental Planning and Assessment Act 1979*, of a proposal by Shoalhaven City Council for the realignment of an approximate 80 metre section of St George Fire Trail, Vincentia from private land Lot 1 DP1301691 to within an undeveloped Council road reserve.

In consideration of the proposal as described in Section 1, and assuming the implementation of all proposed safeguards and mitigation measures (Section 7), it is determined that:

1. It is unlikely that there would be any significant environmental impact as a result of the proposed work and an Environmental Impact Statement is not required for the proposed works.
2. The proposed activity would 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 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:

Michael Berzins
Manager – Works and Services
Shoalhaven City Council Date: 22/05/2025

9. REFERENCES

DECCW (Department of Environment, Climate Change and Water, NSW) 2010 Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales. Available at: https://www.environment.nsw.gov.au/research-and-publications/publications-search/due-diligence-code-of-practice-for-the-protection-of-aboriginal-objects-in-new-south-wales

Landcom 2004 *Managing Urban Stormwater: Soils and Construction – Volume 1.* Published by Landcom ISBN 0-97520-3037 https://www.environment.nsw.gov.au/research-and-publications/publications-search/managing-urban-stormwater-soils-and-construction-volume-1-4th-editon

OEH (Office of Environment and Heritage, NSW) 2018 *Eastern Ground Parrot – Profile Eastern Ground Parrot - profile | NSW Environment, Energy and Science*

OEH (Office of Environment and Heritage, NSW) 2022 *Eastern Pygmy Possum – Profile Eastern Pygmy-possum - profile | NSW Environment, Energy and Science*

OEH (Office of Environment and Heritage, NSW) 2022b *Eastern Pygmy Possum – Profile New Holland Mouse - profile | NSW Environment, Energy and Science*

OEH (Office of Environment and Heritage, NSW) 2023 *White-footed Dunnart – Profile https://threatenedspecies.bionet.nsw.gov.au/profile?id=10758*

OEH (Office of Environment and Heritage, NSW) 2024 *Giant Burrowing Frog – Profile Giant Burrowing Frog - profile | NSW Environment, Energy and Science*

OEH (Office of Environment and Heritage, NSW) 2024b *Eastern Bristlebird – Profile Eastern Bristlebird - profile | NSW Environment, Energy and Science*

OEH (Office of Environment and Heritage, NSW) 2024c *Southern Brown Bandicoot (eastern) – Profile Southern Brown Bandicoot (eastern) - profile | NSW Environment, Energy and Science*

OEH (Office of Environment and Heritage, NSW) 2024d *Eastern Chestnut Mouse – Profile Eastern Chestnut Mouse - profile | NSW Environment, Energy and Science*

APPENDIX A – NSW THREATENED SPECIES LIKELIHOOD OF OCCURRENCE TABLE

The table of likelihood of occurrence (below) 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 Office of Environment and Heritage (OEH) Wildlife Atlas) around the subject site (search undertaken on 02 December 2024). Ecology information has been obtained from the Threatened Species Profiles on the NSW OEH website (www.threatenedspecies.environment.nsw.gov.au).

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 EP&A Act 5-Part Test 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. An EP&A Act 5-Part Test and/or EPBC Act significance assessment is required for this species, population or ecological community.

Endangered Ecological Community name	***Status***	***Likelihood of presence within areas impacted by the activity***
Bangalay Sand Forest of the Sydney Basin and South East Corner Bioregions	Endangered - *NSW* BC *Act*	Does not occur on-site and is not mapped as occurring in close proximity to the site
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
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.
Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion	Endangered - *NSW* BC *Act* Critically Endangered - Commonwealth *EPBC Act*	Does not occur on-site and is not mapped as occurring in close proximity to the site.

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.
Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered - *NSW* BC *Act* Endangered - Commonwealth *EPBC Act*	Does not occur on-site and is not mapped as occurring in close proximity to the site.
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.

Species name	***Status***	***Habitat requirements (www.environment.nsw.gov.au)***	***Likelihood of presence within areas impacted by the activity***
FLORA			
Ettrema Mallee *Eucalyptus sturgissiana*	Vulnerable NSW BC Act	The Ettrema Mallee is mostly restricted to the Northern Budawang Range in Morton National Park, with a few occurrences on the nearby coastal plain.	Does not occur at the site. Not recorded during site investigations

Biconvex Paperbark *Melaleuca biconvexa*	Vulnerable NSW BC Act Vulnerable Commonwealth EPBC Act	Biconvex Paperbark generally grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects.	No – no habitat present. Not recorded during site investigations
Scrub Turpentine *Rhodamnia rubescens*	Endangered NSW BC Act Critically Endangered EPBC Act	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils	No – no habitat present. Not recorded during site investigations
Magenta Lilly Pilly *Syzygium paniculatum*	Endangered NSW BC Act Vulnerable Commonwealth EPBC Act	On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest.	No – no habitat present. Not recorded during site investigations.
Thick Lip Spider Orchid *Caladenia tessellata*	Vulnerable NSW BC Act Vulnerable Commonwealth EPBC Act	Generally found in grassy sclerophyll woodland on clay loam or sandy soils. The Thick Lip Spider Orchid is known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW. Populations in Kiama and Queanbeyan are presumed extinct. It was also recorded in the Huskisson area in the 1930s.	No – no habitat present.
Pretty Beard Orchid *Calochilus pulchellus*	Endangered NSW BC Act Endangered Commonwealth EPBC Act	At Vincentia the species grows in low Scribbly Gum dominated woodland with a low wet heath understorey. The soil is a sandy loam overlying sandstone. In Booderee National Park it grows in a tall heathy association.	Unlikely to occur – no habitat present.
Leafless Tongue Orchid *Cryptostylis hunteriana*	Vulnerable BC Act Vulnerable EPBC Act	The larger populations typically occur in woodland dominated by Scribbly Gum (*Eucalyptus sclerophylla*), Silvertop Ash (*E. sieberi*), Red Bloodwood (*Corymbia gummifera*) and Black Sheoak (*Allocasuarina littoralis*); appears to prefer open areas in the understorey of this community and is often found in	Unlikely - Not recorded during site investigations.

		association with the Large Tongue Orchid (*C. subulata*) and the Tartan Tongue Orchid (*C. erecta*).	
Bauer's Midge Orchid *Genoplesium baueri*	Endangered NSW BC Act Endangered EPBC Act	The species has been recorded from locations between Ulladulla and Port Stephens. About half the records were made before 1960 with most of the older records being from Sydney suburbs including Asquith, Cowan, Gladesville, Longueville and Wahroonga. No collections have been made from those sites in recent years. Currently the species is known from just over 200 plants across 13 sites. The species has been recorded at locations now likely to be within the following conservation reserves: Berowra Valley Regional Park, Royal National Park and Lane Cove National Park. May occur in the Woronora, O'Hares, Metropolitan and Warragamba Catchments. Grows in dry sclerophyll forest and moss gardens over sandstone	Unlikely to occur – no habitat present. Not recorded at the site or nearby.
Jervis Bay Leek Orchid *Prasophyllum affine*	Endangered NSW BC Act Endangered EPBC Act	Jervis Bay Leek Orchid is currently known from three areas south-east of Nowra on South Coast. These are Kinghorne Point, Wowly Gully near the town of Callala Bay, and near the township of Vincentia at the Bay and Basin Leisure Centre. Grows on poorly drained grey clay soils that support low heathland and sedgeland communities.	Unlikely to occur – no habitat present. Not recorded at the site or nearby.
Pterostylis ventricosa	Endangered NSW BC Act	Pterostylis ventricosa is known from populations at St Georges Basin, Sussex Inlet and west of Nowra in the Shoalhaven and also near Tallong and Mittagong in the Southern Highlands. Predominantly in more open areas of tall coastal eucalypt forest often dominated by one or more of the following tree species:- Turpentine, Spotted Gum, Grey Ironbark, Blackbutt, White Stringybark, Scribbly Gum and Sydney Peppermint. Often favours more open areas such as along powerline easements and on road verges where the tree overstorey has been removed or thinned.	Unlikely to occur – no habitat present. Not recorded at the site or nearby.

		Grows in a range of groundcover types, including moderately dense low heath, open sedges and grasses, leaf litter, and mosses on outcropping rock. Small moss gardens are a commonly associated micro-habitat feature in most habitats. Soil type ranges from moisture-retentive grey silty loams to grey sandy loams.	
Eastern Australian Underground Orchid *Rhizanthella slateri*	Vulnerable NSW BC Act Endangered EPBC Act	In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest. Highly cryptic given that it grows almost completely below the soil surface, with flowers being the only part of the plant that can occur above ground. Therefore usually located only when the soil is disturbed.	Unlikely to occur – no habitat present. Not recorded at the site or nearby.
AMPHIBIANS			
Giant Burrowing Frog *Heleioporus australiacus*	Vulnerable BC Act Vulnerable EPBC Act	Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. Spends more than 95% of its time in non-breeding habitat in areas up to 300 m from breeding sites. Whilst in non-breeding habitat it burrows below the soil surface or in the leaf litter. Individual frogs occupy a series of burrow sites, some of which are used repeatedly. The home ranges of both sexes appear to be non-overlapping suggesting exclusivity of non-breeding habitat. Home ranges are approximately 0.04 ha in size. Breeding habitat of this species is generally soaks or pools within first or second order streams. They are also commonly recorded from 'hanging swamp' seepage lines and where small pools form from the collected water.	Species has the potential to occur at the site. Impact assessment provided in Section 3.3.2 of this REF.

Green and Golden Bell Frog *Litoria aurea*	Endangered BC Act Vulnerable EPBC Act	Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (*Typha spp.*) or spikerushes (*Eleocharis* spp.).	No – no habitat present.
REPTILES			
Green Turtle *Chelonia mydas*	Vulnerable BC Act Vulnerable EPBC Act	Ocean-dwelling species spending most of its life at sea.	No – no habitat present.
Hawksbill Turtle *Eretmochelys imbricata*	Vulnerable EPBC Act	Ocean-dwelling species spending most of its life at sea.	No – no habitat present.
MICRO-CHIROPTERAN BATS			
BIRDS			
White-throated Needletail *Hirundapus caudacutus*	Vulnerable BC Act Vulnerable EPBC Act	In Australia, the White-throated Needletail is mostly aerial. Although the species appears to primarily roost aerially, it has been recorded roosting in trees in forest and woodlands. Does not breed in Australia	No – no habitat present.
Black Bittern *Ixobrychus flavicollis*	Vulnerable BC Act	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves. Feeds on frogs, reptiles, fish and invertebrates, including snails, dragonflies, shrimps and crayfish, with most feeding done at dusk and at night. During the day, roosts in trees or on the ground amongst dense reeds. When disturbed, freezes in a characteristic bittern posture (stretched tall, bill pointing up, so that shape and streaked pattern blend with upright stems of reeds), or will fly up to a branch or flush for cover where it will freeze again.	No – no habitat present.

White-bellied Sea-Eagle *Haliaeetus leucogaster*	Vulnerable BC Act	Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass.	Possibly occurring transiently within the site. However it is a highly mobile species and no important habitat will be removed or otherwise affected.
Little Eagle *Haliaeetus morphnoides*	Vulnerable NSW BC Act	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland.	Possibly occurring transiently within the site. However it is a highly mobile species and no important habitat will be removed or otherwise affected.
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 100km^2 Nest within large hollow bearing trees generally within 200m of riparian areas.	Possibly occurring transiently within the site. However it is a highly mobile species and no important habitat will be removed or otherwise affected.
Eastern Osprey *Pandion cristatus*	Vulnerable BC Act	Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.	Possibly occurring transiently within the site. However it is a highly mobile species and no important habitat will be removed or otherwise affected.
Sooty Oystercatcher *Haematopus fuliginosus*	Vulnerable *NSW* BC *Act*	Shore bird – breeds in sand or coral scrapes on offshore islands	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
Pied Oystercatcher *Haemotopus longirostris*	Endangered BC Act	Favours intertidal flats of inlets and bays, open beaches and sandbanks.	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.

		Forages on exposed sand, mud and rock at low tide, for molluscs, worms, crabs and small fish. The chisel-like bill is used to pry open or break into shells of oysters and other shellfish. 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.	
Latham's Snipe *Gallinago hardwickii*	Vulnerable NSW BC Act Vulnerable Commonwealth EPBC Act	Latham's snipe feed in soft mudflats or shallow water typically at night, early morning, or evening. They shelter during the day in small wetlands including urban water bodies, saltmarshes, as well as creek edges, where there is adequate shallow flooded or inundated substrate. They also use crops and pasture. They mostly are found among dense cover comprising sedges, grasses, lignum, reeds, and rushes. The bird tends to disperse after dusk to forage over larger areas	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
Eastern Curlew *Numenius madagascariensis*	Endangered NSW BC Act Critically Endangered EPBC Act	It generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed. It 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. May also roost on wooden oyster leases or other similar structures	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
Sooty Tern *Onychoprion fuscata*	Vulnerable NSW BC Act	The Sooty Tern is found over tropical and sub-tropical seas and on associated islands and cays around Northern Australia. In NSW only known to breed at Lord Howe Island. Occasionally seen along coastal NSW, especially after	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.

		cyclones. Large flocks can be seen soaring, skimming and dipping but seldom plunging in off shore waters. Breeds in large colonies in sand or coral scrapes on offshore islands and cays including Lord Howe and Norfolk Islands.	
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	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
South-eastern Glossy Black-Cockatoo *Calyptorhynchus lathami lathami*	Vulnerable BC Act Vulnerable EPBC Act	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (Allocasuarina littoralis) and Forest Sheoak (A. torulosa) are important foods. Inland populations feed on a wide range of sheoaks, including Drooping Sheoak, Allocasuaraina diminuta, and A. gymnathera. Belah is also utilised and may be a critical food source for some populations. In the Riverina, birds are associated with hills and rocky rises supporting Drooping Sheoak, but also recorded in open woodlands dominated by Belah (Casuarina cristata). Feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species), shredding the cones with the massive bill.	Possibly occurring transiently over or within the site. Highly mobile species. No important habitat will be removed or otherwise affected. No sign of feeding from Black Sheoaks in the vicinity of the proposed activity.
Little Lorikeet *Glossopsitta pusilla*	Vulnerable NSW BC ACT	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.

		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	
Swift Parrot *Lathamus discolour*	Endangered *EPBC Act* Endangered *NSW* BC *Act*	Migrates to the Australian south-east mainland between March and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany (*Eucalyptus robusta*), Spotted Gum (*Corymbia maculata*), Red Bloodwood (*C. gummifera*), Mugga Ironbark (*E. sideroxylon*), and White Box (E. albens). Commonly used lerp infested trees include Inland Grey Box E. microcarpa, Grey Box E. moluccana and Blackbutt E. pilularis. Return to some foraging sites on a cyclic basis depending on food availability. Following winter they return to Tasmania where they breed from September to January, nesting in old trees with hollows and feeding in forests dominated by Tasmanian Blue Gum Eucalyptus globulus.	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
Turquoise Parrot *Neophema pulchella*	Vulnerable NSW BC Act	Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
Eastern Ground Parrot *Pezoporus wallicus wallicus*	Vulnerable BC Act	The Ground Parrot occurs in high rainfall coastal and near coastal low heathlands and sedgelands, generally below one metre in height and very dense (up to 90% projected foliage cover). These habitats provide a high abundance and diversity of food, adequate cover and suitable roosting and nesting opportunities for the Ground Parrot, which spends most of its time on or near the ground. When flushed, birds fly strongly	Species has the potential to occur at the site. Impact assessment provided in Section 3.3.2 of this REF.

		and rapidly for up to several hundred metres, at a metre or less above the ground.	
Barking Owl *Ninox connivens*	Vulnerable NSW BC Act	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey found on these fertile riparian soils. Roost in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as Acacia and Casuarina species. During nesting season, the male perches in a nearby tree overlooking the hollow entrance	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
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	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.

Masked Owl – *Tyto novaehollandiae*	Vulnerable *NSW* BC *Act*	Dry eucalypt forests and woodlands from sea level to 1100 m. Inhabits forest but often hunts along the edges of forests, including roadsides. The typical diet consists of tree-dwelling and ground mammals, especially rats. Pairs have a large home-range of 500 to 1000 hectares. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting. Requires old growth elements-hollow bearing tree resources for nesting and prey source.	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
Sooty Owl *Tyto tenebricosa*	Vulnerable *NSW* BC *Act*	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
Eastern Bristlebird *Dasyornis brachypterus*	Endangered NSW BC Act Endangered Commonwealth EPBC Act	Habitat for central and southern populations is characterised by dense, low vegetation including heath and open woodland with a heathy understorey.	Species has the potential to occur at the site. Impact assessment provided in Section 3.3.2 of this REF.
Regent Honeyeater *Anthochaera Phrygia*	Endangered BC Act Critically Endangered EPBC Act	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast. Birds are occasionally seen on the south coast.	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
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	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.

Olive Whistler *Pachycephala olivacea*	Vulnerable NSW BC Act	The Olive Whistler inhabits the wet forests on the ranges of the east coast. Mostly inhabit wet forests above about 500m. During the winter months they may move to lower altitudes. Forage in trees and shrubs and on the ground, feeding on berries and insects.	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
Dusky Woodswallow *artamus cyanopterus cyanopterus*	Vulnerable NSW BC Act	Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
MAMMALS			
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.	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.

White-footed Dunnart *Sminthopsis leucopus*	Vulnerable NSW BC Act	The Shoalhaven area is the species' northern-most limit. The White-footed Dunnart is found in a range of different habitats across its distribution, including coastal dune vegetation, coastal forest, tussock grassland and sedgeland, heathland, woodland and forest. In NSW, the species seems to favour vegetation communities with an open understorey structure. It is patchily distributed across these habitats and, where present, typically occurs at low densities.	Species has the potential to occur at the site. Impact assessment provided in Section 3.3.2 of this REF.
Southern Brown Bandicoot (eastern) *Isoodon obesulus obesulus*	Endangered EPBC Act Endangered NSW BC Act	Southern Brown Bandicoots are largely crepuscular (active mainly after dusk and/or before dawn). They are generally only found in heath or open forest with a heathy understorey on sandy or friable soils. They feed on a variety of ground-dwelling invertebrates and the fruit-bodies of hypogeous (underground-fruiting) fungi. Their searches for food often create distinctive conical holes in the soil. Males have a home range of approximately 5-20 hectares whilst females forage over smaller areas of about 2-3 hectares. Nest during the day in a shallow depression in the ground covered by leaf litter, grass or other plant material. Nests may be located under Grass trees Xanthorrhoea spp., blackberry bushes and other shrubs, or in rabbit burrows. The upper surface of the nest may be mixed with earth to waterproof the inside of the nest.	Species has the potential to occur at the site. Impact assessment provided in Section 3.3.2 of this REF.
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.	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
Eastern Pygmy-possum *Cercatetus nanus*	Vulnerable NSW BC Act	Rainforest, sclerophyll forest & woodland to heath – but heath & woodland preferred. Forages on banksias, eucalypts & bottlebrushes.	Species has the potential to occur at the site. Impact assessment provided in Section 3.3.2 of this REF.

Yellow-bellied Glider *Petaurus australis*	Vulnerable NSW BC Act Vulnerable EPBC Act	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south.	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
Squirrel Glider *Petaurus norfolcensis*	Vulnerable NSW BC Act	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey.	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.
Southern 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. No important habitat will be removed or otherwise affected.
Grey-headed Flying-fox *Pteropus poliocephalus*	Vulnerable *EPBC Act* Vulnerable *NSW* BC *Act*	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Unlikely to occur. No important habitat will be removed or otherwise affected.

Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris*	Vulnerable 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.	Unlikely to occur. No important habitat will be removed or otherwise affected.
Eastern Coastal Freetail-Bat *Micronomus norfolkensis*	*Vulnerable NSW* BC *Act*	Small tree hollows/fissures in bark for roosting in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.	Unlikely to occur. No important habitat will be removed or otherwise affected.
Eastern False Pipistrelle *Falsistrellus tasmaniensis*	Vulnerable *NSW* BC *Act*	Prefers moist habitat that contains trees greater than 20 m high with a dense understorey.	Unlikely to occur. No important habitat will be removed or otherwise affected.
Southern Myotis (Large-footed Myotis) *Myotis macropus*	Vulnerable *NSW* BC *Act*	This species is predominantly roosts in caves, however, is known to roost in trees and man- made structures close to water. Roosts are generally located close to water, where the bats forage in small groups of three or four. They have a strong association with streams and permanent waterways in areas that are vegetated rather than cleared (Churchill, S 2008, Australian Bats, Jacana Books, Crows Nest, NSW They feed on small fish, prawns and aquatic macroinvertebrates. They have a preference towards large still pools, rather than flowing streams. They will also forage an aerial insects flying over water. They use their large feet to capture prey items (Churchill 2008).	Unlikely to occur. No important habitat will be removed or otherwise affected.

Greater Broad-nosed Bat *Scoteanaux ruepelli*	Vulnerable *NSW* BC *Act*	Found mainly in gullies and river systems that drain the Great Dividing Range, it utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, below 500m, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m	Unlikely to occur. No important habitat will be removed or otherwise affected.
Large Bent-winged Bat *Miniopterus orianae oceanensis*	Vulnerable NSW BC Act	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	Unlikely to occur. No important habitat will be removed or otherwise affected.
Eastern Chestnut Mouse *Pseudomys gracillicaudatus*	Vulnerable NSW BC Act	In NSW the Eastern Chestnut Mouse mainly occurs north from the Hawkesbury River area as scattered records along to coast and eastern fall of the Great Dividing Range extending north into Queensland. There are however isolated records in the Jervis Bay area. In NSW the Eastern Chestnut Mouse is mostly found, in low numbers, in heathland and is most common in dense, wet heath and swamps.	Species has the potential to occur at the site. Impact assessment provided in Section 3.3.2 of this REF.
New Holland Mouse *Pseudomys novaehollandiae*	Vulnerable NSW BC Act Vulnerable Commonwealth EPBC Act	Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes.	Species has the potential to occur at the site. Impact assessment provided in Section 3.3.2 of this REF.
INSECTS			
Giant Dragonfly *Petalura gigantea*	Endangered *NSW* BC *Act*	Live in permanent swamps and bogs with some free water and open vegetation. Adults spend most of their time settled on low vegetation on or adjacent to the swamp. They hunt for flying insects over the swamp and along its margins.	No - No suitable habitat occurs on site. No important habitat will be removed or otherwise affected.

		Adults fly over the swamp and along its margins hunting for flying insects.	