ADDENDUM
REVIEW OF ENVIRONMENTAL FACTORS (REF)
BUSHFIRE APZ & HAZARD REDUCTION
SILVER STRAND Cct, HYAMS BEACH

This Addendum REF Document updates the initial REF (D20/388893) with:

- an assessment of additional works, including tree removal and pruning
- updates to legislation
- a determination by delegated authority

Contents

Document control:

Item	Details
Project	Bushfire hazard reduction works – Silver Strand Circuit, Cyrus Street and Lister Court – Hyams Beach
Client/Proponent	City Services, Shoalhaven City Council
Prepared By	City Services, Shoalhaven City Council

Document status

	Name*	Signature	Date
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*Review and endorsement statement:

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

Assessment and approvals overview

Item	Details
Assessment type	Division 5.1 (EP&A Act) - Review of Environmental Factors (REF)
Proponent	Shoalhaven City Council
Determining authority / authorities	Shoalhaven City Council
Required approvals (consents, licences and permits)	nil
Required publication	Yes – as a matter of public interest (Section 171(4)(c) of the NSW *Environmental Planning and Assessment Regulation 2021*).

1. PROPOSAL AND LOCATION

1.1 Proposed activity

The proposed activity is the undertaking of bushfire hazard reduction works comprising selective vegetation removal (including tree removal and pruning) in the vicinity of Silver Strand Circuit, Lister Court and Cyrus Street, Hyams Beach.

The proposed activity aims to implement the Shoalhaven Bush Fire Risk Management Plan and the NSW RFS 2018 Hyams Beach Preparation Plan. The proposed activity would also contribute to meeting Shoalhaven City Council's (SCC) obligations under Section 63 of the NSW *Rural Fires Act 1997* to take "*the notified steps (if any) any other practicable steps to prevent the occurrence of bush fires on, and to minimise the danger of the spread of a bush fire on or from…any land vested in or under its control or management, or any highway, road, street or thoroughfare, the maintenance of which is charged on the authority."*

The proposal involves the following hazard reduction works (Figure 1):

- Vegetation removal (including trees) and pruning to create a discontinuous canopy and separation from residential homes, within the road reserves of Silver Strand Circuit, Lister Court and Cyrus Street and within Lot 19 DP 740850 (Silver Strand Circle Reserve).
- Low-intensity mosaic burning within the riparian zone within Silver Strand Circle Reserve (Lots 18, 19 & 20 DP 740850), to be undertaken over time and at intervals set by NSW Rural Fire Service (RFS).
- Establishment and maintenance of a defendable space between the riparian corridor and 3 Cyrus St, involving removal of shrubs and pittosporum within 5-10m of the house. Works would be concentrated on flat ground at the top of the slope and would be with hand-held tools only *i.e.* brushcutters and chainsaws. Cut foliage would be removed from the site.

This REF also assesses subsequent maintenance in perpetuity of the bushfire hazard reduction treatments.

All works are to comply with the Shoalhaven Bush Fire Risk Management Plan (SBFMC 2018) (hereafter referred to as the BFRMP), the Hyams Beach Bush Fire Preparation Map (NSW RFS 2018), and the Bushfire Environmental Assessment Code for New South Wales (RFS 2021).

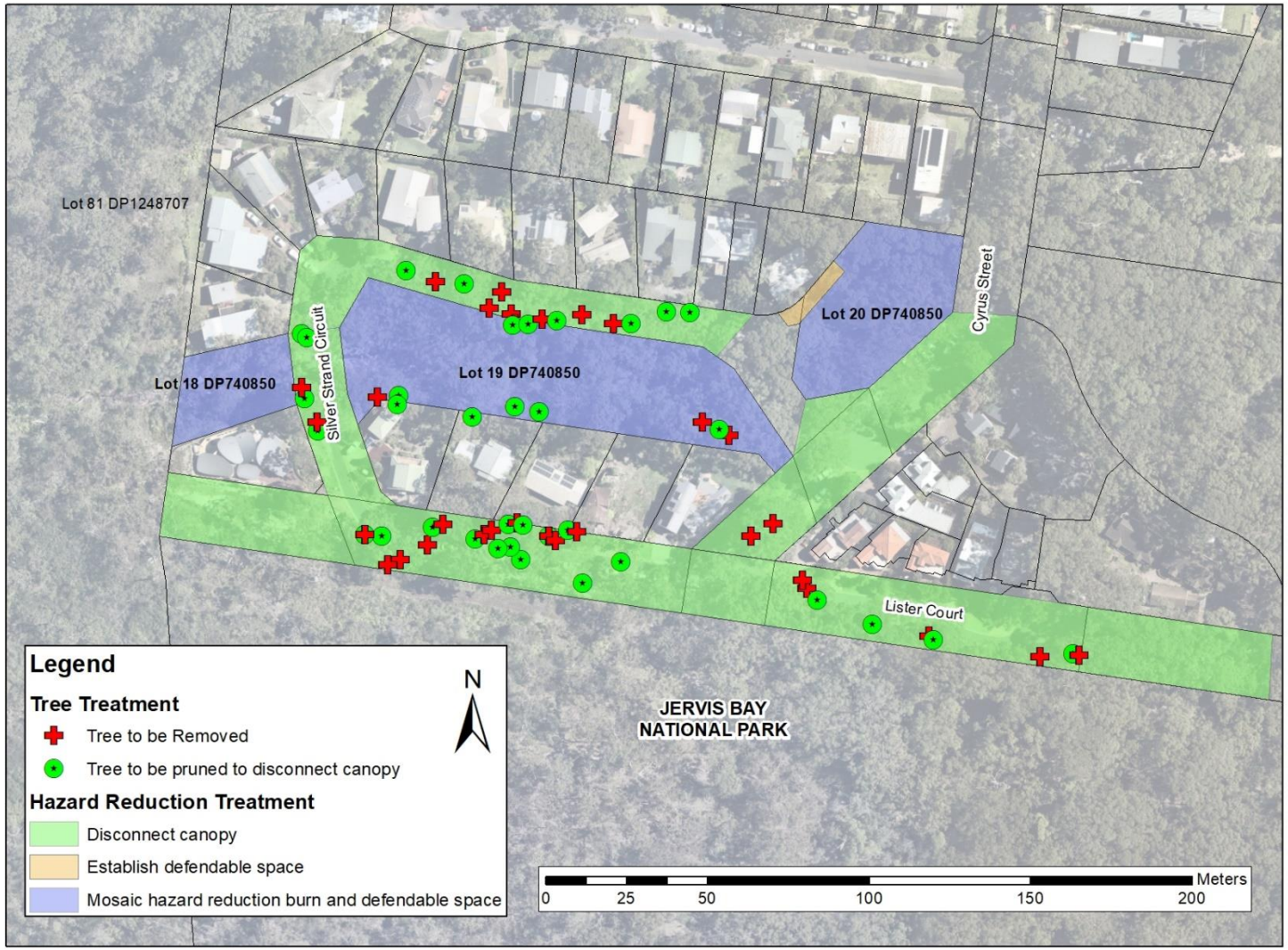
Other works which were initially proposed, including hazard reduction burns through the vegetation east of Cyrus St (within Lot 12 DP 38788 and Lot 17 DP 740851) were found to not be permissible without development consent, in addition to being considered inappropriate to achieve the outcome of reducing the risk of bushfire spread. These points are discussed in further detail in Sections 3.1 and 4.

Shoalhaven City Council (SCC) is the proponent and the determining authority under Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (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 Review of Environmental Factors (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.

This REF is to be reviewed and revised accordingly upon next revision of the Shoalhaven Bush Fire Risk Management Plan.

Figure 1. Site location and permissible treatment of vegetation



1.2 Location

The proposed activity would be undertaken within the road reserves of Silver Strand Circuit, Cyrus Street and Lister Court, in locations identified as Asset Protection Zones (APZs) under the BFRMP (SBFMC 2018), and Lots 18, 19 & 20 DP 740850 (refer to Figure 1).

1.3 Affected land

Pertinent information regarding land within the site, including that which would be affected by the proposal is presented in Table 1.

Table 1. Land affected by the proposed activity

Lot number / DP	***Common name***	***Owner / authority***	***Purpose***	***SCC Land Custodian***
Lot 18 DP 740850	Silver Strand Circle Reserve (Rsv: BHY522)	SCC	Freehold – Community Land (Natural Area - Bushland)	City Development – Environmental Services
Lot 19 DP 740850	Silver Strand Circle Reserve (Rsv: BHY522)	SCC	Freehold – Community Land (Natural Area - Bushland)	City Development – Environmental Services
Lot 20 DP 740850	Silver Strand Circle Reserve (Rsv: BHY522)	SCC	Freehold – Community Land (Natural Area - Bushland)	City Development – Environmental Services
-	Silver Strand Circuit	SCC	Road Reserve	Basin District Engineer
-	Cyrus Street	SCC	Road Reserve	Basin District Engineer
-	Lister Court	SCC	Road Reserve	Basin District Engineer

2. EXISTING ENVIRONMENT

2.1 Habitat and vegetation assessment

The site was surveyed by a Council Environmental Officer on 11th August 2020 from approximately 2.00pm until 4.00pm and on 26th August from approximately 1.00pm until 2.00pm. It was also more recently surveyed on 4 March 2024 as part of this addendum report. The surveys involved vegetation and habitat assessment, recording of all flora species within and immediately adjacent to the subject site, determination of vegetation communities, investigation of fauna signs, and targeted survey for potentially occurring threatened flora species (including threatened orchids, *Melaleuca biconvexa* and Magenta Lilly Pilly). The 4 March 2024 survey was to identify and map tree works.

Vegetation communities

Vegetation communities mapped as occurring within and immediately around the site are shown in Figure 2 and include:

PCT 694 (Biometric SR516) *Blackbutt - Turpentine - Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin* (Wet Sclerophyll Forests (Shrubby subformation))

PCT 659 (Biometric SR512) *Bangalay - Old-man Banksia open forest on coastal sands, Sydney Basin and South East Corner* (Dry Sclerophyll Forests (Shrubby subformation))

PCT 772 (Biometric SR531) *Coast Banksia - Coast Wattle dune scrub, Sydney Basin and South East Corner* (Dry Sclerophyll Forests (Shrubby subformation))

PCT 771 (Biometric SR530) *Coast Banksia – Coast Tea-tree low moist forest on coastal sands and headlands, Sydney Basin and South East Corner* (Dry Sclerophyll Forests (Shrubby subformation))

Site survey confirmed that PCT 694 (Biometric SR516) *Blackbutt - Turpentine - Bangalay moist open forest on sheltered slopes and gullies, southern Sydney Basin* (Wet Sclerophyll Forests (Shrubby subformation)), with strong riparian influence occurred through the site to the west of Cyrus St. To the east of Cyrus St, PCT 659 (Biometric SR512) *Bangalay - Old-man Banksia open forest on coastal sands, Sydney Basin and South East Corner* (Dry Sclerophyll Forests (Shrubby subformation)), occurred through to a narrow band of PCT 771 (Biometric SR530) *Coast Banksia – Coast Tea-tree low moist forest on coastal sands and headlands, Sydney Basin and South East Corner* (Dry Sclerophyll Forests (Shrubby subformation)) occurring parallel and adjacent to the beach.

Vegetation along the riparian corridor to the west of Cyrus Street is dominated by *Callicoma*, *Gahnia* and ferns, indicating that it remains a sheltered and wet environment for the majority of the time. Overstorey trees are dominated by Blackbutt and Bangalay, but also influenced by surrounding vegetation types.

On the western edge of the site (and to the south), the vegetation transitions to low woodland with a heathy/sedgy understorey with Scribbly Gum becoming prominent.

Vegetation to the east of Cyrus St is consistent with locally occurring Bangalay Sand Forest Endangered Ecological Community (EEC), dominated by large Blackbutt and Bangalay overstorey trees, with a somewhat open understorey becoming dominated by Sweet Pittosporum, and transitioning to dense Coastal Tea Tree in the hind dune.

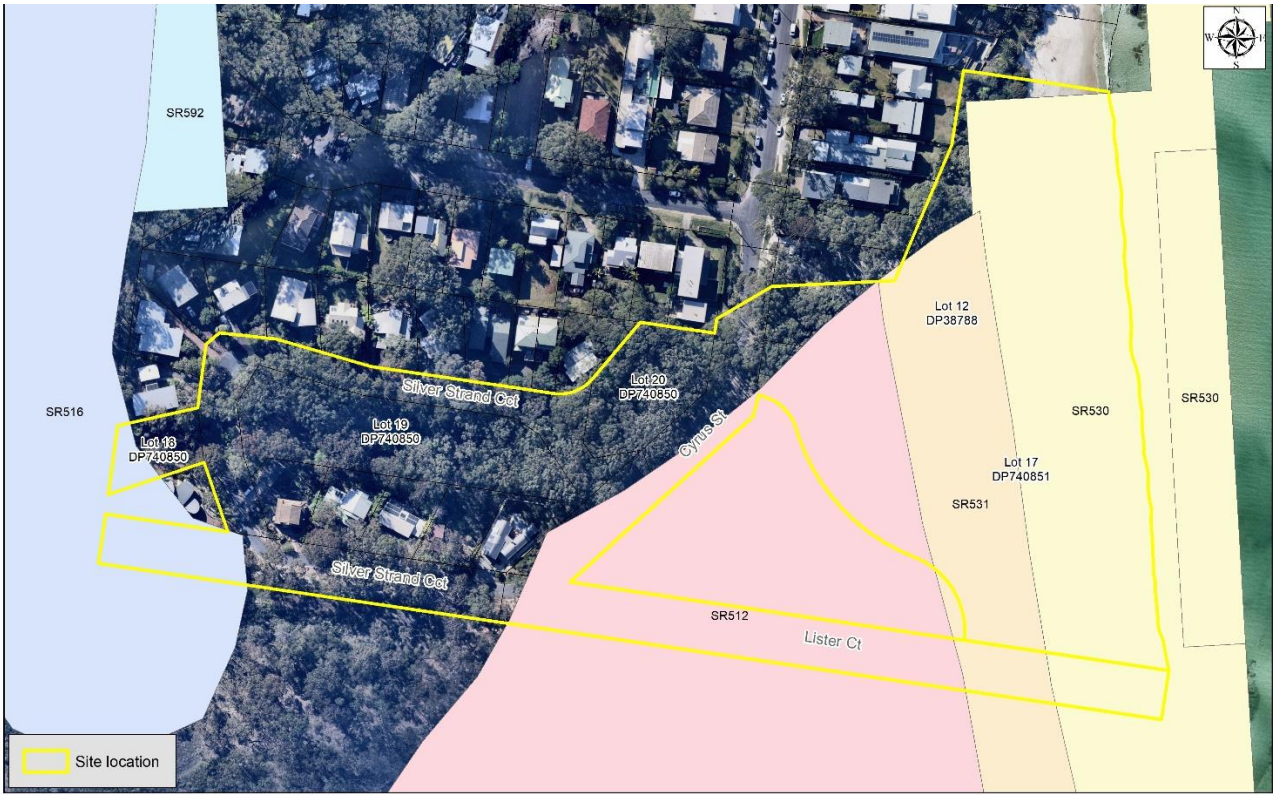
Overlapping, connected tree canopies occur through the majority of the road reserve area within the site, consisting of Blackbutt, Bangalay, Scribbly Gum, Red Bloodwood and Sydney Blue Gum trees, in addition to ornamental, exotic tree species.

A list of flora species recorded over the site is included as Table 2.

For the purpose of this assessment, the vegetation over the site has been mapped by vegetation class as per Keith (2006) to facilitate application of the Rural Fire Service guidelines (refer to Figure 3).

The vegetation throughout the site is in relatively intact condition.

Figure 2. Vegetation communities (Biometric type) mapped as occurring within and in proximity to the site



Habitat and targeted survey results

A meandering transect survey was undertaken through areas where works were initially proposed, to assess habitat features, record flora species and determine the presence and distribution of threatened flora species including Magenta Lilly Pilly *Syzygium paniculatum*, *Melaleuca biconvexa* and habitat suitability for locally occurring threatened orchids including *Prasophyllum affine* and *Cryptostylis hunteriana.*

Planted Syzygium trees (species uncertain) were noted, occurring on the northern edge of Silver Strand Circuit. These will be unaffected by the proposed activity.

No threatened flora or fauna species were observed during surveys and site inspections.

No targeted survey for potentially occurring fauna species was undertaken.

Trees were inspected for hollows, glider scars and evidence of South-eastern Glossy Black-Cockatoo *Calyptorhynchus lathami lathami* feeding. No South-eastern Glossy Black-Cockatoo feed trees were recorded. Habitat features were mapped (refer to Figure 3 and Table 3). The site contains a high number of habitat features, in addition to strong connectivity with expansive areas of intact vegetation, particularly to the west and south. In the absence of targeted surveys, the site is assumed to provide habitat for locally occurring threatened microbats, in addition to arboreal and terrestrial mammals.

Signs of Bandicoot foraging were observed in the Wet Sclerophyll Forest area and more prolifically in the Dry Sclerophyll Forest area (refer to Photo 6).

Signs of Glider feeding (scarred trees) were observed scattered through the Wet Sclerophyll Forest area (refer to Photo 6, Figure 3 and Table 3).

Potential habitat for threatened terrestrial orchids including *Prasophyllum affine, Cryptostylis hunteriana* and *Calochilus pulchellus* occurred at the western edge of the site where vegetation is characterised as low, open woodland with heath and sedge understorey over shallow, sandy soil (indicated in Figure 3 below). Targeted surveys have not been undertaken for these species as works are not proposed in the undisturbed parts of this area.

Table 2. Flora species recorded over the site

Wet Sclerophyll Forest (Shrubby subformation)		
Over-storey species		
Botanical name	**Common name**	**Occurrence**
Corymbia gummifera	Red Bloodwood	Common
Corymbia maculata	Spotted Gum	Uncommon
Eucalyptus botryoides	Bangalay	Common
Eucalyptus pilularis	Blackbutt	Common
Eucalyptus saligna	Sydney Blue Gum	Uncommon
Eucalyptus sclerophylla	Scribbly Gum	Occurring on western edge only
Mid-storey species		
Acacia irrorata	Green Wattle	Occasional
Acacia longifolia subsp *longifolia*	Sunshine Wattle	Common
Acmena smithii	Lilly Pilly	Occasional
Banksia ericifolia	Heath-leaved Banksia	Common
Banksia serrata	Old Man Banksia	Occasional
Banksia spinulosa	Hairpin Banksia	Occasional
Callicoma serratifolia	Callicoma	Very Common

Casuarina glauca	Swamp She-oak	Uncommon
Correa reflexa	Native Fuchsia	Uncommon
Elaeocarpus reticulatus	Blueberry Ash	Common
Hakea salicifolia	Willow-leaved Hakea	Occasional
Hakea teretifolia	Needlebush	Common
Kunzea ambigua	Tick Bush	Common
Leptospermum polygalifolium	Teatree	Common
Leucopogon lanceolatus	Lance Beard Heath	Occasional
Lomandra longifolia	Spiny Mat-rush	Common
Melaleuca ericifolia	Swamp Paperbark	Common
Melaleuca linarifolia	Flax-leaved Paperbark	Occasional
Melaleuca squarrosa	Scented Paperbark	Common
Notelaea longifolia	Mock Olive	Common
Persoonia laevis	Geebung	Uncommon
Persoonia linearis	Narrow-leaved Geebung	Occasional
Pittosporum undulatum	Sweet Pittosporum	Common
Ground-storey species		
Adiantum aethiopicum	Maidenhair Fern	Common
Bauera rubioides	River Rose	Common at western edge
Blechnum cartilagineum	Gristle Fern	Occasional
Calochlaena dubia	Rainbow Fern	Common
Caustis flexuosa	Curly Wig	Occasional
Entolasia marginata	Wiry Panic Grass	Common
Eustrephus latifolius	Wombat Berry	Occasional
Gahnia sieberiana	Red-fruit Saw-sedge	Very Common
Gleichenia dicarpa	Pouched Coral Fern	Very Common
Gonocarpus micranthus	Creeping Raspwort	Common at western edge
Gonocarpus teucrioides	Raspwort	Common
Goodenia heterophylla		Common at western edge
Hardenbergia violacea	Purple Coral Pea	Common
Hibbertia scandens	Golden Guinea Flower	Occasional
Histiopteris incisa	Batswing Fern	Occasional
Imperata cylindrica	Blady Grass	Common
Isopogon anemonifolius	Broad-leaf Drumsticks	Common at western edge
Lepidosperma filiforme		Common at western edge
Lepidosperma laterale	Sword Sedge	Common
Leptocarpus tenax		Common at western edge
Lepyrodia scariosa		Common at western edge
Lomandra glauca	Pale Mat-rush	Occasional
Lomandra longifolia	Spiny Mat-rush	Common
Lomandra multiflora	Many flowered Mat-rush	Occasional
Patersonia sericea	Silky Purple Flag	Occasional
Parsonsia straminea	Common Silk Pod	Occasional

Platylobium formosum	Handsome Flat-pea	Occasional
Pteridium esculentum	Bracken Fern	Common
Ptilothrix deusta		Common at western edge
Selaginalla uliginosa	Swamp Selaginella	Common at western edge
Schoenus melanostachys	Black Bog-rush	Occasional
Smilax glycinoides	Native Sarsparilla	Occasional
Sticherus flabellatus	Umbrella fern	Occasional
Themeda triandra	Kangaroo Grass	Occasional
Dry Sclerophyll Forest (Shrubby subformation)		
Over-storey species		
Eucalyptus botryoides	Bangalay	Common
Eucalyptus pilularis	Blackbutt	Common
Mid-storey species		
Acacia filicifolia	Fern-leaved Wattle	Occasional
Acacia maidenii	Maiden's Wattle	Common
Allocasuarina littoralis	Black She-oak	Occasional
Banksia serrata	Old-man Banksia	Common
Exocarpus cupressiformis	Cherry Ballart	Occasional
Homalanthus populifolius	Bleeding Heart	Uncommon
Leptospermum laevigatum	Tea-tree	Common
Monotoca elliptica	Tree Broom-heath	Common
Myoporum boninense	Boobialla	Uncommon
Notelaea longifolia	Mock Olive	Common
Pittosporum undulatum	Sweet Pittosporum	Common
Podocarpus spinulosus	Spiny-leaf Podocarpus	Common
Ground-storey species		
Calochlaena dubia	Rainbow fern	Patches in transition zone
Commelina cyanea	Scurvy Weed	Common
Dichondra repens	Kidney Weed	Common
Hibbertia scandens	Golden Guinea Flower	Common
Kennedia rubicunda	Dusky Coral Pea	Occasional
Lomandra longifolia	Spiny Mat-rush	Common
Pteridium esculentum	Bracken	Common

Figure 3. Habitat features over the site with proposed treatments

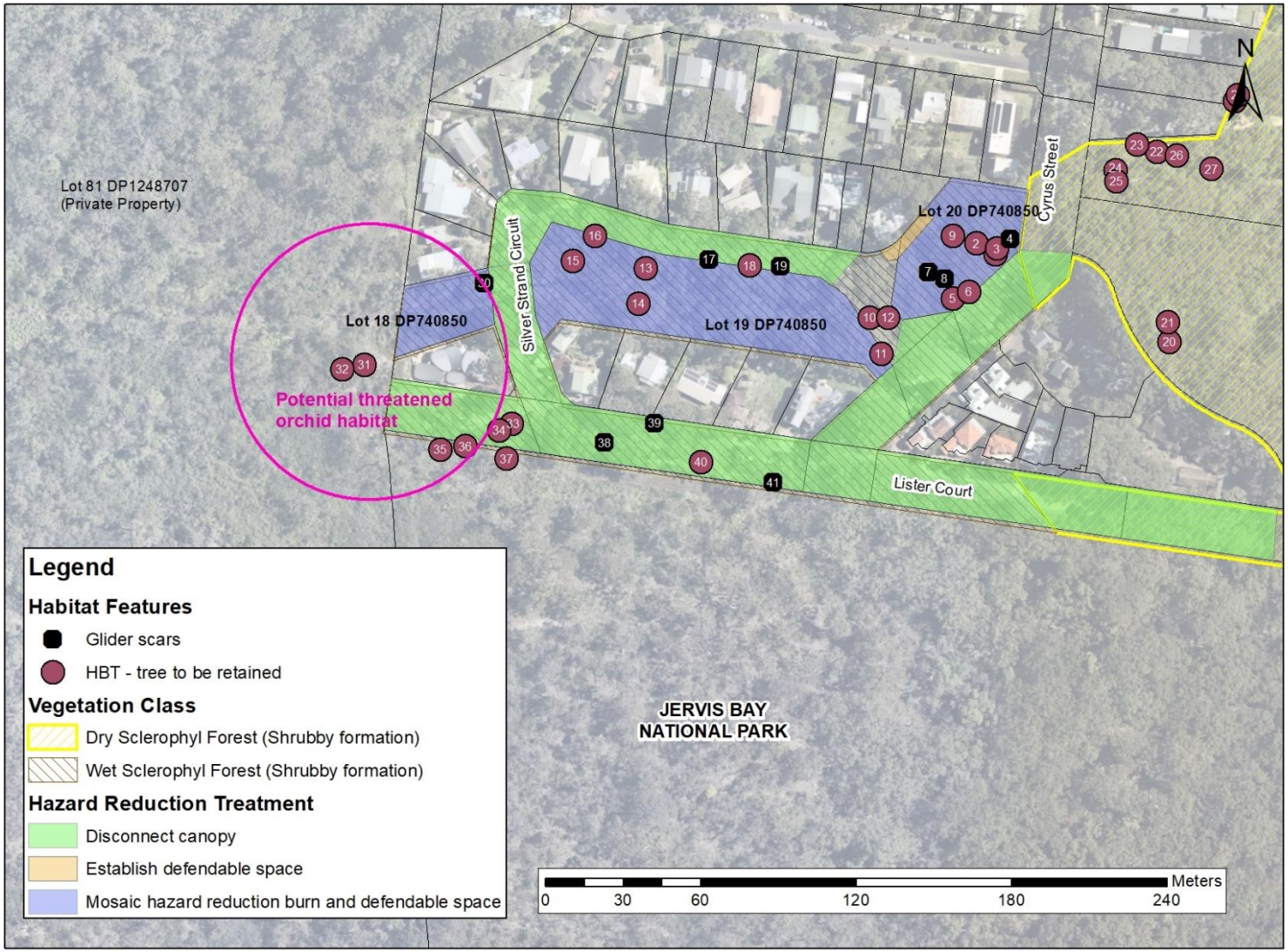


Table 3. Habitat features recorded within and in close proximity to the site

Number	Habitat type	Description
1	HBT	Blackbutt – multiple hollows
2	HBT	Blackbutt – multiple hollows
3	HBT	Blackbutt – apparent hollows
4	Glider scar tree	Red Bloodwood
5	HBT	Blackbutt – hollows
6	HBT	Stag with large chimney
7	Glider scar tree	Red Bloodwood
8	Glider scar tree	Red Bloodwood
9	HBT	Bangalay with significant hollow
10	HBT	Blackbutt – multiple hollows
11	HBT	Blackbutt
12	HBT	Blackbutt
13	HBT	Red Bloodwood – multiple hollows
14	HBT	Scribbly Gum – multiple hollows
15	HBT	Blackbutt with large spout
16	HBT	Blackbutt – multiple hollows
17	Glider scar tree	Red Bloodwood
18	HBT	Blackbutt – multiple hollows
19	Glider scar tree	Red Bloodwood
20	HBT	Blackbutt – multiple hollows
21	HBT	Bangalay – multiple hollows
22	HBT	Blackbutt – multiple significant hollows
23	HBT	Blackbutt – multiple hollows
24	HBT	Blackbutt
25	HBT	Bangalay
26	HBT	Bangalay
27	HBT	Blackbutt
28	HBT	Blackbutt
29	HBT	Blackbutt
30	Glider scar tree	Red Bloodwood
31	HBT	Red Bloodwood – multiple significant hollows
32	HBT	Scribbly Gum – multiple significant hollows
33	HBT	Scribbly Gum
34	HBT	Scribbly Gum
35	HBT	Scribbly Gum – multiple significant hollows
36	HBT	Red Bloodwood – large spout
37	HBT	Scribbly Gum – multiple significant hollows
38	Glider scar tree	Red Bloodwood
39	Glider scar tree	Red Bloodwood
40	HBT	Scribbly Gum – multiple significant hollows
41	Glider scar tree	Red Bloodwood

Photo 1. Riparian corridor west of Cyrus Street

Photo 2. Western edge of site – vegetation transitioning into low woodland with heath and sedge (facing east)

Photo 3. Interface of riparian corridor and houses on southern side of Silver Strand Circuit (facing west).

Photo 4. Bangalay Sand Forest occurring east of Cyrus Street – not affected by the proposed activity

Photo 5. North-east portion of site – interface between houses and beach (facing north).

Photo 6. Glider scar tree (left). Bandicoot foraging (right)

Photo 7. Proposed clearing and pruning to create discontinuous canopy on northern part of Silver Strand Cct (left), Cyrus St (middle) and the southern part of Silver Strand Cct into Lister Ct (right)

3. ASSESSMENT OF LIKELY ENVIRONMENTAL IMPACTS

3.1 Impacts associated with the proposal

Refer to Figure 1 for treatment of vegetation over the site.

The proposal involves:

- Vegetation removal and pruning to create a discontinuous canopy where permissible, within the road reserves of Silver Strand Circuit, Lister Court and Cyrus Street (refer to Figure 1 and Photo 7). Tree canopies shall be separated by a distance of 2 to 5m in accordance with *Planning for Bushfire Protection* (NSW RFS 2019). No identified habitat trees (refer to Figure 3) shall be removed. Preference shall be given to pruning branches in order to create a discontinuous canopy.
- Tree removal to create a discontinuous canopy would involve the removal of trees described in Section 3.2 below:
- A low-intensity mosaic burn within the riparian zone within Silver Strand Circuit, to be undertaken over time by Rural Fire Service and not involving fire breaks or any other vegetation removal. *NOTE: MUCH OF THIS WORK HAS BEEN UNDERTAKEN PURSUANT TO THE INITIAL REF BUT IS RETAINED IN THIS ADDENDUM TO PROVIDE FOR SUCCESSIVE BURNS AT APPROPRIATE AND ALLOWABLE INTERVALS (E.G. NSWRFS 2021).*
- Establishment and maintenance of a defendable space between the riparian corridor and 3 Cyrus St, involving removal of shrubs and pittosporum within 5-10m of the house. Works would be concentrated on flat ground at the top of the slope and would be with hand-held tools only *i.e* brushcutters and chainsaws. Cut foliage would be removed from the site. No trees greater than 10cm DBH shall be removed. *NOTE: THIS WORK HAS BEEN UNDERTAKEN PURSUANT TO THE INITIAL REF BUT IS RETAINED IN THIS ADDENDUM TO PROVIDE FOR THE MAINTENANCE OF THIS SPACE.*

The composition of vegetation through the riparian corridor to the west of Cyrus St (dominated by Paperbark species, *Callicoma, Gahnia*, and numerous fern species) indicates that the area remains sheltered and wet. This area in its current state, is naturally resistant to bushfire threat and would become less resistant if opened through removal of vegetation, particularly through the shrub layer. The low-intensity mosaic burn would target drier shrubs and leaf litter, and not affect wet areas and vegetation of low-flammability. Vegetation removal and pruning works shall therefore only be applied to trees to achieve separation between house and tree canopy and shall not involve any removal of understorey vegetation.

3.2 Tree removal and pruning

The proposed activity would result in the removal of 36 trees and large shrubs and the pruning of 35 trees. The 36 trees and large shrubs to be removed comprise:

- 11 Blackbutts *Eucalyptus pilularis* from 150 to 600 mm diameter and breast height (dbh)
- 4 Scribbly Gums *E. sclerophylla* - one multi-stem and the others 100 to 400 mm dbh

- 1 Sydney Blue Gum *E. saligna* 150 mm dbh
- 2 Bangalays *E. botryoides* 100 to 150 mm dbh
- 3 Red Bloodwoods *Corymbia gummifera* 250 to 400 mm dbh
- 1 Spotted Gum *C. maculata* 200 mm dbh
- 3 Maiden's Wattles *Acacia maidenii*
- 6 Green Wattles *A. irrorata*
- 1 Callicoma *Callicoma serratifolia*
- 3 Willow-leaved Hakea *Hakea salicifolia*
- 1 Norfolk Island Pine *Araucaria heterophylla*

The impact caused by the by the vegetation removal is not significant for the following reasons:

- The trees and shrubs affected are common species.
- There are no plants in this area listed in the threatened species schedules of the NSW *Biodiversity Conservation Act 2016* (NSW BC Act) or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Fauna species listed in the threatened species schedules of the NSW BC Act and the EPBC Act are not likely to reside in this location or rely on this vegetation for food, refuge or breeding (refer to Section 3.3 and 3.4 of this REF).
- The clearing would not have a significant impact on an endangered ecological community listed under the NSW BC Act or EPBC Act (refer to Sections 3.3 and 3.4 of this REF).
- The vegetation is not within a riparian area of a waterway.
- The vegetation does not appear to provide important food sources for locally occurring threatened species and does not appear to contain nests or hollows.
- The vegetation is not mapped on the Biodiversity Values Map administered for the purposes of the NSW *Biodiversity Conservation Act 2016.*
- The purpose of the works is to reduce the bushfire risk to life and property in this area of Hyams Beach.

An environmental impact statement (EIS) is therefore not considered warranted.

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.

- ***Part 7A Fisheries Management Act 1994***

Part 7A relates to threatened species conservation. As the proposed activity would not affect aquatic environments, this section of the Act is not relevant and further consideration is unnecessary.

- ***Part 7 Biodiversity Conservation Act 2016***

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

- Pretty Beard Orchid *Calochilus pulchellus*
- Leafless Tongue Orchid *Cryptostylis hunteriana*
- Jervis Bay Leek Orchid *Prasophyllum affine*
- Giant Burrowing Frog *Heleioporus australiacus*
- Eastern False Pipistrelle *Falsistrellus tasmaniensis*
- Eastern Freetail-Bat *Micronomus norfolkensis*
- Greater Broad-nosed Bat *Scoteanaux ruepelli*
- Southern Myotis (Large-footed Myotis) *Myotis macropus*
- Dusky Woodswallow *Artamus cyanopterus cyanopterus*
- Gang-gang Cockatoo *Callocephalon fimbriatum*
- South-eastern Glossy Black-cockatoo *Calyptorhynchus lathami lathami*
- Little Lorikeet *Glossopsitta pusilla*
- Masked Owl *Tyto novaehollandiae*
- Powerful Owl *Ninox strenua*
- Square-tailed Kite *Lophoictinia isura*
- Varied Sittella *Daphoenositta chrysoptera*
- White-bellied Sea-Eagle *Haliaeetus leucogaster*
- Grey-headed Flying-fox *Pteropus poliocephalus*
- Southern Brown Bandicoot (eastern) *Isoodon obesulus obesulus*
- Squirrel Glider *Petaurus norfolcensis*
- Yellow-bellied Glider *Petaurus australis*
- *Bangalay Sand Forest in the Sydney Basin and South East Corner Bioregions* endangered ecological community

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.

Terrestrial orchids: Pretty Beard Orchid (*Calochilus pulchellus*), Leafless Tongue Orchid (*Cryptostylis hunteriana*), Jervis Bay Leek Orchid (*Prasophyllum affine*)

Calochilus pulchellus is known from the Sydney Basin Bioregion, where a total of less than 30 adult plants have been recorded in three sites over a range of 40 km on the South Coast of NSW,

at altitudes from 20-560 m above sea level. All currently known sites are within the Shoalhaven Local Government Area. Occurrence in small, widely separated colonies is not unusual in the genus. The cryptic nature of the species, with a single leaf above ground for only a few months and a flowering stem lasting a few days or a week, makes detection difficult for most of the year. It is likely that additional scattered individuals and small colonies exist within the area of occurrence. The life cycle of *C.pulchellus* is typical for temperate zone members of the genus, with the leaf emerging from a subterranean tuber in mid-winter, and flowering occurring from late October to late November, with only one or two flowers open at a time and each flower lasting only 2-4 days. The plant dies back to tubers in later summer. Over time the species is probably reliant on recruitment from seed rather than vegetative persistence. 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. In Morton National Park on the Little Forest Plateau it occurs in low heath among scattered clumps of emergent eucalypts and Banksia in shallow coarse white sand over sandstone, in a near-escarpment area subject to strong orographic precipitation (OEH 2018b).

Cryptostylis hunteriana produces an upright flower-stem to 45 cm tall, bearing five to 10 flowers dominated by an erect narrow very hairy ‘tongue’ (the labellum) between November (early flowering in October observed) and February (late flowering in March observed). It is known historically from a number of localities on the NSW south coast and has been observed in recent years at many sites between Batemans Bay and Nowra (although it is uncommon at all sites). This orchid does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. However, 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*), with a preference for open areas in the understorey of this community and often found in association with the Large Tongue Orchid (*C. subulata*) and the Tartan Tongue Orchid (*C. erecta*). In addition to reproducing from seed, it is also capable of vegetative reproduction and thus forms colonies which can become more or less permanent at a site (OEH 2019a; TSSC 2008).

Prasophyllum affine is a ground orchid which produces a single onion-like leaf that can grow to 40 cm long. Up to 35 flowers are produced on a cylindrical stalk that emerges from about two thirds of the way up the hollow leaf. Each flower is about 9 mm across and flower colour varies between plants. 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. This orchid grows on poorly drained grey clay soils that support low heathland and sedgeland communities. The underground dormant tubers commence shooting in mid-winter and leaves are known to have emerged above ground by June. The flowering period reliably commences in the first week of November and extends for about 3 weeks. Pollination is primarily by specialised wasp species. The primary pollinator is the male of one species and they are attracted to the orchid flowers by a scent of the flower that mimics that of the female wasp. The fruit (small green ovoid capsules) develop rapidly following flowering and eventually split to release fine dust-like seeds. Each capsule contains thousands of seeds that are primarily wind

dispersed. By January the leaves and fruiting stems have withered and the plants then persist as underground tubers until they resprout the following winter (OEH 2018a).

Marginal potential habitat exists for each of these terrestrial orchid species, at the western edge of the site where the riparian corridor transitions to low woodland with a heathy/sedgy understorey on shallow, sandy soil (refer to Photo 2 and Figure 3).

Targeted surveys were not undertaken for these species and they are therefore assumed to be potentially occurring. Surveys around October-November through suitable on-site habitat, following confirmation of flowering of each respective species at local reference sites, would need to be undertaken to locate or otherwise discount each of these species as occurring within the site.

Within areas where potential habitat for these terrestrial orchids occurs (at the south-western corner of Silver Strand Circuit), the proposal involves the continual removal and pruning of native trees to create a discontinuous canopy between the site and adjacent vegetation to the south and west (refer to Photo 2) of Silver Strand Circuit, in addition to mosaic burning.

The groundlayer vegetation and soil shall not be removed or disturbed. The canopy layer is already quite open and the removal of branches to create a discontinuous canopy would have a negligible effect on the microclimate beneath. The low-intensity mosaic burn would not affect the tubers of any terrestrial orchids occurring within the soil. While some terrestrial orchid species are stimulated by fire, some terrestrial orchids have been observed as being inhibited by fire, however the reduction in flowering usually lasts for one season only (Jones 1988).

Potential habitat for these species will therefore not be removed or substantially degraded by the proposed works and the low-intensity mosaic burn would not significantly impact Pretty Beard Orchid (*Calochilus pulchellus*), Leafless Tongue Orchid (*Cryptostylis hunteriana*) or Jervis Bay Leek Orchid (*Prasophyllum affine*) if present.

Any works occurring within this area during October to November shall be preceded by a site survey conducted by Council's Environmental Officer to determine the presence or absence of threatened terrestrial orchids and thereby avoid potential trampling or burning of flowering and fruiting plants.

It is considered unlikely therefore that Pretty Beard Orchid (*Calochilus pulchellus*), Leafless Tongue Orchid (*Cryptostylis hunteriana*) and Jervis Bay Leek Orchid (*Prasophyllum affine*) would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

Giant Burrowing Frog (*Heleioporus australiacus*)

The Giant Burrowing Frog (GBF) usually lives along clear, small, slowly flowing water courses which traverse plateaus and broad upland gullies. They also live adjacent to stream head-waters where they prefer permanently moist soaks and pondages. Many breeding sites have been found to be associated with shallow temporary ponds receiving seepage and the ponded sections of slow flowing creeks that drain ridges and plateaus. GBFs have not been recorded breeding in waters that are even mildly polluted and are adversely affected by small pH changes. Burrows are

excavated into the earth around, or associated with rocks fissures or boulders, probably to take advantage of water run-off from outcroppings. It has also been reported that yabbie holes are utilised along the beds and banks of drying creeks. Opportunistic use of the excavations of small mammals may also be made. The tadpoles are quite easy to distinguish and unlikely to be confused with other species within its range and are often present over extended periods due to their slow growth rate. They can attain a very large size prior to metamorphosis (up to 75mm), are relatively short-tailed and very dark brown to blackish dorsally and bluish-grey ventrally. (NPWS 2001). This frog 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 2017e). 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. Individuals move into the breeding site either immediately before or following heavy rain and occupy these sites for up to 10 days. Most individuals will not attempt to breed every year. 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. Tadpole development ranges from around 12 weeks duration to up to 12 months with late developing tadpoles overwintering and completing development when warmer temperatures return (OEH 2017e).

The site contains marginal potential habitat for the GBF within the upper riparian corridor, west of Cyrus St.

Ground-layer vegetation and soil shall not be removed or disturbed from within the riparian corridor. The canopy layer is already quite open and the selective removal of trees and pruning of branches to create a discontinuous canopy around the edge of the riparian corridor, would have a negligible effect on the microclimate beneath.

The low-intensity mosaic burn would be unlikely to affect refuge habitat that the GBF would utilise. Potential breeding habitat (i.e. pools within the creek) would not be affected.

The proposal will not result in increased sediment deposition within the creek line. Potential habitat for the GBF will therefore not be removed or degraded by the proposed works.

The proposal would not result reduction of available habitat, fragmentation of habitat or severing of movement corridors.

It is considered unlikely therefore that the Giant Burrowing Frog would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of

the species such that a viable local population of this species is likely to be placed at risk of extinction.

Hollow-dependent microchiropteran bats: Eastern False Pipistrelle (*Falsistrellus tasmaniensis*); Eastern Bentwing-bat (*Miniopterus orianae oceanensis*); Greater Broad-nosed Bat (*Scoteanax rueppellii*); Southern Myotis (Large-footed Myotis) *Myotis macropus*

The Eastern False Pipistrelle prefers moist habitats, with trees taller than 20m. It generally roosts in eucalypt hollows but has also been found under loose bark on trees or in buildings, however roost requirements poorly known. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy. Hibernates in winter. Females are pregnant in late spring to early summer (OEH 2017b).

The Eastern Freetail-Bat (*Micronomus norfolkensis*) occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. The species roosts mainly in tree hollows but will also roost under bark or in man-made structures. It will usually change breeding sites regularly (every few days), rendering it very difficult to confirm breeding sites. It has been known to occasionally aggregate in large breeding groups (including in buildings). It is usually solitary but has also been recorded roosting communally. The Eastern Freetail-Bat is considered to be probably insectivorous (OEH 2017c).

Greater Broad-nosed Bat (*Scoteanax rueppellii*) utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, 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. The species forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species. Little is known of its reproductive cycle, however a single young is born in January; prior to birth, females congregate at maternity sites located in suitable trees, where they appear to exclude males during the birth and raising of the single young (OEH 2017g).

Southern Myotis (*Myotis macropus*) generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, stormwater channels, buildings, under bridges and in dense foliage. The species is dependent on waterways with pools of 3m wide or greater for foraging, with habitat surrounding the waterways (usually within 200m) being used for breeding and roosting. The species will forage over streams and pools catching insects and small fish by raking their feet across the water surface. In NSW females have one young each year usually in November or December (OEH 2017m).

The site contains suitable roosting (HBTs) and foraging habitat for the Eastern False Pipistrelle, Eastern Freetail-Bat, Greater Broad-nosed Bat and Southern Myotis.

The proposal would modify some potential foraging habitat through selective removal of trees and pruning of branches to create a discontinuous canopy. The site would therefore retain a treed canopy and extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of these species. The selective removal and pruning of trees within the

site to disconnect canopies would represent only a negligible reduction in available foraging habitat in the locality. The proposal would not result in fragmentation of habitat or severing of movement corridors.

No HBTs would be removed. Potential roosting and breeding habitat for these species would therefore not be impacted.

Removal and pruning of trees would occur during typical construction work hours and is therefore unlikely to impact nocturnal foraging activities of these species.

It is considered unlikely therefore that the Eastern False Pipistrelle, Eastern Freetail-Bat, Greater Broad-nosed Bat and Southern Myotis would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)

The Dusky Woodswallow is a medium-sized bird (16-19.5 cm, 35 g), mostly dark grey-brown with a merging to blackish on its longish tail. The species is widespread in eastern, southern and south western Australia, occurring throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. The Dusky Woodswallow primarily inhabits 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 being found in farmland, usually at the edges of forest or woodland. The species primarily eats invertebrates, mainly insects, which are captured whilst hovering or sallying above the canopy or over water and occasionally will take nectar, fruit and seed. It also frequently hovers, sallies and pounces under the canopy, primarily over leaf litter and dead timber. Depending on location and local climatic conditions (primarily temperature and rainfall), the Dusky Woodswallow can be resident year round or migratory. In NSW, after breeding, birds migrate to the north of the state and to south-eastern Queensland, while Tasmanian birds migrate to south-eastern NSW after breeding. Migrants generally depart between March and May, heading south to breed again in spring. There is some evidence of site fidelity for breeding. Although Dusky Woodswallows generally breed as solitary pairs or occasionally in small flocks, large flocks may form around abundant food sources in winter. Large flocks may also form before migration, which is often undertaken with other species. The species nests in an open, cup-shape, made of twigs, grass, fibrous rootlets and occasionally casuarina needles, and may be lined with grass, rootlets or infrequently horsehair, occasionally unlined. Nest sites vary greatly, but generally occur in shrubs or low trees, living or dead, horizontal or upright forks in branches, spouts, hollow stumps or logs, behind loose bark or in a hollow in the top of a wooden fence post. Nest sites may be exposed or well concealed by foliage (OEH 2017a).

The site contains potential foraging and breeding habitat for the Dusky Woodswallow.

The proposal would modify some potential foraging habitat through selective removal of trees and pruning of branches to create a discontinuous canopy. The site would therefore retain a treed canopy and extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of these species. The selective removal and pruning of trees within the site to disconnect canopies would represent only a negligible reduction in available foraging habitat in the locality. The proposal would not result in fragmentation of habitat or severing of movement corridors. The species is highly mobile and would vacate the site if at risk of threat.

It is considered unlikely therefore that the Dusky Woodswallow would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

Gang-gang Cockatoo (*Callocephalon fimbriatum*)

In spring and summer, the Gang-gang Cockatoo is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. May also occur in sub-alpine Snow Gum (*Eucalyptus pauciflora*) woodland and occasionally in temperate rainforests. Gang-gang Cockatoo favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts (OEH 2017d). Suitable hollows are usually vertical or points steeply upward (Morcombe 2004). Breeding is generally from October to January. Feeds on seeds, nuts and berries (Morcombe 2004).

The site contains suitable foraging habitat in addition to potential nesting and breeding habitat (HBTs) for the Gang-gang Cockatoo.

The proposal would modify some potential foraging habitat through selective removal of trees and pruning of branches to create a discontinuous canopy. The site would therefore retain a treed canopy and extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of these species. The selective removal and pruning of trees within the site to disconnect canopies would represent only a negligible reduction in available foraging habitat in the locality. The proposal would not result in fragmentation of habitat or severing of movement corridors. No HBTs would be removed as a part of the proposal. Potential nesting and breeding habitat for the species would therefore not be impacted.

The species is highly mobile and would vacate the site if at risk of threat.

The proposal would not result in fragmentation of habitat or severing of movement corridors. No HBTs that could be breeding habitat would be removed.

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

South-eastern Glossy Black-cockatoo (*Calyptorhynchus lathami lathami*)

The South-eastern Glossy Black-cockatoo (SGBC) inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of She-oak occur. Black She-oak (*Allocasuarina littoralis*) and Forest She-oak (*A. torulosa*) are important foods. Inland populations feed on a wide range of She-oaks, including Drooping She-oak, *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 She-oak, but also recorded in open woodlands dominated by Belah (*Casuarina cristat*a). The species feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species), shredding the cones with the massive bill. SGBC is dependent on large hollow-bearing eucalypts for nest sites. A single egg is laid between March and May (OEH 2017f).

The site contains potential nesting and breeding habitat (HBTs) for the SGBC. The site contains a small number of young Black She-oaks (*Allocasuarina littoralis*), but no evidence of feeding on this species was observed, suggesting that Glossy Black-Cockatoos do not rely on feed resources within the site.

The proposal would modify some potential foraging habitat through selective removal of trees and pruning of branches to create a discontinuous canopy. The site would therefore retain a treed canopy and extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of these species. The selective removal and pruning of trees within the site to disconnect canopies would represent only a negligible reduction in available foraging habitat in the locality. The proposal would not result in fragmentation of habitat or severing of movement corridors. No HBTs would be removed as a part of the proposal. Potential nesting and breeding habitat for the species would therefore not be impacted.

The species is highly mobile and would vacate the site if at risk of threat.

The proposal would not result in fragmentation of habitat or severing of movement corridors. No HBTs would be removed.

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

Little Lorikeet (*Glossopsitta pusilla*)

The Little Lorikeet 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. The species feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards. The Little Lorikeet is gregarious, travelling and feeding in small flocks (<10), though often with other lorikeets. Flocks numbering hundreds are still occasionally observed and may have been the norm in past centuries. The species roosts in

treetops, often distant from feeding areas. Nests are 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. The nesting season extends from May to September. In years when flowering is prolific, Little Lorikeet pairs can breed twice, producing 3-4 young per attempt. However, the survival rate of fledglings is unknown (OEH 2017i).

The site contains marginal foraging habitat and potential nesting and breeding habitat (HBTs) for the Little Lorikeet.

The proposal would modify some potential foraging habitat through selective removal of trees and pruning of branches to create a discontinuous canopy. The site would therefore retain a treed canopy and extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of these species. The selective removal and pruning of trees within the site to disconnect canopies would represent only a negligible reduction in available foraging habitat in the locality. The proposal would not result in fragmentation of habitat or severing of movement corridors. No HBTs would be removed as a part of the proposed activity. Potential nesting and breeding habitat for the species would therefore not be impacted.

The species is highly mobile and would vacate the site if at risk of threat.

The proposal would not result in fragmentation of habitat or severing of movement corridors.

It is considered unlikely therefore that the Little Lorikeet would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

Masked Owl (*Tyto novaehollandiae*)

The Masked Owl lives in dry eucalypt forests and woodlands from sea level to 1100m. The species is a forest owl, 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 from May-Aug in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting (OEH 2017j).

The site contains suitable foraging habitat and potential nesting and breeding habitat (HBTs) for the Masked Owl.

The proposal would modify some potential foraging habitat through selective removal of trees and pruning of branches to create a discontinuous canopy. The site would therefore retain a treed canopy and extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of these species. The selective removal and pruning of trees within the site to disconnect canopies would represent only a negligible reduction in available foraging habitat in the locality. The proposal would not result in fragmentation of habitat or severing of movement corridors. No HBTs would be removed as a part of the proposed activity. Potential nesting and breeding habitat for the species would therefore not be impacted.

The proposal would not result in fragmentation of habitat or severing of movement corridors.

Removal of trees would occur during typical construction work hours and is therefore unlikely to impact nocturnal foraging activities of the species.

It is considered unlikely therefore that the Masked Owl would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

Powerful Owl (*Ninox strenua*)

The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The species requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day 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 eucalypt species. The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. There may be marked regional differences in the prey taken by Powerful Owls. For example in southern NSW, Ringtail Possum make up the bulk of prey in the lowland or coastal habitat. At higher elevations, such as the tableland forests, the Greater Glider may constitute almost all of the prey for a pair of Powerful Owls. Flying foxes are important prey in some areas; birds comprise about 10-50% of the diet depending on the availability of preferred mammals. As most prey species require hollows and a shrub layer, these are important habitat components for the owl. Pairs of Powerful Owls demonstrate high fidelity to a large territory, the size of which varies with habitat quality and thus prey densities. In good habitats 400 hectares can support a pair; where hollow trees and prey have been depleted the owls need up to 4000 hectares. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old. While the female and young are in the nest hollow, the male Powerful Owl roosts nearby (10-200 m away) guarding them, often choosing a dense "grove" of trees that provide concealment from other birds. Powerful Owls are monogamous and mate for life. Nesting occurs from late autumn to mid-winter (generally May-Aug) but is slightly earlier in north-eastern NSW (late summer - mid autumn). Clutches consist of two dull white eggs and incubation lasts approximately 38 days (OEH 2017k).

The site contains suitable foraging habitat and potential nesting and breeding habitat (HBTs) for the Powerful Owl.

The proposal would modify some potential foraging habitat through selective removal of trees and pruning of branches to create a discontinuous canopy. The site would therefore retain a treed canopy and extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of these species. The selective removal and pruning of trees within the site to disconnect canopies would represent only a negligible reduction in available foraging habitat in the locality. The proposal would not result in fragmentation of habitat or severing of movement corridors. No HBTs would be removed as a part of the proposal. Potential nesting and breeding habitat for the species would therefore not be impacted.

The proposal would not result in fragmentation of habitat or severing of movement corridors. No HBTs would be removed.

Removal of trees would occur during typical construction work hours and is therefore unlikely to impact nocturnal foraging activities of the species.

It is considered unlikely therefore that the Powerful Owl would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

Square-Tailed Kite *Lophoictinia isura*

The Square-tailed Kite is a reddish, medium-sized, long-winged raptor. A key character in flight is the long fingered, upswept wings with a large white patch at the base of the barred 'fingers'. In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast, arriving in September, and leaving by March. Breeding is from July to February, with nest sites generally located along or near watercourses, in a fork or on large horizontal limbs. The Square-tailed Kite is found in a variety of timbered habitats including dry woodlands and open forests, showing a particular preference for timbered watercourses. It appears to occupy large hunting ranges of more than 100km^2. In arid north-western NSW, it has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland. This raptor is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage (OEH 2017n).

The site contains potential roosting habitat in addition to potential nesting and breeding habitat for the Square-tailed Kite. No evidence of large stick nests was observed within the site.

The proposal would modify some potential foraging habitat through selective removal of trees and pruning of branches to create a discontinuous canopy. The site would therefore retain a treed canopy and extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of these species. No large trees with stick nests would be removed. Potential nesting and breeding habitat for the species would therefore not be impacted. The proposal would not result in fragmentation of habitat or severing of movement corridors.

The species is highly mobile and unlikely to remain within the site during the undertaking of the hazard reduction and tree removal activities.

It is considered unlikely therefore that the Square-tailed Kite would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

Varied Sittella *Daphoenositta chrysoptera*

The Varied Sittella is a small and highly mobile species. Varied Sittellas are more active and acrobatic among branches than the larger treecreepers. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. It feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree

canopy. It builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years (OEH, 2017p).

The site contains marginal suitable foraging habitat for the Varied Sittella.

The species is highly mobile and would vacate the site if at risk of threat.

The proposal would modify some potential foraging habitat through selective removal of trees and pruning of branches to create a discontinuous canopy. The site would therefore retain a treed canopy and extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of these species. The selective removal and pruning of trees within the site to disconnect canopies would represent only a negligible reduction in available foraging habitat in the locality. The proposal would not result in fragmentation of habitat or severing of movement corridors.

It is considered unlikely therefore that the Varied Sittella would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

White-bellied Sea-Eagle *Haliaeetus leucogaster*

The White-bellied Sea-eagle is distributed around the Australian coastline, including Tasmania, and well inland along rivers and wetlands of the Murray Darling Basin. In New South Wales it is widespread along the east coast, and along all major inland rivers and waterways. Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. It occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). The species feeds mainly on fish and freshwater turtles, but also waterbirds, reptiles, mammals and carrion. It hunts its prey from a perch or whilst in flight (by circling slowly, or by sailing along 10–20 m above the shore). Prey is usually carried to a feeding platform or (if small) consumed in flight, but some items are eaten on the ground. 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. Typically, two eggs are laid between June and September with young birds remaining in the nest for 65-70 days. The White-bellied Sea-Eagle may be solitary, or live in pairs or small family groups consisting of a pair of adults and dependent young (OEH 2019b).

The site contains potential roosting habitat in addition to potential nesting and breeding habitat for the White-bellied Sea-eagle. No evidence of large stick nests was observed within the site.

The proposal would modify some potential foraging habitat through selective removal of trees and pruning of branches to create a discontinuous canopy. The site would therefore retain a treed canopy and extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of these species. No large emergent trees with emergent dead branches would be removed. Potential nesting and breeding habitat for the species would therefore not be

impacted. The proposal would not result in fragmentation of habitat or severing of movement corridors.

The species is highly mobile and unlikely to remain within the site during construction or vegetation removal activities.

It is considered unlikely therefore that the White-bellied Sea-eagle would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

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

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

The site is not in close proximity to any roost camp for GHFF.

The site contains suitable foraging habitat (flowering Eucalypt trees) for GHFF.

The proposal would modify some potential foraging habitat through selective removal of trees and pruning of branches to create a discontinuous canopy. The site would therefore retain a treed canopy and extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of these species. The proposal would not result in fragmentation of habitat or severing of movement corridors.

The species is highly mobile and unlikely to remain within the site during construction or vegetation removal activities.

It is considered unlikely therefore that the Grey-headed Flying-fox would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

Southern Brown Bandicoot (eastern) *Isoodon obesulus obesulus*

The Southern Brown Bandicoot is a terrestrial marsupial with a patchy distribution. It is found in south-eastern NSW, east of the Great Dividing Range south from the Hawkesbury River, southern coastal Victoria and the Grampian Ranges, south-eastern South Australia, south-west Western Australia and the northern tip of Queensland. 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. The Southern Brown Bandicoot nests 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. Two or three litters of 2-4 young may be produced annually. The gestation period of 11-12 days is the shortest known of any marsupial while young remarkably become independent around 60 days after being born (OEH 2017l).

The site and adjacent areas contain suitable foraging habitat and potential nesting and breeding habitat (open forest with dense understorey and sandy soil) for the Southern Brown Bandicoot.

Conical holes indicating Bandicoot foraging were detected during survey in the Wet Sclerophyll Forest area and more prolifically in the Dry Sclerophyll Forest area (refer to Photo 6), although it is unknown if these were created by Southern Brown Bandicoot or the more common Long-nosed Bandicoot. No nesting areas were detected during site surveys.

The proposal would modify some potential habitat through selective removal of trees and pruning of branches to create a discontinuous canopy in locations that are unlikely to be utilised by Southern Brown Bandicoot (e.g. roads and the immediate rear of residential properties). The site would retain a treed canopy and extensive treed areas would remain around the site. The selective removal and pruning of trees within the site to disconnect canopies would not affect habitat utilised by the species. The proposal would not result in fragmentation of habitat or severing of movement corridors.

The low-intensity mosaic burn within the riparian corridor would be unlikely to affect refuge habitat that the Southern Brown Bandicoot would utilise. Extensive available and accessible habitat exists around the site that the species would temporarily relocate to if the burn were to affect currently utilised habitat. The canopy layer is already quite open and the selective removal of trees and pruning of branches to create a discontinuous canopy around the edge of the riparian corridor, would have a negligible effect on the microclimate beneath.

Removal of vegetation would occur during typical construction work hours and are therefore unlikely to impact nocturnal foraging activities of the species.

It is considered unlikely therefore that the Southern Brown Bandicoot would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

Squirrel Glider (*Petaurus norfolcensis*)

The Squirrel Glider 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. This species prefers mixed species stands with a shrub or Acacia midstorey. Squirrel Gliders live in family groups of a single adult male one or more adult females and offspring. The species requires abundant tree hollows for refuge and nest sites. The Squirrel Glider diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein (OEH 2017o).

The site contains suitable foraging, den and breeding habitat (HBTs) for the Squirrel Glider. Red bloodwood trees with glider scars were recorded and mapped within the site (refer to Photo 6).

The proposal would modify some potential foraging habitat through selective removal of trees and pruning of branches to create a discontinuous canopy. The site would therefore retain a treed canopy and extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of these species. No identified Red Bloodwood trees with glider scars would be removed as a result of the proposal. The proposal would not result in fragmentation of habitat or severing of movement corridors.

No HBTs would be removed as a result of the proposed activity. Potential den and breeding habitat for this species would therefore not be impacted.

Removal of trees would occur during typical construction work hours and is therefore unlikely to impact nocturnal foraging activities of the species.

It is considered unlikely therefore that the Squirrel Glider would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

Yellow-bellied Glider (*Petaurus australis*)

The Yellow-bellied Glider is a large, active, sociable and vocal glider. The species occurs 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. The species feeds primarily on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein. Sap is extracted by incising (or biting into) the trunks and branches of favoured food trees, often leaving a distinctive ‘V’-shaped scar. Yellow-bellied Gliders live in small family groups of two - six individuals and are nocturnal. The species use dens, often in family groups, in hollows of large trees. The Yellow-bellied Glider is very mobile and occupies large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food resources. Dispersal requires continuous habitat connectivity (gliding distance around 120m). Typically produce one young per year (in high quality habitat) but during poor conditions may only

breed every second year. Key threats to the species include loss of hollows (generally >30cm) and important feed trees as a result of wildfire, in addition to landscape fragmentation. A highly vocal species with loud, high-pitched shrieks audible over 500m away (OEH 2017q).

The site contains suitable foraging, den and breeding habitat (HBTs) for the Yellow-bellied Glider. Red bloodwood trees with glider scars were recorded and mapped within the site (refer to Photo 6, Figure 3 and Table 3), with a number of scars appearing to be from Yellow-bellied Gliders.

The proposal would modify some potential foraging habitat through selective removal of trees and pruning of branches to create a discontinuous canopy. The site would therefore retain a treed canopy and extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of these species. No identified Red Bloodwood trees with glider scars would be removed as a result of the proposal. The proposal would not result in fragmentation of habitat or severing of movement corridors.

No HBTs would be removed as a result of the proposal. Potential den and breeding habitat for this species would therefore not be impacted.

Removal of trees would occur during typical construction work hours and is therefore unlikely to impact nocturnal foraging activities of the species.

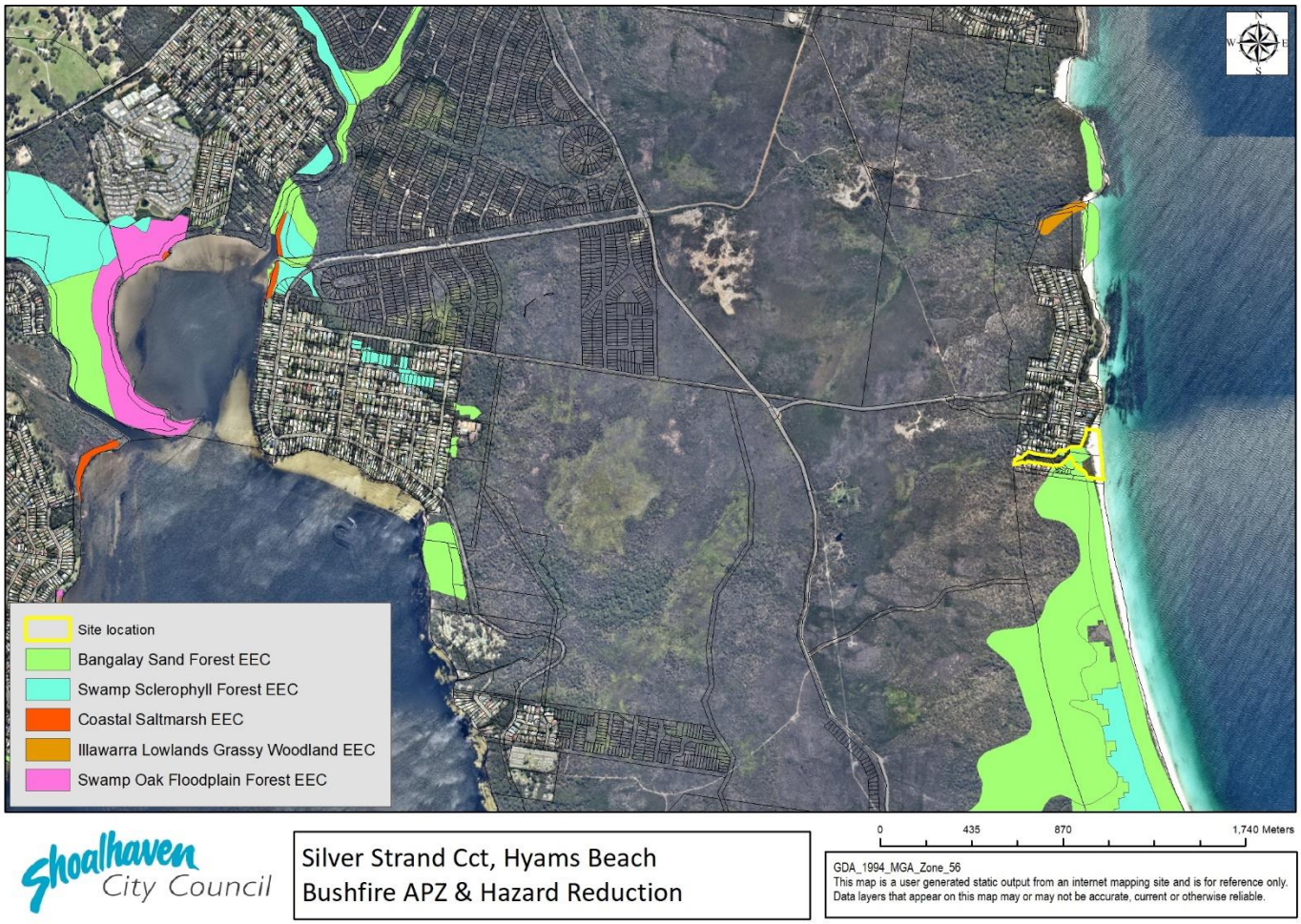
It is considered unlikely therefore that the Yellow-bellied Glider would be impacted by the proposed works and the proposed activity is unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of any of these species is likely to be placed at risk of extinction.

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

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

The eastern portion of the site and adjoining vegetation extending to the south is mapped as containing Bangalay Sand Forest EEC (refer to Figure 4). Site survey confirmed that the vegetation occurring within the site to the east of Cyrus St is consistent with Bangalay Sand Forest EEC.

Figure 4. Endangered Ecological Communities in mapped in proximity to the site



<u>Bangalay Sand Forest of the Sydney Basin and South East Corner Bioregions (Bangalay Sand Forest)</u>

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

The proposal would involve the removal and pruning of trees to create a discontinuous canopy, impacting an area of approximately 0.18ha of Bangalay Sand Forest EEC occurring at the eastern end Lister Court. Bangalay Sand Forest EEC occurring within the site is part of a contiguous patch of the vegetation community covering 84.6ha.

The works would occur within a road reserve and be limited to canopy management to create clearance of 2 to 5m between trees occurring along the road reserve. Understorey vegetation would not be removed.

The proposal would not result in fragmentation or isolation of areas of Bangalay Sand Forest EEC. The proposed activity would be on the residential interface.

The proposal is therefore unlikely to substantially and adversely modify the composition of the ecological community.

The proposal is therefore unlikely to adversely affect the extent or composition of Bangalay Sand Forest EEC such that a local occurrence of the EEC will be placed at risk of extinction.

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

(iii)the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity

(iv)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

(v) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.

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

Bangalay Sand Forest EEC would not be fragmented or isolated, nor removed or modified to an extent that would affect the long-term survival of the EEC occurring in the locality. Refer to Part B.

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

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

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

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

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

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

Clearing of native vegetation has been shown to:

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

The proposal would involve selective removal of trees and pruning of branches to create a discontinuous canopy within the prescribed bushfire asset protection zone. The site would

therefore retain most of its treed canopy. Extensive treed areas would remain around the site. Canopy gaps of 2 to 5m would not affect the movement of locally occurring fauna species. No large trees (greater than 30cm DBH) would be removed. The proposal would not result in fragmentation of habitat or severing of movement corridors.

There would be no destruction of important habitat nor impact to any locally occurring threatened species (see Part 1).

The proposed vegetation clearing would therefore not result in fragmentation of ecological communities or disrupt ecological function.

The impacts of the key threatening process of clearing of native vegetation would therefore be minimised and managed as part of the proposal.

3.4 Threatened species impact assessment (Commonwealth EPBC Act 1999)

A Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Report was generated on 20 March 2024. Of those threatened species and endangered ecological communities reported as likely occurring or having habitat within the area of the report, Greater Glider (Vulnerable) and Grey-headed Flying-fox (Vulnerable) were considered to require further assessment. Additional, highly mobile species including migratory birds may occur occasionally and transiently within the vicinity of the proposed activity but would not be affected by the proposal.

The following species are assessed against the relevant EPBC Act significant impact criteria:

- Greater Glider (Vulnerable)
- Grey-headed Flying-fox (Vulnerable)
- Jervis Bay Leek Orchid (*Prasophyllum affine*) (Endangered)

Table 4. EPBC Significant impact assessments

Critically endangered and endangered species - Significant impact criteria Species to consider: **Jervis Bay Leek Orchid (*Prasophyllum affine*)**	
Criteria	***Assessment***
lead to a long-term decrease in the size of a population	The proposed activity will not impact a known population of Jervis Bay Leek Orchid.
reduce the area of occupancy of the species	No
fragment an existing population into two or more populations	No
adversely affect habitat critical to the survival of a species	Potential habitat for this species will not be removed or substantially degraded by the proposed works.
disrupt the breeding cycle of a population	The proposed activity will not impact a known population of Jervis Bay Leek Orchid.
modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The groundlayer vegetation and soil shall not be removed or disturbed. The canopy layer is already quite open and the removal of branches to create a discontinuous canopy would have a negligible effect on the microclimate beneath. Potential habitat for these species will therefore not be removed or substantially degraded by the proposed works.

	Fire might temporarily inhibit flowering but would not harm the species. Any works occurring within this area during October to November shall be preceded by a site survey conducted by Council's Environmental Officer to determine the presence or absence of threatened terrestrial orchids and thereby avoid potential trampling of flowering and fruiting plants.
result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	No invasive species will be introduced
introduce disease that may cause the species to decline	No disease will be introduced
interfere with the recovery of the species	No
Vulnerable species - Significant impact criteria Species to consider: **Greater Glider** **Grey-headed Flying-fox (GHFF)**	
Criteria	***Assessment***
lead to a long-term decrease in the size of an important population of a species	The proposal would not involve the removal of habitat for any known population of Greater Glider. The site is not in close proximity to any roost camp for GHFF. The site contains potential foraging habitat for both Greater Glider and GHFF, but neither species would rely on the habitat within the site. No HBTs would be removed. Removal and pruning of trees would occur during typical construction work hours and is therefore unlikely to impact nocturnal foraging activities of these species.
reduce the area of occupancy of an important population	No
fragment an existing important population into two or more populations	No
adversely affect habitat critical to the survival of a species	No important habitat will be impacted
disrupt the breeding cycle of an important population	No
modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No important habitat will be impacted. The proposal would modify some potential foraging habitat through selective pruning and removal of trees to create a disconnected canopy around the riparian corridor within the site. The site would retain a treed canopy and extensive treed areas would remain around the site. The removal of some trees within the site would represent only a negligible reduction in available foraging habitat in the locality. The proposal would not result in fragmentation of habitat or severing of movement corridors. Canopy separation by 2 to 5m would not impede movement by these species.
result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No invasive species will be introduced
introduce disease that may cause the species to decline	No disease will be introduced
interfere substantially with the recovery of the species	No

3.5 Indigenous heritage

Under Section 86 of the NSW *National Parks and Wildlife Act 1974* (NPW Act) it is an offence to disturb, damage, or destroy any Aboriginal object without an Aboriginal Heritage Impact Permit (AHIP). The Act, however, provides that if a person who exercises 'due diligence' in determining that their actions will not harm Aboriginal objects has a defence against prosecution if they later unknowingly harm an object without an AHIP (Section 87(2) of the Act). To effect this, the NSW Department of Environment, Climate Change and Water have prepared the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wale*s (hereafter referred to as the 'Due Diligence Guidelines) to assist individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects and to determine whether they should apply for an AHIP.

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

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

The site occurs within 200m of waters and partially within a sand system and within 200m of water.

In accordance with the Due Diligence Guidelines (DECCW 2010), a search on the Aboriginal Heritage Information Management System (AHIMS) on 21 March 2024 indicated that there are no recorded Aboriginal sites or places in the vicinity of the proposal (refer AHIMS report below in Figure 5).

The proposal is for the removal and pruning of vegetation but will not involve excavation of the soil. No artefacts would therefore be impacted. The trees that would be removed do not exhibit scarring that could be of Aboriginal origin.

As the proposal does not involve disturbance to the soil and can be considered an activity involving "harm that is trivial or negligible", the Due Diligence Guidelines requires no further assessment, an AHIP is not required, and the activity can proceed with caution.

Figure 5. Results of AHIMS Aboriginal heritage search

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : silver strand hyams
Client Service ID : 875524

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: 21 March 2024

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 289276.0 - 289765.0, Northings : 6112802.0 - 6113103.0 with a Buffer of 0 meters, conducted by Geoffrey Young on 21 March 2024.

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. *

3.6 Non-indigenous heritage

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

3.7 Other considerations

In the context of this environmental assessment, the area to be affected by the proposed activity:

- is not an Aboriginal Place in the context of the NSW National Parks and Wildlife Act 1974, nor is it known to contain Aboriginal heritage artefacts
- is not mapped as "potentially contaminated land"
- is not mapped as having potential for Acid Sulfate Soils (the site is mapped as Class 5 A.S.S)
- is not mapped as being flood liable

3.8 EP&A Regulation – Clause 171 matters of consideration

Clause 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 5 deals with each of the factors in relation to the proposed activity.

Table 5. Clause 171 Matters of consideration

Does the proposal:	Assess	Reason
a) Have any environmental impact on a community?	Positive	The proposal is to undertake Bushfire hazard reduction works comprising selective pruning and removal of trees through native vegetation, in addition to a low-intensity mosaic hazard reduction burn. The works have been proposed for the purpose of reducing the risk of bushfire to the surrounding community. The proposed activity would not have any impact on other community services and infrastructure such as water, waste management, educational, medical or social services.
b) Cause any transformation of a locality?	Negligible	The locality's current use would remain unchanged. Selective pruning and removal of trees would be limited to that required to achieve a discontinuous canopy (with gaps of 2 to 5m) within the road reserves of Silver Strand Circuit, Lister Court and Cyrus Street. The site has been identified and prescribed in bushfire management plans as an asset protection zone for many years.
c) Have any environmental impact on the	Low adverse	The five-part test of significance (Section 3.3) concludes that the proposed activity would not have a significant impact upon endangered ecological communities.

Does the proposal:	Assess	Reason
ecosystem of the locality?		No hollow-bearing trees, threatened flora species, rocky outcrops, caves, crevices or water bodies would be removed or otherwise impacted. No food resources critical to the survival of a particular species would be removed. Aquatic ecosystems are not likely to be affected by the proposed activity and there is not likely to be any long-term or long-lasting impact through the input of sediment and nutrient into the ecosystem.
d) Cause a diminution of the aesthetic, recreational, scientific or other environmental quality or value of a locality?	Low adverse	Impact to the aesthetic, recreational, scientific and environmental values of the site would be temporary and not significant.
e) Have any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific, or social significance or other special value for present or future generations?	Low adverse	The site of the proposed activity has no documented significant aesthetic, architectural, cultural, historical or scientific values. As such, the proposed activity would have no significant impact on these items. No items in the vicinity of the work site which are listed on the State Heritage Register and the Shoalhaven Local environmental Plan would be impacted by the proposal. The site is not within an Aboriginal Place declared under the *National Parks and Wildlife Act 1974.* In accordance with the NSW Department of Environment, Climate Change and Water's Due Diligence Code of Practice, the proposed activity does not require an Aboriginal Heritage Impact Permit as harm to an Aboriginal object is unlikely (refer to Section 3.5 of this REF).

Does the proposal:	Assess	Reason
f) Have any impact on the habitat of protected fauna (within the meaning of the Biodiversity Conservation Act 2016)?	Low adverse	The five-part test of significance, provided in Section 3.3 above, concludes that the proposed activity would not have a significant impact upon threatened fauna. Mitigation measures will reduce risks further. Threatened fauna breeding or roosting habitat would not be removed or otherwise impacted by the activity.
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?	Low adverse	No potentially important habitat or food resources for locally occurring threatened species would be removed or otherwise impacted by the proposal. No hollow-bearing trees, threatened flora species, rocky outcrops, caves, crevices or water bodies would be removed or otherwise impacted. No food resources critical to the survival of a particular species would be removed.
h) Have any long-term effects on the environment?	Negligible	The works would be short term and temporary. The proposed activity would not use hazardous substances or use or generate chemicals which may build up residues in the environment.
i) Cause any degradation of the quality of the environment?	Low-adverse	The environmental safeguards (Section 7) to be undertaken would minimise impacts and risks to the quality of the environment. The proposal would not intentionally introduce noxious weeds, vermin, or feral animals into the area or contaminate the soil.
j) Cause any risk to the safety of the environment?	Positive	The proposed works would reduce the fuel load and connectivity of the vegetation, thereby reducing the risk of bushfire spread, heat intensity and flame length. Removal of understorey vegetation which would result in the exposure and drying of the currently sheltered and wet riparian corridor shall not be undertaken.

Does the proposal:	Assess	Reason
k) Cause any reduction in the range of beneficial uses of the environment?	Negligible	The site (road reserve at the residential interface) and local environment will remain unchanged. The site has been identified and prescribed in bushfire management plans as an asset protection zone for many years.
l) Cause any pollution of the environment?	Low adverse	It is unlikely that the activity (including the environmental impact mitigation measures) would result in water pollution, spillages, dust, odours, vibration or radiation. The proposal does not involve the use, storage or transportation of hazardous substances or the use or generation of chemicals which may build up residues in the environment.
m) Have any environmental problems associated with the disposal of waste?	No	There would be no trackable waste, hazardous waste, liquid waste, or restricted solid waste as described in the NSW *Protection of the Environment Operations Act 1997*.
n) Cause any increased demands on resources (natural or otherwise) which are, or are likely to become, in short supply?	Low	The amount of resources that would be used are not considered significant and would not increase demands on current resources such that they would become in short supply.
o) Have any cumulative environmental effect with other existing or likely future activities?	Low	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.

Does the proposal:	Assess	Reason
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	Low-adverse	The proposed activity would have no effect on coastal processes including those projected under climate change conditions. Mitigation measures (Section 7) shall be implemented. The proposal site is not located in an identified coastal hazard area.
q) Any applicable local strategic planning statement, regional strategic plan or district strategic plan made under Division 3.1 of the Act	Positive	The proposed activity is consistent with the Shoalhaven 2040 planning statement particularly Planning Priority 11 – *Adapting to natural hazards through building resilience* (https://doc.shoalhaven.nsw.gov.au/displaydoc.aspx?record=D20/437277) *i.e. "Community assets at risk from bush fire have been identified and a program of coordinated treatments set to reduce identified risks, including fuel reduction, community education and fire trail maintenance."* and "*Implementing the land-sue recommendations of Shoalhaven's Adaptation Plan…..and the Shoalhaven District Bushfire Risk Management Plan."* The proposed activity is consistent 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) in particular Objective 12 – *Build resilient places and communities*, Strategy 12.1 "*integrate emergency management and recovery needs into new and existing urban areas including evacuation planning, safe access and egress for emergency services personnel, buffer areas,…".* The proposed activity would impact an area mapped in the plan as "High Environmental Value". This reflects the presence of endangered ecological communities present in the location (Lister Court). However, as explained in Section 3.3 of this REF, the removal of the vegetation to establish the bushfire APZ would not have a significant impact on the endangered ecological community.

4. PERMISSIBILITY

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

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

In this regard, section 2.52 of the NSW *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) provides that:

> *Development for the purpose of bush fire hazard reduction work may be carried out by any person without consent on any land that is 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.*

Under the Shoalhaven Bushfire Risk Management Plan (BFRMP), APZ areas are identified within the site over the road reserves of Silver Strand Circuit, Cyrus Street and Lister Court, with Strategic Fire Advantage Zones (SFAZs) wrapping the entire Hyams Beach village over NPWS and Jerrinja Local Aboriginal Council land (refer to SBFMC 2018, Map 3 of Appendix 4 and Figure 6 below – *Hyams Beach Bushfire Preparation Map* which informs the SBFMC).

Of the areas covered by the BFRMP, within and in proximity to the site, Council is the land manager with authority for the road reserves only. However, under the Hyams Beach Preparation Map (see Fig. 6; NSW RFS 2018) which informs the BFRMP, Council is also responsible for the management of Lots 18, 19 & 20 DP 740850 as part of the Resident Preparation Zone (RPZ), for which provision of defendable space for residents / fire fighters and maintenance of vegetation in close proximity to residential assets are fire suppression objectives *i.e.*

Management of APZs, SFAZs and RPZs are described in Table 6 below.

Table 6. Management of APZs, SFAZs and RPZ (from SBFMC 2018 and NSW RFS 2018)

Zone	Purpose	Suppression Objective(s)	Zone characteristics
Asset Protection Zone (APZ)	To protect human life, property and highly valued public assets and values.	To enable the safe use of Direct Attack suppression strategies within the zone. To minimise bush fire impacts on undefended assets.	As per RFS document Standards for Asset Protection Zones.
Strategic Fire Advantage Zone (SFAZ)	To provide strategic areas of fire protection advantage which will reduce the speed and intensity of bush fires, and reduce the potential for spot fire development;	To improve the likelihood and safe use of: Parallel Attack suppression strategies within the zone and/or Indirect Attack (back burning) in high to very high fire weather conditions within the zone. To reduce the likelihood of: Crown fire development within the zone and/or	Zone width related to suppression objectives and dependant upon: • Topography • Aspect • Spotting propensity • Location of adjacent • firebreaks • Mosaic pattern of treatment Assess Overall Fuel Hazard (OFH) once

	To aid containment of wildfires to existing management boundaries.	Spot fire ignition potential from the zone	vegetation communities reach minimum fire thresholds within this plan. Management practices should aim to achieve mosaic fuel reduction patterns so that the majority of the SFAZ has an OFH of less than high.
Residential Preparation Zone (RPZ)	To identify that residents / property owners have a vital role to play in bush fire risk management and that they are responsible for their own property preparedness.	To increase the preparedness of residents for bush fire and ensure that vegetation in close proximity to residential assets are adequately maintained. To provide a defendable space for residents / fore fighters and complement hazard reduction works carried out within Asset Protection Zones / Strategic Fire Advantage Zones.	Residents / property owners should strive to achieve a 'fire-safe' property as outlined in the illustration above. Concerns regarding the bush fire safety of neighbouring properties should be raised with NSW Rural Fire Service.

Rural Fires Act 1997

Section 100C *Carrying out bush fire hazard reduction work* of the *Rural Fires Act 1997* provides that:

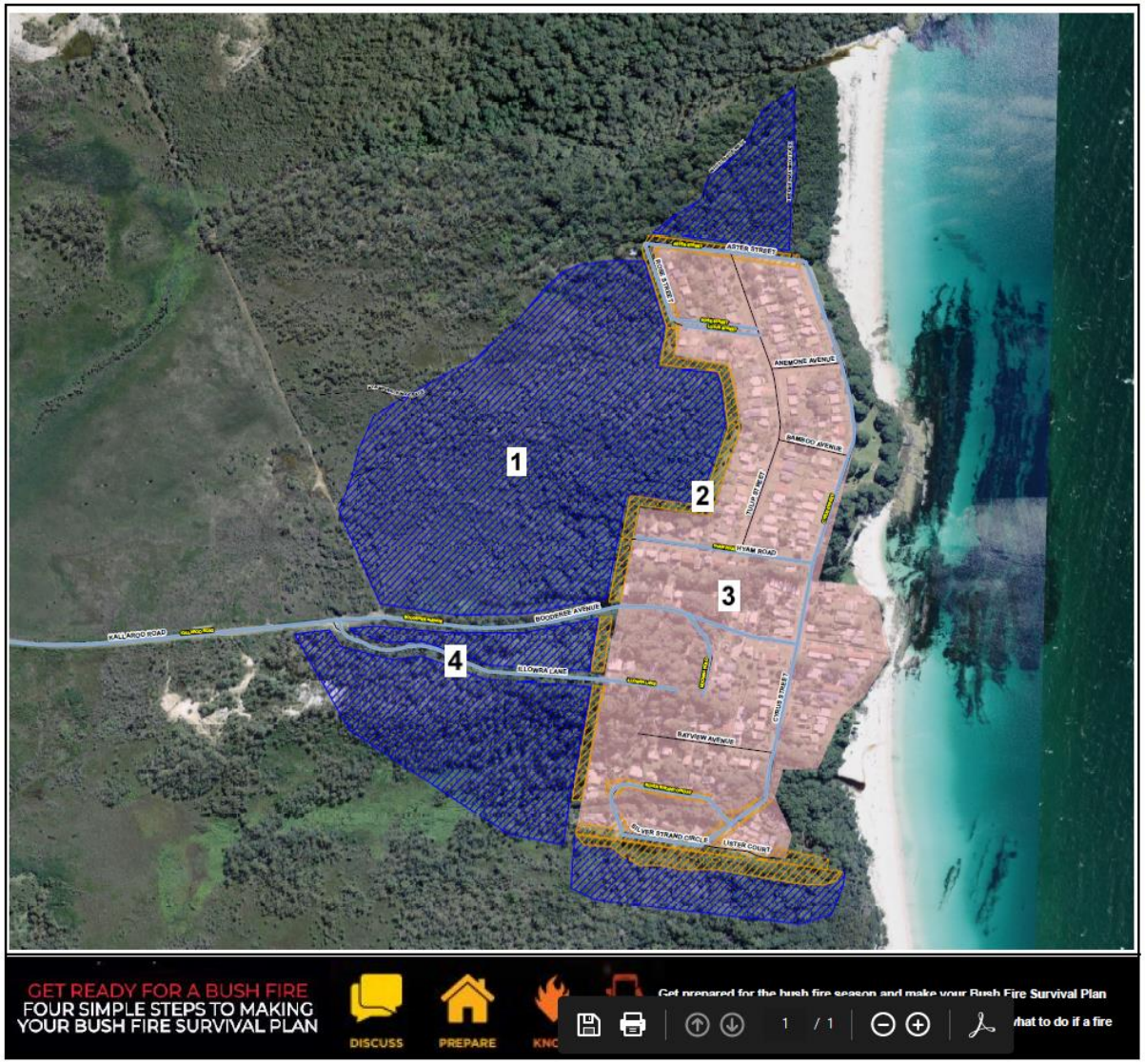
> (1) An environmental planning instrument under the Environmental Planning and Assessment Act 1979 cannot prohibit, require development consent for or otherwise restrict the doing of:
>
> (a) emergency bush fire hazard reduction work on any land, or
>
> (b) managed bush fire hazard reduction work on land other than excluded land.
>
> (2) Part 5 of the Environmental Planning and Assessment Act 1979 does not apply to or in respect of emergency bush fire hazard reduction work carried out on any land.
>
> (3) Part 5 of the Environmental Planning and Assessment Act 1979 does not apply to or in respect of managed bush fire hazard reduction work carried out on land other than excluded land if:
>
> (a) the work is carried out in accordance with a bush fire risk management plan that applies to the land, and
>
> (b) there is a bush fire hazard reduction certificate in force in respect of the work and the work is carried out in accordance with any conditions specified in the certificate, and
>
> (c) the work is carried out in accordance with the provisions of a bush fire code applying to the land specified in the certificate.
>
> (4) Bush fire hazard reduction work may be carried out on land despite any requirement for a licence, approval, consent or other authorisation for the work made by the Biodiversity Conservation Act 2016, the National Parks and Wildlife Act 1974 or any other Act or instrument made under an Act only if:
>
> (a) the work is carried out in accordance with a bush fire risk management plan that applies to the land, and

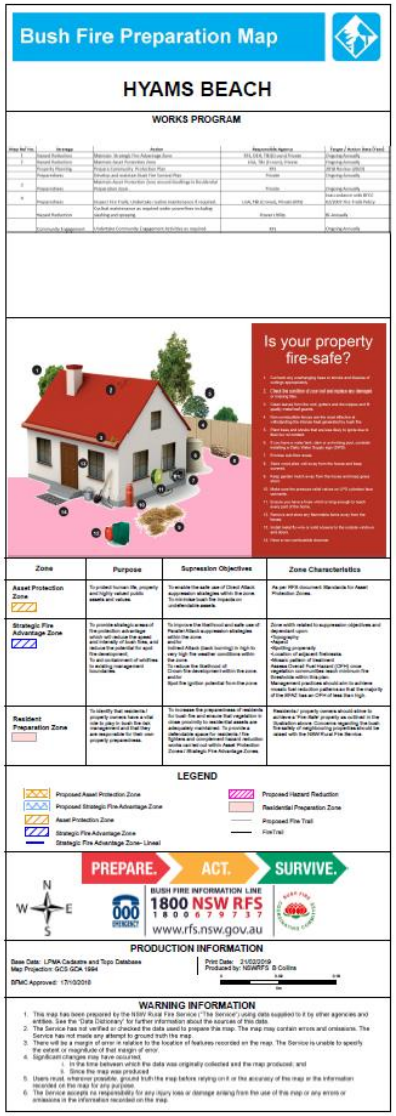
(b) there is a bush fire hazard reduction certificate in force in respect of the work and the work is carried out in accordance with any conditions specified in the certificate, and

(c) the work is carried out in accordance with the provisions of any bush fire code applying to the land specified in the certificate.

Managed bush fire hazard reduction work can therefore only be carried out in accordance with a bush fire risk management plan that applies to the land – in this case the BFRMP (SBFMC 2018).

Figure 6. Hyams Beach Bushfire Preparation Map (NSW RFS 2018)





Summary

Both the T&I SEPP and the *Rural Fires Act 1997* provide that managed (as opposed to emergency) bush fire hazard reduction works can only be undertaken as development without consent if the proposed works are in accordance with a bush fire risk management plan that applies to the land. As the BFRMP (SBFMC 2018) within Council managed land covers only parts of the road reserves as APZs and does not cover any vegetation east of Cyrus Street (within Lot 12 DP 38788 and Lot 17 DP 740851) no bush fire hazard reduction works, whether vegetation removal or hazard reduction burns are permissible in this area without development consent.

Under the Hyams Beach Preparation Map (see Figure 6 below; NSW RFS 2018) which informs the BFRMP, Council is also responsible for the management of Lots 18, 19 & 20 DP 740850 as part of the Resident Preparation Zone, for which provision of defendable space for residents / fire fighters and maintenance of vegetation in close proximity to residential assets are fire suppression objectives. Establishment of defendable space between the riparian vegetation and 3 Cyrus St, in addition to a low-intensity mosaic burn (without mechanical disturbance) through the riparian corridor to manage any fuel loads in this area is therefore permissible as fire suppression measures.

The proposal for bush fire hazard reduction works within Council managed land assessed by this REF (as an EP&A Act Part 5 activity), must therefore be limited to APZ works in accordance with *Planning for Bush Fire Protection* (NSW RFS 2019) within the road reserves of Silver Strand Circuit, Cyrus Street and Lister Court, as mapped under the BFRMP (SBFMC 2018), establishment of a defendable space for residents / fire fighters and maintenance of vegetation in close proximity to residential assets in Lots 18, 19 & 20 DP 740850 as part of the Resident Preparation Zone (RPZ), and a low-intensity mosaic burn through the riparian corridor. Bush fire hazard reduction works contrary to or outside of these parameters would require development consent.

As the proposal 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 would be required.

Section 100C(3) of the *Rural Fires Act 1997* however, provides that works which are in accordance with a bush fire risk management plan and the provisions of applicable bush fire codes, can be undertaken without Part 5 assessment, if a bush fire hazard reduction certificate is in place.

Although a current bush fire hazard reduction certificate would preclude the requirement under legislation, this REF was requested to further inform works which would potentially occur in sensitive environmental areas, with risk to locally occurring threatened flora and fauna.

A summary of other relevant legislation and permissibility is provided in Table 7 below.

Table 7. 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.
Shoalhaven Local Environmental Plan 2014 (SLEP)
Permissible √ Not permissible ☐
Justification: Under the SLEP the proposed activity may have required development consent. The provisions of T&I SEPP, however, prevail over the SLEP where there is an inconsistency by virtue of Section 3.28 of the EP&A Act. Consequently, development consent is not required.
State Environmental Planning Policy (Resilience and Hazards) 2021
Permissible √ Not permissible ☐
Justification: The proposed activity would be undertaken within an area which is mapped for the purpose of the SEPP as *Coastal Use Area* and *Coastal Management Area*. The development controls associated with these mapped areas do not apply as the proposal does not require development consent. The proposed activity would not impact coastal wetland and littoral rainforest.
State Environmental Planning Policy (Biodiversity and Conservation) 2021
Permissible √ Not permissible ☐
Justification: Development control provisions of the SEPP apply only in relation to a development application (Part 2 of the SEPP). The proposal would not remove or otherwise impact habitat that Koalas are likely to rely on.

Wilderness Act 1987
Permissible √ Not permissible ☐
Justification: The proposed activity is not located within a wilderness area declared under this Act.
Protection of the Environment Operations Act 1997
Permissible √ Not permissible ☐
Justification: The proposed activity does not constitute scheduled development work or scheduled activities as listed in Schedule 1 of the Act. The proposed activity therefore does not require an environmental protection licence.
***National Parks and Wildlife Act 1974* (NP&W Act)**
Permissible √ Not permissible ☐
Justification: • The proposed activity would not encroach into National Park estate. • The Act provides the basis for the legal protection and management of Aboriginal sites in NSW. Under Sections 86 and 90 of the Act it is an offence to disturb an Aboriginal object or knowlingly destroy or damage, or cause the destruction or damage to, an Aboriginal object or place, except in accordance with a permit of consent under section 87 and 90 of the Act. • As there are no recorded sites or visible objects and as the site is on 'disturbed land', the Due Diligence Guidelines requires no further assessment as it is reasonable to conclude that there is a low probability of objects occurring in the area of the proposed activity and an AHIP is not required. Refer to Section 3.4 for more information.
Fisheries Management Act 1994
Permissible √ Not permissible ☐
Justification: The proposed activity: • would not affect declared aquatic reserves (Part 7, Division 2 of the Act); • would not involve dredging or reclamation (Part 7, Division 3); • would not involve blocking the passage of fish (s.219); • would not impact mangroves and marine vegetation (Part 7, Division 4); • would not involve disturbance to gravel beds where salmon or trout spawn (s.208 of the Act);

- does not involve the release of live fish (Part 7, Division 7);
- does not involve the construction of dams and weirs (s.218);
- would not result in the blocking of the passage of fish;
- would not impact declared threatened species of endangered ecological communities (Part 7A);
- does not constitute a declared key threatening process (Part 7A); and
- would not use explosives in a watercourse (Clauses 70 and 71 of the *Fisheries Management (General) Regulation 2019).*

A Fisheries Permit is therefore not required

Heritage Act 1977

Permissible √ Not permissible ☐

Justification:

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

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

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

Biodiversity Conservation Act 2016

Permissible √ Not permissible ☐

Justification:

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

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

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

Water Management Act 2000

Permissible √ Not permissible ☐

Justification:

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

COMMONWEALTH LEGISLATION

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

Permissible √ Not permissible ☐

Justification:

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

Commonwealth *Native Title Act 1993*

Permissible √ Not permissible ☐

Justification:

All affected land comprises road reserves for which Council is the authority or own in freehold title (refer to Section 1.3). Native Title can therefore be reasonably assumed to have been extinguished as a Previous Exclusive Possession Act – Freehold Title

(Section 23B). Consultation or approval from native title claimants is therefore not required.

5. CONSULTATION WITH GOVERNMENT AGENCIES

5.1 Transport and Infrastructure SEPP

Note that consultation under Chapter 2, Part 2.2 of the T&I SEPP applies only to activities undertaken as development without consent under the provisions of Chapter 2.

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

The proposed activity:

- would not have a substantial adverse impact on stormwater management services,
- would not generate additional traffic,
- does not require connection to Council's sewerage management system,
- does not require connection to Council's water supply system and would not use water from this system,
- would not involve the installation of a temporary structure on, or the enclosing of, a public place that is under Council's control more than a minor extent,
- would not involve excavation of the surface of a road or adjacent footpath.

Consultation under section 2.10 is therefore not required.

Section 2.11 – Development with impacts on local heritage

No listed heritage items occur in proximity to the proposal. Refer to Section 3.5 of this REF for more information.

Consultation under section 2.11 is therefore not required.

Section 2.12 – Development with impacts on flood liable land

The proposal would occur on land which is not mapped as being flood liable.

Consultation under section 2.12 is therefore not required.

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

The proposal would occur on land which is not mapped as being flood liable.

Consultation under section 2.13 is therefore not required.

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

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

Section 2.15 – Consultation with public authorities other than councils

The proposed activity would be undertaken adjacent to Jervis Bay National Park. In accordance with Section 2.15(1)(a) a notice of intention was submitted to National Parks and Wildlife Service on 12 March 2014 (D24/99815 - notice of intention - NSW National Parks and Wildlife Service - Bushfire hazard reduction works - Lister Court and Silver Strand Circuit - Hyams Beach). As of 25 March 2024, there has been no response. Works can proceed without further consultation.

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

- would be undertaken on adjacent to land reserved under the *National Parks and Wildlife Act 1974* or in Zone E1 or in equivalent zones.
- does not comprise a fixed or floating structure in or over navigable waters
- would not increase the amount of artificial light in the night sky and located on land within the dark sky region as identified on the dark sky region map
- would not be undertaken within Defence communications facility buffer (only relevant to the defence communications facility near Morundah)
- would not be undertaken on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*
- would not be development on, or reasonably likely to have an impact on, a part of the Willandra Lakes Region World Heritage Property—the World Heritage Advisory Committee and Heritage NSW,
- does not comprise development within a Western City operational area specified in the Western Parkland City Authority Act 2018, Schedule 2 with a capital investment value of $30 million or more—the Western Parkland City Authority constituted under that Act.

The consultation requirements specified under section 2.15 of the Transport and Infrastructure SEPP therefore do not apply.

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

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

5.2 Internal SCC Asset Custodian

A notice of intention was given to the SCC land custodian for the Silver Strand Reserve riparian area on 12 March 2024 (D24/100721 - notice of intention - internal asset land custodian - bushfire hazard reduction works - Silver Strand Circle Reserve Hyams Beach). SCC's response was received on 22 March 2024 and they had no objections to the works (D24/119013 - response to notice of intention - internal asset land custodia - bushfire hazard reduction works - Silver Strand Circle Reserve). No further consultation is required.

6. COMMUNITY ENGAGEMENT

The proposal is in response to community concerns (e.g. D20/112730) and follows a meeting between concerned residents and Council officers which took place on the 15th of July 2020.

In accordance with Council's Community Engagement Policy, the proposal constitutes a *Local Area – Low Impact* activity which does not require any formal community engagement. A notice of intention was submitted to the Hyams Beach Villagers Association on 12 March 2024 to inform the community consultative body of the works (D24/100558 - notice of intention - CCB - bushfire hazard reduction works - Lister Court, Cyrus Street and Silver Strand Circuit).

Notification via mail to properties on Silver Strand Circuit, Lister Court, and Cyrus Street in proximity to the proposed works shall be undertaken at least one week prior to works commencing.

This REF shall be published on the NSW Planning Portal to facilitate public access to the document.

No further consultation is required.

7. ENVIRONMENTAL SAFEGUARDS AND MEASURES TO MINIMISE IMPACTS

- This REF shall be published on the NSW Planning Portal prior to the commencement of works.
- Noisy works (tree removal and stump grinding) shall be undertaken outside the usual holiday peak period, *i.e.,* after the ANZAC day long-weekend.
- Notification via mail to resident and owners of properties on Silver Strand Circuit, Lister Court, and Cyrus Street in proximity to the proposed works shall be undertaken at least one week prior to commencement of works.
- An appropriate traffic control plan shall be developed and implemented by the Contractor.
- Any works undertaken during October to November in the area identified as potential threatened orchid habitat in Figure 3, shall be preceded by a site survey conducted by Council's Environmental Officer to determine the presence or absence of threatened terrestrial orchids and thereby avoid potential trampling or burning of flowering and fruiting plants.
- Tree removal shall be undertaken only to the extent required to create a discontinuous canopy in locations shown in Figure 1, with canopy gaps of 2 to 5m between trees.
- Native tree removal shall be undertaken only where branch pruning is impractical. Preference shall be given to pruning branches in order to create a discontinuous canopy.
- Any trees to be removed shall be cut (not pushed) and felled into cleared areas to minimise impact to adjacent vegetation to be retained.
- The low-intensity mosaic burn within the riparian zone within Silver Strand Cct (Lots 18, 19 & 20 DP 740850), shall be undertaken over time by Rural Fire Service and shall not involve creation of fire breaks or any other vegetation removal. The mosaic burn should not exceed more than 30% of the area of vegetation at any one interval and should be distributed in patches evenly through the site. Readily flammable vegetative material shall be burnt, but dry material shall not be introduced to the site or piled within the site to encourage burning of fire resistant vegetation.
- Pruning of trees where required is to be undertaken in accordance with AS 4373-1996 "Pruning of Amenity Trees".
- The riparian corridor shall not be intentionally opened or thinned by removing understorey vegetation. The ground-layer vegetation and soil shall not be removed or disturbed.
- No identified habitat trees (refer to Figure 3) shall be removed. However, in the event that any wildlife be significantly disturbed or injured during works, Council's Environmental Officers are to be contacted on 4429 3405, or if unavailable, Wildlife Rescue – South Coast should be contacted on 0418 427 214, to rescue and relocate the animal(s).

8. SIGNIFICANCE EVALUATION & CONCLUSION

This Review of Environmental Factors has assessed the likely environmental impacts, in the context of Part 5 of the NSW *Environmental Planning and Assessment Act 1979*, of a proposal by Shoalhaven City Council for the undertkaing of bush fire hazard reduction works in the riparian corridor within Silver Strand Circuit, and the road reserves of Silver Strand Circuit, Cyrus Street and Lister Court, Hyams Beach.

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

1. It is unlikely that there will be any significant environmental impact as a result of the proposed activity and an Environmental Impact Statement is not required.
2. The proposed activity will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats, and a Species Impact Statement / BDAR is not required.
3. No statutory approvals, licences, permits or 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.

Trevor Dando

Manager - Works and Service

Shoalhaven City Council Date: 22 March 2024

Document Review:

	Name	Signature	Date
Author:	Jeff Bryant		10/09/2020
Reviewed by:	Geoff Young		11/09/2020

Revised:	Jeff Bryant		10/11/2020
Updated:	Geoff Young		12/03/2024

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APPENDIX A

Likelihood of Occurrence Table (NSW Threatened Species)

NSW Threatened Species Likelihood of Occurrence Table

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

Likelihood of occurrence in study area

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

Possibility of impact

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

Endangered Ecological Community name	*Status*	*Likelihood of presence within areas impacted by the activity*
Bangalay Sand Forest of the Sydney Basin and South East Corner Bioregions	Endangered - *NSW* BC *Act*	Mapped as occurring over the eastern portion of the site and confirmed as such during site survey. Further assessment required.
Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered - *NSW* BC *Act* Vulnerable - Commonwealth *EPBC Act*	Does not occur on-site and is not mapped as occurring in close proximity to the site (nearest records are approx. 3.6km to the west of the site).
Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion	Endangered - *NSW* BC *Act* Critically Endangered - Commonwealth *EPBC Act*	Does not occur on-site and is not mapped as occurring in close proximity to the site (nearest records are approx. 940m to the north of the site).
Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered - *NSW* BC *Act* Endangered - Commonwealth *EPBC Act*	Does not occur on-site and is not mapped as occurring in close proximity to the site (nearest records are approx. 3.9km to the west of 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 (nearest records are approx. 980m to the south of the site).

Species name	***Status***	***Habitat requirements (www.environment.nsw.gov.au)***	***Likelihood of presence within areas impacted by the activity***
FLORA			
Banksia vincentia	NSW BC Act Critically endangered	Low sedgeland and grassy heath, sometimes amongst emergent mallee Eucalyptus gummifera and other tall shrubs of Banksia and Hakea. Found on coastal sands over clay on sandstone. One population known, containing 14 individuals	No suitable habitat on site. Conspicuous species not detected during survey.
Calochilus pulchellus Pretty Beard Orchid	Endangered NSW BC Act	The habitat of this species varies considerably. At Vincentia the species grows in dense low wet heath in wet sand over sandstone. In Booderee National Park it grows in a tall heathy association. In Morton National Park on the Little Forest Plateau it occurs in low heath among scattered clumps of emergent eucalypts and Banksia in shallow coarse white sand over sandstone, in a near-escarpment area subject to strong orographic precipitation.	Potential habitat occurring at western edge of site. Further assessment required.
Cryptostylis hunteriana Leafless tongue Orchid	Vulnerable EPBC Act Vulnerable NSW BC Act	Occurs in a wide variety of habitats from moist sandy soil to dense heathland, sedgeland and verges of fire trails. 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 association with the Large Tongue Orchid (C.	Potential habitat occurring at western edge of site. Further assessment required.

		subulata) and the Tartan Tongue Orchid (C. erecta).	
Genoplesium baueri Bauer's Midge Orchid	Endangered *EPBC Act* Endangered *NSW* BC *Act*	Grows in dry sclerophyll forest and moss gardens over sandstone.	Unlikely to occur – no suitable habitat present
Melaleuca biconvexa Biconvex Paperbark	Vulnerable *EPBC Act* Vulnerable *NSW* BC *Act*	Generally grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects.	No. A conspicuous species not detected during surveys.
Prasophyllum affine Jervis Bay Leek Orchid	Endangered NSW BC Act	Highly localised species, known from 4 sites with 93%on private property. Found in heathland and sedge in well drained sandy soil (Stephenson 2011)	Potential habitat occurring at western edge of site. Further assessment required.
Pterostylis ventricosa	Critically endangered NSW BC Act	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	No – No suitable habitat

		removed or thinned. Grows in a range of groundcover types, including moderatley dense low heath, open sedges and grasses, leaf litter, and mosses on outcropping rock. Soil type ranges from moisture retentive grey silty loams to grey sandy loams. Sometimes found in skeletal soils on sandstone rock shelves	
Rhizanthella slateri Eastern Australia Underground Orchid	Endangered EPBC Act Vulnerable NSW BC Act	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. Flowers September to November.	Unlikely to occur. No potential habitat would be affected.
Syzygium paniculatum Magenta Lilly Pilly	Vulnerable EPBC Act Endangered NSW BC Act	On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest.	Not detected during site surveys. Planted Syzgium shrubs noted during survey in garden adjoining riparian vegetation.
AMPHIBIANS			
Giant Burrowing Frog *Heleioporus australiacus*	Vulnerable EPBC Act Vulnerable NSW BC 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. While in these areas, individuals burrow below the soil surface or in the leaf litter. Individual frogs occupy a series of burrow sites,	Possibly occurring. Suitable habitat present within the site. Further assessment required.

		some of which are used repeatedly. 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. Frogs breed after heavy rain mainly in late summer and Autumn from February to April. Eggs usually laid out of water in a moist burrow in sandy clay banks of smaller creeks, dams or ephemeral pools in forest (Anstis 2017).	
Green and Golden Bell Frog *Litoria aurea*	Vulnerable *EPBC Act* Endangered *NSW* BC *Act*	Heath, woodland and open dry sclerophyll forest on a variety of soil types except clay based. Whilst in non-breeding habitat it burrows below the soil surface or in the leaf litter. Breeding frogs will call from open spaces, under vegetation or rocks or from within burrows in the creek bank. Egg masses 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. Tadpole development ranges from 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.	Unlikely to occur. No suitable habitat present.
REPTILES			

Green Turtle *Chelonia mydas*	Vulnerable *EPBC Act* Vulnerable *NSW* BC *Act*	Ocean-dwelling species spending most of its life at sea. Eggs are laid in holes dug in beaches throughout their range.	No habitat present
Hawksbill Turtle *Eretmochelys imbricata*	*EPBC Act* Vulnerable	Marine, nesting on islands in the Great Barrier Reef and Western Australia.	No habitat present
MICRO-CHIROPTERAN BATS			
Eastern Bentwing-bat *Miniopterus orianae oceanensis*	NSW BC Act Vulnerable	Specific caves are known maternity sites with other caves being primary roosting habitat outside breeding period. Also uses derelict mines, storm-water tunnels, buildings and other man-made structures. Hunts in forested areas, catching moths and other flying insects above the tree tops.	Unlikely to occur or rely on habitat within the site. Possibly occurring transiently over the site but will not be affected by proposal or associated works. No important habitat e.g. breeding habitat would be removed or otherwise impacted by the proposal.
Eastern False Pipistrelle *Falsistrellus tasmaniensis*	NSW BC Act Vulnerable	Prefers moist habitat that contains trees greater than 20 m high with a dense undertstorey. They are fast flyers. Roosts in hollow trunks of eucalyptus trees, in colonies of 3 – 80. Also may roost in caves and old wooden buildings. This species changes roost every night. Roosts on consecutive nights are usually less than 750 m apart. This species has a home range of up to 136 ha (Churchill, S	Possibly occurring. Suitable habitat present within the site. Further assessment required.

		2008, Australian Bats, Jacana Books, Crows Nest, NSW). Although they prefer habitat with a dense understorey, they prefer to forage along flyways to avoid the thick understorey. They prefer continuous forest and avoid remnant vegetation. However, they have been recorded in open forests (Churchill, S 2008, Australian Bats, Jacana Books, Crows Nest, NSW).	
Eastern Freetail-Bat *Micronomus norfolkensis*	*Vulnerable NSW* BC *Act* Vulnerable *EPBC 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.	Possibly occurring. Suitable habitat present within the site. Further assessment required.
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	Possibly occurring. Suitable habitat present within the site. Further assessment required.

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).	Possibly occurring. Suitable habitat present within the site. Further assessment required.
BIRDS			
Black Bittern *Ixobrychus flavicollis*	Vulnerable *NSW* BC *Act*	Terrestrial and estuarine wetlands generally in areas of permanent water and dense vegetation that may comprise grassland, woodland forest rainforest and mangroves. Roosts in trees or on ground amongst dense reeds, nests in branches overhanging water	No – no habitat present
Dusky Woodswallow *Artamus cyanopterus cyanopterus*	Vulnerable NSW BC Act	The Dusky Woodswallow is often reported in woodlands is eastern, southern and southwestern Australia. In New South Wales it is widespread from coast to inland, including the western slopes of the great Diving Range and farther west. It is often reported in woodlands and dry open sclerophyll forests, usually dominated by eucalyptus, including mallee associations. It have also been recorded in shrublands and	Possibly occurring. Suitable habitat present within the site. Further assessment required.

		heathlands and carious modified habitats including regenerating forests; very occasionally in moist forests of rainforests. At sites where Dusky Woodswallows are recorded the understorey is typically open with sparse eucalypt saplings, acacias and other shrubs, including heath. The ground cover may consist of grasses, sedges or open ground, often with course woody debris. Birds are often observed in farmland usually at the edges of forests, woodlands or in roadside remnants or wind breaks with dead timber. Nesting occurs from late September to late February, with eggs present between October and early December. They nest in an open shallow untidy cup, frequently in an open hollow, crevice or stump.	
Eastern Bristlebird- *Dasyornis brachypterus*	Endangered EPBC Act Endangered NSW BC Act	Sedgeland/heathland/dry sclerophyll and woodlands- / requires thick shrub/heath layer for shelter, nesting and foraging	Unlikely to occur – no suitable habitat present
Eastern Curlew *Numenius madagascariensis*	Critically Endangered *EPBC Act*	Most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes use the mangroves. The birds are also found in saltworks and sewage farms (Marchant & Higgins 1993). The numbers of Eastern Curlew recorded during one study were correlated with wetland areas.	Unlikely to occur – no suitable habitat present

		Mainly forages on soft sheltered intertidal sandflats or mudflats, open and without vegetation or covered with seagrass, often near mangroves, on saltflats and in saltmarsh, rockpools and among rubble on coral reefs, and on ocean beaches near the tideline. The birds are rarely seen on near-coastal lakes and in grassy areas. Roosts on sandy spits and islets, especially on dry beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves. It occasionally roosts on reef-flats, in the shallow water of lagoons and other near-coastal wetlands. Eastern Curlews are also recorded roosting in trees and on the upright stakes of oyster-racks. At Roebuck Bay, Western Australia, birds fly from their feeding areas on the tidal flats to roost 5 km inland on a claypan. In some conditions, waders may choose roost sites where a damp substrate lowers the local temperature. This may have important conservation implications where these sites are heavily disturbed beaches. It may be possible to create artificial roosting sites to replace those destroyed by development. Eastern Curlews typically roost in large flocks, separate from other waders.	
Eastern Ground Parrot *Pezoporus wallicus wallicus*	Vulnerable *NSW* BC Act	The Eastern Ground Parrot occurs in 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	Unlikely to occur – no suitable habitat present

		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 2013)	
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	Possibly occurring. Further assessment required.
Glossy Black-cockatoo *Calyptorhynchus lathami*	Vulnerable *NSW* BC *Act*	The GBC inhabits open forest and woodlands of the coast where stands of she-oak occur. In the Jervis Bay region they feed almost exclusively on the seeds of the black she-oak *Allocasuarina littoralis*, shredding the cones with their bill	Possibly occurring. Further assessment required.
Latham's Snipe *Gallinago hardwickii*	*EPBC Act:* Migratory	In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity.	Unlikely to occur – no suitable habitat present

		In Australia, Latham's Snipe occurs in a wide variety of permanent and ephemeral wetlands. They usually occur in open, freshwater wetlands that have some form of shelter (usually low and dense vegetation) nearby. They generally occupy flooded meadows, seasonal or semi-permanent swamps, or open waters, but various other freshwater habitats can be used including bogs, waterholes, billabongs, lagoons, lakes, creek or river margins, river pools and floodplains. The structure and composition of the vegetation that occurs around these wetlands is not important in determining the suitability of habitat. As such, snipe may be found in a variety of vegetation types or communities including tussock grasslands with rushes, reeds and sedges, coastal and alpine heathlands, lignum or tea-tree scrub, button-grass plains, alpine herbfields and open forest. Latham's Snipe sometimes occur in habitats that have saline or brackish water, such as saltmarsh, mangrove creeks, around bays and beaches, and at tidal rivers. These habitats are most commonly used when the birds are on migration. They are regularly recorded in or around modified or artificial habitats including pasture, ploughed paddocks, irrigation channels and drainage ditches, ricefields, orchards, saltworks, and sewage and dairy farms. They can also occur in various sites close to humans or human activity (e.g. near roads, railways, airfields, commercial or industrial complexes).	

		The foraging habitats of Latham's Snipe are characterized by areas of mud (either exposed or beneath a very shallow covering of water) and some form of cover (e.g. low, dense vegetation). The snipe roost on the ground near (or sometimes in) their foraging areas, usually in sites that provide some degree of shelter, e.g. beside or under clumps of vegetation, among dense tea-tree, in forests, in drainage ditches or plough marks, among boulders, or in shallow water if cover is unavailable.	
Little Lorikeet *Glossopsitta pusilla*	Vulnerable NSW BC ACT	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). These nest sites are often used repeatedly for decades, suggesting that preferred sites are limited. Riparian trees often chosen, including species like Allocasuarina	Possibly occurring. Further assessment required

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.	Possibly occurring. Further assessment required
Olive Whistler *Pachycephala olivacea*	Vulnerable *NSW* BC *Act*	The Olive Whistler inhabits the wet forests on the ranges of the east coast. It has a disjunct distribution in NSW chiefly occupying the beech forests around Barrington Tops and the MacPherson Ranges in the north and wet forests from Illawarra south to Victoria. In the south it is found inland to the Snowy Mountains and the Brindabella Range. 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. Make nests of twigs and grass in low forks of shrubs. Lay two or three eggs between September and January.	Unlikely to occur – no suitable habitat present
Pied Oystercatcher *Haematopus longirostris*	Endangered *NSW* BC *Act*	Favours intertidal flats of inlets and bays, open beaches and sandbanks. Forages on exposed sand, mud and rock at low tide, for molluscs, worms, crabs and small fish. Nests mostly on coastal or estuarine beaches although occasionally they use saltmarsh or grassy areas.	Unlikely to occur – no suitable habitat present

		Nests are shallow scrapes in sand above the high tide mark, often amongst seaweed, shells and small stones.	
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	Possibly occurring. Further assessment required
Regent Honeyeater *Anthochaera phrygia*	Critically endangered EPBC Act Critically endangered NSW BC Act	Temperate woodlands and open forests- and drier coastal woodlands in some years (flowering coastal woodlands and forests including box-ironbark woodland, and riparian forests-that exhibit large numbers of mature trees, high canopy cover and abundance of mistletoes) Key eucalypt species include Mugga Ironbark, Yellow Box, Blakely's Red Gum, White Box and Swamp Mahogany. Also utilises: Eucalyptus microcarpa, E. punctata, E. polyanthemos, E. moluccana, Corymbia robusta, E. crebra, E. caleyi, C. maculata, E.mckieana, E. macrorhyncha, E. laevopinea, and Angophora floribunda. Nectar and fruit from the mistletoes Amyema miquelii, A.	Unlikely to occur – no suitable habitat present

		pendula and A. cambagei are also eaten during the breeding season.	
Short-tailed Shearwater *Ardenna tenuirostris*	Migratory *EPBC Act*	Coastal, oceanic.	Unlikely to occur – no suitable habitat present
Sooty Oystercatcher *Haematopus fuliginosus*	Vulnerable *NSW* BC *Act*	Shore bird – breeds in sand or coral scrapes on offshore islands	Unlikely to occur – no suitable habitat present
Square-Tailed Kite *Lophoictinia isura*	*Vulnerable NSW* BC *Act*	Summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses large hunting ranges of more than 100km2 Nest within large hollow bearing trees generally within 200m of riparian areas.	Possibly occurring. Further assessment required
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	Possibly occurring. Further assessment required
Wedge-tailed Shearwater *Ardenna pacificus*	Migratory *EPBC Act*	A pelagic, marine bird known from tropical and subtropical waters. The species tolerates a range of surface-temperatures and salinities, but is most abundant where temperatures are greater than 21 °C and salinity is greater than 34.6 %. In tropical zones the species may feed over cool nutrient-rich waters. The species has been recorded in offshore waters of eastern Victoria and southern NSW, mostly over continental slope	Unlikely to occur – no suitable habitat present

		with sea-surface temperatures of 13.9–24.4 °C and usually off the continental shelf in north-west Australia.	
White-bellied Sea-Eagle *Haliaeetus leucogaster*	*NSW* BC *Act* Vulnerable Migratory *EPBC Act*	Found in coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands in tropical and temperate regions of mainland Australia and its offshore islands. The habitats occupied by the sea-eagle are characterized by the presence of large areas of open water (larger rivers, swamps, lakes, the sea). Birds have been recorded in (or flying over) a variety of terrestrial habitats. The species is mostly recorded in coastal lowlands, but can occupy habitats up to 1400 m above sea level on the Northern Tablelands of NSW and up to 800 m above sea level in Tasmania and South Australia. Birds have been recorded at or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs, saltmarsh and sewage ponds. They also occur at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest (including rainforest) and even urban areas. Breeding has been recorded on the coast, at inland sites, and on offshore islands. Breeding territories are located close to water, and mainly in tall open forest or woodland, although nests are sometimes located in other habitats such as dense forest (including rainforest), closed scrub or in remnant trees on cleared land.	Possibly occurring. Further assessment required

		Forages over large expanses of open water; this is particularly true of birds that occur in coastal environments close to the sea-shore, where they forage over in-shore waters. However, the White-bellied Sea-Eagle will also forage over open terrestrial habitats (such as grasslands). Birds may move to and congregate in favorable sites during drought or food shortage.	
White-throated Needletail *Hirundapus caudacutus*	Migratory *EPBC Act*	Almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable, but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks. In coastal areas, they are sometimes seen flying over sandy beaches or mudflats, and often around coastal cliffs and other areas with prominent updraughts, such as ridges and sand-dunes. They are sometimes recorded above islands well out to sea.	Unlikely to occur – no suitable habitat present
MAMMALS			

Australian Fur-seal *Arctocephalus pusillus doriferus*	Vulnerable *NSW* BC *Act*	Prefers rocky parts of islands with flat, open terrain. They occupy flatter areas than do New Zealand Fur-seals where they occur together.	Unlikely to occur – no suitable habitat present
Eastern Chestnut Mouse *Pseudomys gracilicaudatus*	Vulnerable *NSW* BC *Act*	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	Unlikely to occur. No suitable habitat within the site.
Eastern Pygmy-possum *Cercatetus nanus*	Vulnerable NSW BC Act	Rainforest, sclerophyll forest & woodland to heath – but heath & woodland preferred. Forages on banksias, eucalypts & bottlebrushes.	Unlikely to occur. No suitable habitat within the site.
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.	Possibly occurring. Further assessment (under EPBC significant impact guidelines) required

Grey-headed Flying-fox *Pteropus poliocephalus*	Vulnerable *EPBC Act* Vulnerable *NSW* BC *Act*	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Possibly occurring. Further assessment required
Humpback Whale *Megaptera novaeangliae*	Vulnerable EPBC Act Vulnerable NSW BC Act	The population of Australia's east coast migrates from summer cold-water feeding grounds in Subantarctic waters to warm-water winter breeding grounds in the central Great Barrier Reef. They are regularly observed in NSW waters in June and July, on northward migration and October and November, on southward migration	No – no habitat present
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	Possibly occurring. Further assessment required.

		mixed with earth to waterproof the inside of the nest.	
Squirrel Glider *Petaurus norfolcensis*	*NSW* BC *Act* Vulnerable	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. Live in family groups of a single adult male one or more adult females and offspring. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.	Possibly occurring. Further assessment required.
White-footed Dunnart *Sminthospsis leucopus*	Vulnerable NSW BC Act	Dry sclerophyll forests, sedgeland or heathland- coastal dune vegetation, coastal forest, tussock grassland and woodland and forest post disturbance – open understorey layer. They shelter in bark nests in hollows under standing or fallen timber, burrows in the ground, piles of logging debris, large grass clumps such as provided by Grass Trees *Xanthorrhoea* spp.and Cycads *Macrozamia* spp. and rock crevices	Unlikely to occur – no suitable habitat present
Yellow-bellied Glider - *Petaurus Australis*	Vulnerable *NSW* BC *Act*	Forest with old growth elements. Large Eucalypt Hollows for denning- Inhabits mature or old growth Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia	Possibly occurring. Further assessment required.

		mid storey. Feed primarily on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein. Extract sap by incising (or biting into) the trunks and branches of favoured food trees, often leaving a distinctive 'V'-shaped scar. Very mobile and occupy large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food resources.	
INSECTS			
Giant Dragonfly *Petalura gigantea*	NSW BC Act Endangered	Live in permanent swamps and bogs with some free water and open vegetation. Adults emerge from late October and are short-lived, surviving for one summer after emergence. 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. Adults fly over the swamp and along its margins hunting for flying insects. Males sometimes congregate waiting for females to mate with. Females lay eggs into moss, under other soft ground layer vegetation, and into moist litter and humic soils, often associated with groundwater seepage areas within appropriate swamp and bog habitats. The species does not utilise areas of standing water wetland, although it may utilise suitable boggy areas adjacent to open water wetlands. Larvae dig long branching burrows under the swamp. Larvae are slow growing and the larval stage may last 10 years or more. It is thought that larvae leave their burrows at night	Unlikely to occur – no suitable habitat present

		and feed on insects and other invertebrates on the surface and also use underwater entrances to hunt for food in the aquatic vegetation.	