



Survey for threatened flora and threatened ecological communities -
Bundian Way – Pinnacles to Worange Point



Report for Wolfpeak Environmental Services.

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Axis Ecological Services

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Bundian Way-Beowa NP threatened flora and communities_Axis Ecological Services_Final.docx



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1. Background

The Bundian Way is an ancient track joining Turemulerrer (Twofold Bay) and Targangal (Mount Kosciuszko). The Bundian Way is currently in development to become a connected walking track, starting with a section between Jigamy Farm near Pambula Lake and Fisheries Beach, in the south of Twofold Bay.

Previously, Axis Ecological Services was engaged by WolfPeak Environmental Services in 2022 to undertake an assessment of threatened flora and threatened ecological communities within a number of smaller sections along this route, where modification of native vegetation was required to establish the track.

A subsequent re-design of a section of this has required an additional survey within Beowa National Park, from Pinnacles carpark south to Worange Point. This survey encompasses mapping of Plant Community Types due to the new alignment through previously unsurveyed vegetation.

2. Methodology

2.1 Track section

The Pinnacles to Worange Point section stretches from near The Pinnacles carpark south to the intersection of N Head Track and an unnamed track directly south near Worange Point, within Beowa National Park north of Eden NSW. This track section replaces a section of the Bundian Way alignment that previously partly followed N Head Track. This new alignment, and the original alignment, are shown in **Figure 2.1** below.

2.2 Candidate threatened flora species

Ten threatened flora species have been recorded within 10km of the study area (Bionet search August 4th 2024). These species are listed in **Table 2.1** and locations are shown in **Figure 2.2** below.

Table 2.1. Candidate threatened flora species recorded within 10km of the study area.

Family	Scientific name	In flowering time?	NSW status	Commonwealth status
Araliaceae	<i>Astrotricha</i> sp. <i>Wallagaraugh</i>	No	E1	
Convolvulaceae	<i>Wilsonia backhousei</i>	No	V	
Fabaceae (Faboideae)	<i>Pultenaea pedunculata</i>	No	E1	
Euphorbiaceae	<i>Pseudanthus ovalifolius</i>	No	E1	
Orchidaceae	<i>Cryptostylis hunteriana</i>	No	V	V
Orchidaceae	<i>Genoplesium rhyoliticum</i>	No	E1	E
Rhamnaceae	<i>Pomaderris bodalla</i>	Possibly	V	
Rutaceae	<i>Leionema ralstonii</i>	Yes	V	V
Rutaceae	<i>Zieria formosa</i>	No	E4A	E
Violaceae	<i>Viola cleistogamoides</i>	No	E1	



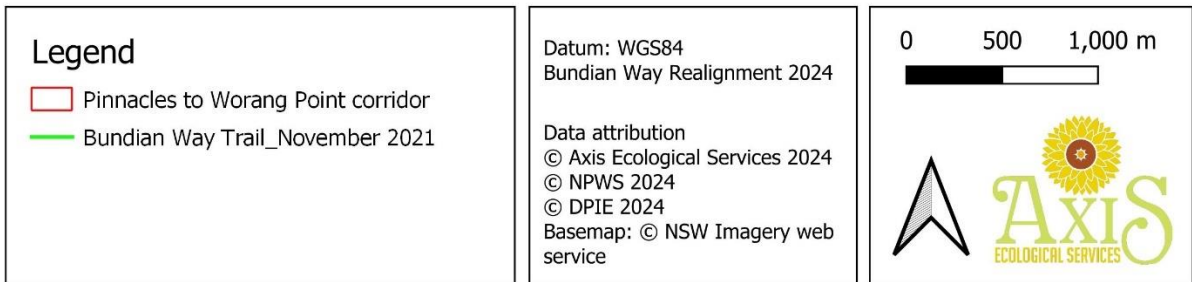
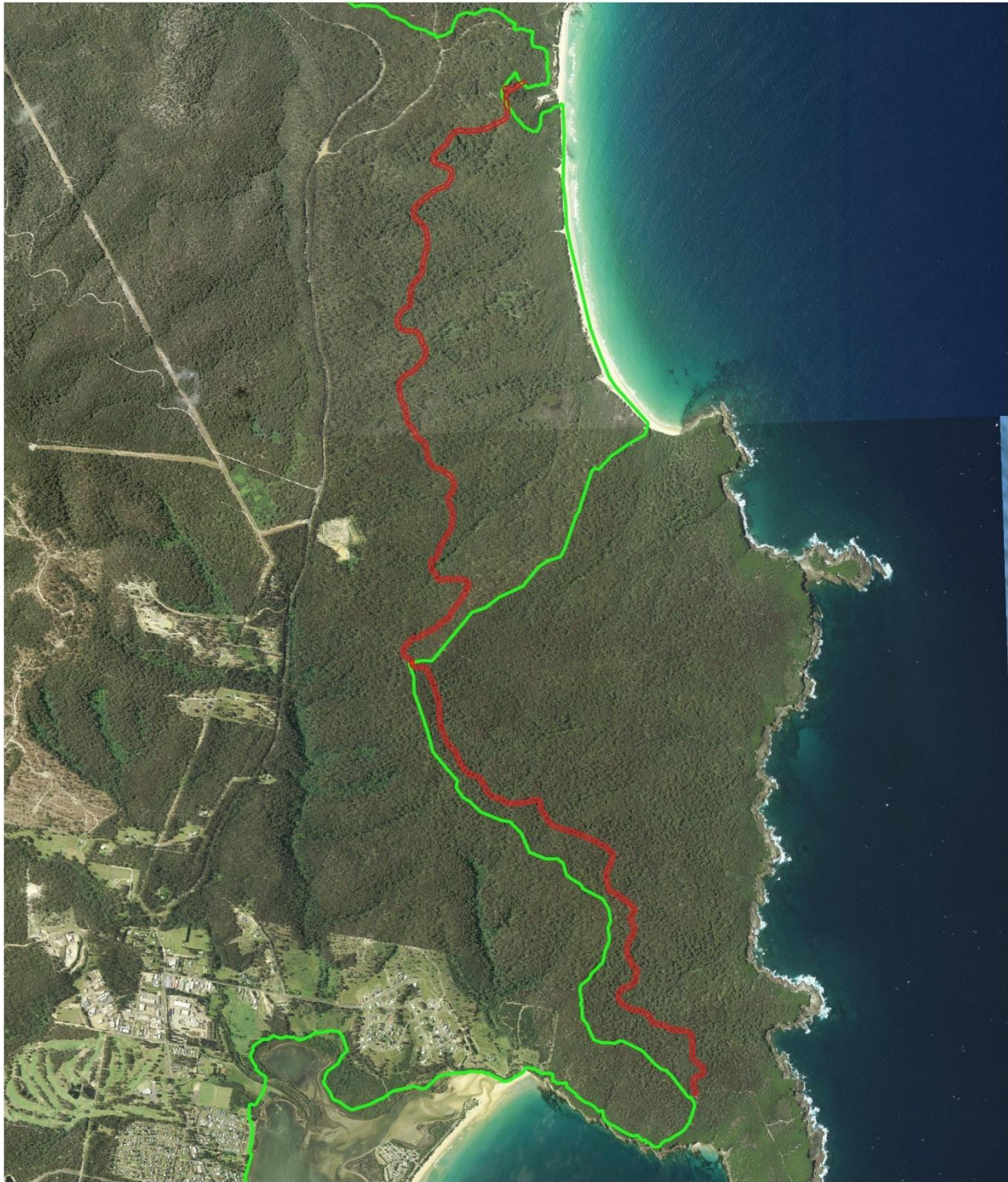


Figure 2.1. Study area showing new Pinnacles to Worange Point alignment, and the earlier proposed alignment through Beowa National Park.



While all species listed above have been recorded within 10km of the study area and are therefore considered to potentially occur, several species listed have highly specific habitat associations which are not present along the Bundian Way track alignment. Specifically, Rhyolite Midge Orchid (*Genoplesium rhyoliticum*), Ralston's Leionema (*Leionema ralstonii*) and Shapely Zieria (*Zieria formosa*) are all associated with rhyolite rocky outcrops west of Pambula and Eden. While outlying occurrences of these species are possible, these species are deemed unlikely to occur within the study area.

The Oval-leafed Pseudanthus (*Pseudanthus ovalifolia*) has been recorded only once within NSW, at a site very close to the Pinnacles to Worange Point realignment, in 1978. This specific location is between Pinnacles and North Head Track just east of the alignment, coinciding with Terrace Beach Track, though precise recording of location would not have been possible in 1978. The habitat description of the record is 'Open dry forest, sandy ground', which could apply to most of the habitat available in the study area. All previous attempts to relocate the species have been unsuccessful. This species is considered to potentially occur in the study area based on proximity to the existing historical record.

The Merimbula Star-hair (*Astrotricha* sp. *Wallagaraugh*) is known from two disjunct populations including one north from Merimbula. While no records of the species occur within the vicinity of the track alignment, the species is known to occur in forests dominated by Blackbutt (*Eucalyptus pilularis*), Red Bloodwood (*Corymbia gummifera*) and Black She-oak (*Allocasuarina littoralis*) on moderate to deep sandy soils, similar to that present within the northern extent of the study area around the Pinnacles to Worange Point section.

The Hidden Violet (*Viola cleistogamoides*) is a small forb known to occur in mostly coastal wet heath but also dry forests and woodlands on skeletal soils. It is known from two localities near to the study area, and is a very small, cryptic species which would not have been flowering during the survey period. This species is considered to potentially occur in the study area.

Narrow-leafed Wilsonia (*Wilsonia backhousei*) is a small perennial shrub that forms low mats on the margins of lakes and saltmarshes. It is known from Pambula Lake to the north of the study area, however no suitable habitat is available along the specific Pinnacles to Worange Point section.

The Bodalla Pomaderris (*Pomaderris bodalla*) is a tall shrub growing in wet gullies north from Merimbula. While the study area is south of the known distribution of the species, the track alignment crosses a number of small gullies potentially suitable for the species. It is therefore considered to potentially occur within the study area.

The Leafless Tongue Orchid (*Cryptostylis hunteriana*) is distributed in a range of coastal forest and woodland communities along the coast of New South Wales. The species was recently recorded approximately 2km to the east of the study area in Nullica State Forest, in October 2023 (after earlier 2022 surveys along the Bundian Way alignment). The species is not readily identifiable outside of the flowering period (December-February), as the above-ground part is a flower spike lacking leaves that desiccates after seed fall. This species is considered to potentially occur within the study area.



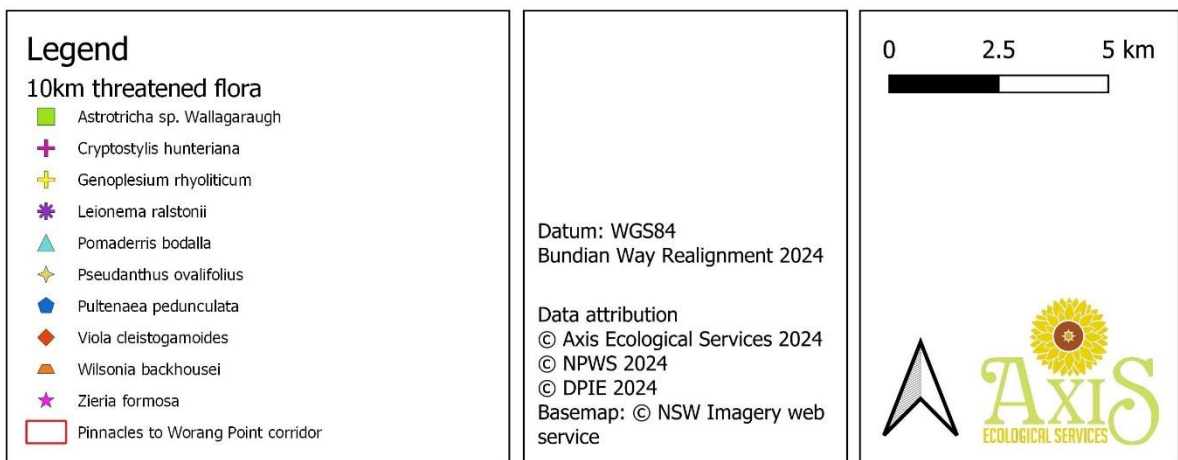


Figure 2.2. Threatened flora species recorded within 10km of the Pinnacles to Worang Point trail section.



2.3 Candidate threatened ecological communities

Eight threatened ecological communities are known to occur or are predicted to occur around the study area. These communities are listed in **Table 2.2** below.

Table 2.2. Candidate threatened ecological communities predicted to potentially occur within the study area.

Name	NSW status	Commonwealth status
Bangalay Sand Forest in the Sydney Basin and South East Corner Bioregions	Endangered	
Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered	Vulnerable
Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	
Littoral Rainforest in the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered	Critically Endangered
Lowland Grassy Woodland in the South East Corner Bioregion	Endangered	Critically Endangered
River-flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered	Critically Endangered
Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions	Endangered	Endangered
Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered	

2.4 Survey methodology

Surveys were conducted on the 8th and 9th July 2024, with the proposed track realignment traversed by botanist Dr James Schlunke along with Yully from track builder Creative Lines, NPWS representatives, LALC representatives and other experts. The coordinated track surveys were carried out to enable scoping of specific track alignment, and incorporating any required alignment changes due to survey findings during the assessment phase. The proposed alignment includes a 1m track plus a buffer of 10m either side for potential required realignment during the construction phase.

The survey methodology included recording and mapping of any threatened flora or threatened ecological communities recorded, and also recording of any incidental threatened fauna or threatened fauna sign. Other data collected included an incidental list of plant species encountered, and noting changes in plant community composition and structure along the alignment to allow for identification and mapping of Plant Community Types (PCTs).

3. Results

3.1 Threatened flora

No threatened flora species were detected during the surveys. Habitats present included mainly tall *Eucalyptus pilularis* - *Corymbia gummifera* forests on deep sands, which is potentially suitable for *Astrotricha* sp. *Wallagaraugh* and *Cryptostylis hunteriana*, though neither species were detected. Other vegetation recorded include *Eucalyptus sieberi* – *Eucalyptus baxteri* – *Corymbia gummifera* dominated forest on more elevated sections on shallower soils. Habitat suitability for candidate



threatened flora species is summarised in **Table 3.1** below. Survey tracks are shown in **Figure 3.1** and **3.2**.

Table 3.1. Summary of habitat availability and detectability of threatened flora species within the Pinnacles to Morang Point section.

Scientific name	Potential habitat present	Detectable	Recorded
<i>Astrotricha</i> sp. <i>Wallagaraugh</i>	Yes	Yes	No
<i>Wilsonia backhousei</i>	No	Yes	No
<i>Pultenaea pedunculata</i>	Yes	Yes	No
<i>Pseudanthus ovalifolius</i>	Yes	Yes	No
<i>Cryptostylis hunteriana</i>	Yes	No	No
<i>Genoplesium rhyoliticum</i>	No	No	No
<i>Pomaderris bodalla</i>	Yes	Yes	No
<i>Leionema ralstonii</i>	No	Yes	No
<i>Zieria formosa</i>	No	Yes	No
<i>Viola cleistogamoides</i>	Yes	Yes	No

3.2 Plant Community Types (PCTs) and Threatened Ecological Communities

Vegetation along the track alignment was found to comprise two distinct but broadly similar plant community types (**Figure 3.3**). Plant species recorded are shown in **Table 3.2**.

3.2.1 PCT 3662 – South Coast Lowland Blackbutt Forest

This PCT occurs on lower lying sections on sandy soils, particularly in the north of the alignment (**Figure 3.3**). This PCT has a canopy comprising mostly Blackbutt (*Eucalyptus pilularis*) and Red Bloodwood (*Corymbia gummifera*), plus a patchy lower canopy of Port Jackson Pine (*Callitris rhomboidea*), Black She-oak (*Allocasuarina littoralis*), Old Man Banksia (*Banksia serrata*) and Blueberry Ash (*Elaeocarpus reticulatus*) is sometimes present. A diverse mid-storey is present including shrubs *Acacia longifolia* subsp. *longifolia*, *Lasiopetalum macrophyllum*, *Monotoca elliptica*, Cherry Ballart (*Exocarpos cupressiformis*), *Podocarpus spinulosus*, *Ozothamnus diosmifolius*, *Platylobium parviflorum*, *Bursaria spinosa* and *Crowea exalata*. The ground layer includes often dense Bracken Fern (*Pteridium esculentum*), forbs *Dianella caerulea*, *Patersonia glabrata*, *Opercularia diphylla*, *Poranthera corymbosa*, *Hydrocotyle sibthorpiodes*, and *Dichondra repens*, and grasses *Entolasia stricta*, *Imperata cylindrica*, *Rytidosperma pallidum*, *Themeda triandra* and *Oplismenus imbecilis*.

Some sections along drainage lines include dense patches of ferns including Rainbow Fern (*Calochlaena dubia*) and Gristle Fern (*Blechnum cartilagineum*) and sedges and rushes including *Empodisma minus*, *Gahnia* spp. and *Lepidosperma filiforme*. Some sections include some very large remnant old-growth Blackbutt (*Eucalyptus pilularis*) and Red Bloodwood (*Corymbia gummifera*) trees, which include abundant hollows (**Figure 3.5**). A section in the north of the alignment within PCT 3662 was previously an historical plantation of the exotic Radiata Pine (*Pinus radiata*). These stands have been managed/removed by NPWS over time, however some small stands still remain.

PCT 3662 does not correspond to any threatened ecological communities (TECs).



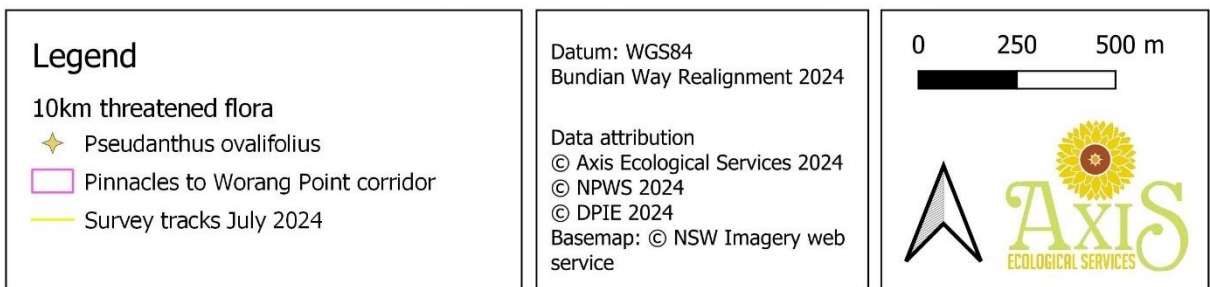


Figure 3.1. Survey tracks in the north of the Pinnacles to Morang Point track section.



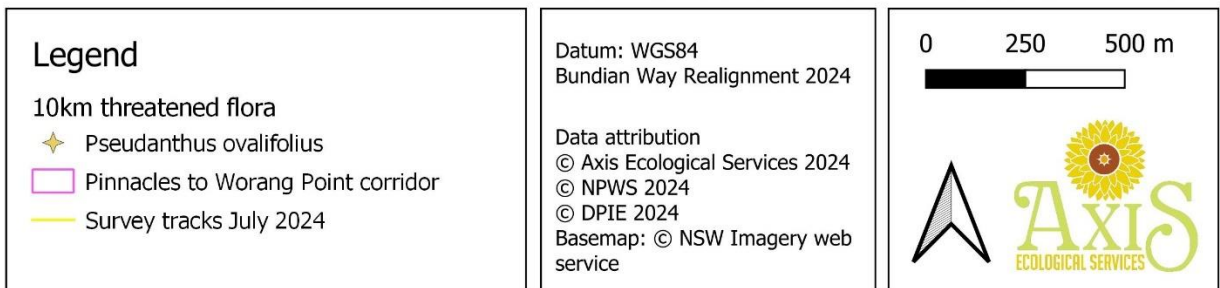
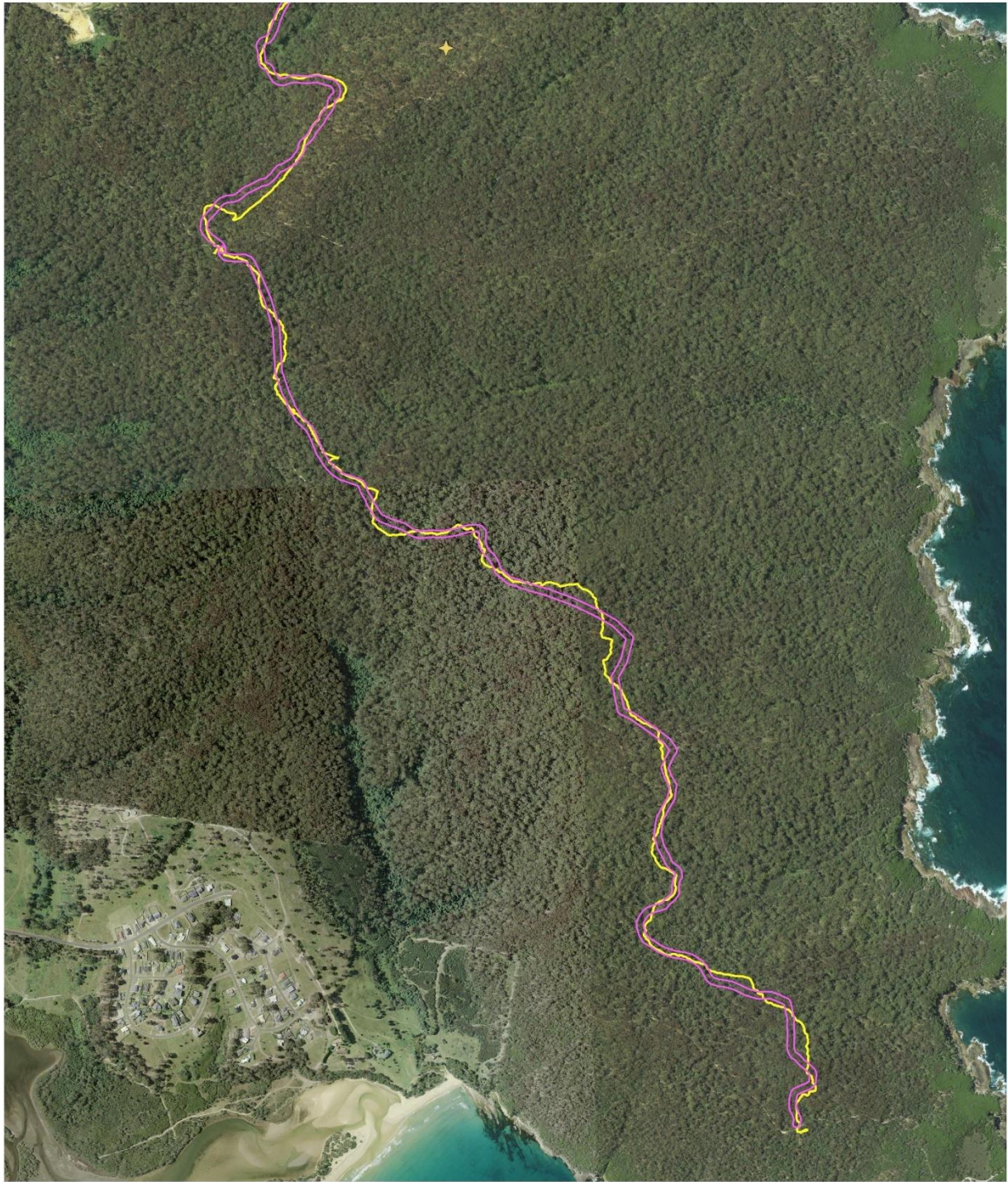


Figure 3.2. Survey tracks in the north of the Pinnacles to Worang Point track section.



3.2.2 PCT 3646 – Far South Coastal Ranges Silvertop Ash Forest

PCT 3646 occurs within the southern half of the study area, interspersed with PCT 3662. It occurs on slightly higher elevations in the landscape, and features a canopy of mostly Silvertop Ash (*Eucalyptus sieberi*) and Red Bloodwood (*Corymbia gummifera*), plus an outlying population of Brown Stringybark (*Eucalyptus baxterii*), which is typically found further south. A lower canopy of Black She-oak (*Allocasuarina littoralis*), Old Man Banksia (*Banksia serrata*) and Blueberry Ash (*Elaeocarpus reticulatus*) is often present. The mid-storey features a diverse array of shrubs including *Acacia terminalis*, *Acacia myrtifolia*, *Bossiaea obcordata*, *Banksia spinulosa*, *Acacia obtusifolia*, *Persoonia linearis* and *Ricinocarpos pinifolius*. The ground is also diverse, including forbs *Tetratheca thymifolia*, *Patersonia glabrata*, *Xanthosia pilosa* and *Gonocarpus teuroides*, shrubs *Correa reflexa* var. *speciosa*, *Hibbertia empetrifolia* subsp. *empetrifolia* and *Epacris impressa*, sedges *Caustis flexuosa*, *Lepidosperma sieberi* and *Lepidosperma laterale*, and fern *Pteridium esculentum*. PCT 3646 includes some areas of large, mature hollow-bearing trees (**Figure 3.6**).

PCT 3646 does not correspond with any listed threatened ecological communities.



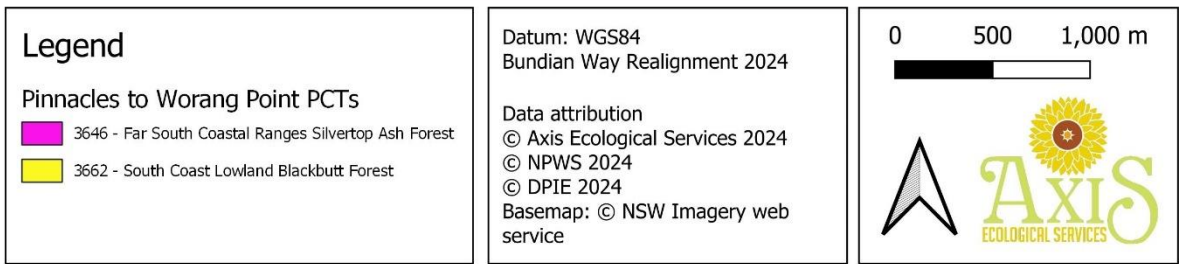


Figure 3.3. PCT mapping of the Pinnacles to Worange Point track section.





Figure 3.4. PCT 3662 in the northern section of the track section.





Figure 3.5. Very large old-growth Red Bloodwood (*Corymbia gummifera*) in PCT 3662.





Figure 3.6. PCT 3646 in the southern half of the study area, featuring a large mature Silvertop Ash (*Eucalyptus sieberi*).



3.3 Threatened fauna and habitats

Impacts on threatened fauna and habitats was covered in the original Review of Environmental Factors (REF) for this project, and the relatively minor adjustment to the route indicates that this original assessment is still valid for the current realignment of the Pinnacles to Worange Point section. However, threatened fauna species were detected either directly through observation or indirectly through sign during the surveys. The locations of observations are shown in **Figure 3.8** below.

The presence of the NSW BC Act listed vulnerable Yellow-bellied Glider (*Petaurus australis*) was detected through the presence of abundant feed scar on numerous Red Bloodwood trees (*Corymbia gummifera*) (**Figure 3.7**). This was particularly commonly observed in the southern half of the track alignment.

Evidence of the BC Act listed vulnerable Glossy Black-cockatoo (*Calyptorhynchus lathami*) was observed in the form of chewed cones of Black She-oak (*Allocasuarina littoralis*). This feed tree is abundant throughout this section of Beowa National Park. Three BC Act listed vulnerable Gang-gang Cockatoos (*Callocephalon fibriatum*) were observed feeding on Eucalypt fruit in the southern section of the alignment.

Owl whitewash was also detected during the survey in the north of the study area, to the immediate west of The Pinnacles. Several species of owl could be responsible for this whitewash, however this includes several threatened species such as the BC Act listed vulnerable Powerful Owl (*Ninox strenua*). Also, the likely call of a BC Act listed vulnerable White-bellied Sea Eagle (*Haliaeetus leucogaster*) was heard in the northern end of the alignment near The Pinnacles.



Figure 3.7. Chew marks of the Yellow-bellied Glider on a mature Red Bloodwood tree.



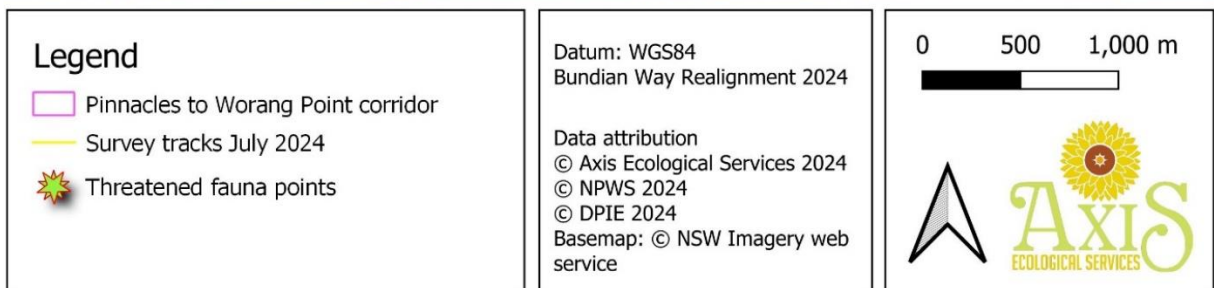
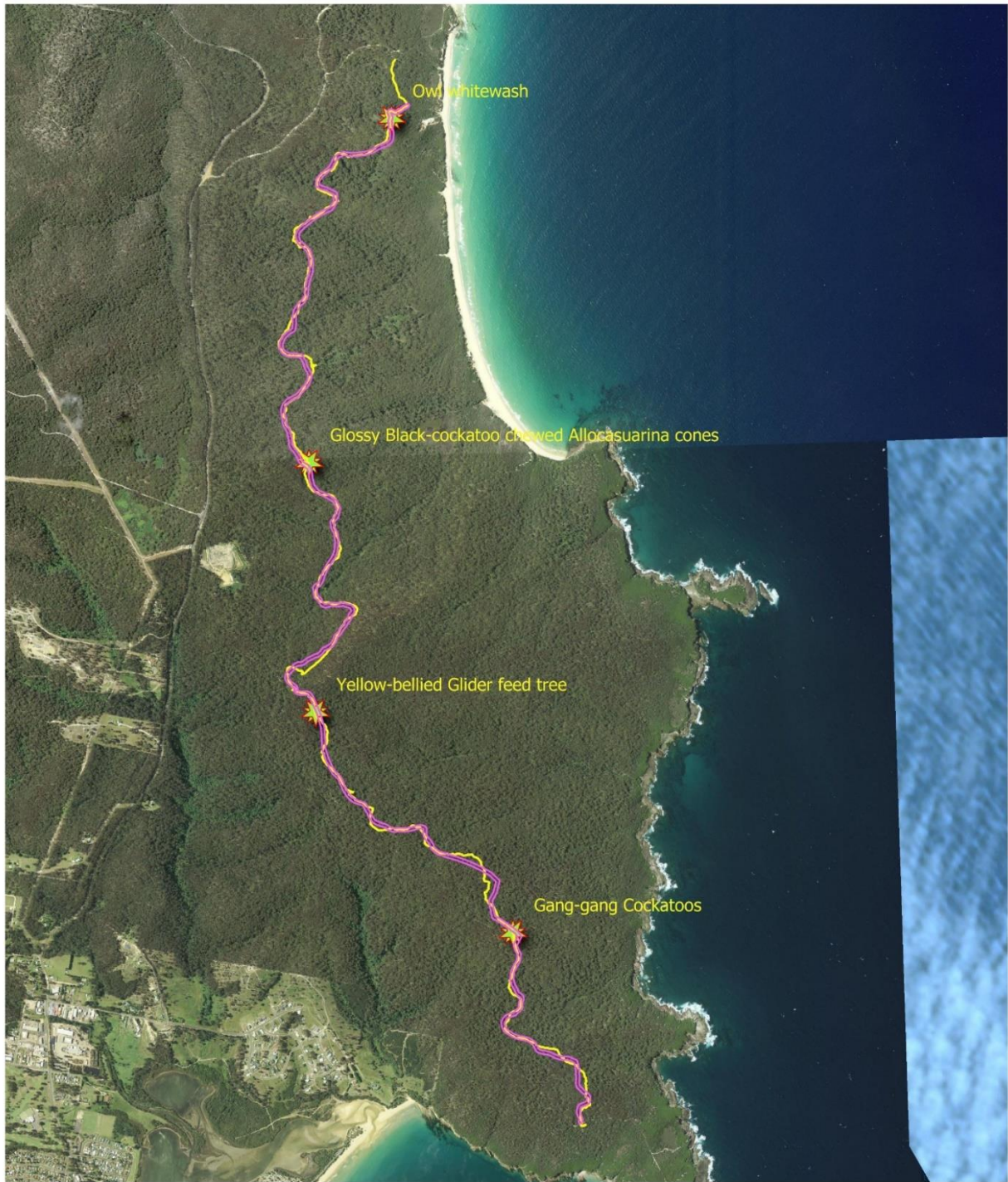


Figure 3.8. Threatened fauna records and sign detected during the survey.



Table 3.2. Plant species recorded within the Pinnacles to Morang Point section.

Family	Exotic	Scientific Name	Common Name	BAM Growth Form Group
Apiaceae		<i>Hydrocotyle sibthorpioides</i>		Forb (FG)
Apiaceae		<i>Platysace lanceolata</i>	Shrubby Platysace	Shrub (SG)
Apiaceae		<i>Xanthosia pilosa</i>	Woolly Xanthosia	Forb (FG)
Apiaceae		<i>Xanthosia tridentata</i>	Rock Xanthosia	Forb (FG)
Apocynaceae		<i>Marsdenia rostrata</i>	Milk Vine	Other (OG)
Apocynaceae		<i>Tylophora barbata</i>	Bearded Tylophora	Other (OG)
Araliaceae		<i>Polyscias murrayi</i>	Pencil Cedar	Tree (TG)
Araliaceae		<i>Trachymene composita</i>		Forb (FG)
Asphodelaceae		<i>Dianella caerulea</i>	Blue Flax-lily	Forb (FG)
Asphodelaceae		<i>Dianella tasmanica</i>		Forb (FG)
Asteraceae		<i>Cassinia longifolia</i>		Shrub (SG)
Asteraceae		<i>Coronidium elatum</i>		Shrub (SG)
Asteraceae		<i>Lagenophora gracilis</i>	Slender Lagenophora	Forb (FG)
Asteraceae		<i>Olearia tomentosa</i>	Toothed Daisy-bush	Shrub (SG)
Asteraceae		<i>Ozothamnus diosmifolius</i>	White Dogwood	Shrub (SG)
Blechnaceae		<i>Blechnum cartilagineum</i>	Gristle Fern	Fern (EG)
Campanulaceae		<i>Wahlenbergia gracilis</i>	Sprawling Bluebell	Forb (FG)
Convolvulaceae		<i>Dichondra repens</i>	Kidney Weed	Forb (FG)
Cupressaceae		<i>Callitris rhomboidea</i>	Port Jackson Pine	Tree (TG)
Cyperaceae		<i>Caustis flexuosa</i>	Curly Wig	Grass & grasslike (GG)
Cyperaceae		<i>Caustis pentandra</i>	Thick Twist Rush	Grass & grasslike (GG)
Cyperaceae		<i>Gahnia spp.</i>		Grass & grasslike (GG)
Cyperaceae		<i>Lepidosperma filliforme</i>		Grass & grasslike (GG)
Cyperaceae		<i>Lepidosperma laterale</i>	Variable Sword-sedge	Grass & grasslike (GG)
Cyperaceae		<i>Lepidosperma sieberi</i>		Grass & grasslike (GG)
Dennstaedtiaceae		<i>Pteridium esculentum</i>	Bracken	Fern (EG)
Dicksoniaceae		<i>Calochlaena dubia</i>	Rainbow Fern	Other (OG)
Dilleniaceae		<i>Hibbertia acicularis</i>		Shrub (SG)
Dilleniaceae		<i>Hibbertia aspera</i>	Rough Guinea Flower	Shrub (SG)
Dilleniaceae		<i>Hibbertia dentata</i>	Twining Guinea Flower	Other (OG)
Dilleniaceae		<i>Hibbertia empetrifolia</i> subsp. <i>empetrifolia</i>		Shrub (SG)
Dilleniaceae		<i>Hibbertia linearis</i>		Shrub (SG)
Dilleniaceae		<i>Hibbertia obtusifolia</i>	Hoary Guinea Flower	Shrub (SG)
Elaeocarpaceae		<i>Elaeocarpus reticulatus</i>	Blueberry Ash	Shrub (SG)
Elaeocarpaceae		<i>Tetradlea thymifolia</i>	Black-eyed Susan	Shrub (SG)
Ericaceae		<i>Acrotriche serrulata</i>	Honeypots	Shrub (SG)
Ericaceae		<i>Epacris impressa</i>	Common Heath	Shrub (SG)
Ericaceae		<i>Leucopogon ericoides</i>	Pink Beard-heath	Shrub (SG)



Family	Exotic	Scientific Name	Common Name	BAM Growth Form Group
Ericaceae		<i>Leucopogon lanceolatus</i>		Shrub (SG)
Ericaceae		<i>Monotoca elliptica</i>	Tree Broom-heath	Shrub (SG)
Euphorbiaceae		<i>Amperea xiphioclada</i>		Shrub (SG)
Euphorbiaceae		<i>Homalanthus populifolius</i>		Shrub (SG)
Euphorbiaceae		<i>Ricinocarpos pinifolius</i>	Wedding Bush	Shrub (SG)
Fabaceae (Faboideae)		<i>Aotus ericoides</i>		Shrub (SG)
Fabaceae (Faboideae)		<i>Bossiaea cinerea</i>		Shrub (SG)
Fabaceae (Faboideae)		<i>Bossiaea ensata</i>	Sword Bossiaea	Shrub (SG)
Fabaceae (Faboideae)		<i>Bossiaea heterophylla</i>	Variable Bossiaea	Shrub (SG)
Fabaceae (Faboideae)		<i>Bossiaea obcordata</i>	Spiny Bossiaea	Shrub (SG)
Fabaceae (Faboideae)		<i>Glycine clandestina</i>	Twining glycine	Other (OG)
Fabaceae (Faboideae)		<i>Hardenbergia violacea</i>	False Sarsaparilla	Other (OG)
Fabaceae (Faboideae)		<i>Hovea heterophylla</i>		Forb (FG)
Fabaceae (Faboideae)		<i>Kennedia rubicunda</i>	Dusky Coral Pea	Other (OG)
Fabaceae (Faboideae)		<i>Platylobium parviflorum</i>	Small-flowered Flat-pea	Shrub (SG)
Fabaceae (Faboideae)		<i>Pultenaea daphnoides</i>	Large-leaf Bush-pea	Shrub (SG)
Fabaceae (Mimosoideae)		<i>Acacia longifolia</i> subsp. <i>longifolia</i>	Sydney Golden Wattle	Shrub (SG)
Fabaceae (Mimosoideae)		<i>Acacia myrtifolia</i>	Red-stemmed Wattle	Shrub (SG)
Fabaceae (Mimosoideae)		<i>Acacia obtusifolia</i>		Shrub (SG)
Fabaceae (Mimosoideae)		<i>Acacia suaveolens</i>	Sweet Wattle	Shrub (SG)
Fabaceae (Mimosoideae)		<i>Acacia terminalis</i>	Sunshine Wattle	Shrub (SG)
Fabaceae (Mimosoideae)		<i>Acacia ulicifolia</i>	Prickly Moses	Shrub (SG)
Goodeniaceae		<i>Cooperhooikia barbata</i>	Purple Goodenia	Forb (FG)
Goodeniaceae		<i>Goodenia ovata</i>	Hop Goodenia	Shrub (SG)
Haloragaceae		<i>Gonocarpus teucrioides</i>	Germander Raspwort	Forb (FG)
Iridaceae		<i>Patersonia glabrata</i>	Leafy Purple-flag	Forb (FG)
Lindsaeaceae		<i>Lindsaea linearis</i>	Screw Fern	Fern (EG)
Lomandraceae		<i>Lomandra confertifolia</i> subsp. <i>rubiginosa</i>		Grass & grasslike (GG)
Lomandraceae		<i>Lomandra glauca</i>	Pale Mat-rush	Grass & grasslike (GG)
Lomandraceae		<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	Grass & grasslike (GG)
Lomandraceae		<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	Many-flowered Mat-rush	Grass & grasslike (GG)



Family	Exotic	Scientific Name	Common Name	BAM Growth Form Group
Lycopodiaceae		<i>Lycopodium deuterodensum</i>	Bushy Clubmoss	Fern (EG)
Malvaceae		<i>Lasiopetalum macrophyllum</i>	Shrubby Velvet-bush	Shrub (SG)
Menispermaceae		<i>Stephania japonica</i>	Snake vine	Other (OG)
Myrtaceae		<i>Acmena smithii</i>	Lilly Pilly	Tree (TG)
Myrtaceae		<i>Angophora floribunda</i>	Rough-barked Apple	Tree (TG)
Myrtaceae		<i>Corymbia gummifera</i>	Red Bloodwood	Tree (TG)
Myrtaceae		<i>Eucalyptus baxteri</i>	Brown Stringybark	Tree (TG)
Myrtaceae		<i>Eucalyptus pilularis</i>	Blackbutt	Tree (TG)
Myrtaceae		<i>Eucalyptus sieberi</i>	Silvertop Ash	Tree (TG)
Myrtaceae		<i>Kunzea ambigua</i>	Tick Bush	Shrub (SG)
Myrtaceae		<i>Leptospermum trinervium</i>	Slender Tea-tree	Shrub (SG)
Myrtaceae		<i>Melaleuca squarrosa</i>	Scented Paperbark	Shrub (SG)
Myrtaceae		<i>Sannantha pluriflora</i>		Shrub (SG)
Oleaceae		<i>Notelaea venosa</i>	Veined Mock-olive	Shrub (SG)
Orchidaceae		<i>Acianthus fornicatus</i>	Pixie Caps	Forb (FG)
Orchidaceae		<i>Chiloglottis spp.</i>		Forb (FG)
Phyllanthaceae		<i>Phyllanthus hirtellus</i>	Thyme Spurge	Shrub (SG)
Phyllanthaceae		<i>Poranthera corymbosa</i>		Shrub (SG)
Pinaceae	*	<i>Pinus radiata</i>	Radiata Pine	#N/A
Pittosporaceae		<i>Billardiera mutabilis</i>	Climbing Apple Berry	Other (OG)
Pittosporaceae		<i>Bursaria spinosa</i>	Native Blackthorn	Shrub (SG)
Pittosporaceae		<i>Pittosporum undulatum</i>	Sweet Pittosporum	Shrub (SG)
Poaceae		<i>Anisopogon avenaceus</i>	Oat Speargrass	Grass & grasslike (GG)
Poaceae		<i>Aristida vagans</i>	Threeawn Speargrass	Grass & grasslike (GG)
Poaceae		<i>Austrostipa rudis</i>		Grass & grasslike (GG)
Poaceae		<i>Echinopogon caespitosus</i>	Bushy Hedgehog-grass	Grass & grasslike (GG)
Poaceae		<i>Entolasia stricta</i>	Wiry Panic	Grass & grasslike (GG)
Poaceae		<i>Hierochloe rariflora</i>	Scented Holygrass	Grass & grasslike (GG)
Poaceae		<i>Imperata cylindrica</i>	Blady Grass	Grass & grasslike (GG)
Poaceae		<i>Oplismenus imbecillis</i>		Grass & grasslike (GG)
Poaceae		<i>Panicum simile</i>	Two-colour Panic	Grass & grasslike (GG)
Poaceae		<i>Rytidosperma pallidum</i>	Redanther Wallaby Grass	Grass & grasslike (GG)
Poaceae		<i>Themeda triandra</i>		Grass & grasslike (GG)
Podocarpaceae		<i>Podocarpus spinulosus</i>	Spiny-leaf Podocarp	Shrub (SG)
Polygalaceae		<i>Comesperma volubile</i>		Other (OG)
Proteaceae		<i>Banksia paludosa</i>		Shrub (SG)
Proteaceae		<i>Banksia serrata</i>	Old-man Banksia	Tree (TG)
Proteaceae		<i>Banksia spinulosa</i>	Hairpin Banksia	Shrub (SG)
Proteaceae		<i>Hakea decurrens</i>		Shrub (SG)



Family	Exotic	Scientific Name	Common Name	BAM Growth Form Group
Proteaceae		<i>Hakea laevipes</i>		Shrub (SG)
Proteaceae		<i>Lomatia ilicifolia</i>	Holly Lomatia	Shrub (SG)
Proteaceae		<i>Persoonia levis</i>	Broad-leaved Geebung	Shrub (SG)
Proteaceae		<i>Persoonia linearis</i>	Narrow-leaved Geebung	Shrub (SG)
Pteridaceae		<i>Adiantum aethiopicum</i>	Common Maidenhair	Fern (EG)
Ranunculaceae		<i>Clematis aristata</i>	Old Man's Beard	Other (OG)
Restionaceae		<i>Empodisma minus</i>		Grass & grasslike (GG)
Restionaceae		<i>Hypolaena fastigiata</i>		Grass & grasslike (GG)
Rhamnaceae		<i>Pomaderris ferruginea</i>		Shrub (SG)
Rubiaceae		<i>Opercularia diphylla</i>	Stinkweed	Forb (FG)
Rubiaceae		<i>Opercularia hispida</i>	Hairy Stinkweed	Forb (FG)
Rubiaceae		<i>Pomax umbellata</i>	Pomax	Forb (FG)
Rutaceae		<i>Boronia anemonifolia</i> <i>subsp. variabilis</i>	Coast Boronia	Shrub (SG)
Rutaceae		<i>Correa reflexa</i> var. <i>speciosa</i>		Shrub (SG)
Rutaceae		<i>Crocea exalata</i>		Shrub (SG)
Rutaceae		<i>Philotheca trachyphylla</i>	Rock Waxflower	Shrub (SG)
Rutaceae		<i>Zieria pilosa</i>	Pilose-leaved Zieria	Shrub (SG)
Santalaceae		<i>Exocarpos cupressiformis</i>	Cherry Ballart	Shrub (SG)
Santalaceae		<i>Leptomeria acida</i>	Sour Currant Bush	Shrub (SG)
Sapindaceae		<i>Dodonaea triquetra</i>	Large-leaf Hop- bush	Shrub (SG)
Thymelaeaceae		<i>Pimelea linifolia</i> subsp. <i>linifolia</i>		Shrub (SG)
Ulmaceae		<i>Trema tomentosa</i> var. <i>aspera</i>	Native Peach	Shrub (SG)
Violaceae		<i>Viola hederacea</i>	Ivy-leaved Violet	Forb (FG)
Vitaceae		<i>Cissus hypoglauca</i>	Giant Water Vine	Other (OG)
Xanthorrhoeaceae		<i>Xanthorrhoea australis</i>	Grasstree	Other (OG)



1. Discussion

4.1 Survey limitations

While no threatened species were recorded in the current surveys, timing and conditions of the survey were not ideal for detection of all species. Two threatened orchid species were recorded within 10km of the study area and would not have been detectable during the survey. Of these two threatened orchid species, only the Leafless Tongue Orchid (*Cryptostylis hunteriana*) has any realistic chance of occurring within the study area based on available habitat. This species would not have been flowering (and therefore not positively identifiable) during the current surveys. The likelihood of this species occurring had previously been determined to be negligible during the 2022 surveys as surveys were carried out by Wolfpeak during the flowering period, however the recent (2023) observation of the species increases the likelihood of occurrence somewhat. Habitat requirements for the species suggest an association with Silvertop Ash (*Eucalyptus sieberi*), Red Bloodwood (*Corymbia gummifera*) and Black She-oak (*Allocasuarina littoralis*) exists (DPE 2024), indicating that PCT 3646 presents the more likely habitat for this species though all areas could be considered potential habitat.

The Rhyolite Midge Orchid (*Genoplesium rhyoliticum*) also would not have been detectable during the surveys, however it is unlikely to occur within the study area due to the very specific habitat requirements (rhyolitic rocky outcrops).

The Oval-leafed Pseudanthus (*Pseudanthus ovalifolius*) was historically recorded within this section of Beowa National Park, likely along Terrace Beach Track. This record is the only recorded occurrence of the species in NSW, recorded 46 years ago in 1978, and the species has not been encountered since. While this species may still occur within the Beowa NP section, it was not detected during the surveys.

All remaining candidate threatened flora species would have been detectable during the survey period, at least in a non-reproductive state. However, any substantial alteration to the track route could result in impacts on threatened species not accounted for in the current survey. Due to the approach to track assessment (simultaneous assessment by all relevant parties), further track alteration is however unlikely.

There are no seasonal or conditional limitations on detectability of the candidate threatened ecological communities. However, TECs could be impacted in the event of a substantial alteration to the track location could not accounted for in the current survey.

4.2 Conclusions and recommendations

As stated above, no threatened flora species were detected in the survey.

The Leafless Tongue Orchid (*Cryptostylis hunteriana*) was recently (2023) recorded within 2km of the study area, likely in very similar habitat to that occurring across the current realignment, and the species was not flowering and therefore not detectable during the current surveys. For this reason, this species must be considered as potentially occurring along the surveyed alignment.

The Leafless Tongue Orchid lacks above-ground parts for much of the year (including the time of the current survey, and persists as a below-ground tuber between seasons. Consequently, the species is



unlikely to be impacted during construction of the track outside of the flowering and fruit set periods, provided that impacts on the soil surface are limited. Mitigation for potential impacts on this species could include additional, post-construction surveys along the track during the flowering period (typically December to February however the nearby 2023 occurrence was recorded in late October), assuming that all construction works are carried out prior to flowering times. Alternatively, additional surveys could be carried out prior to construction if construction has not been carried out/completed before the flowering period. Impacts on the soil surface should be kept to a minimum throughout the construction of the track to minimise any potential impacts on the species.

While detectability of some other species was limited due to survey timing and conditions, the overall likelihood of unforeseen impacts on other threatened flora is considered to be low. Any further alteration of the track alignment however could result in impacts on threatened flora species.

No threatened ecological communities were detected during the surveys and are not likely to occur within near proximity of the current track alignment.

4. References

NSW Department of Planning and Environment (DPE) (2024). Leafless Tongue Orchid - profile
Available at: <https://threatenedspecies.bionet.nsw.gov.au/profile?id=10187>

