Flora and Fauna

Assessment

lot 100 dp 629555
lot 101 dp 629555
lot 2 dp 800836

Pacific Hwy, Coffs Harbour

for

Sapphire Beach

Development Pty Ltd

prepared by:

BushFireSafe (aust) pty ltd
environmental services

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1.0 INTRODUCTION

1.1 BACKGROUND

Bushfiresafe was engaged by Sapphire Beach Development Pty Ltd to complete a Flora and Fauna Assessment for lots 100 & 101 DP 629555 and lot 2 DP 800836 Pacific Hwy, Coffs Harbour.

The assessment involved the following:

- Determining the threatened flora species recorded from the locality
- Assessing the nature and condition of vegetation at the site, and searching for threatened flora species
- Determining the threatened fauna species occurring in the locality
- Searching for threatened fauna species
- Assessing the habitat value of the site for threatened species
- Addressing statutory requirements including State Environmental Planning Policy No. 44 (SEPP 44 – Koala Habitat Protection), Section 5A of the Environmental Planning & Assessment Act (1979) and the Commonwealth Environment Protection and Biodiversity Act (1999)

1.2 LOCATION OF PROPOSED DEVELOPMENT

The subject site – the area subject to the proposed development, currently known as Pelican Beach Resort, is located between Korora and Sapphire, 6km north of Coffs Harbour in the Coffs Harbour Local Government Area on the North Coast of NSW. The Subject site is located adjacent to Campbell's Beach on the Pacific Ocean. The majority of the subject site is zoned 2(e) Residential/Tourist with a small portion zoned 7(a) Environmental Protection under the Coffs Harbour LEP. The site occupies an area of 4.1503ha. The vegetation at the Subject site is mainly of landscape nature except for two Hoop Pines, regarded as significant landscape signature trees, the small area of dry sclerophyll forest within the 7(a) Environmental Protection zone and another small area of dunal vegetation adjacent to the beach.

1.3 GEOLOGY AND SOILS

Soils in the area are Aeolian sands and Arillite with moderate erosion hazard.

1.4 TOPOGRAPHY

The subject site is located on the southern peninsula of Campbell's Beach approximately at or above sea level. The subject site is connected to Solitary Island's Marine Park which is located along the coastline of Campbell's Beach. The site generally slopes east with a gradient between 10 and 15 degrees.

1.5 LAND USE

The site is currently occupied by the Pelican Beach Resort and resort comprises 114 suites.

1.6 THE PROPOSED DEVELOPMENT

It is proposed to redevelop the site to include both resort style apartment and beachfront housing to accommodate both tourist and permanent residents.

2.0 FLORA ASSESSMENT

2.1 METHODS

2.1.1 NPWS WILDLIFE ATLAS SEARCH

The NPWS Wildlife Atlas was searched for records of threatened species from within 10km of the site ("the locality"). The likelihood that each threatened species recorded from the locality might occur at the site was assessed on the basis of its habitat preferences.

2.1.2 SITE SURVEY

A site survey was undertaken by Craig Harman B.Sc. Hort on the 8th and 9th of June 2006. The survey involved walking a random meander through the resort including a thorough investigation of the 7(a) zoned portion and the dunal vegetation along the foreshore.

The nature and condition of vegetation at the subject site was assessed, and all threatened flora species as well as all flora species, threatened or not, encountered during the meander were recorded. All individuals of threatened flora species were marked with flagging tape. Plants were identified by Craig Harman.

2.1.3 LIMITATIONS

While the site survey was as thorough as time allowed, it is possible that some flora species present at the subject site were not recorded. Seasonal surveys will not necessarily detect species that are dormant or inconspicuous for part of the year (e.g. some terrestrial orchids) due to small cyclic windows of some species.

The proposed development is a redevelopment of an existing resort facility, the vegetation within the development property has been significantly modified with the majority of the current vegetation consisting of landscaped and maintained lawn areas; as the vegetation within the 7(a) zone and hind dune area are to be retained and rehabilitated, seasonal surveys were considered not necessary.

2.2 RESULTS

2.2.1 NPWS WILDLIFE ATLAS SEARCH

The NPWS Wildlife Atlas search revealed records of 26 threatened flora species within 10 km of the subject site (Table 2). On the basis of habitat preferences, 18 of these species were considered possible occurrences at the subject site (Table 2).

2.2.2 SITE SURVEY

Vegetation communities were identified on and/or adjacent to the subject site and are described in section 2.3 and are shown in Table 1.

Portions of the subject site has been cleared (Table 1 community 2), and there are several other clearings, as already stated, the land is being used as a resort facility.

2.3 COMMUNITY DESCRIPTION

Three vegetation communities were recorded in the site survey (Table 1). The conservation status of these communities is discussed with reference to the Comprehensive Regional Assessment (CRA) completed by NSW Forest and Non-Forest Ecosystems as part of the Regional Forestry Agreement (RFA) process (CRA Unit 1999).

The RFA establishes a framework for the management of the forests of upper north-east and lower north-east regions. The RFA sets out the percentage reservation status of forest and non-forest ecosystems based on vegetation modelling to establish the pre-1750 extent of forest ecosystems in the region.

Where the RFA does not provide adequate information, a supplementary assessment is made using standard conservation assessment such as Benson (1989), Griffiths (1993), Hager & Benson (1994) and NPWS (1995).

A full list of plant species recorded at the subject site is presented in Appendix A.

Table 1: Vegetation Communities Present on the Subject Site

	Vegetation Type
1	Dry Sclerophyll Forest
2	Grassland
3	Coastal Hind-dune

2.3.1 COMMUNITY 1 * DRY SCLEROPHYLL FOREST

Location:
This community occurs on the proposed lot within the central northern portion of the subject property with an approximate area of approximately 2500 sq m. It is found on the eastern facing slope.

Description:
This community consists of predominately of regrowth Forest Red Gum and Brushbox, other species include Bleeding Heart, Blackwood Wattle, Silver-Leaved Desmodium, Hairy Pittosporum, Sweet Pittosporum, Dogwood, Beach Acronychia and Hairy Psychotria. Shrubs and groundcovers include Bungalow Palms, Celery Wood, Scentless Rosewood, Bolwarra, Three Veined Cryptocaria, Cudgerie, native Ginger, Bracken Fern, Gristle Fern, Maidenhair and False Bracken. Weed species include Wild Tobacco, Lantana, Ochna and Winter Senna.

Conservation Status:
Under the CRA classification, this community is best described by Forest Ecosystem 106 (Open Coastal Brushbox) (NPWS 1999), though this site is of poor representation due to modification, the Regional Forestry Agreement document provides the following data on this ecosystem.

This ecosystem is distributed extensively on coastal lowlands and foothills from the Manning River north to the Corindi River. It is reserved in several reserves along the Coffs coastal strip.

2.3.2 COMMUNITY 2 * GRASSLAND

Location:

This community occurs over a large area of the overall site; it represents approximately 4 acres of the proposed development and is comprised of maintained landscaped and open space recreational areas.

Description:

This community is dominated by kept lawns and landscaped gardens.

Conservation Status:

The community has no conservation value due to heavy modification of the area for domestic use.

2.3.3 COMMUNITY 3 * COASTAL HIND-DUNE

Location:

This community occurs over a small area adjacent to the coastline, it represents approximately 1ac of the proposed development.

Description:

This community is dominated by Pandanus, Blackwood wattle, Coastal wattle, Coast banksias, Geebung and grass species.

Conservation Status:

The community has high conservation value due to its function as a barrier to erosion due to coastal processes.

Note: Several Hoop Pine trees located within the north-west portion of the development property have been found to be contaminated with Mundulla Yellows syndrome which has travelled approximately 15 metres through the surrounding soil; these trees will have to be removed and the surrounding soil treated to eradicated the organisms to prevent it spreading and impacting on the 7(a) Environmental Protection Zone (refer appendix 11 Active Trees Service report).

Table 2: Threatened Plant Species Recorded From Within 10km of the Subject Site, and Their Likelihood of Occurrence at the Subject Site.

Sources: NPWS (2002a), NPWS (2005), Harden (2000), Williams et al. (1984)

Scientific Name	Common Name	NSW Status	Habitat	Likelihood Of Occurrence
Senna acclinis	Rainforest Cassia	E1	edges of subtropical and dry rainforest	Unlikely
Triplarina imbricata	Creek Triplarina	E1	Along watercourses in low open forest with Water Gum	Unlikely
Parsonsia dorrigoensis	Milky Silkpod	E1	subtropical and warm-temperature rainforest	Unlikely
Marsdenia longiloba	Slender Marsdenia	E1	subtropical and warm-temperature rainforest	Unlikely
Tylophora woollsii	Cryptic Forest Twiner	E1	moist eucalypt forest, moist sites in dry eucalypt forest	Unlikely
Olearia flocktoniae	Dorrigo Daisy Bush	E1	northern fall of the Dorrigo Plateau and Nimboi-Binderay National Park	Unlikely
Lindsaea incisa	Slender Screw Fern	E1	waterlogged or poorly drained sites along creeks	Unlikely
Sarcochilus fitzgeraldii	Ravine Orchid	V	subtropical rainforest at altitudes between 500 and 700 m	Unlikely
Sarcochilus hartmannii	Hartman's Sarcochilus	E1	cliff faces on steep narrow ridges supporting eucalypt forest	Unlikely
Boronia umbellate	Orara Boronia	V	between Glenreagh and Lower Bucca, north of Coffs Harbour	Unlikely
Zieria smithii	Low growing form of Z. smithii, Diggers Head	V	Diggers Head at Coffs Harbour	Unlikely
Amorphospermum whitei	Rusty Plum	V	Rainforest and the adjacent understorey of moist eucalypt forest	Unlikely
Allocasuarina defungens	Dwarf Heath Casuarina	V	tall heath on sand, but can also occur on clay soils and sandstone	Possible
Eleocharis tetraquetra	Square-stemmed Spike-rush	V	stream edges and in and on the margins of freshwater swamps.	Possible
Chamaesyce psammogeton	Sand Spurge	V	fore-dunes and exposed headlands	Possible
Pultenaea maritima	Coast Headland Pea	V	grasslands, shrublands and heath on exposed coastal headlands.	Possible
Tinospora tinosporoides	Arrow-head Vine	V	subtropical rainforest, including littoral rainforest, on fertile, basalt-derived soils	Possible
Phaius australis	Southern Swamp Orchid	V	Swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas.	Possible
Arthraxon hispidus	Hairy Jointgrass	V	edges of rainforest and in wet eucalypt forest, often near creeks or swamps	Possible
Pomaderris queenslandica	Scant Pomaderris	V	moist eucalypt forest or sheltered woodlands with a shrubby understorey	Possible
Acronychia littoralis	Scented Acronychia	V	Scented Acronychia grows in littoral rainforest on sand	Possible
Zieria prostrata	Headland Zieria	V	Low grassy heath on exposed sites and wind-pruned open to sparse shrubland on more sheltered aspects.	Possible
Thesium australe	Austral Toadflax	V	grassland or grassy woodland	Possible
Quassia sp. Mooney Creek	Moonee Quassia	V	Shrubby layer below tall moist eucalypt forest and tall dry eucalypt forest	Possible
Alexfloydia repens	Floyd's Grass	V	Floyd's Grass is confined to coastal	Possible

			stands of Swamp Oak and Paperbark	
Oberonia titania	Red-flowered King of the Fairies	V	littoral and subtropical rainforest and paperbark swamps	Possible

3.0 FAUNA ASSESSMENT

3.1 METHODS

3.1.1 NPWS WILDLIFE ATLAS SEARCH

The NPWS Wildlife Atlas was searched for records of threatened fauna species from within 10km of the subject site.

3.1.2 SITE SURVEY

The fauna survey took place concurrently with the flora survey on the 8th and 9th of June 2006 following the same random meander. The survey involved both searching for threatened species and assessing the value of the site as habitat for fauna. Birds were surveyed by listening for their calls and observing through binoculars any species present. Frogs were surveyed by listening for their calls and both reptiles and frogs were surveyed by searching potential hiding places, such as under stones and logs. Scats, tracks and other signs of mammals, herptiles and birds were also searched for. All fauna species seen, heard or represented by scats, tracks or other signs were noted, and attention was paid to habitat features such as:

- The presence of mature trees with hollows, fissures and/or other suitable roosting/nesting places
- The presence of Koala food trees
- The condition, flow and water quality of drainage lines and bodies of water
- Areas of dense vegetation
- The presence of hollow logs/debris and areas of dense leaf litter
- The presence of fruiting flora species
- The presence of blossoming flora species, particularly winter-flowering species
- Vegetation connectivity and proximity to neighbouring areas of intact vegetation
- The presence of caves and man-made structures that may be suitable for microchiropteran bat roost sites
- The presence of bulky nests which may belong to raptors

3.1.3 SITE NIGHT SURVEY

Comprehensive night surveys were undertaken on the nights of the 8th and 9th June 2006 by Craig Harman.

The survey involved the following:

STAG WATCHES

All hollow-bearing trees likely to be disturbed by the proposed development were identified on the afternoon of the 8th of June, 2006. Stag watches on identified hollow-bearing trees commenced half an hour before sunset, and finished an hour after sunset, on the 8th and 9th of June, 2006.

SPOTLIGHTING

Spotlighting surveys were conducted at the site by Craig Harman B.Sc Hort on the nights of the 8th and 9th of June, 2006. Spotlighting was concentrated on the following areas:

- the scattered trees within the 7(a) zone
- grassland area at southern end of property
- the area around the resort structure

On the first night, spotlighting effort was 6 person hours; the second night consisted of 6 person hours.

CALL PLAYBACK

Call playback surveys were conducted at the site by Craig Harman (on the nights of the 8th and 9th of June, 2006. Playbacks of calls of the following species were made;

- Squirrel Glider
- Koala
- Powerful Owl
- Masked Owl
- All frog species

Each playback involved broadcasting the species' call for 2 minutes, followed by 5 minutes of quiet listening. With the exception of the Squirrel Glider calls, which were broadcast 3 times per night, the calls of each species were broadcast twice per night. Playbacks were broadcast from near and within all forest communities in and adjacent to the development property, as this was considered the area where the target species were most likely to be detected. Squirrel glider calls were also broadcast from a point roughly in the middle of the 7(a) zone, and from the area of scattered trees south of the proposed site.

The targeted call playback survey conducted by Craig Harman carried out as described above recorded one species; Powerful Owl.

BAT ECHOLOCATION

Bat echolocation surveys were conducted using an Anabat on the nights of the 8th and 9th of June, 2006. Two sites were targeted on each night with the Anabat recording, for intervals not less than 60 minutes per site, through the recording period at each site the surrounding area was traversed with spotlights for the opportunistic sighting of bat movement.

The Anabat II S/N106782 was used for the bat echolocation survey and was placed in an elevated location at each site (approximately 1 metre). The Anabat was placed in a vertical position with a sensitivity setting of 6.5, division ratio of 16, volume of 7; a 20 second calibration was carried out to commence each recording session.

The targeted bat echolocation survey conducted by Craig Harman carried out as described above observed no evident bat movement or Anabat detection; the mobility of bat species means that failure to detect them at a location does not necessarily

mean they are *never* present at that location. The bat echolocation night observations focused on the areas described in Appendix 3.

TRAPPING

Trapping surveys were conducted by Craig Harman, using multiple trapping methods on the nights of the 8th and 9th of June, 2006. Total trapping time was over six hundred trap hours. This equates to a minimum of two hundred hours per community. These methods included:-

- Elliot Traps at intervals of 50m in both north-south and east-west directions throughout all communities.
- Pit Traps at intervals of a maximum of 200m in both north-south and east-west directions throughout all communities.
- Hair Traps at intervals of a maximum of 200m in both north-south and east-west directions throughout all communities.
- Harp Trap set in multiple locations

The targeted trapping survey conducted by Craig Harman carried out as described above recorded no species.

3.1.3 LIMITATIONS

Many fauna species are cryptic and/or nocturnal and/or wide-ranging and mobile, and are therefore unlikely to be detected even during seasonal surveys. The fauna assessment is, accordingly, largely an assessment of the *potential* of the Subject site as habitat for various fauna species. With the exception of species definitely recorded from the site, there is no certainty as to the presence or absence of the species discussed.

The proposed development is a redevelopment of an existing resort facility, the vegetation within the development property has been significantly modified with the majority of the current vegetation consisting of landscaped and maintained lawn areas; as the potential habitat within the 7(a) zone and hind dune area are to be retained and rehabilitated, seasonal surveys were considered not necessary.

3.2 RESULTS

3.2.1 NPWS WILDLIFE ATLAS SEARCH

The NPWS Wildlife Atlas search revealed records of 49 threatened fauna species within 10 km of the Subject site (Table 3). On the basis of habitat preferences, 29 of these species were considered possible occurrences at the Subject site.

Table 3: Non-marine Threatened Fauna Species Recorded From Within 10km of the Subject Site.
Source: NPWS (2005)

Scientific name	**Common name**
Coracina lineata	Barred Cuckoo-shrike
Ixobrychus flavicollis	Black Bittern
Ephippiorhynchus asiaticus	Black-necked Stork
Climacteris picumnus	Brown Treecreeper
Phascogale tapoatafa	Brush-tailed Phascogale
Burhinus grallarius	Bush Stone-curlew

Scientific name	Common name
Todiramphus chloris	Collared Kingfisher
Irediparra gallinacean	Comb-crested Jacana
Miniopterus schreibersii	Common Bentwing-bat
Syconycteris australis	Common Blossom-bat
Cylopsitta diophthalma coxeni	Double-eyed Fig-parrot
Mixophyes iterates	Giant Barred Frog
Calyptorhynchus lathami	Glossy Black-cockatoo
Kerivoula papuensis	Golden-tipped Bat
Tyto capensis	Grass Owl
Chelonia mydas	Green Turtle
Pteropus poliocephalus	Grey-headed Flying-fox
Phascolarctos cinereus	Koala
Miniopterus australis	Little Bentwing-bat
Sterna albifrons	Little Tern
Tyto Novaihollandiae	Masked Owl
Pandion haliaetus	Osprey
Grantiella picta	Painted Honeyeater
Haematopus longirostris	Pied Oystercatcher
Ninox strenua	Powerful Owl
Calyptorhynchus banksii	Red-tailed Black-cockatoo
Xanthomyza Phrygia	Regent Honeyeater
Ptilinopus regina	Rose-crowned Fruit-dove
Tyto tenebricosa	Sooty Owl
Haematopus fuliginosus	Sooty Oystercatcher
Macronectes giganteus	Southern Giant Petrel
Dasyurus maculatus	Spotted-tailed Quoll
Lophoictinia isura	Square-tailed Kite
Petaurus norfolcensis	Squirrel Glider
Hoplocephalus stephensi	Stephens' Banded Snake
Ptilinopus superbus	Superb Fruit-dove
Lathamus discolour	Swift Parrot
Monarcha leucotis	White-eared Monarch
Ptilinopus magnificus	Wompoo Fruit-dove
Petaurus australis	Yellow-bellied Glider
Pomatostomus temporalis temporalis	Grey-crowned babbler
Grus rudicunda	Brolga

3.2.2 SITE SURVEY

3.2.2.1 FAUNA RECORDED

33 species of vertebrates (all birds) were recorded during the site survey, none of which are threatened, the fauna species recorded are listed in Appendix 2.

3.2.2.2 HABITAT FEATURES

In terms of habitat for threatened species, the most important features of the subject site are the presence of 7(a) zone tree species in Community 1 and the small area of coastal vegetation Community 3. Although species are limited, these communities represent the majority (80%) of suitable habitat.

Table 4: Assessment of Habitat Features of Subject Site

Feature	Assessment
The presence of mature trees with hollows, fissures and/or other suitable roosting/nesting places	No trees observed with hollows or fissures
The presence of Koala food trees	Eucalypts present
The presence of caves or hollows suitable for Molossidae species	No caves present and unlikely to be on property
The presence of Petauridae feeding scars	Absent
Condition, flow and water quality of drainage lines and bodies of water	No creek lines present
Areas of dense vegetation.	Yes, community group 1; see community descriptions
Presence of hollow logs/debris and areas of dense leaf litter	Absent
Presence of fruiting flora species	Some species in woodland though fruit absent due to season-refer community 1
Presence of blossoming flora species, particularly winter-flowering species	Eucalypts in community 1 refer community 1
Vegetation connectivity and proximity to neighbouring areas of intact vegetation	Absent
Presence of caves and man-made structures that may be suitable for michrochiropteran bat roost sites	Absent
Presence of bulky nests which may belong to raptors	Absent

3.2.2.3 SUITABILITY OF HABITAT FOR THREATENED SPECIES

Based on the habitat features present, and considering that the natural vegetation is woodland with little to no shrub layer and limited rainforest, an assessment was made of the suitability of the subject site as habitat for the threatened species listed in Table 2 and it was concluded that the site does not provide suitable habitat for any of the listed threatened fauna species.

The Powerful Owl *Ninox strenua* was identified on the 8th of June, 2006 by Craig Harman by using a call back method. An extensive search for an opportunistic habitat for the Powerful Owl was conducted, concluding no suitable habitat sites existed within the subject property.

Table 5: Habitat of Threatened Fauna Species and Their Likelihood of Occurrence at the Subject Site.
Sources: NPWS (2002b), NPWS (2005), Pizzey and Knight (1999), Churchill (1998), Wilson and Knowles (1988), Readers Digest (1993), Robinson (1995).

Scientific name	Common name	Habitat	Likelihood of occurrence at Subject site
Ixobrychus flavicollis	Black Bittern	Riparian Habitats	Unlikely
Coracina lineata	Barred Cuckoo-shrike	Rainforest, eucalypt forest, woodland and swamp woodland	Unlikely
Phascogale tapoatafa	Brush-tailed Phascogale	Sub-tropical, wet sclerophyll forest, heathlands and swamp	Unlikely
Irediparra gallinacean	Comb-crested Jacana	Floating vegetation on freshwater lakes and ponds	Unlikely

Scientific name	Common name	Habitat	Likelihood of occurrence at Subject site
Cylopsitta diophthalma coxeni	Double-eyed Fig-parrot	Rainforests and moist eucalypt forest	Unlikely
Mixophyes iteratus	Giant Barred Frog	Rainforests and moist eucalypt forest	Unlikely
Kerivoula papuensis	Golden-tipped Bat	Subtropical rainforest	Unlikely
Grantiella picta	Painted Honeyeater	Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	Unlikely
Ptilinopus regina	Rose-crowned Fruit-dove	Tropical and subtropical rainforest	Unlikely
Tyto tenebricosa	Sooty Owl	Heavily wooded habitat	Unlikely
Ptilinopus superbus	Superb Fruit-dove	Tropical and subtropical rainforest	Unlikely
Lathamus discolour	Swift Parrot	Riparian vegetation and woodland	Unlikely
Petaurus australis	Yellow-bellied glider	Open forest, woodland with range of eucalypt species	Unlikely
Tyto Novaihollandiae	Masked Owl	Heavy eucalypt forest	Unlikely
Todiramphus chloris	Collared Kingfisher	Paperbark forest and mangroves	Unlikely
Ephippiorhynchus asiaticus	Black-necked Stork	Grassland Habitats	Possible
Climacteris picumnus	Brown Treecreeper	Open eucalypt woodland lacking dense understorey	Possible
Burhinus grallarius	Bush Stone-curlew	Open grassed woodland or sparsely treed rangeland	Possible
Syconycteris australis	Common Blossom-bat	Blossom producing trees	Possible
Calyptorhynchus lathami	Glossy Black-cockatoo	Coastal forests and open inland woodland	Possible
Tyto capensis	Grass Owl	Coastal heath and tall grassland	Possible
Chelonia mydas	Green Turtle	Beaches locally	Possible
Pteropus poliocephalus	Grey-headed Flying-fox	Eucalypt forest and woodland	Possible
Phascolarctos cinereus	Koala	Eucalypt forest and woodland	Possible
Miniopterus australis	Little Bentwing-bat	Coastal plain and nearby ranges	Possible
Sterna albifrons	Little Tern	Rainforest and eucalypt forest	Possible
Pandion haliaetus	Osprey	Coastal rivers, estuaries and streams	Possible
Haematopus longirostris	Pied Oystercatcher	Coastal beaches and dunes	Possible
Ninox strenua	Powerful Owl	Variety of habitats including coastal forests	Possible
Calyptorhynchus banksii	Red-tailed Black-cockatoo	Coastal forests and open inland woodland	Possible
Xanthomyza Phrygia	Regent Honeyeater	Coastal rivers, estuaries and streams around Coffs Harbour	Possible
Haematopus fuliginosus	Sooty Oystercatcher	Rocky outcrops and headlands along coast	Possible
Macronectes giganteus	Southern Giant Petrel	Coastal rivers, estuaries and streams	Possible
Dasyurus maculatus	Spotted-tailed Quoll	Sclerophyll forests, woodlands, rainforest and coastal heathlands	Possible
Lophoictinia isura	Square-tailed Kite	Open forest, woodland and sandplains both coastal and subcoastal	Possible
Petaurus norfolcensis	Squirrel Glider	Wet and open dry sclerophyll forests	Possible

Scientific name	Common name	Habitat	Likelihood of occurrence at Subject site
Hoplocephalus stephensi	Stephens' Banded Snake	Variety of habitats	Possible
Monarcha leucotis	White-eared Monarch	Sub-tropical, wet sclerophyll forest, heathlands and swamp	Possible
Ptilinopus magnificus	Wompoo Fruit Dove	Rainforest, low elevation forest along coast and ranges	Possible
Grus rubicunda	Brolga	Shallow wetland and grassland	Possible
Pomatostomus temporalis temporalis	Grey-crowned babbler	Open forest, woodland and acacia scrub land	Possible
Myotis adversus	Large-footed myotis	Coastal rivers, estuaries and streams	Possible

4.0 IMPACTS AND AMELIORATION

4.1 IMPACTS OF THE DEVELOPMENT

The proposed development will not result in any loss of native vegetation for the construction of units, houses, access roads, driveways, associated infrastructure and Asset Protection Zones for Bushfire protection.

An increase in traffic along the Pacific Hwy due to the proposed development is likely to result in an increase in heavy traffic to the Site.

Other potential environment impacts associated with the proposed development include:

- Potential degradation of potential habitat for small number of other threatened species
- Increase in the level of disturbance for shore birds
- A possible reduction in size of some vegetation communities on the site.
- Increased potential for establishment of weeds in neighbouring areas of vegetation
- Impacts on water quality entering the Solitary Island Marine Park
- Increases in noise, light and disturbance may cause more reclusive species to move away from habitat edges of retained vegetation in the study area, in effect increasing the penetration of edge-effects on habitat

4.2 AMELIORATION AND OPPORTUNITIES FOR THE ENVIRONMENT

It is recommended that building envelopes be positioned to minimise the need to clear vegetation for units, houses and for bushfire buffers. A Draft Plan Management (DPM) has been prepared for the entire Site. The Draft Plan of Management has addressed:

- Rehabilitation of hind-dune area
- Rehabilitation of Environmental Protection Zone
- Weed control in developed areas and areas of retained habitat
- Landscape and embellishment plantings of local endemic species
- Buffer plantings to hind-dune and environmental protection zone areas

Additional amelioration measures have been recommended in this report, these include:

- All stormwater from development to be diverted away from coastal area and stored onsite to allow dissipation through dunal area over a period of time
- Rehabilitation of sections of the low-lying areas of the site and the revegetation of the grassed area adjacent to the beach as a physical boundary to buffer the coastline
- Suitable traffic control measures should be incorporated into the re-development
- Retention and enhancement of areas of natural habitat, Banksias, native coastal grasses and other flowering trees and shrubs throughout the development area
- Lighting from the proposed development should be designed to minimise disturbance to the coastal foreshores to reduce impacts on turtles and birds possibly nesting on the beach
- Fencing to be provided to limit entry to vegetation areas and to provide physical separation between residential development and natural areas

5.0 STATUTORY CONSIDERATIONS

5.1 ASSESSMENTS OF SIGNIFICANCE (7 PART TEST)

Threatened species impact assessment is an integral component of environmental impact assessment. The ultimate objective of the application of section 5A of the *Environmental Planning and Assessment Act 1979* (EP&A Act), the Assessment of Significance, is to improve the standard of consideration afforded to threatened species, populations and ecological communities, and their habitats through the planning and assessment process, and to ensure this consideration is transparent.

Under the *Threatened Species Conservation Amendment Act 2002*, the factors to be considered when determining whether an action, development or activity is likely to significantly affect threatened species, populations or ecological communities, or their habitats (known previously as the "8-part test"), have been revised. This affects 5A EPA Act, s94 *Threatened Species Conservation Act 1995* (TSC Act) and s220ZZ *Fisheries Management Act 1994* (FM Act).

The revised factors maintain the same intent but focus consideration of likely impacts in the context of the local rather than the regional environment as the long-term loss of biodiversity at all levels arises primarily from the accumulation of losses and depletions of populations at a local level.

This is the broad principle underpinning the TSC Act, State and Federal biodiversity strategies and international agreements. The consideration of impacts at a local level is designed to make it easier for local government to assess, and easier for applicants and consultants to undertake the Assessment of Significance because there is no longer a need to research regional and state wide information. The Assessment of Significance is only the first step in considering potential impacts. Further consideration is required when a significant effect is likely and is more appropriately considered when preparing a Species Impact Statement.

5.1.1 DEFINITIONS

LOCAL POPULATION

For the purposes of the TSC Act (1995) a local population is defined as "a population that occurs within the study area, unless the existence of contiguous or proximal occupied habitat and the movement of individuals or exchange of genetic material across the boundary of the study area can be demonstrated" (NPWS 1996).

REGION

The subject site is located within the New South Wales North Coast bioregion (Thackway and Cresswell 1995), which extends from the Queensland/NSW border south to about Port Stephens, and west to the Great Dividing Range.

5.1.2 FLORA

The NPWS Atlas search identified 18 threatened fauna species likely to occur at the subject site. No threatened flora species were recorded through the site flora survey.

***Senna acclinis* (Rainforest Cassia)**

Conservation status in NSW: Endangered

Rainforest Cassia is a shrub to 3 m tall with compound leaves to 15 cm long, each with up to 6 pairs of oval-shaped leaflets at about 15 mm intervals along the central spine. There is a gland between the lower one to four pairs of leaflets. The flowers are in groups of two to five on a short stalk, hanging on the underside of the branchlets. They are bright golden yellow and cup-shaped. The seed pod is long and narrow, 12 - 15 cm long, 6 - 8 mm wide and more or less flat. *Senna acclinis* can easily be mistaken for introduced Senna (formerly Cassia) species which are environmental weeds. The Rainforest Cassia is found in Coastal districts and adjacent tablelands of NSW from the Illawarra in NSW to Queensland and grows in or on the edges of subtropical and dry rainforest.

The *Senna acclinis* (Rainforest Cassia) has not been considered in the 7 part test due to the lack of flora communities present that the Rainforest Cassia is found.

***Triplarina imbricata* (Creek Triplarina)**

Conservation status in NSW: Endangered

Creek Triplarina is an open shrub with fine upright or weeping branches, growing about 2.8 m in height. Its bark is grey and scaly. The paired leaves are flat, narrow-oval in shape, 4 mm or less in length, broader towards the tips and have blunt ends. Large oil dots, obvious on the back of the leaf, release a strong menthol smell. The little white flowers are borne in pairs, developing into dry hemispherical fruits containing tiny seeds. This is a newly recognised species previously thought to be the same as *Baeckea camphorata*. Found only in a few locations in the ranges south-west of Glenreagh and near Tabulam in north-east NSW along watercourses in low open forest with Water Gum (*Tristaniopsis laurina*).

The *Triplarina imbricata* (Creek Triplarina) has not been considered in the 7 part test as the species is only found locally within the Glenreagh locality.

***Parsonsia dorrigoensis* (Milky Silkpod)**
Conservation status in NSW: Vulnerable

Milky Silkpod is a slender, trailing climber that grows to 5 m long; plants exudes a milky sap if cut. The leaves vary from narrow to broad, are 4 - 12 cm long, have a fine point and have green to purplish undersides. There are no glands at the base of the leaf-blade. Clusters of white or yellowish, tubular flowers are produced in summer, followed by narrow capsules (up to 7 cm long) that split lengthwise to release many seeds, each bearing a tuft of long, silky hairs.

Milky Silkpod is found only within NSW, with scattered populations in the North Coast region between Kendall and Woolgoolga. Found in subtropical and warm-temperature rainforest, on rainforest margins, and in moist eucalypt forest up to 800 m, on brown clay soils. Flowers in summer, however little is known of the species' reproductive biology, it appears to be able to withstand, and maybe even favour, light to moderate physical disturbance and has a well developed root stock, suggesting it may re-sprout after fire.

The *Parsonsia dorrigoensis* (Milky Silkpod) has not been considered in the 7 part test due to the lack of flora communities present that Milky Silkpod is found.

***Marsdenia longiloba* (Slender Marsdenia)**
Conservation status in NSW: Endangered

Slender Marsdenia is a slender climber of the milk vine group, with pairs of very finely pointed leaves and 5-6 tiny glands at the base of the leaves. The stems of Slender Marsdenia exude clear, watery sap when cut, unlike most of the milk vines which have milky sap. Clusters of small white star-shaped flowers are produced in summer and are followed by long, narrow seed-capsules that split to release many seeds with tufts of long silky hair.

Found through Scattered sites on the north coast of NSW north from Barrington Tops. Also occurs in south-east Queensland, within Subtropical and warm temperate rainforest, lowland moist eucalypt forest adjoining rainforest and, sometimes, in areas with rock outcrops.

The *Marsdenia longiloba* (Slender Marsdenia) has not been considered in the 7 part test due to the lack of flora communities present that Slender Marsdenia is found.

***Tylophora woollsii* (Cryptic Forest Twiner)**
Conservation status in NSW: Endangered

A slender woody climber that grows to 3 m long. The paired leaves are on stalks 7 - 20 mm long, and are heart-shaped with a firm texture. There are two to four tiny glands at the base of each leaf-blade and the stems exude a clear, watery sap if cut. The purple to red flowers are 5 - 6 mm in size, and are produced in late summer to autumn on zigzagging branched stalks growing from the leaf junctions. They are

followed by narrow seed-capsules 5 - 8 cm long, which split to release many seeds, each of which has a tuft of silky hair.

The Cryptic Forest Twiner is found from the NSW North Coast and New England Tablelands to Southern Queensland, but is very rare within that range. Known on the Tablelands from the Bald Rock and Boonoo Boonoo areas north of Tenterfield.

This species grows in moist eucalypt forest, moist sites in dry eucalypt forest and rainforest margins. Flowering occurs in summer and autumn, usually between January and March but sometimes as late as November. Thought to be wind-dispersed. Plants appear to persist as a network of stems under leaf litter when aerial stems are absent.

The *Tylophora woollsii* (Cryptic Forest Twiner) has not been considered in the 7 part test as there have been no recorded occurrences of the species within 10km of the site (NPWS Wildlife Atlas).

***Olearia flocktoniae* (Dorrigo Daisy Bush)**
Conservation status in NSW: Endangered

A short-lived shrub that grows to 2.5 m tall. It can be single- or multi-stemmed near the base. The leaves are soft and slender, 1 – 5 mm wide and 20 – 90 mm long, sometimes with finely toothed margins. The typically daisy-like flower heads are 19 – 25 mm wide, with white petals, sometimes tinged with violet, and a yellow central disc. The Dorrigo Daisy Bus has a restricted distribution on the northern fall of the Dorrigo Plateau in north-east NSW. The species occurs primarily on road verges in state forests, though it also occurs at a number of locations within Nimboi-Binderay National Park.

This is a pioneer species that colonises disturbed locations, such as roadsides or timber plantations adjacent to wet eucalypt forest or rainforest.
After subsequent colonisation of these areas by other longer lived species, Dorrigo Daisy Bush often may, over time, disappear from locations where it was once abundant.

The *Olearia flocktoniae* (Dorrigo Daisy Bush) has not been considered in the 7 part test because the site is well outside the known range of its current known habitat.

***Lindsaea incisa* (Slender Screw Fern)**
Conservation status in NSW: Endangered

Slender Screw Fern is a delicate-looking ground fern with a creeping underground root. The light-green fronds are slender, up to 30 cm long, and stand erect or tangled through other vegetation. Divided fan-shaped leaflets are spaced along the stems, often in pairs. The leafless part of the stem is straw-coloured, darker at the base, and is much shorter than the frond length. The spores are produced under membranous flaps on the lobes of some of the leaflets.

In NSW it is known only from a few locations between Woombah and just south of Coffs Harbour. Also occurs in north and south-east Queensland. the Slender Screw Fern occurs in dry eucalypt forest on sandstone and moist shrubby eucalypt forest on metasediments. It is usually found in waterlogged or poorly drained sites along creeks, where ferns, sedges and shrubs grow thickly.

The *Lindsaea incisa* (Slender Screw Fern) has not been considered in the 7 part test as its known habitat is restricted to the Boambee –Bonville area (NPWS Wildlife Atlas).

Sarcochilus fitzgeraldii (*Ravine Orchid*)
Conservation status in NSW: Vulnerable

A clumping, pendulous orchid with broad, dark-green and slightly channelled leaves to 20 cm long and fleshy grey-green roots. In spring, several 20 cm long arching flowering stems are produced, each bearing up to 15 showy and fragrant flowers, which are 30 mm across, and usually white with crimson spots in the centre or, rarely, all crimson.

Distributed throughout North-east NSW, north of the Macleay River, to Maleny in south-east Queensland. The Ravine Orchid grows mainly on rocks, amongst organic matter, in cool, moist, shady ravines, gorges and on cliff faces in dense subtropical rainforest at altitudes between 500 and 700 m. Occasional clumps are found on the bases of fibrous-barked trees.

The *Sarcochilus fitzgeraldii* (Ravine Orchid) has not been considered in the 7 part test due to the lack of flora communities present that the ravine orchid is found.

Sarcochilus hartmannii (*Hartman's Sarcochilus*)
Conservation status in NSW: Vulnerable

Hartman's Sarcochilus is an epiphytic orchid with upright or semi-upright stems attached by fleshy creeping roots to rocks. Stems can be up to 100 cm long, though are usually shorter. Leaves are arranged in two ranks, scattered along the stem, and are about 20 cm long by 2 cm wide and folded. The flowering stem is up to 25 cm long with as many as 25 flowers. Each flower is 3 cm across, and is white with reddish-brown spots in the central parts of the flowers.

Found from the Richmond River in northern NSW to Gympie in south-east Queensland; favours cliff faces on steep narrow ridges supporting eucalypt forest and clefts in volcanic rock from 500 to 1,000 m in altitude. Also found occasionally at the bases of fibrous trunks of trees, including cycads and grass-trees.

The *Sarcochilus hartmannii* (Hartman's Sarcochilus) has not been considered in the 7 part test due to the lack of flora communities present that the Hartman's Sarcochilus is found.

***Boronia umbellata* (Orara Boronia)**
Conservation status in NSW: Vulnerable

Orara Boronia is an open shrub, 1 – 2 m tall, with upright branches. The fragrant, paired leaves are divided into one or two pairs of leaflets with a longer terminal leaflet. Dense hairs cover the underside of the leaves, branchlets and new shoots. Clusters of dark pink, four-petalled flowers, 7 - 10 mm long, are held at the base of the leaves, and are produced in spring and early summer. The fruit is smooth and has four lobes.

Found at only a few locations between Glenreagh and Lower Bucca, north of Coffs Harbour, but it is locally common in the restricted area where it occurs. This boronia grows as an understorey shrub in and around gullies in wet open forest. It appears to regenerate well after disturbance, but it is not known whether prolonged or repeated disturbance affects long-term persistence.

The *Boronia umbellata* (Orara Boronia) has not been considered in the 7 part test because the site is well outside the known range of its current known habitat.

***Zieria smithii* population at Diggers Head**
Conservation status in NSW: Endangered Population

Diggers Head Zieria is a sprawling shrub, up to 1 m tall and 2 m wide. The branches are smooth, and the young parts are covered with fine hairs. The paired leaves are divided into three, narrow-oval leaflets, all with blunt ends, and the central one is longer than the others. The upper surface of the leaf is darker than the lower and both are dotted with oil-glands. The flowers are small, pink with four petals. The egg-shaped fruit capsules are green, and contain one seed. Diggers Head Zieria is distinct from other forms of *Zieria smithii*.

Known only from Diggers Head at Coffs Harbour and closely related forms occur on eight to ten headlands north to Byron Bay. Occurs in low heath with Kangaroo Grass (*Themeda australis*) on a coastal headland.

The *Zieria smithii* population at Diggers Head has not been considered in the 7 part test as its only known locations are at Korora Headland and Diggers Head (NPWS Wildlife Atlas)

***Amorphospermum whitei* (Rusty Plum)**
Conservation status in NSW: Vulnerable

The Rusty Plum is a small to medium-sized tree to 20 m high with a very fluted or irregular trunk. The young shoots have rusty hairs, and the shoots and stems exude white milky sap if cut. The leaves are alternate, 5 - 15 cm long and 2 - 5 cm wide with a firm texture and a ‘quilted’ appearance. The undersurface of the leaves is paler than the upper surface and has prominent raised veins, including 15 to 20 pairs of curved secondary veins. Creamy green flowers form in clusters of four to 15 on the stems in spring. The Rusty Plum has globular plum-like fruit, red turning black, 2 - 5 cm in diameter. The round seed inside is very shiny, with an elliptical scar on one side.

Rusty Plum occurs in the coast and adjacent ranges of northern NSW from the Macleay River into southern Queensland. Its distributional stronghold is on the mid north coast around Coffs Harbour. Habitat is Rainforest and the adjacent understorey of moist eucalypt forest.

The *Amorphospermum whitei* (Rusty Plum) has not been considered in the 7 part test due to lack of flora communities present that the rusty plum is found.

***Allocasuarina defungens* (Dwarf Heath Casuarina)**
Conservation status in NSW: Endangered

Description
Dwarf Heath Casuarina is a member of the sheoak family. It is a straggly shrub to 2 m high growing from a tuber. Like all sheoaks it has wiry foliage consisting of jointed branchlets rather than leaves. Leaves are reduced to ribs on the branchlets, projecting at the nodes as small teeth. In Dwarf Heath Casuarina the foliage is blue-green, the branchlets are up to 12 cm long and the leaf teeth may overlap. Male and female flowers are inconspicuous and occur on separate plants. The cones are very irregular, 8 to 11 mm long, held on narrow stalks to 7 mm.

Distribution
Dwarf Heath Casuarina is found only in NSW from the Nabiac area, north-west of Forster, to Byron Bay on the NSW North Coast.

Habitat and ecology
- Dwarf Heath Casuarina grows mainly in tall heath on sand, but can also occur on clay soils and sandstone.
- The species also extends onto exposed nearby-coastal hills or headlands adjacent to sand plains.

Threats
- Loss of habitat through coastal development
- Sandmining
- Timber harvesting activities
- Inappropriate burning which does not allow regeneration of the species

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
No Dwarf Heath Casuarina species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No Dwarf Heath Casuarina populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.
No
In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

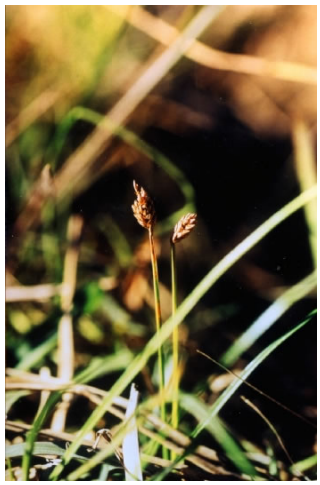
(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.
The development will not isolate any known or potential Dwarf Heath Casuarina habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).
No critical habitat for Dwarf Heath Casuarina occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.
Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.
The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Eleocharis tetraquetra* (Square-stemmed Spike-rush)**
Conservation status in NSW: Endangered



A tufted perennial plant distinguished by its slender four-angled stem and broad spikelet on top of the stem. Stems grow 30 to 100 cm tall and are 1 – 1.5 mm in diameter. The leaves are at the base of the stem and are not very conspicuous, being reduced to tubular sheaths. The spikelet is 10 – 20 mm long and 3.5 – 5mm in diameter. The seeds are contained within the spikelet and are a shining yellow or brown colour, approximately 1.5 mm long and 1 mm wide.

Thought to be extinct in NSW until it was rediscovered in 1997 at Boambee near Coffs Harbour. It has since been found in other north coast localities near Grafton and Murwillumbah. The species also occurs in south-east Queensland. it is found in damp locations on stream edges and in and on the margins of freshwater swamps.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
No Squared-stemmed Spike-rush species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No Squared-stemmed Spike-rush populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
(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.
No
In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:
(i) the extent to which habitat is likely to be removed or modified as a

result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Squared-stemmed Spike-rush habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for Squared-stemmed Spike-rush occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Chamaesyce psammogeton* (Sand Spurge)**

Conservation status in NSW: Endangered

Description

Sand Spurge is a herb that forms mats to 1 m across. Leaves are smooth, to 30 mm long and 15 mm wide. The tiny flower-heads are surrounded by white leaf-like processes (bracts); each flower-head actually comprises a female flower surrounded by up to five sprays of minute male flowers, hidden in a cup from which the bracts grow. The fruiting capsule is smooth and about 2 mm long.

Distribution

Sand Spurge is found sparsely along the coast from south of Jervis Bay (at Currarong, Culburra and Seven Mile Beach National Park) to Queensland (and Lord Howe Island). Populations have been recorded in Wamberal Lagoon Nature Reserve, Myall Lakes National Park and Bundjalung National Park.

Habitat and Ecology

- Grows on fore-dunes and exposed headlands, often with Spinifex (*Spinifex sericeus*).
- Flowering occurs in summer.

- *C. psammogeton* seeds float, so some dispersal between beaches may occur.
- Longevity of the species is approximately 5 – 30 years with a primary juvenile period of less than 1 year.
- Plant growth occurs in spring and summer.

Threats

- Coastal developments may increase visitor pressure on populations.
- Off-road driving is a threat to Sand Spurge.
- Bitou Bush (*Chrysanthemoides monilifera*) invades Sand Spurge habitat and smothers the species.
- Excessive pedestrian trampling may cause erosion of dunes and loss of Sand Spurge habitat.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

No Sand Spurge species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No Sand Spurge populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

No

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Sand Spurge habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for Sand Spurge occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Pultenaea maritima* (Coast Headland Pea)**

Conservation status in NSW: Vulnerable

Description

Pultenaea maritima is a prostrate, mat forming shrub with hairy stems. Its leaves are 3.5-5 mm long, 1.8-2.8 mm wide, with incurved margins. The stipules (at the leaf bases) are 1.1-2 mm long. Inflorescences are leafy and appear at or towards the ends of branches. The pea-flowers are 6.5-10 mm long on stalks about 0.5 mm long. Pods are about 5 mm long. The species was only recently described and was previously considered a prostrate maritime form of *Pultenaea villosa*. A full description of the species can be found in the Scientific Committee determination.

Distribution

Occurs in New South Wales and Queensland. Within NSW, the species has been recorded from Newcastle north to Byron Bay on 16 headlands. The number of individuals at each of these sites is unknown. Five sites occur within conservation reserves.

Habitat and ecology

- The species occurs in grasslands, shrublands and heath on exposed coastal headlands.

Threats

- Competition from weeds, mostly Bitou Bush
- Mowing
- Recreational activities

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

No Coastal Headland Pea species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No Coastal Headland Pea populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

No

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Coastal Headland Pea habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for Coastal Headland Pea occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Tinospora tinosporoides* (Arrow-head Vine)**
Conservation status in NSW: Vulnerable

Arrow-head Vine is a tall woody climber. The triangular leaves with broadly notched bases give the plant its common name, though leaf-shape varies through to oval. The leaves are thick, stiff, glossy, and are mostly 8 – 13 cm long. The leaf stalk is 5 – 12 cm long, with a swelling at each end, and a characteristic twist or angle at its junction with the stem. Male and female flowers are borne on separate plants, and are small and inconspicuous in long branched clusters. The fleshy fruits are produced in groups of three.

Distributed North from the Richmond River in north-east NSW, where it is locally common in some parts of its range. Also recorded from a single location in south-east Queensland. Occurs in Wetter subtropical rainforest, including littoral rainforest, on fertile, basalt-derived soils.

The *Tinospora tinosporoides* (Arrow-head Vine) has not been considered in the 7 part test due to lack of flora communities present that the Arrow-head Vine is found

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
No Arrow-head Vine species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No Arrow-head Vine populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
(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.

No

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Arrow-head Vine habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for Arrow-head Vine occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Phaius australis* (Southern Swamp Orchid)**

Conservation status in NSW: Endangered

Description

This orchid has flower stems up to 2 m tall and large broad leaves with a pleated appearance, both arising from a fleshy bulb near ground level. The large, showy flowers, with up to 20 per stem, have four petals which are white on the outside and brown with white or yellow veins on the inside. The central tongue of the flower is pink and yellow with lobes slightly curved inwards.

Distribution
Occurs in Queensland and north-east NSW as far south as Coffs Harbour. Historically, it extended farther south,
to Port Macquarie.

Habitat and ecology

- Swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas.

Threats

- Illegal collection for horticulture or cut flowers. This showy species is highly sought after.
- Clearing and fragmentation of habitat for development, agriculture and roadworks.
- Drainage of swamps, or pollution from nutrient run-off.
- Frequent fire
- Grazing and trampling by domestic stock and feral pigs.
- Invasion of habitat by introduced weeds.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
No Southern-Swamp Orchid species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No Southern-Swamp Orchid populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

No
In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Southern-Swamp Orchid habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for Southern-Swamp Orchid occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

Arthraxon hispidus *(Hairy Jointgrass)*
Conservation status in NSW: Vulnerable

Hairy Jointgrass is a creeping grass with branching, erect to semi-erect purplish stems. Leaf-blades are 2–6 cm long, broad at the base and tapering abruptly to a sharp point. Long white hairs project around the edge of the leaf. The seed-heads are held above the plant on a long fine stalk. This grass is considered to be a perennial but it tends to die down in winter.

Occurs over a wide area in south-east Queensland, and on the northern tablelands and north coast of NSW, but is never common. Also found from Japan to central Eurasia. Moisture and shade-loving grass, found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

No Hairy Joint Grass species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No Hairy Joint Grass populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

No
In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Hairy Joint Grass habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).
No critical habitat for Hairy Joint Grass occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.
Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Pomaderris queenslandica* (Scant Pomaderris)**
Conservation status in NSW: Endangered

Description
Scant Pomaderris is a medium-sized shrub 2 - 3m tall. The stems are whitish with tiny star-shaped hair clusters. The leaves are oval to narrow elliptical, 2.5 - 7 cm long and 10 - 25 mm wide. They are shiny on the top and woolly underneath. The small creamy yellow flowers appear during spring-summer.

Distribution
Widely scattered but not common in north-east NSW and in Queensland. It is only known from a few locations on the New England Tablelands and North West Slopes, including near Torrington and Coolatai, and also from several locations on the NSW north coast.

Habitat and ecology
- Found in moist eucalypt forest or sheltered woodlands with a shrubby understorey, and occasionally along creeks.

Threats
- Disturbance from roadworks and timber harvesting activities
- Invasion by introduced weeds.
- Risk of local extinction because populations are isolated.
- Clearing of habitat for agriculture.
- Inappropriate fire regime

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
No Scant Pomaderris species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No Scant Pomaderris populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
(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.

No

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Scant Pomaderris habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for Scant Pomaderris occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Acronychia littoralis* (Scented Acronychia)**

Conservation status in NSW: Endangered

Scented Acronychia is a small tree to 6 m high with 5 - 16 cm long oval-shaped glossy leaves on a short stalk. The lower surface of the leaves is paler than the upper surface and there are many oil dots visible. They have a pleasant aromatic smell when crushed. The small four-petalled yellowish flowers are produced in summer on a stalk growing from the junction of the leaf and stem. The fruit that follows is creamy-lemon in colour and 10 - 20 mm in diameter. It is a flattened oval shape and has four lobes with shallow fissures between them.

Scented Acronychia is found between Fraser Island in Queensland and Port Macquarie on the north coast of NSW and grows in littoral rainforest on sand.

The *Acronychia littoralis* (Scented Acronychia) has not been considered in the 7 part test due to the lack of flora communities present that the Scented Acronychia is found.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
No Scented Acronychia species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No Scented Acronychia populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
- **(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.**

No
In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

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

The development will not isolate any known or potential Scented Acronychia habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).
No critical habitat for Scented Acronychia occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Zieria prostrata* (Headland Zieria)**

Conservation status in NSW: Endangered

Description

The Headland Zieria is a prostrate shrub forming mats about 0.5 m in diameter. The branches are ridged but not warted as in some other Zieria species. The leaves are paired and divided into three narrow-oval leaflets, all with blunt ends and the central one longer than the others. Both leaf-surfaces are of similar colour and are dotted with oil-glands. The flowers are small, white (pink in bud) and have four petals. The fruits are red-green and dotted with oil-glands.

Distribution

Restricted to four coastal headlands in the Coffs Harbour area of north-east NSW.

Habitat and ecology

- Low grassy heath on exposed sites and wind-pruned open to sparse shrubland on more sheltered aspects.

Threats

- Trampling by people visiting headlands.
- Illegal collection of plants or flowers.
- Invasion of habitat by weeds, especially Bitou Bush, Lantana, Kikuyu and Parramatta Grass.
- Risk of local extinction because populations are small.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

No Headland Zieria species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No Headland Zieria populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

No
In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Headland Zieria habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).
No critical habitat for Headland Zieria occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.
Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Thesium australe* (Austral Toadflax)**
Conservation status in NSW: Vulnerable

Description
Austral Toadflax is a small, straggling herb to 40 cm tall. Leaves are pale green to yellow-green, somewhat succulent, 1 - 4 cm long and 0.5 - 1.5 mm wide. Flowers are minute and white, emerging where the leaves meet the stems and appearing in spring. The fruit is small and nut-like, developing in summer. This species is often hidden amongst grasses and herbs.

Distribution
Austral Toad-flax is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. It is also found in Tasmania and Queensland and in eastern Asia.

Habitat and ecology
- Occurs in grassland or grassy woodland.
- Often found in damp sites in association with Kangaroo Grass (*Themeda australis*).
- A root parasite that takes water and some nutrient from other plants, especially Kangaroo Grass.

Threats
- Loss and degradation of habitat and/or populations for residential, infrastructure and agricultural developments.
- Loss and degradation of habitat and/or populations by intensification of grazing regimes.
- Loss and degradation of habitat and/or populations by invasion of weeds.
- Loss and degradation of habitat and/or populations from road works (particularly widening or re-routing).

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
No Austral Toad-flax species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No Austral Toad-flax populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

No

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Austral Toad-flax habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for Austral Toad-flax occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

Quassia sp. Mooney Creek (Moonee Quassia)
Conservation status in NSW: Endangered

Moonee Quassia is a slender or bushy shrub growing to about 1.5m tall. Its stems are often kinked, showing periodic halts to growth. Its tough leaves are very narrow, about 10cm long, and arranged alternatively along the stems. They are glossy dark green above and paler below, wit numerous veins at the wide angle to the midrib. Flowers are small and green tinged reddish, developing into distinctive finely airy fruits made up of one to five radiating segments which are red when mature.

Scattered distribution from Moonee Creek area north of Coffs Harbour to north east of Grafton. The Moonee Quassia occurs within the shrubby layer below tall moist eucalypt forest, including forest edges, mostly at lower altitudes.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.
No Moonee Quassia species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No Moonee Quassia populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
- **(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.**

No
In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:
- **(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and**
- **(ii) whether an area of habitat is likely to become fragmented or isolated**

from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Moonee Quassia habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for Moonee Quassia occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Alexfloydia repens* (Floyd's Grass)**

Conservation status in NSW: Endangered

Description

Floyd's Grass is a creeping grass with a solitary flower head that appears during spring. The smooth, hairless leaves have a prominent white midrib.

Distribution

Floyd's Grass is found only in the Coffs Harbour area. It is known from Bongil Bongil National Park and on private property.

Habitat and ecology

- Floyd's Grass is confined to coastal stands of Swamp Oak and Paperbark in peat-like soil edging the upper tidal areas of mangroves. It is known to grow on the banks of estuarine creeks.
- Floyd's Grass is the sole food plant for the caterpillar of the Endangered Black Grass-dart butterfly *Ocybadistes knightorum*.

Threats

- Loss of habitat through clearing or disturbance.
- Grazing by cattle and associated impacts including burning, trampling, soil compaction and spread of weeds.
- Water pollution and acidification from agriculture and residential sources.
- Frequent fires.

- Risk of extinction due to restricted distribution.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

No Floyd's Grass species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No Floyd's Grass populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

No

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Floyd's Grass habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for Floyd's Grass occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Oberonia titania* (Red-flowered King of the Fairies)**

Conservation status in NSW: Vulnerable

Description

Red-flowered King of the Fairies is a small orchid which grows on trees and rocks. Each plant possesses one to several shoots in a tight, iris-like clump. There are 4-10 leaves per shoot. The leaves are narrowly oval- to spear-shaped, 1-8 cm long, 2-8 mm wide, and green to greenish pink in colour. About 50-350 tiny red flowers are borne on erect to drooping stems 5-17 cm long in autumn and spring.

Distribution

Red-flowered King of the Fairies occurs on the NSW north coast north from Kendall, and also in in Queensland and Norfolk Island. It is known from 10 locations in NSW, two of which occur within Dorrigo National Park and Washpool National Park.

Habitat and ecology

- Red-flowered King of the Fairies occurs in littoral and subtropical rainforest and paperbark swamps, but it can also occur in eucalypt-forested gorges and in mangroves.

Threats

- Loss of habitat through clearing, degradation and fragmentation of native vegetation.
- Collection by orchid enthusiasts.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

No Red-flowered King of the Fairies species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No Red-flowered King of the Fairies populations occurs at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

No
In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Red-flowered King of the Fairies habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).
No critical habitat for Red-flowered King of the Fairies occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.
Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

CONCLUSION

The proposed development will involve removing native vegetation (selected individual tree species). The subject site is connected to native vegetation and will remain so; and that areas of native vegetation are to be retained and improved where possible, the proposed development is unlikely to have a significant effect on any threatened flora species. Consequently, a Species Impact Statement is not necessary.

5.1.3 FAUNA

The NPWS Atlas search identified 29 threatened fauna species likely to occur at the subject site, one species was recorded through the site fauna survey; the Ninox strenua (Powerful Owl) was recorded through utilising callback response techniques. A separate 7 part test has been prepared for the Powerful Owl (refer appendix 4).

Ixobrychus flavicollis **Black Bittern**
Conservation status in NSW: Vulnerable

The Black Bittern is a heron, dark grey to black in colour, with buff streaks on the throat and a characteristic yellow streak on the sides of the head and down the neck. The female is paler than the male, with a more yellow wash on the underparts. The species has a characteristic booming call that is mainly heard during the breeding season, at day or night. The colour alone readily distinguishes it from the other two much paler bittern species.

The Black Bittern has a wide distribution, from southern NSW north to Cape York and along the north coast to the Kimberley region. The species also occurs in the south-west of Western Australia. In NSW, records of the species are scattered along the east coast, with individuals rarely being recorded south of Sydney or inland.

The Black Bittern has not been considered in the 7 part test due to lack of flora communities present where this species is found.

Coracina lineata **(Barred Cuckoo-shrike)**
Conservation status in NSW: Vulnerable

The Barred Cuckoo-Shrike is a medium-sized bird to 25 cm long. It is dark grey above and under the chin, with a front barred with strong horizontal stripes of white and very dark grey. A darker stripe runs from the base of the bill through the pale yellow eye. Distributed through coastal eastern Australia from Cape York to the Manning River in NSW. Barred Cuckoo-shrikes are generally uncommon in their range, and are rare in NSW. Occurs in Rainforest, eucalypt forests and woodlands, clearings in secondary growth, swamp woodlands and timber along watercourses. They are usually seen in pairs or small flocks foraging among foliage of trees for insects and fruit. They are active birds, frequently moving from tree to tree.

The *Coracina lineata* (Barred Cuckoo-shrike) has not been considered in the 7 part test due to lack of flora communities present that the Barred Cuckoo-shrike is found.

Phascogale tapoatafa **(Brush-tailed Phascogale)**
Conservation status in NSW: Vulnerable

The Brush-tailed Phascogale is tree-dwelling marsupial carnivore. It has a characteristic, black, bushy ‘bottlebrush’ tail, with hairs up to 4 cm long. Its fur is grey above and pale cream below and it has conspicuous black eyes and large naked ears. Adults have a head and body length of about 20 cm, a tail length of about 20 cm and weigh 110 - 235 grams.

The Brush-tailed Phascogale has a patchy distribution around the coast of Australia. In NSW it is more frequently found in forest on the Great Dividing Range in the north-east and south-east of the State. There are also a few records from central NSW. Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter, also inhabit heath, swamps, rainforest and wet sclerophyll forest.
Agile climber foraging preferentially in rough barked trees of 25 cm DBH or greater.
Feeds mostly on arthropods but will also eat other invertebrates, nectar and sometimes small vertebrates. Females have exclusive territories of approximately 20 - 60 ha, while males have overlapping territories of up to 100 ha. Nest and shelter in tree hollows with entrances 2.5 - 4 cm wide and use many different hollows over a short time span. Mating occurs May - July; males die soon after the mating season whereas females can live for up to three years but generally only produce one litter.

The *Phascogale tapoatafa* (Brush-tailed Phascogale) has not been considered in the 7 part test due to lack of flora communities present that the Brush-tailed Phasogale is found.

***Irediparra gallinacea* (Comb-crested Jacana)**
Conservation status in NSW: Vulnerable

The Comb-crested Jacana is small (up to 25 cm long), with huge toes - its feet are virtually as long as its entire body - to walk on floating vegetation. Brown above, it has a white face and throat and belly, separated by a broad dark breast-band, with a big red forehead comb and red bill. It is a busy and unmistakable walker on lily pads and other floating vegetation. Its strident chittery call is also distinctive.

It occurs throughout coastal Australia and well inland in the north from the Kimberley to Sydney. Vagrants occasionally appear further south, possibly in response to unfavourable conditions further north in NSW. Inhabits permanent wetlands with a good surface cover of floating vegetation, especially water-lilies. Pairs and family groups forage across floating vegetation, walking with a characteristic bob and flick, or flying low with toes dangling behind. They feed primarily on insects and other invertebrates, as well as some seeds and other vegetation. Breeds in spring and summer in NSW, in a nest of floating vegetation. The male builds the nest, incubates the eggs and broods the young. Females defend up to four mated males and their territories (the floating vegetation around their nest) from other females. Young birds will dive and stay submerged with just their nostrils exposed for a very long time. Adults will also dive for safety on occasion.

The *Irediparra gallinacea* (Comb-crested Jacana) has not been considered in the 7 part test due to lack of flora communities present that the Comb-crested Jacana is found.

Cyclopsitta diophthalma coxeni* (*Double-eyed Fig-Parrot)
Conservation status in NSW: Endangered

Double-eyed Fig-Parrots, also known as Coxen's Fig-Parrots, are small, dumpy, green parrots with very short tails. The wings are blue-edged and appear to be set well back in flight. At rest there are two obvious red spots on the back. The head has distinctive

red and blue markings with a prominent blue forehead in the adults. They can distinguished from small lorikeets by their short tail and lack of underwing colour. Limited to about five populations scattered between Bundaberg in Queensland and the Hastings River in NSW. The total number is thought to be less than 200 birds which makes it one of Australia's most endangered birds. Usually recorded from drier rainforests and adjacent wetter eucalypt forest but rarely seen due to its small size and cryptic habits. Also found in the wetter lowland rainforests that are now largely cleared in NSW. The bird shows a decided preference for fig trees, but also feeds on other fruiting rainforest species.

The *Cyclopsitta diophthalma coxeni* (Double-eyed Fig-Parrot**)** has not been considered in the 7 part test due to lack of flora communities present that the Double-eyed Fig Parrot is found.

***Mixophyes iteratus* (Giant Barred Frog)**
Conservation status in NSW: Endangered

Giant Barred Frogs are large frogs, up to 115 mm in length. They are olive to dark brown above with paler or darker blotches, and cream to pale yellow below. The skin is finely granular. The pupil of the eye is vertical and the iris is pale golden in the upper half and brown in the lower half. The call is a deep 'ork' breaking into a series of 'orks' and grunts. The Giant Barred Frog can be most easily distinguished from other barred frog species by the black thighs with smaller yellow spots, distinct barring on the limbs, dark blotches on the sides, absence of a creamy stripe on the upper lip and the distinctive eye colour. Distribution Coast and ranges from south-eastern Queensland to the Hawkesbury River in NSW. North-eastern NSW, particularly the Coffs Harbour-Dorrigo area, is now a stronghold.

Giant Barred Frogs forage and live amongst deep, damp leaf litter in rainforests, moist eucalypt forest and nearby dry eucalypt forest, at elevations below 1000 m. They breed around shallow, flowing rocky streams from late spring to summer. Females lay eggs onto moist creek banks or rocks above water level, from where tadpoles drop into the water when hatched. Tadpoles grow to a length of 80 mm and take up to 14 months before changing into frogs. When not breeding the frogs disperse hundreds of metres away from streams. They feed primarily on large insects and spiders.

The *Mixophyes iteratus* (Giant Barred Frog) has not been considered in the 7 part test due to lack of flora communities present that the Giant Barred Frog is found.

***Kerivoula papuensis* (Golden-tipped Bat)**
Conservation status in NSW: Vulnerable

The Golden-tipped Bat has dark brown, curly fur with bright golden tips. The distinctively coloured fur extends along the wings, legs and tail. It has a short, pointed, over-hanging muzzle and pointy, funnel-shaped ears. Adults weigh about 6 grams and have a wingspan of about 25 cm.

The Golden-tipped Bat is distributed along the east coast of Australia in scattered locations from Cape York Peninsula in Queensland to Bega in southern NSW.

Found in rainforest and adjacent sclerophyll forest. Roost in abandoned hanging Yellow-throated Scrubwren and Brown Gerygone nests located in rainforest gullies on small first- and second-order streams. Will fly up to two km from roosts to forage in rainforest and sclerophyll forest on upper-slopes. Specialist feeder on small web-building spiders.

The *Kerivoula papuensis* (Golden-tipped Bat) has not been considered in the 7 part test due to lack of flora communities present that the Golden-tipped Bat is found.

***Grantiella picta* (Painted Honeyeater)**
Conservation status in NSW: Vulnerable

The Painted Honeyeater is small (16 cm) and distinctive, with a black head and back and white underparts with dark streaks on the flanks. The wings and tail are black with bright yellow edgings. The distinctive bill is pink with a dark tip. The female is greyer on the upperparts and has less streaking on the flanks.
The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema. Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.

The *Grantiella picta* (Painted Honeyeater) has not been considered in the 7 part test due to lack of flora communities present that the species is found.

***Ptilinopus regina* (Rose-crowned Fruit-dove)**
Conservation status in NSW: Vulnerable

Rose-crowned Fruit-doves are small, colourful rainforest pigeons to 24 cm in length. Males have a rose crown edged with yellow, and the head and breast are blue-grey, spotted white. The upper parts are grey-green, the tail-tip yellow and the abdomen are orange. Females are mostly grey-green. The call is a loud, explosive, repeated 'hookcoo' which becomes faster and on declining notes as a rapid 'coocoocoocoocoo'.

Distribution from the Coast and ranges of eastern NSW and Queensland, from Newcastle to Cape York. Vagrants are occasionally found further south to Victoria. Rose-crowned Fruit-doves occur mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful. They are shy pigeons, not easy to see amongst the foliage, and are more often heard than seen. They feed entirely on fruit from vines, shrubs, large trees and palms, and are thought to be locally nomadic as they follow the ripening of fruits. Some populations are migratory in response to food availability - numbers in north-east NSW increase during spring and summer then decline in April or May.

The *Ptilinopus regina* (Rose-crowned Fruit-dove) has not been considered in the 7 part test due to lack of flora communities present that the species is found.

***Tyto tenebricosa* (Sooty Owl)**
Conservation status in NSW: Vulnerable

A medium-sized owl to 45 cm long, with dark eyes set in a prominent flat, heart-shaped facial disc. Dark sooty-grey in colour, with large eyes in a grey face, fine white spotting above and below, and a pale belly. The plumage of the fledglings is similar to the adult, but has tufts of down on the head and underparts.
Occupies the easternmost one-eighth of NSW, occurring on the coast, coastal escarpment and eastern tablelands. There is no seasonal variation in its distribution. Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests. Roosts by day in the hollow of a tall forest tree or in heavy vegetation; hunts by night for small ground mammals or tree-dwelling mammals such as the Common Ringtail Possum (Pseudocheirus peregrinus) or Sugar Glider (Petaurus breviceps). Nests in very large tree-hollows.

The *Tyto tenebricosa* (Sooty Owl) has not been considered in the 7 part test due to lack of flora communities present that the species is found. The closest recorded evidence of the Sooty Owl is within Korora Nature Reserve.

***Ptilinopus superbus* (Superb Fruit-dove)**
Conservation status in NSW: Vulnerable

The Superb Fruit-dove is a small pigeon, approximately 24 cm in length. The male is brightly coloured, with golden-green upperparts, a brilliant orange-vermilion neck, and a rich purple crown. The tail is short and tipped with white. The throat and breast are grey with a lilac tinge, and a broad black band on the lower breast separates the grey breast from the creamy-white belly and green flanks. The female is light green on the back, has a small purple spot on the crown, and no dark breast band. The call is a distinctive cooing, rising in pitch and volume to a loud and clear ‘whoop, whoop’. Also gives a low ‘oom’ in a steady sequence.
The Superb Fruit-dove occurs principally from north-eastern in Queensland to north-eastern NSW. It is much less common further south, where it is largely confined to pockets of suitable habitat as far south as Moruya. There are records of vagrants as far south as eastern Victoria and Tasmania.

Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees. Part of the population is migratory or nomadic. There are records of single birds flying into lighted windows and lighthouses, indicating that birds travel at night. At least some of the population, particularly young birds, moves south through Sydney, especially in autumn. Breeding takes place from September to January. The nest is a structure of fine interlocked forked twigs, giving a stronger structure than its flimsy appearance would suggest, and is usually 5-30 metres up in rainforest and rainforest edge tree and shrub species. The male incubates the single egg by day, the female incubates at night.

The *Ptilinopus superbus* (Superb Fruit-dove) has not been considered in the 7 part test due to lack of flora communities present that the species is found.

***Lathamus discolor* (*Swift Parrot*)**
Conservation status in NSW: ***Endangered***

The Swift Parrot is small parrot about 25 cm long. It is bright green with red around the bill, throat and forehead. The red on its throat is edged with yellow. Its crown is blue-purple. There are bright red patches under the wings. One of most distinctive features from a distance is its long (12 cm), thin tail, which is dark red. This distinguishes it from the similar lorikeets, with which it often flies and feeds. Can also be recognised by its flute-like chirruping or metallic "kik-kik-kik" call.

Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes. Migrates to the Australian south-east mainland between March and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*.

Return to home foraging sites on a cyclic basis depending on food availability.
Following winter they return to Tasmania where they breed from September to January, nesting in old trees with hollows and feeding in forests dominated by Tasmanian Blue Gum *E. globulus.*

The *Lathamus discolor* (Swift Parrot) has not been considered in the 7 part test due to lack of flora communities present that the Swift Parrot is found.

***Petaurus australis* (Yellow-bellied Glider)**
Conservation status in NSW: Vulnerable

The Yellow-bellied Glider is a large, active, sociable and vocal glider. Adults weigh 450 - 700 grams, have a head and body length of about 30 cm and a large bushy tail that is about 45 cm long. It has grey to brown fur above with a cream to yellow belly, which is paler in young animals. The dark stripe down the back is characteristic of the group. It has a large gliding membrane that extends from the wrist to the ankle. It has a loud, distinctive call, beginning with a high-pitched shriek and subsiding into a throaty rattle.
The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria.
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. 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. Live in small family groups of two - six individuals and are nocturnal. Den, often in family groups, in hollows of large trees. Very mobile and occupy large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food resources.

The *Petaurus australis* (Yellow-bellied Glider) has not been considered in the 7 part test due to lack of flora communities present that the species is found.

***Tyto novaehollandiae* (Masked Owl)**
Conservation status in NSW: Vulnerable

A medium-sized owl to 40 - 50 cm long, with dark eyes set in a prominent flat, heart-shaped facial disc that is encircled by a dark border. The feet are large and powerful, with fully feathered legs down to the toes. The owl exists in several colour forms, with wide variation in plumage. The upperparts are grey to dark brown with buff to rufous mottling and fine, pale spots. The wings and tail are well barred. The underparts are white to rufous-brown with variable dark spotting. The palest birds have a white face with a brown patch around each eye; the darkest birds have a chestnut face. The dark form of the Masked Owl is much browner than the Sooty Owl *Tyto tenebricosa*.

Distribution extends from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner. There is no seasonal variation in its distribution. Lives in dry eucalypt forests and woodlands from sea level to 1100 m. 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 in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.

Extends from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner. There is no seasonal variation in its distribution.

Lives in dry eucalypt forests and woodlands from sea level to 1100 m; 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 in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.

The *Tyto novaihollandiae* (Masked Owl) has not been considered in the 7 part test due to lack of flora communities present.

***Todiramphus chloris* (Collared Kingfisher)**
Conservation status in NSW: Vulnerable

The Collared Kingfisher is a medium-sized kingfisher, dark blue-green to olive-green above and white below, with blue wings and tail, a broad white collar and a small white spot between the eye and the bill. It has a low, direct flight and a loud, strident, deliberate two or three note call. The Collared Kingfisher is larger, darker and appears more "clean cut" than the similar Sacred Kingfisher.

Around the northern Australian coastline from Shark Bay in Western Australia to the mouth of the Clarence River, NSW. In NSW it is most commonly observed in the Tweed River estuary, where it breeds. It appears to be an irregular visitor further south.

The Collared Kingfisher has not been considered in the 7 part test due to lack of flora communities present the Collared Kingfisher species is found.

***Ephippiorhynchus asiaticus* (Black-necked Stork)**
Conservation status in NSW: Endangered

Description
The Black-necked Stork is the only stork species in Australia. It stands about 1.3 m tall, and has a wingspan of around 2 m, with a massive, strong, black bill. The head and neck are black with an iridescent green and purple gloss. Black panels are visible above and below the white wings. The tail is short and black, with the rest of the plumage white. The legs are long and red. The female has a yellow eye, and the male has a dark eye. Juvenile birds have a dark to pale brown plumage, gradually changing over several years to the black and white adult plumage.

Distribution
The species is widespread across coastal northern and eastern Australia, becoming increasingly uncommon further south into NSW, and rarely south of Sydney. Some birds may move long distances and can be recorded well outside their normal range.

Habitat and ecology
- Inhabits permanent freshwater wetlands including margins of billabongs, swamps, shallow floodwaters, and adjacent grasslands and savannah woodlands; can also be found occasionally on inter-tidal shorelines, mangrove margins and estuaries.
- Feeds in shallow, still water on a variety of prey including fish, frogs, eels, turtles, crabs and snakes.
- Breeds in late summer in the north, and early summer further south.
- A large nest, up to 2 m in diameter, is made in a live or dead tree, in or near a freshwater swamp.

- Two to four eggs are laid; incubation is by both parents.

Threats

- Loss of wetland habitat through clearing and draining for flood mitigation, agriculture and residential development.
- Degradation of wetland habitats through pollution and salinisation.
- Modification of natural wetlands through changes in natural water flow regimes.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Black –necked Stork species is at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No Black-necked Stork populations occur at the Subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

No

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Black-necked Stork habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical

habitat (either directly or indirectly).

No critical habitat for the Black-necked Stork occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will not involve clearing native vegetation, which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Climacteris picumnus victoriae* (Brown Treecreeper (eastern subspecies))**

Conservation status in NSW: Vulnerable

Description

The Brown Treecreeper, Australia's largest treecreeper, is a grey-brown bird with black streaking on the lower breast and belly and black bars on the undertail. Pale buff bands across the flight feathers are obvious in flight. The face is pale, with a dark line through the eye, and a dark crown. Sexes differ slightly in all plumages, with small patches of black and white streaking on the centre of the uppermost breast on males, while the females exhibit a rufous and white streaking. Juveniles differ from adults mainly by the pattern of the under-body, and by their a pale bill and gape. Subspecies *victoriae* is distinguished from subspecies *picumnus* by colour differences on the face, body and tail markings. The two subspecies grade into each other through central NSW. Individuals are active, noisy and conspicuous, and give a loud 'pink' call, often repeated in contact, and sometimes given in a series of 5 - 10 descending notes. Breeds from July to Feb across its range.

Distribution

The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. The western boundary of the range of *Climacteris picumnus victoriae* runs approximately through Wagga Wagga, Temora, Forbes, Dubbo and Inverell and along this line the subspecies intergrades with the arid zone subspecies of Brown Treecreeper *Climacteris picumnus picumnus*.

The eastern subspecies lives in eastern NSW in eucalypt woodlands through central NSW and in coastal areas with drier open woodlands such as the Snowy River Valley, Cumberland Plains, Hunter Valley and parts of the Richmond and Clarence Valleys. The population density of this subspecies has been greatly reduced over much of its

range, with major declines recorded in central NSW and the northern and southern tablelands. Declines have occurred in remnant vegetation fragments smaller than 300 hectares, that have been isolated or fragmented for more than 50 years.

Habitat and ecology

- Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.
- Sedentary, considered to be resident in many locations throughout its range; present in all seasons or year-round at many sites; territorial year-round, though some birds may disperse locally after breeding.
- Gregarious and usually observed in pairs or small groups of eight to 12 birds; terrestrial and arboreal in about equal proportions; active, noisy and conspicuous while foraging on trunks and branches of trees and amongst fallen timber; spend much more time foraging on the ground and fallen logs than other treecreepers.
- When foraging in trees and on the ground, they peck and probe for insects, mostly ants, amongst the litter, tussocks and fallen timber, and along trunks and lateral branches; up to 80% of the diet is comprised of ants; other invertebrates (including spiders, insects larvae, moths, beetles, flies, hemipteran bugs, cockroaches, termites and lacewings) make up the remaining percentage; nectar from Mugga Ironbark (E. sideroxylon) and paperbarks, and sap from an unidentified eucalypt are also eaten, along with lizards and food scraps; young birds are fed ants, insect larvae, moths, craneflies, spiders and butterfly and moth larvae.
- Hollows in standing dead or live trees and tree stumps are essential for nesting.
- The species breeds in pairs or co-operatively in territories which range in size from 1.1 to 10.7 ha (mean = 4.4 ha). Each group is composed of a breeding pair with retained male offspring and, rarely, retained female offspring. Often in pairs or cooperatively breeding groups of two to five birds.

Threats

- Loss of ground litter from compaction and overgrazing.
- Historical loss of woodland, forest and mallee habitats as a result of agriculture, forestry, mining and residential development.
- Fragmentation of woodland and forest remnants which isolates populations and causes local extinctions.
- Ongoing degradation of habitat, particularly the loss of tree hollows and fallen timber from firewood collection and overgrazing.
- Lack of regeneration of eucalypt overstorey in woodland due to overgrazing and too-frequent fires.
- Inappropriate forestry management practices.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

No Brown Treecreeper species is at risk of extinction by the development.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No Brown Treecreeper populations occur at the site.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

No

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Brown Treecreeper habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for Brown Treecreeper occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening

process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Burhinus grallarius* (Bush Stone-curlew)**

Conservation status in NSW: Endangered

Description

The Bush Stone-curlew stands about 55 cm tall. It has a grey to light brown back, marked with black blotches, and a streaked rump. It has buff and white underparts with dark streaks, and a black band that runs from near its eye down its neck. This species has large, bright yellow eyes and a hunch-shouldered stance on long spindly legs. When disturbed it lies flat on the ground, with its head and neck outstretched. Its call is a loud eerie wailing "wee-loo", mostly heard at night.

Distribution

The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range.

Habitat and ecology

- Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber.
- Largely nocturnal, being especially active on moonlit nights.
- Feed on insects and small vertebrates, such as frogs, lizards and snakes.
- Nest on the ground in a scrape or small bare patch.
- Two eggs are laid in spring and early summer.

Threats

- Predation by foxes and cats.
- Trampling of eggs by cattle.
- Clearance of woodland habitat for agricultural and residential development.
- Modification and destruction of ground habitat through removal of litter and fallen timber, introduction of exotic pasture grasses, grazing and frequent fires.
- Disturbance in the vicinity of nest sites.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Bush Stone-curlew species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No Bush Stone-curlew populations occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

No

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Bush Stone-curlew habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Bush Stone-curlew occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Syconycteris australis* (Common Blossom-bat**
Conservation status in NSW: Vulnerable

Description
Common Blossom-bats are small nectar-eating bats. They are around 6 cm long and have very soft fawn to reddish fur. They are highly specialised for a diet of nectar, having very pointed muzzles and long, thin brush-like tongues.

Distribution
Coastal areas of north-east NSW and eastern Queensland.

Habitat and ecology

- Common Blossom-bats often roost in littoral rainforest and feed on flowers in adjacent heathland and paperbark swamps.
- They roost individually in foliage of the sub-canopy, changing roost sites daily, and return to favoured feeding sites on consecutive nights.

Threats

- Clearing of coastal habitat for urban development or sandmining.
- Weeds, such as Bitou Bush, that suppress the regeneration of key food trees, such as Coastal Banksia.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.
No Common Blossom-bat species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No Common Blossom-bat populations occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

No

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Common Blossom-bat habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Common Blossom-bat occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

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

Conservation status in NSW: Vulnerable

National conservation status: Endangered

Description

The Glossy Black-cockatoo is a dusky brown to black cockatoo with a massive, bulbous bill and a broad, red band through the tail. The red in the tail is barred black and edged with yellow. The female usually has irregular pale-yellow markings on the head and neck and yellow flecks on the underparts and underwing. They are usually seen in pairs or small groups feeding quietly in she-oaks. They are smaller than other black-cockatoos (about 50 cm in length), with a smaller crest.

Distribution

The species is uncommon although widespread throughout suitable forest and

woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. An isolated population exists on Kangaroo Island, South Australia.

Habitat and ecology

- Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of she-oak species, particularly Black She-oak (*Allocasuarina littoralis*), Forest She-oak (*A. torulosa*) or Drooping She-oak (*A. verticillata*) occur.
- In the Riverina area, inhabits open woodlands dominated by Belah (Casuarina cristata).
- Feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species), shredding the cones with the massive bill.
- Dependent on large hollow-bearing eucalypts for nest sites. One or two eggs are laid between March and August.

Threats

- Reduction of suitable habitat through clearing for development.
- Loss of tree hollows.
- Excessively frequent fire which reduces the abundance and recovery of she-oaks.
- Illegal bird smuggling and egg-collecting.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Glossy Black-cockatoo species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No Glossy Black-cockatoo populations occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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

(iii) ecological community such that its local occurrence is likely to be placed at risk of extinction.

No

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Glossy Black-cockatoo habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Glossy Black-cockatoo occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Tyto capensis* (Grass Owl)**

Conservation status in NSW: Vulnerable

Description

The Grass Owl is a small ground-dwelling owl to 38 cm long. The upperparts are a rich yellow-buff, heavily marbled with blue-black or dark grey and with fine silvery spots. Underparts are pale orange-buff to dull white with sparse dark spots. The facial disc is triangular and a pale buff colour. The legs are long and sparsely covered with short feathers in the upper part, bare in the lower part. When in flight Grass Owls have noticeably long trailing legs (longer than the tail) and appear large-headed. When roosting the posture is tall and upright. The call is similar to a Barn Owl - a hoarse, wavering reedy screech 'sk-air' or 'skee-air', also a thin, quavering whistle.

Distribution

Grass Owls have been recorded occasionally in all mainland states of Australia but appear to be more commonly recorded in northern and north-eastern Australia. In

NSW they are more likely to be found in the north-east. Grass Owl numbers often increase when rodent numbers increase.

Habitat and ecology

- Grass Owls are found in areas of tall grass, including grass tussocks in swampy areas, grassy plains, swampy heath, and cane grass, or sedges on flood plains.
- They rest by day in a 'form' - a trampled platform in a large tussock or other heavy growth.
- If disturbed they burst out of cover, flying rather slowly, before dropping straight down again into cover.
- They also nest in trodden-down grass.

Threats

- Loss of suitable habitat due to grazing, agriculture and development.
- Disturbance and habitat degradation by stock.
- Use of pesticides in agriculture to control rodent populations thereby reducing seasonal food sources for owls, and potentially poisoning owls.
- Frequent burning, which reduces ground cover.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Grass Owl species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No Grass Owl populations occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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

(iii) ecological community such that its local occurrence is likely to be placed at risk of extinction.

No

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(iii) the extent to which habitat is likely to be removed or modified as a

result of the action proposed, and

(iv) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential Grass Owl habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Grass Owl occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Chelonia mydas* (Green Turtle)**

Conservation status in NSW: Vulnerable

Description

A large sea-turtle that grows up to 1 m in length. Its heart-shaped shell is olive-green, brown and black, and the scales on the side of the face and limbs have distinctive pale edges.

Distribution

Widely distributed in tropical and sub-tropical seas.Usually found in tropical waters around Australia but also occurs in coastal waters of NSW, where it is generally seen on the north or central coast, with occasional records from the south coast.

Habitat and ecology

- Ocean-dwelling species spending most of its life at sea.
- Carnivorous when young but as adults they feed only on marine plant material.
- Eggs laid in holes dug in beaches throughout their range.
- Scattered nesting records along the NSW coast.

Threats

- Collision with boats and other marine traffic.

- Accidental entanglement in shark nets, traps, longlines and other fishing gear.
- Marine debris, particularly plastic, which is mistaken for jellyfish and can cause asphyxiation, abrasion, infection and blockages in the turtle's system when swallowed.
- Predation at nest site by feral pigs and foxes.
- Disturbance to nest sites.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Green Turtle species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No area of known potential habitat of the Green Turtle will be disturbed by development.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Green Turtles from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Grass Owl occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

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

Conservation status in NSW: **Vulnerable**

Description

The Grey-headed Flying-fox 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.

Distribution

Grey-headed Flying-foxes are found within 200 km of the eastern coast of Australia, from Bundaberg in Queensland to Melbourne in Victoria.

Habitat and ecology

- 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 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, birth and the rearing of young.
- Annual mating commences in January and a single young is born each October or November.
- Site fidelity to camps is high with some caps being used for over a century.
- Travel up to 50 km to forage.
- Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines.
- Also forage in cultivated gardens and fruit crops and can inflict severe crop damage.

Threats

- Loss of foraging habitat.
- Disturbance of roosting sites.

- Unregulated shooting.
- Electrocution on powerlines.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

Grey-headed Flying Foxes are highly mobile, wide-ranging animals which are able to cross stretches of open ground and are unlikely to have populations placed at risk of extinction by the clearing of a relatively small area of vegetation. Given that the area to be cleared is already highly modified; and that native vegetation is to be retained at the subject site, it is unlikely that the proposed development will place any viable local populations of the Grey-headed Flying Foxes at risk of extinction.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No endangered populations of Grey-headed Flying Foxes occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat for the Grey Headed Flying Fox, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential threatened Grey Headed Flying Fox habitat from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for Grey-headed Flying Foxes occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

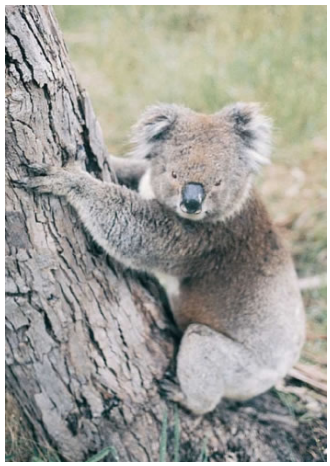
Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Phascolarctos cinereus* (Koala)**

Conservation status in NSW: Vulnerable



Description

The Koala is an arboreal marsupial with fur ranging from grey to brown above, and is white below. It has large furry ears, a prominent black nose and no tail. It spends most of its time in trees and has long, sharp claws, adapted for climbing. Adult males weigh 6 - 12 kg and adult females weigh 5 - 8 kg. During breeding, males advertise with loud snarling coughs and bellows.

Distribution

The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In NSW it mainly occurs on the central and north coasts with some populations in the western region. It was historically abundant on the south coast of NSW, but now occurs in sparse and possibly disjunct populations. Koalas are also
known from several sites on the southern tablelands.

Habitat and ecology

- Inhabit eucalypt woodlands and forests.
- Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.
- Inactive for most of the day, feeding and moving mostly at night.
- Spend most of their time in trees, but will descend and traverse open ground to move between trees.
- Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.
- Generally solitary, but have complex social hierarchies based on a dominant male with a territory overlapping several females and sub-ordinate males on the periphery.
- Females breed at two years of age and produce one young per year.

Threats

- Loss, modification and fragmentation of habitat.
- Predation by feral and domestic dogs.
- Intense fires that scorch or kill the tree canopy.
- Road-kills.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Koala species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No endangered populations of Koalas occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Koalas from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Koala occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Miniopterus australis* (Little Bentwing-bat)**

Conservation status in NSW: Vulnerable

Description

Little Bentwing-bats are small chocolate brown insectivorous bats with a body length of about 45 mm. The fur is long and thick, especially over the crown and around the neck. The tip of the wing is formed by a particularly long joint of the third finger.

Distribution

Coastal north-eastern NSW and eastern Queensland.

Habitat and ecology

- Moist eucalypt forest, rainforest or dense coastal banksia scrub.
- Little Bentwing-bats roost in caves, tunnels and sometimes tree hollows during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.
- They often share roosting sites with the Common Bentwing-bat and, in winter, the two species may form mixed clusters.
- In NSW the largest maternity colony is in close association with a large maternity colony of Common Bentwing-bats (M. schreibersii) and appears to depend on the large colony to provide the high temperatures needed to rear its young.

Threats

- Disturbance of colonies, especially in nursery or hibernating caves may be catastrophic.
- Destruction of caves that provide seasonal or potential roosting sites.
- Changes to habitat, especially surrounding maternity caves.
- Use of pesticides.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Little Bentwing-bats species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No endangered populations of Little Bentwing-bats occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Little Bentwing-bats from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Little Bentwing-bats occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Sterna albifrons* (Little Tern)**
Conservation status in NSW: Endangered

Description

The Little Tern is a small, slender, migratory or partly migratory seabird. At less than 25 cm long it is two- thirds to half the size of any other south-eastern tern. Pale grey upperparts contrast with the white chest, underbelly and the moderately long, deeply forked tail (80 - 110 mm). The Little Tern has a black cap and black outer wing-edges. During breeding the bill (26 - 32 mm) and legs change from black to yellow, and a black wedge appears from the bill to the eye. During non-breeding, the Little Tern's black cap shrinks to a black nape and its bill becomes black.

Distribution

Migrating from eastern Asia, the Little Tern is found on the north, east and south-east Australian coasts, from Shark Bay in Western Australia to the Gulf of St Vincent in South Australia. In NSW, it arrives from September to November, occurring mainly north of Sydney, with smaller numbers found south to Victoria. It breeds in spring and summer along the entire east coast from Tasmania to northern Queensland, and is seen until May, with only occasional birds seen in winter months.

Habitat and ecology

- Almost exclusively coastal, preferring sheltered environments; however may occur several kilometres from the sea in harbours, inlets and rivers (with occasional offshore islands or coral cay records).
- Nests in small, scattered colonies in low dunes or on sandy beaches just above high tide mark near estuary mouths or adjacent to coastal lakes and islands.
- The nest is a scrape in the sand, which may be lined with shell grit, seaweed or small pebbles.
- Both parents incubate up to three well-camouflaged eggs for up to 22 days, aggressively defending the nest against intruders until the young fledge at 17 - 19 days.
- Often seen feeding in flocks, foraging for small fish, crustaceans, insects, annelids and molluscs by plunging in the shallow water of channels and estuaries, and in the surf on beaches, or skipping over the water surface with a swallow-like flight.

Threats

- Nesting at flood-prone locations.
- Predation of eggs and chicks by foxes, dogs, cats, black rats, silver gulls, ravens and raptors.
- Disturbance to coastal feeding, nesting and roosting areas through beach-combing, fishing, dog-walking, horse-riding and 4WD vehicles; parents often leave the nest when approached, resulting in exposure of chicks or eggs.
- Coastal and inland habitat areas are being impacted by land clearing for residential, agricultural and tourism developments, by sand and rutile mining, and by waste disposal dumps.

- Hydrological changes to estuaries and similar waterbodies may modify or remove important areas of suitable habitat, or affect the availability of food.
- Potentially susceptible to pesticides and contamination of estuaries by oil-spills and heavy metals.
- Well-camouflaged eggs are at risk of accidental destruction.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Little Tern species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No endangered populations of No endangered populations of Little Tern occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Little Tern from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Little Tern occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will not involve clearing native vegetation, which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Pandion haliaetus* (Osprey)**

Conservation status in NSW: Vulnerable

Description

The Osprey is a large, water-dependent bird of prey, distinctive in flight and when perched. Despite its wing-span of up to 1.7 m, it is noticeably smaller than the White-bellied Sea-eagle. In flight it can be recognised by its distinctly bowed wings that are dark brown above, and barred underneath, and with white underwing coverts. Perched, the upperparts are dark brown and the underparts are white. The female has a dark streaky collar. The head is mainly white with a blackish stripe through the eye.

Distribution

Ospreys are found right around the Australian coast line, except for Victoria and Tasmania. They are common around the northern coast, especially on rocky shorelines, islands and reefs. The species is uncommon to rare or absent from closely settled parts of south-eastern Australia. There are a handful of records from inland areas.

Habitat and ecology

- Favour coastal areas, especially the mouths of large rivers, lagoons and lakes.
- Feed on fish over clear, open water.
- Breed from July to September in NSW. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea. .
- Incubation of 2-3 eggs, usually by the female, is about 40 days. Female remains with young almost until they fly, usually after about nine weeks in the nest.

Threats

- Removal of large trees near the coast that could be used as nest sites.
- Disturbances to water quality, such as from the disposal of treated effluent or stormwater runoff, that increases turbidity in feeding areas.
- Ingestion of fish containing discarded fishing tackle.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Osprey species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No endangered populations of No endangered populations of Osprey occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Osprey from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Osprey occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Haematopus longirostris* (Pied Oystercatcher)**
Conservation status in NSW: Vulnerable

Description

The Pied Oystercatcher is an unmistakable, large, black and white wader, reaching 50 cm in length. The sexes are similar, yet may be separable when together with the female having a slightly longer, more slender bill. When not in flight, the Pied Oystercatcher appears entirely black above, with white underparts. The back, head and breast are black, and the belly, rump and tail are white. The tail is tipped black. The wings are black with a narrow white bar on the upperwing and white underwing coverts. The eye-ring, iris and bill of the Pied Oystercatcher are brilliant scarlet and its legs are stout and coral pink. The most often heard call is a loud, sharp, high-pitched 'kurvee-kurvee-kurvee', usually given in alarm, which increases in pitch and rapidity when a nest site is approached.

Distribution

The species is distributed around the entire Australian coastline, although it is most common in coastal Tasmania and parts of Victoria, such as Corner Inlet. In NSW the species is thinly scattered along the entire coast.

Habitat and ecology

- 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. The chisel-like bill is used to pry open or break into shells of oysters and other shellfish.
- Nests mostly on coastal or estuarine beaches although occasionally they use saltmarsh or grassy areas. Nests are shallow scrapes in sand above the high tide mark, often amongst seaweed, shells and small stones.
- Two to three eggs are laid between August and January. The female is the primary incubator and the young leave the nest within several days.

Threats

- Disturbance to coastal feeding, nesting and roosting areas through beach-combing, fishing, dog-walking, horse-riding and 4WD vehicles.
- Predation of eggs and chicks by foxes, dogs, cats, Australian Ravens and raptors.

- Habitat destruction as a result of residential, agricultural and tourism developments.
- Hydrological changes to estuaries and similar water bodies causing modification or removal of important areas of suitable habitat.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Pied Oystercatcher species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No endangered populations of No endangered populations of Pied Oystercatcher occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Pied Oystercatcher from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Pied Oystercatcher occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Calyptorhynchus banksii* (Red-tailed Black-Cockatoo)**

Conservation status in NSW: Vulnerable

Description

The Red-tailed Black-Cockatoo is a large black cockatoo with a strong bill and large crest. Male birds have a broad band of bright red across the tail. Female and immature birds have yellow spots on the head, neck and wings, yellowish bars across the chest and a paler red band across the tail. This species can be distinguished from the similar Glossy Black Cockatoo by its greater size, large crest and louder call.

Distribution

The Red-tailed Black-Cockatoo is the most widespread of the Black-Cockatoos, ranging broadly across much of northern and western Australia as well as western Victoria. In NSW, one population occurs on the north-western slopes and plains but another small isolated population is found in the coastal north-east.

Habitat and ecology

- Red-tailed Black-Cockatoos are found in a wide variety of habitats. In coastal north-east NSW they have been recorded in dry open forest and areas of mixed rainforest/eucalypt forest.

Threats

- Loss of native forest and riparian vegetation for agriculture and development.
- Removal of large trees containing large hollows needed for nesting.
- Too frequent burning of areas of habitat.
- Overgrazing in areas of habitat which prevents regeneration of food resources for cockatoos.
- Illegal removal of eggs and chicks for the aviculture trade, as these birds do not breed well in captivity.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Red-tailed Black-Cockatoo species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No endangered populations of No endangered populations of Red-tailed Black-Cockatoo occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Red-tailed Black-Cockatoo from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).
No critical habitat for the Red-tailed Black-Cockatoo occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.
Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Xanthomyza phrygia* (Regent Honeyeater)**
Conservation status in NSW: **Endangered**

Description
The Regent Honeyeater is a striking and distinctive, medium-sized, black and yellow honeyeater with a sturdy, curved bill. Adults weigh 35 - 50 grams, are 20 - 24 cm long and have a wings-pan of 30 cm. Its head, neck, throat, upper breast and bill are black and the back and lower breast are pale lemon in colour with a black scalloped pattern. Its flight and tail feathers are edged with bright yellow. There is a characteristic patch of dark pink or cream-coloured facial-skin around the eye. Sexes are similar, though males are larger, darker and have larger patch of bare facial-skin. The call is a soft metallic bell-like song; birds are most vocal in non-breeding season.

Distribution
The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. Once recorded between Adelaide and the central coast of Queensland, its range has contracted dramatically in the last 30 years to between north-eastern Victoria and south-eastern Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years non-breeding flocks converge on flowering coastal woodlands and forests.

Habitat and ecology

- The Regent Honeyeater is a flagship threatened woodland bird whose conservation will benefit a large suite of other threatened and declining woodland fauna. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes.
- Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast. Birds are occasionally seen on the south coast.
- In the last 10 years Regent Honeyeaters have been recorded in urban areas around Albury where woodlands tree species such as Mugga Ironbark and Yellow Box were planted 20 years ago.

- The Regent Honeyeater is a generalist forager, which mainly feeds on the nectar from a wide range of eucalypts and mistletoes. Key eucalypt species include Mugga Ironbark, Yellow Box, Blakely's Red Gum, White Box and Swamp Mahogany. Also utilises: *E. microcarpa, E. punctata, E. polyanthemos, E. mollucana, Corymbia robusta, E. crebra, E. caleyi, Corymbia maculata, E.mckieana, E. macrorhyncha, E. laevopinea*, and *Angophora floribunda*. Nectar and fruit from the mistletoes *A. miquelii, A. pendula, A. cambagei* are also eaten during the breeding season. When nectar is scarce lerp and honeydew comprise a large proportion of the diet. Insects make up about 15% of the total diet and are important components of the diet of nestlings. A shrubby understorey is an important source of insects and nesting material.
- Colour-banding of Regent Honeyeater has shown that the species can undertake large-scale nomadic movements in the order of hundreds of kilometres. However, the exact nature of these movements is still poorly understood. It is likely that movements are dependent on spatial and temporal flowering and other resource patterns. To successfully manage the recovery of this species a full understanding of the habitats used in the non-breeding season is critical.
- There are three known key breeding areas, two of them in NSW - Capertee Valley and Bundarra-Barraba regions. The species breeds between July and January in Box-Ironbark and other temperate woodlands and riparian gallery forest dominated by River Sheoak. Regent Honeyeaters usually nest in horizontal branches or forks in tall mature eucalypts and Sheoaks. Also nest in mistletoe haustoria.
- An open cup-shaped nest is constructed of bark, grass, twigs and wool by the female. Two or three eggs are laid and incubated by the female for 14 days. Nestlings are brooded and fed by both parents at an average rate of 23 times per hour and fledge after 16 days. Fledglings fed by both parents 29 times per hour.

Threats

- Historical loss, fragmentation and degradation of habitat from clearing for agricultural and residential development, particularly fertile Yellow Box-White Box-Blakely's Red Gum woodlands.
- Continuing loss of key habitat tree species and remnant woodlands from strategic agricultural developments, timber gathering and residential developments.
- Suppression of natural regeneration of overstorey tree species and shrub species from overgrazing. Riparian gallery forests have been particularly impacted by overgrazing.
- Inappropriate forestry management practices that remove large mature resource-abundant trees. Firewood harvesting in Box-Ironbark woodlands can also remove important habitat components.
- Competition from larger aggressive honeyeaters, particularly Noisy Miners, Noisy Friarbirds and Red Wattlebirds.
- Egg and nest predation by native birds.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Regent Honeyeater species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No endangered populations of No endangered populations of Regent Honeyeater occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Regent Honeyeater from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Regent Honeyeater occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Haematopus fuliginosus* (Sooty Oystercatcher)**
Conservation status in NSW: Vulnerable

Description

The Sooty Oystercatcher is an unmistakable, large wader, reaching 50 cm in length. Like the Pied Oystercatcher, the Sooty Oystercatcher has a bright orange-red bill, eye-ring and iris, and coral pink legs and feet. However, the Sooty Oystercatcher has entirely black plumage. Sexes are separable when together, with the female having a longer, more slender bill. The call is similar to the Pied Oystercatcher's, although sharper and more piercing. Gives a loud whistling call before taking flight, and a piercing call if an intruder approaches the nest.

Distribution
Sooty Oystercatchers are found around the entire Australian coast, including offshore islands, being most common in Bass Strait. Small numbers of the species are evenly distributed along the NSW coast. The availability of suitable nesting sites may limit populations.

Habitat and ecology

- Favours rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.
- Forages on exposed rock or coral at low tide for foods such as limpets and mussels.
- Breeds in spring and summer, almost exclusively on offshore islands, and occasionally on isolated promontories. The nest is a shallow scrape on the ground, or small mounds of pebbles, shells or seaweed when nesting among rocks.

Threats

- Hydrological changes to estuaries and similar water bodies causing modification or removal of important areas of suitable habitat.
- Disturbance to coastal feeding, nesting and roosting areas through beach-combing, fishing, dog-walking, horse-riding and 4WD vehicles.
- Predation of eggs and chicks by foxes, dogs, cats, rats and raptors.
- Habitat destruction as a result of residential, agricultural and tourism developments.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Sooty Oystercatcher species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No endangered populations of No endangered populations of Sooty Oystercatcher occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Sooty Oystercatcher from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Sooty Oystercatcher occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Macronectes giganteus* (Southern Giant-Petrel)**
Conservation status in NSW: Endangered

Description
A large seabird up to 100cm in length with a wingspan between 150 and 210cm. The species is sexually dimorphic, with males larger than females. Within populations, two colour morphs occur. The most common is the dark morph with a white head and neck, and a dark grey-brown body. There is also a white morph with scattered black feathers.

Distribution
The Southern Giant Petrel has a circumpolar pelagic range from Antarctica to approximately 20° S and is a common visitor off the coast of NSW.

Habitat and ecology
- Over summer, the species nests in small colonies amongst open vegetation on Antarctic and subantarctic islands, including Macquarie and Heard Islands and in Australian Antarctic territory.
- A single chick is raised and although breeding occurs annually, approximately 30% of the potential breeding population does not nest.
- It is an opportunistic scavenger and predator, and scavenges from fishing vessels and animal carcasses on land.
- It is also an active predator of cephalopods and euphausiids, as well as smaller birds (particularly penguins) both at land and at sea.
- Birds will desert their nests if disturbed at the breeding colony.

Threats
- Mortality as a result of long-line fishing.
- Predation by feral cats and black rats on breeding islands.
- Habitat degradation on breeding islands from introduced caribou, sheep and rabbits.
- Loss of the southern cuttlefish populations.
- Oil spills.
- Changes to sea temperature and air temperatures which affect marine prey availability.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.
No Southern Giant Petrel species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No endangered populations of No endangered populations of Southern Giant Petrel occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Southern Giant Petrel from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Red-tailed Black-Cockatoo occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Dasyurus maculatus* (Spotted-tailed Quoll)**
Conservation status in NSW: Vulnerable

Description

The Spotted-tailed Quoll is about the size of a domestic cat, from which it differs most obviously in its shorter legs and pointed face. The average weight of an adult male is about 3500 grams and an adult female about 2000 grams. It has rich-rust to dark-brown fur above, with irregular white spots on the back and tail, and a pale belly. The spotted tail distinguishes it from all other Australian mammals, including other quoll species. However, the spots may be indistinct on juvenile animals.

Distribution

The range of the Spotted-tailed Quoll has contracted considerably since European settlement. It is now found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Queensland. Only in Tasmania is it still considered common.

Habitat and ecology

- Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.
- Individual animals use hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites.
- Mostly nocturnal, although will hunt during the day; spends most of the time on the ground, although also an excellent climber and may raid possum and glider dens and prey on roosting birds.
- Use 'latrine sites', often on flat rocks among boulder fields and rocky cliff-faces; these may be visited by a number of individuals; latrine sites can be recognised by the accumulation of the sometimes characteristic 'twisty-shaped' faeces deposited by animals.
- Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits and insects; also eats carrion and takes domestic fowl.
- Females occupy home ranges up to about 750 hectares and males up to 3500 hectares; usually traverse their ranges along densely vegetated creeklines.
- Average litter size is five; both sexes mature at about one year of age.

Threats

- Loss, fragmentation and degradation of habitat.
- Accidental poisoning during wild dog and fox control programs. Deliberate poisoning, shooting and trapping may also be an issue.
- Competition with introduced predators such as cats and foxes.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Spotted-tailed Quoll species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No endangered populations of No endangered populations of Spotted-tailed Quoll occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Spotted-tailed Quoll from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Spotted-tailed Quoll occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Lophoictinia isura* (Square-tailed Kite)**
Conservation status in NSW: Vulnerable

Description

The Square-tailed Kite is a reddish, medium-sized, long-winged raptor, about the size of a Little Eagle or harrier. Adults have a white face with thick black streaks on the crown and finer streaks elsewhere. The saddle, rump and central upper tail coverts are blackish with grey-brown barring. The underparts are predominantly grey-brown with black tips on the grey, square-tipped tail and wing edges. A key character in flight is the long fingered, upswept wings with a large white patch at the base of the barred 'fingers'.

Distribution

The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW and Victoria. 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.

Habitat and ecology

- Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses.
- In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland.
- 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.
- Appears to occupy large hunting ranges of more than 100km2.
- Breeding is from July to February, with nest sites generally located along or near watercourses, in a fork or on large horizontal limbs.

Threats

- Clearing, logging, burning, and grazing of habitats resulting in a reduction in nesting and feeding resources.
- Disturbance to or removal of potential nest trees near watercourses.
- Illegal egg collection and shooting.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Square-tailed Kite species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is

likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No endangered populations of Square-tailed Kite occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Square-tailed Kite from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Square-tailed Kite occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Petaurus norfolcensis* (Squirrel Glider)**
Conservation status in NSW: Vulnerable

Description
Adult Squirrel Gliders have a head and body length of about 20 cm. They have blue-grey to brown-grey fur above, white on the belly and the end third of the tail is black. There is a dark stripe from between the eyes to the mid-back and the tail is soft and bushy averaging about 27 cm in length. Squirrel Gliders are up to twice the size of Sugar Gliders, their facial markings are more distinct and they nest in bowl-shaped, leaf lined nests in tree hollows. Squirrel Gliders are also less vocal than Sugar Gliders.

Distribution
The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria.

Habitat and ecology
- 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.

Threats
- Loss and fragmentation of habitat.
- Loss of hollow-bearing trees.
- Loss of flowering understorey and midstorey shrubs in forests.
- Individuals can get caught in barbed wire fences while gliding.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.
No Squirrel Gliders species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No endangered populations of Squirrel Gliders occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Squirrel Gliders from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Squirrel Gliders occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Hoplocephalus stephensii* (Stephens' Banded Snake)**
Conservation status in NSW: Vulnerable

Description
Stephens' Banded Snake is a medium-sized partly tree-dwelling snake up to one metre long. It is brown or yellow-brown above, with a series of irregular, broad, dark crossbands. The head is black with a brown crown and a brown or cream patch on either side of the nape and the lips are barred with black and cream.

Distribution
Coast and ranges from Southern Queensland to Gosford in NSW.

Habitat and ecology
- Rainforest and eucalypt forests and rocky areas up to 950 m in altitude.
- Stephens' Banded Snake is nocturnal, and shelters between loose bark and tree trunks, amongst vines, or in hollow trunks limbs, rock crevices or under slabs during the day.
- At night it hunts frogs, lizards, birds and small mammals.

Threats
- Illegal collection of snakes from the wild.
- Clearing and fragmentation of habitat.
- Forestry practices which result in loss of old or dead trees.
- Too frequent burning for fuel reduction or grazing management which destroys old and dead trees and removes understorey vegetation.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.
No Stephens' Banded Snake species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No endangered populations of Stephen's Banded Snake occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Red-tailed Black-Cockatoo from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Stephens' Banded Snake occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Monarcha leucotis* (White-eared Monarch)**
Conservation status in NSW: Vulnerable

Description
White-eared Monarchs are distinctive small flycatchers with a black, white and grey harlequin pattern to the plumage. They have a characteristic hovering flight when foraging around the outer foliage of trees and a distinctive plaintive two note call, with the second note descending and drawn-out. They also have a scolding, three to four note alarm call.

Distribution
Restricted to eastern Queensland and the NSW north coast from Cape York south to Iluka at the mouth of the Clarence River and occur west only as far as the Richmond Range. Occasionally found further south in the vicinity of Coffs Harbour and Port Macquarie.

Habitat and ecology
In NSW this species occurs primarily in coastal rainforest, swamp forest and wet eucalypt forest. It appears to favour rainforest edges where trees are frequently covered with vines and through the canopy of more extensive patches of rainforest.

Threats
- Clearing and isolation of low elevation subtropical rainforest, coastal rainforest and wet and swamp forest resulting from agricultural, tourist and residential development.
- Conversion of multi-aged wet forests to young, even-aged stands through forest management.
- Weed invasions completely dominating habitats.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.
No White-eared Monarchs species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No endangered populations of White-eared Monarchs occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of White-eared Monarchs from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Red-tailed Black-Cockatoo occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Ptilinopus magnificus* (Wompoo Fruit-dove)**
Conservation status in NSW: Vulnerable

Description
A large and dramatically beautiful rainforest pigeon, almost twice the size of other coloured fruit-doves. It is up to 56 cm long, with a pale grey head shading into rich green back and wings. There is a broken yellow band across each wing. The breast and belly are plum-purple and the underparts are yellow.

Distribution
Occurs along the coast and coastal ranges from the Hunter River in NSW to Cape York Peninsula. It is rare south of Coffs Harbour. Three subspecies are recognised, with the most southerly in NSW and south-eastern Queensland. It used to occur in the Illawarra, though there are no recent records.

Habitat and ecology
- Occurs in, or near rainforest, low elevation moist eucalypt forest and brush box forests.
- Feeds on a diverse range of tree and vine fruits and is locally nomadic - following ripening fruit; some of its feed trees rely on species such as the this to distribute their seeds.
- Feeds alone, or in loose flocks at any height in the canopy.
- Despite its plumage, can be remarkably cryptic as it feeds, with the call and falling fruit being an indication of its presence.
- The nest is a typical pigeon nest - a flimsy platform of sticks on a thin branch or a palm frond, often over water, usually 3 - 10 m above the ground.
- Breeds in spring and early summer; a single white egg is laid.
- Most often seen in mature forests, but also found in remnant and regenerating rainforest.
- Aspects of its behaviour such as social behaviour and structure, movements and breeding biology have not been well-studied.

Threats
- Clearing, fragmentation and weed invasion of low to mid-elevation rainforest due to coastal development and grazing.
- Logging and roading in moist eucalypt forest with well-developed rainforest understorey.
- Burning, which reduces remnant rainforest habitat patches.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.
No Wompoo Fruit Dove species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No endangered populations of Wompoo Fruit Dove occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Wompoo Fruit Dove from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Wompoo Fruit Dove occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Grus rubicunda* (Brolga)**
Conservation status in NSW: Vulnerable

Description
Brolgas are large waterbirds, best known in Australia for their spectacular dancing displays. They stand 2-2.25m tall and are silvery grey with yellow eyes and dark grey legs. The bare skin of the face, cheek and back of the head is scarlet with a small grey patch over the ears. A black haired dewlap hangs from the chin. The call is a far-carrying wooping trumpet, ending in a staccato cackling, or a hoarse croak.

Distribution
Northern and eastern Australia but generally uncommon and localised in the east.

Habitat and Ecology
- Brolgas inhabit shallow swamps and swamp margins, floodplains, grassland and pastoral lands, usually in pairs or parties.
- They plunge their heads under water to dig for roots and corms of swamp vegetation.
- The nest is usually made of grasses and plant stems on small islands in swamps or standing in water.

Threats
- Drainage of swamps and other wetlands
- Reduced water quality from siltation and pollution
- Use of herbisides, insecticides and other chemicals near wetlands
- Destruction of nests by grazing stock and associated frequent burning of wetlands
- Predation at nest sites by feral animals and domestic dogs
- Changing waterflow into and from wetlands
- Collision with powerlines near nest sites and wetlands

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.
No Brolgas species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.
No endangered populations of Brolga occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Brolgas from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Brolgas occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Pomatostomus temporalis temporalis* (Grey-crowned Babbler (eastern subspecies)**
Conservation status in NSW: Vulnerable

Description

The Grey-crowned Babbler is the largest of the four Australian babblers, reaching to 30 cm long. Its distinctive bill is scimitar-shaped, long and heavy. The broad white eyebrow and a pale grey crown-stripe are other distinguishing characters. A dark band passes from the bill through the eye, separating the pale throat and brow to giving a 'masked' look. It has dark greyish-brown upperparts and is paler brown on the underparts, grading to a whitish throat. It is distinctive in flight, showing white tips to the tail feathers, and orange-buff patches in the broad, rounded wings. Young birds have dark brown eyes, with the iris becoming paler with age, reaching a yellow colour by about three years. This species has a loud and often repeated 'ya-hoo' call which is a duet between the male and female (the female says 'ya' and the male answers with 'hoo'). It is used to maintain the bond between the pair and as a territorial call. The 'ya-hoo' duet sequence is repeated rapidly, up to thirty times in a row.

Distribution

The Grey-crowned Babbler is found throughout large parts of northern Australia and in south-eastern Australia. In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Hay. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands.

Habitat and ecology

- Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains.
- Flight is laborious so birds prefer to hop to the top of a tree and glide down to the next one. Birds are generally unable to cross large open areas.
- Live in family groups that consist of a breeding pair and young from previous breeding seasons. A group may consist of up to fifteen birds. All members of the family group remain close to each other when foraging. A soft 'chuck' call is made by all birds as a way of keeping in contact with other group members.
- Feed on invertebrates, either by foraging on the trunks and branches of eucalypts and other woodland trees or on the ground, digging and probing amongst litter and tussock grasses
- Build and maintain several conspicuous, dome-shaped stick nests about the size of a football. A nest is used as a dormitory for roosting each night. Nests are usually located in shrubs or sapling eucalypts, although they may be built in the outermost leaves of low branches of large eucalypts. Nests are maintained year round, and old nests are often dismantled to build new ones.
- Breed between July and February. Usually two to three eggs are laid and incubated by the female. During incubation, the adult male and several helpers in the group may feed the female as she sits on the nest. Young birds are fed by all other members of the group.

- Territories range from one to fifty hectares (usually around ten hectares) and are defended all year. Territorial disputes with neighbouring groups are frequent and may last up to several hours, with much calling, chasing and occasional fighting.

Threats

- Clearing of woodland remnants.
- Heavy grazing and removal of coarse, woody debris within woodland remnants.
- Nest predation by species such as ravens and butcherbirds may be an issue in some regions where populations are small and fragmented.

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Grey-crowned Babbler species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No endangered populations of Grey- crowned Babbler occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Grey-crowned Babbler from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Grey-crowned Babbler occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

***Myotis adversus* (Large-footed Myotis)**

Conservation status in NSW: Vulnerable

Description

This species is now most often referred to as *Myotis macropus* or the Southern Myotis. It has disproportionately large feet; more than 8 mm long, with widely-spaced toes which are distinctly hairy and with long, curved claws. It has dark-grey to reddish brown fur above and is paler below. It weighs up to 15 grams and has a wingspan of about 28 cm.

Distribution

The Large-footed Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers.

Habitat and ecology

- Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage.
- 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.

Threats

- Loss or disturbance of roosting sites.
- Clearing adjacent to foraging areas.
- Application of pesticides in or adjacent to foraging areas.
- Reduction in stream water quality affecting food resources

(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.

No Large-footed Myotis species are at risk of extinction by the development.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No endangered populations of Large-footed Myotis occur at the subject site.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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.

In relation to the regional distribution of habitat, the area to be modified or removed is not significant.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

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

The development will not isolate any known or potential habitat of Large-footed Myotis from adjoining areas of similar habitat.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No critical habitat for the Large-footed Myotis occurs at the subject site.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

Threat abatement has been managed via amelioration measures.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995).

Conclusion

The proposed development will involve removing native vegetation (selected individual tree species). The Subject site is not connected to native vegetation; and that areas of native vegetation are to be retained and improved where possible at the Subject site, the proposed development is unlikely to have a significant effect on any threatened fauna species. Consequently, a Species Impact Statement is not necessary.

Table 9. Occurrence in selected north coast conservation reserves of threatened fauna species that may possibly occur at the Subject site. X = recorded from reserve.

Source: NPWS (2005)

Scientific name	Common name	Fortis Creek NP	Bungawalbin NR	Bungawalbin NP	Cathedral Rock NP	Guy Fawkes River NP	Mann River NR	Washpool NP	Chaelundi NP	Bundjalung NP	Yuraygir NP	Cudgen NR	Myall Lakes NP
Atrichornis rufescens	Rufous Scrub-bird	X	X	X	X	X	X	X	X	X	X	X	X
Coracina lineata	Barred Cuckoo-shrike	X	X	X	X	X	X	X	X	X	X	X	X
Ptilinopus magnificus	Wompoo Fruit-Dove	X	X	X	X	X	X	X	X	X	X	X	X
Ptilinopus regina	Rose-crowned Fruit-Dove	X	X	X	X	X	X	X	X	X	X	X	X
Ptilinopus superbus	Superb Fruit-Dove	X								X	X	X	X
Monarcha leucotis	White-eared Monarch	X	X	X	X	X	X	X	X	X	X	X	X
Menura alberti	Albert's Lyrebird										X	X	X
Podargus ocellatus	Marbled Frogmouth								X		X		
Ninox strenua	Powerful Owl	X	X	X	X	X		X	X	X	X		X
Tyto tenebricosa	Sooty Owl	X	X	X					X	X	X		
Assa darlingtoni	Pouched Frog						X	X					

Philoria loveridgei	Loveridge's Frog												
Phascogale tapoatafa	Brush-tailed Phascogale	X	X	X	X			X	X	X	X		
Petaurus norfolcensis	Squirrel Glider		X	X		X	X	X	X	X	X	X	X
Phascolarctos cinereus	Koala		X			X		X		X		X	X
Syconycteris australis	Common Blossom-bat	X	X	X	X			X	X	X	X		
Miniopterus australis	Little Bentwing-bat									X	X	X	
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat							X		X	X	X	
Nyctophilus bifax	Eastern Long-eared Bat	X	X	X				X	X	X	X		
Hoplocephalus stephensii	Stephens' Banded Snake	X								X	X	X	X

5.2 SEPP 44

State Environmental Planning Policy 44 – Koala Habitat Protection – aims to "encourage the proper conservation and management of area of natural vegetation that provide habitat for Koalas, to ensure permanent free-living populations over their present range and to reverse the current trend of population decline."

A number of criteria in the SEPP are to be addressed

1. Does the policy apply?
Does the Subject land occur in an LGA identified in Schedule 1?
The site occurs in the Coffs Harbour LGA, which is listed under Schedule 1.

Is the landholding to which the DA applies greater than 1 hectare in area?
Yes

2. Is the land potential Koala habitat?
Does the site contain areas of native vegetation where the trees of types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component?
Yes

3. Is there core Koala habitat on the Subject land?
"Core Koala habitat" means an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population. Signs of koalas – were not observed at the Subject site, there are no historical records of a koala populations at the site. Consequently, the Subject site does contain core Koala habitat.

4. Is there a requirement for the preparation of a Plan of Management for identified core Koala habitat?
No

5.3 COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT (1999)

5.3.1 INTRODUCTION

Under the Commonwealth Environment Protection and Biodiversity Conservation Act (1999), a person must not, without an approval under the Act, take an action that has or will have, or is likely to have, a significant impact on a matter of National Environmental Significance (NES). These matters are listed as:

(a) the world heritage values of a declared World Heritage property,
(b) the ecological character of a declared Ramsar wetland,
(c) a threatened species or endangered community listed under the Act,
(d) a migratory species listed under the Act, or
(e) the environment in a Commonwealth marine area or on Commonwealth land.

The EPBC Act (1999) does not require Commonwealth approval for the rezoning of land. It does, however, suggest that when rezoning land, planning authorities should consider whether to allow actions that could significantly affect NES matters or the environment of Commonwealth land.

Matters of NES in NSW are:

(a) Declared World Heritage Areas;
(b) Declared Ramsar Wetlands;
(c) Listed threatened Species under the EPBC Act (1999);
(d) Listed Ecological Communities under the EPBC Act (1999);
(e) Listed migratory species (JAMBA and CAMBA)

5.3.2 SITE ASSESSMENT

Commonwealth Assessment will be required for proposed activities on the site if they affect any matter of NES. The Subject site is not a Declared World Heritage Area nor does it contain any Declared Ramsar Wetlands. No threatened species listed under the EPBC Act (1999) may possibly occur at the Subject site.

5.3.3 LISTED ECOLOGICAL COMMUNITIES IN NSW

None of the ecological communities currently listed in the EPBC Act (1999) occur at the subject site.

5.3.4 LISTED MIGRATORY SPECIES

Listed migratory species in NSW are considered predominantly in the Japan-Australia Migratory Bird Agreement (JAMBA) and China-Australia Migratory Bird Agreement (CAMBA).

An action has, will have, or is likely to have a significant impact on a migratory species if it does, will, or is likely to:

- substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat of the migratory species, or
- result in invasive species that are harmful to the migratory species becoming established in an area of important habitat of the migratory species, or
- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of the species.

An area of important habitat is:

1. habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, or
2. habitat utilised by a migratory species which is at the limit of the species range, or

3. habitat within an area where the species is declining.

No CAMBA or JAMBA species are known to occur or – in view of the absence of wetlands – likely to occur at the site. The proposed development is therefore unlikely to have a significant impact on any CAMBA or JAMBA species.

5.3.5 REQUIREMENT FOR COMMONWEALTH ASSESSMENT

In light of the considerations discussed above, Commonwealth Assessment is not required for the proposed development of the site.

6.0 CONCLUSION

Bushfiresafe was engaged by Sapphire Beach Development Pty Ltd to complete a Flora and Fauna Assessment for Lots 100 & 101 DP 629555 and lot 2 DP 800836 Pacific Hwy, Coffs Harbour.

The assessment involved the following:

- Determining the threatened flora species recorded from the locality
- Assessing the nature and condition of vegetation at the site, and searching for threatened flora species
- Determining the threatened fauna species occurring in the locality
- Searching for threatened fauna species
- Assessing the habitat value of the site for threatened species
- Addressing statutory requirements including State Environmental Planning Policy No. 44 (SEPP 44 – Koala Habitat Protection), State Environmental Planning Policy No. 14 (SEPP 26 – Littoral Rainforest) ,Section 5A of the Environmental Planning & Assessment Act (1979) and the Commonwealth Environment Protection and Biodiversity Act (1999)

The subject site – the area subject to the proposed development, currently known as Pelican Beach Resort, is located between Korora and Sapphire, 6km north of Coffs Harbour in the Coffs Harbour Local Government Area on the North Coast of NSW and is currently used as a resort facility with 114 suites. The subject site is located adjacent to Campbell's Beach on the Pacific Ocean. The majority of the subject site is zoned 2(e) Residential with a small portion zoned 7(a) Environmental Protection under the Coffs Harbour LEP. The site occupies an area of 41503sq m. The vegetation at the subject site is mainly of landscape nature except for two Hoop Pines, regarded as significant landscape signature trees, the small area of dry sclerophyll forest within the 7(a) Environmental Protection zone and another small area of dunal vegetation adjacent to the beach.

Soils in the area are Aeolian sands and arillite with moderate erosion hazard.

The subject site is located on the southern peninsula of Campbell's Beach approximately at or above sea level. The subject site is connected to Solitary Island's Marine Park which is located along the coastline of Campbell's Beach. The site generally slopes east with a gradient between 10 and 15 Degrees.

A site survey was undertaken by Craig Harman B.Sc. Hort on the 8th and 9th of June 2006. The survey involved walking a random meander through the resort including thorough investigation of the 7(a) zoned portion and the dunal vegetation along the foreshore.

The nature and condition of vegetation at the subject site was assessed, and all threatened flora species, as well as all flora species, threatened or not, encountered during the meander were recorded. All individuals of threatened flora species were marked with flagging tape; plants were identified by Craig Harman.

Based on an assessment of the type and condition of habitat present, it was concluded that out of 26 threatened flora species listed on the NPWS Atlas Search, 18 may possibly occur at the subject site; out of 49 threatened fauna species listed on the NPWS Atlas Search, 29 are possible.

An assessment of significance under Section 5A of the NSW EP&AA (1979) was completed for the threatened flora species known to occur, and the 29 threatened fauna species assumed to occur, at the Subject site. The assessment concluded that the proposed development is unlikely to have a significant effect on any of these species. A Species Impact Statement (SIS) is therefore not required.

A SEPP 44 assessment concluded that the Subject site does not support core Koala habitat, and that there is therefore no need for of a plan of management for core Koala habitat.

An assessment under the Commonwealth Environment Protection and Biodiversity Conservation Act (1999) concluded that the proposed development will not have a significant impact on any matters of National Environmental Significance, Commonwealth assessment of the proposal is therefore not required.

It is recommended that building envelopes be positioned to minimise the need to clear vegetation for units, houses and for bushfire buffers. A Draft Plan Management (DPM) has been prepared for the entire Site. The Draft Plan of Management has addressed:

- Headland and hind-dune area
- Rehabilitation of Environmental Protection Zone
- Weed control in developed areas and areas of retained habitat.
- Landscape and embellishment plantings of local endemic species.
- Buffer plantings to hind-dune and environmental protection zone areas.

Additional amelioration measures have been recommended in this report; these include:

- All stormwater from development to be diverted away from coastal area and stored onsite to allow dissipation through dunal area over a period of time
- Rehabilitation of sections of the low-lying areas of the site and the revegetation of the grassed area adjacent to the beach as a physical boundary to buffer the coastline

- Suitable traffic control measures should be incorporated into the re-development.
- Retention and enhancement of areas of natural habitat, Banksias, native coastal grasses and other flowering trees and shrubs throughout the development area.
- Lighting from the proposed development should be designed to minimise disturbance to the coastal foreshores to reduce impacts on turtles and birds may possibly nest on the beach.
- Fencing to be provided to limit entry to vegetation areas and to provide physical separation between residential development and natural areas

7.0 REFERENCES

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Appendix 1: Plant species recorded during site survey
(Asterisks indicate species not naturally found on the North Coast of NSW)

Family	Species	Common Name
PALMAE	*Archontopopheonix Cunninghamiana*	Bangalow Palm
EUPHORBIACEAE	*Omalanthus nutans*	Bleeding Heart
ARALIACEAE	*Polyscias elegans*	Celerywood
ZINGIBERACEAE	*Alpinia coerulea*	Native Ginger
EUPOMATIACEAE	*Eupomatialaurina*	Bolwarra
LAURACEAE	*Cryptocaria triplinervis*	Three Veined Cryptocaria
SAPENDACEAE	*Alectryon coriaceus*	Beach alectryon
	Cupaniopsis anacardioides	Tuckeroo
BLECHNACEAE	*Blechnum cartilagineum*	False Bracken
MELIACEAE	*Synoum glandulosum*	Scentless Rosewood
ADIANTACEAE	*Adiantum diaphanum*	Maidenhair Fern
BLECHNACEAE	*Blechnum cartilagineum*	Gristle Fern
	Lantana camara	Lantana
LAURACEAE	*Cinnamomum camphora*	Camphor Laurel
CAESALPINIACEAE	*Senna gaudichaudii*	Winter Senna
EUCALYPTUS	Ecalyptus tereticornis	Forest Red Gum
MYRTACEAE	*Lophostemon confertus*	Brush Box
CAESALPINIOIDEAE	*Senna coluteoides*	Winter Senna
CONVULVOLACEAE	*Ipomoea cairica*	Mile-a-minute
DILLENIACEAE	*Hibbertia riparia*	
	Hibbertia scandens	Climbing guinea flower
	Hibbertia vestita	
ELEOCARPACEAE	*Elaeocarpus reticulates*	Blueberry ash
EPACRIDACEAE	*Monotoca scoparia*	Broom heath
EUPHORBIACEAE	*Glochidion sumatranum*	Umbrella cheese tree
FABACEAE	*Acacia irrorata*	
	Acacia melanoxylon	Blackwood wattle
	Acacia sophorae	Coastal wattle
	Desmodium uncinatum	Silver-leaved desmodium
	Jacksonia scoparia	Dogwood
PITTOSPORACEAE	*Pittosporum revolutum*	Hairy pittosporum
	Pittosporum undulatum	Sweet pittosporum
PROTEACEAE	*Banksias integrifolia*	Coast banksias
	Persoonia stradbrokensis	Geebung
RUBIACEAE	*Psychotria loniceroides*	Hairy psychotria
RUTACEAE	*Acronychia imperforate*	Beach acronychia
	Acronychia littoralis	Scented acronychia
	Flindersia schottiana	Cudgerie

Appendix 2: Fauna species recorded during site survey

Family	Species	Common Name
Artamidae	*Cracticus nigrogularis*	Pied Butcherbird
Artamidae	*Gymnorhina tibicen*	Australian Magpie
Artamidae	*Gymnofhina Tibicen*	Magpie
Artamidae	*Serepera graculina*	Pied Currawong
Apodidae	*Hirundadus Cavdacutus*	White Throated Needletail
Anhingdae	*Anhinga Melanogaster*	Common Darter
Acanthizidai	*Acanthiza Pusilla*	Brown Thornbill
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike
Columbidae	*Leucosarcia melanoleuca*	Wonga Pigeon
Corvidae	*Corvus orru*	Torresian Crow
Charadriidae	*Vanellus Miles*	Masked Lapwing
Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird
Dicruridae	*Rhipidura leucophrys*	Willy Wagtail
Dicruridae	*Rhipidura Albiscapa*	Grey Fantail
Halcyonidae	*Dacelo novaeguineae*	Laughing Kookaburra
Hirundinidae	*Hirundo neoxena*	Welcome Swallow
Maluridae	*Malurus cyaneus*	Superb Fairy-wren
Meliphagidae	*Acanthorhynchus tenuirostris*	Eastern Spinebill
Meliphagidae	*Lichmera indistincta*	Brown Honeyeater
Meliphagidae	*Manorina melanocephala*	Noisy Miner
Meliphagidae	*Melithreptus albogularis*	White-throated Honeyeater
Meliphagidae	*Myzomela sanguinolenta*	Scarlet Honeyeater
Meliphagidae	*Philemon corniculatus*	Noisy Friarbird
Pachycephalidae	*Falcunculus frontatus*	Eastern Shrike-tit
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler
Pardalotidae	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill
Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote
Passeridae	*Neochmia temporalis*	Red-browed Firetail
Podargidae	*Podargus strigoides*	Powerful Owl
Psittacidae	*Alisterus scapularis*	Australian King Parrot
Psittacidae	*Platycercus eximius*	Eastern Rosella
	Dasyornis Brachypterus	Eastern Bristlebird
	Glossopsitta pusilla	Little Lorikeet

Appendix 3: Night survey results

STAG WATCHES

None of the hollow-bearing trees watched were being used by any fauna species on the night of observation (Table 6 and 6a).

Table 6: Details of Trees Watched and Results of Stag Watching on 8th June, 2006

Tree(s)	Description of location	Observer	Fauna observed entering/exiting hollows
Dead tree	South of Property Entrance across road	Craig Harman	-
Flooded Gum with potential hollows	Near south-western boundary	Craig Harman	-

Table 6a: Details of Trees Watched and Results of Stag Watching on 9th June, 2006

Tree(s)	Description of location	Observer	Fauna observed entering/exiting hollows
Dead tree	South of Property Entrance across road	Craig Harman	-
Flooded Gum with potential hollows	Near south-western boundary	Craig Harman	-

SPOTLIGHTING/CALL PLAYBACK

The results of spotlighting/call playback surveys are presented in Table 2a. The most notable record is that of a powerful Owl, which was heard during call playbacks on the night of the 8th June 2006.

Table7: Fauna species recorded during spotlighting and call playback surveys on 8th June, 2006

Class	Species	Method of Detection	Comments
Birds	Powerful Owl	Heard	Individual responded from adjacent southern vegetation

BAT ELOCATION

Table 7a: Details of Bat Echolocation Observations on June 2006, and Results of Anabat Recordings

Date	Time	Description of Location	Observer	Observations Recordings
8/6/06	19:30 – 20:35	Northern point of Open Grassland	Craig Harman	No sightings or recordings of bat activity
8/6/06	21:00 – 22:05	North-Western point of 7(a) zone	Craig Harman	No sightings or recordings of bat activity
9/6/06	19:00 – 20:00	Fig Tree Adjacent to old restaurant	James Harrison / Craig Harman	No sightings or recordings of bat activity
9/6/06	20:05 – 21:05	Adjacent to South-eastern point of 7(a) zone	James Harrison / Craig Harman	No sightings or recordings of bat activity

BIRD SURVEY

One threatened species was recorded during the bird surveys (Powerful Owl during call-back). Species recorded during the bird survey are presented in Appendix 2.

Appendix 4: Powerful Owl
Ninox strenua

New South Wales Legislative Status: Vulnerable

Description: Powerful Owls are large, nocturnal birds up to 65cm in length. The upperparts are dark, greyish-brown with indistinct off-white bars. The underparts are whitish with dark greyish-brown V-shaped markings. Juveniles have white crown and underparts that contrasts with its small, dark streaks and dark eye patches. The call is slow, deep and resonant woo-woo, which can be heard over a great distance in the forest at night.

Distribution: Powerful Owls are found throughout eucalypt forests and woodland in south-eastern Australia but are uncommon and occur at low densities. The eucalypt forest of North-East NSW now provide the stronghold for the species.

Habitat: Powerful Owls have large home-ranges (more than 1000 hectares) and occupy a variety of vegetation types, from woodlands and open forest to tall moist forest and rainforest. They roost by day in dense vegetation, commonly along drainage lines and nest in large tree-hollows (at least 50cm deep) in large eucalypts. Adult birds appear to be faithful to nesting sites, remaining in one large home-range all their lives. The Powerful Owl's main prey is medium sized arboreal marsupials, particularly Greater Gliders, Common Ringtail Possums, Sugar Gliders and Flying Foxes.

Threats:

- Destruction of suitable forest and woodland habitat.
- Forest management practices that reduces the availability of food or that results in the loss of old trees and large tree-hollows.
- High frequency burning.
- Disturbances during breeding period, such as clearing, logging and burning.

Conservation actions

- Retain stands of forest and woodland habitat, especially those containing hollow-bearing trees.
- When clearing or logging, ensure sufficient hollow-bearing and large, mature trees (future hollow-bearing trees) are maintained within stands.
- Retain creek side vegetation.
- Retain a buffer of native vegetation of at least 200m radius around know nest sites.

Recovery strategies
Priority actions are the specific, practical things that must be done to recover a threatened species, population or ecological community. The NSW Draft Recovery Plan within the Department of Environment and Conservation has identified 23 priority actions to help recover the Powerful Owl in New South Wales.

What needs to be done to recover this species?

- Apply low-intensity, mosaic pattern fuel reduction regimes.
- Searches for the species should be conducted in suitable habitat in proposed development areas and proposed forest harvesting compartments.
- Retain at least a 200 metre buffer of native vegetation around known nesting sites.
- Retain large stands of native vegetation, especially those containing hollow-bearing trees.
- Protect riparian vegetation to preserve roosting areas.
- Protect hollow-bearing trees for nest sites. Younger recruitment trees should also be retained to replace older trees in the long-term.
- Minimise visits to nests and other disturbances, including surveys using call playback, when owls are breeding.
- Assess the importance of the site to the species' survival. Include the linkages the site provides for the species between ecological resources across the broader landscape.

Assessment of Significance (7 Part Test)

Threatened species impact assessment is an integral component of environmental impact assessment. The ultimate objective of the application of section 5A of the *Environmental Planning and Assessment Act 1979* (EP&A Act), the Assessment of Significance, is to improve the standard of consideration afforded to threatened species, populations and ecological communities, and their habitats through the planning and assessment process, and to ensure this consideration is transparent. Under the *Threatened Species Conservation Amendment Act 2002*, the factors to be considered when determining whether an action, development or activity is likely to significantly affect threatened species, populations or ecological communities, or their habitats (known previously as the "8-part test"), have been revised. This affects s5A EP&A Act, s94 *Threatened Species Conservation Act 1995* (TSC Act) and s220ZZ *Fisheries Management Act 1994* (FM Act).

The revised factors maintain the same intent but focus consideration of likely impacts in the context of the local rather than the regional environment as the long-term loss of biodiversity at all levels arises primarily from the accumulation of losses and depletions of populations at a local level. This is the broad principle underpinning the TSC Act, State and Federal biodiversity strategies and international agreements. The consideration of impacts at a local level is designed to make it easier for local government to assess, and easier for applicants and consultants to undertake the Assessment of Significance because there is no longer a need to research regional and statewide information. The Assessment of Significance is only the first step in considering potential impacts. Further consideration is required when a significant effect is likely and is more appropriately considered when preparing a Species Impact Statement.

Definitions

Local population

For the purposes of the TSC Act (1995) a local population is defined as “a population that occurs within the study area, unless the existence of contiguous or proximal occupied habitat and the movement of individuals or exchange of genetic material across the boundary of the study area can be demonstrated” (NPWS 1996).

Region

The subject site is located within the New South Wales North Coast bioregion (Thackway and Cresswell 1995), which extends from the Queensland/NSW border south to about Port Stephens, and west to the Great Dividing Range.

One species of threatened fauna was identified at the subject site; the Powerful Owl.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Powerful Owls are highly mobile, wide-ranging animals which are able to cross stretches of open ground and populations are unlikely to be placed at risk of extinction as the proposed development does not include clearing of any vegetation other than sparsely scattered trees within the Resort Facility.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,
This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

No endangered populations of the Powerful Owl occur at the subject site.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
- **(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 Powerful Owl was identified in the vicinity of the subject site using a call back method on the 8th of June 2006. The Powerful Owls greatest threat is the loss of habitat and has lead to permanent regional declines and local extinctions (NSW Draft Recovery Plan, 2001). In relation to the regional distribution of habitat regarding the proposed development, the area to be modified or removed is not significant.

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

The Powerful Owl responds to geomorphology, moisture regime, vegetation structure and consequent site productivity rather than specific floristic types. The Powerful Owl tends to take preference to broad forest types such as rainforest, wet sclerophyll and dry sclerophyll rather than specific forest types (NSW Draft Recovery Plan, 2001). Furthermore, the Powerful Owl's habitat is widespread and includes a tall shrub layer and abundant hollows supported by high densities of arboreal marsupials (NSW Draft Recovery Plan, 2001).

The development will not isolate any known or potential threatened Powerful Owl habitat from within the subject property or adjoining areas of similar habitat.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No critical habitat for the Powerful Owl occurs at the subject site.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

Threat abatement has been managed via amelioration measures for the Powerful Owl. As noted in the NSW Draft Recovery Plan, the main threat to the Powerful Owl is the threat to their habitat, specifically vegetation clearing; the proposed development does not include clearing of any potential habitat vegetation. Other recovery actions include updating existing owl habitat models, mapping modelled habitat across public and private lands, encouraging research, increase community awareness and involvement (NSW Draft Recovery Plan, 2001).

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposed development will involve clearing native vegetation (selected individual tree species) which is listed as a threatening process under Schedule 3 of the Threatened Species Conservation Act (1995). As outlined in the NSW Draft Recovery Plan, vegetation clearing is the primary source of threat to the Powerful Owl. Other threats include logging, fire, grazing from agricultural industry, predation and human hazards such as road kills, fences, rabbit traps, secondary poisoning by pesticides (NSW Draft Recovery Plan, 2001).

Conclusion

The Powerful Owl (*Ninox strenua*) is listed as vulnerable under Schedule 2 of the Threatened Species Conservation Act and are not listed nationally under the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act). It is estimated that the population size of Powerful Owls within NSW are approximately 2000 pairs or 10000 individuals, most of which are found in conservation reserves and state forests (NSW Draft Recovery Plan, 2001).

The Powerful Owl has been classified as vulnerable due to past and continuing human impacts on their habitat, specifically the clearing of forests and woodland for development and agricultural purposes reducing the amount of habitat available (NSW Draft Recovery Plan, 2001). The proposed development will involve removing native vegetation which will not pose as an impact on the Powerful Owls habitat.

The subject site is not connected to native vegetation and areas of vegetation are to be retained and improved where possible and the proposed development is unlikely to have a significant effect on the Powerful Owl. Therefore, no habitat resources or potential impacts to the Powerful Owl will be degraded or altered from to the proposed development; therefore a Species Impact Statement is not required.

	Bushfiresafe (Aust) Pty Ltd 20 McLachlan Street Maclean NSW 2463	Project: Bushfire Risk Management Assessment for proposed redevelopment of Pelican Beach Resort Coffs Harbour	Client: Sapphire Beach Development Pty Ltd North Sydney	Appendix 5 Aerial

APPENDIX 6: ONSITE WEATHER SUMMARY

DATE:8/06/2006 TIME:18:00hrs TEMP:19.1 HUMIDITY 56%

WIND: (Strong/Moderate/Mild/Calm) DIRECTION: S/E

CLOUD COVER %: 50% COMMENT:

DATE: 8/06/2006 TIME: 21:00hrs TEMP: 16.3˚ HUMIDITY 59%

WIND: (Strong/Moderate/Mild/Calm) DIRECTION: S/E

CLOUD COVER %: 50% COMMENT:

DATE: 8/06/2006 TIME: 24:00hrs TEMP: : 14.1˚ HUMIDITY 66%

WIND: (Strong/Moderate/Mild/Calm) DIRECTION: S/E

CLOUD COVER %: 50 COMMENT:

DATE: 9/06/2006 TIME: 06:00hrs TEMP: 13.8˚ HUMIDITY 61%

WIND: (Strong/Moderate/Mild/Calm) DIRECTION: S/E
(Circle appropriate)

CLOUD COVER %: 60% COMMENT:

DATE: 9/06/2006 TIME: 18:00hrs TEMP: 13.8˚ HUMIDITY 62%

WIND: (Strong/Moderate/Mild/Calm) DIRECTION: S/W
(Circle appropriate)

CLOUD COVER %: 10% COMMENT:

DATE: 9/06/2006 TIME: 21:00hrs TEMP: 13.8˚ HUMIDITY 76%

WIND: (Strong/Moderate/Mild/Calm) DIRECTION:
(Circle appropriate)

CLOUD COVER %: 0% COMMENT:

Appendix 7: TRAP SUMMARY

JOB NAME: Pelican Beach Resort DATE: 8/06/2006 SHEET No; 1

TRAP TYPE	#	LOCATION-G/R	HABITAT TYPE	SET TIME	CHECK TIME	CHECK TIME	CHECK TIME	CHECK TIME	RESULTS
Elliot	701	See Map		18:00	23:00	05:00			1)
"	702	"							2)
"	703	"							3)
"	704	"							4)
"	705	"							1)
"	706	"							2)
"	707	"							3)
"	708	"							4)
"	709	"							1)
"	710	"							2)
"	711	"							3)
"	712	"							4)
"	713	"							1)
"	714	"							2)
"	715	"							3)
"	716	"							4)
"	717	"							1)
"	718	"							2)
"	719	"							3)
"	720	"							4)

TRAP SUMMARY

JOB NAME: Pelican Beach Resort DATE: 8/06/2006 SHEET No; 2 Continued

“	721	“							1)
“	722	“							2)
“	723	“							3)
“	724	“							4)
“	725	“							1)
TRAP TYPE	**#**	**LOCATION-G/R**	**HABITAT TYPE**	**SET TIME**	**CHECK TIME**	**CHECK TIME**	**CHECK TIME**	**CHECK TIME**	**RESULTS**
Lg Elliot	41	See Map		18:30	22:30	06:00			1)
“	42	“							2)
“	43	“							3)
“	44	“							4)
“	45	“							1)
“	46	“							2)
“	47	“							3)
“	48	“							4)
“	49	“							1)
“	50	“							2)
Harp		“							1)
Anabat		“							2)
Hair	1	“							3)
“	2	“							4)
“	3	“							5)

TRAP SUMMARY

JOB NAME: Pelican Beach Resort DATE: 9/06/2006 SHEET No; 1

TRAP TYPE	#	LOCATION-G/R	HABITAT TYPE	SET TIME	CHECK TIME	CHECK TIME	CHECK TIME	CHECK TIME	RESULTS
Elliot	701	See Map		18:00	21:00	24:00	03:00	06:00	1)
"	702	"							2)
"	703	"							3)
"	704	"							4)
"	705	"							1)
"	706	"							2)
"	707	"							3)
"	708	"							4)
"	709	"							1)
"	710	"							2)
"	711	"							3)
"	712	"							4)
"	713	"							1)
"	714	"							2)
"	715	"							3)
"	716	"							4)
"	717	"							1)
"	718	"							2)
"	719	"							3)
"	720	"							4)

TRAP SUMMARY

JOB NAME: Pelican Beach Resort DATE: 9/06/2006 SHEET No; 2 Continued

"	721	"							1)
"	722	"							2)
"	723	"							3)
"	724	"							4)
"	725	"							1)
TRAP TYPE	**#**	**LOCATION-G/R**	**HABITAT TYPE**	**SET TIME**	**CHECK TIME**	**CHECK TIME**	**CHECK TIME**	**CHECK TIME**	**RESULTS**
Lg Elliot	41	See Map		19:00	22:00	01:00	04:00	07:00	1)
"	42	"							2)
"	43	"							3)
"	44	"							4)
"	45	"							1)
"	46	"							2)
"	47	"							3)
"	48	"							4)
"	49	"							1)
"	50	"							2)
Harp		"							1)
Anabat		"							2)
Hair	1	"							3)
"	2	"							4)
"	3	"							5)

Appendix 11: ACTIVE TREE SERVICE REPORT

ACTIVE TREE SERVICES

FAR NORTH COAST OFFICE

9TH August 2006

Our Ref: ch06-12945/3

To: Craig Harman
Bushfiresafe Pty.Ltd.
20 McLaughlan St
Maclean NSW 2463

Dear Craig,

Results of Testing for Mundulla Yellows (MY) Syndrome in Pines at Pelican Beach Resort

Testing for the dieback syndrome, Mundulla Yellows (MY), was undertaken by Southern Cross University Plant Pathology Department analysing soil and tissue samples from the two pine trees located adjacent to the old restaurant building in the north-eastern corner of the Pelican Beach Site.

All samples were tested for the presence of fungi, nematodes, bacteria, phytoplasmas, viruses and virus-like organisms. Insects were collected from tree foliage and understorey vegetation to investigate the presence of pests and disease vectors at the site. Topsoil and subsoil was collected from each of the trees,, and soil properties and chemistry were assessed. Foliage chemistry from both trees was also investigated.
The results of biotic and abiotic testing were compared to analysis from known MY infected plants held by the Department of the Environment and Sustainability, enabling determination of the presence of Mundulla Yellows in the pines at Pelican Beach.

The results revealed that Mundulla Yellows Syndrome is present in the pines onsite. In addition, fungi, nematodes, bacteria, phytoplasmas, viruses and virus-like organisms effected by MY were detected in samples as far away as fifteen (15) Meters from the pines.

As a result of such findings, it is recommended that the pines be removed and surrounding area be cleared to an area of eighteen Meters in radius from the effected trees. Unfortunately the pines seem to be adversely effected beyond salvation and limiting the spread of MY is paramount. Furthermore, future plantings of the area need to be implemented using plants known not to be effected by any type of dieback syndrome.

If you would like to contact us to discuss any of the above, please contact Wayne Elliot at our Coffs Harbour Office on 1300 130 287, he will be happy to help.

Regards,

Mark Thomas

PO Box 1332, Mona Vale NSW 2102
Phone: (02) 6582 3220 Mobile: 0438 623 132 Fax: (02) 6582 2673