



## **Abel Mine SMP Area 1 Application- Written Report**

### **APPENDIX D**

#### **Flora and Fauna Lists and Descriptions**

#### **Abel Underground Mine Part 3A Environmental Assessment**

## Appendix J – Flora and Fauna

### TABLE OF CONTENTS

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1	Flora species - surface facilities study area .....	2
2	Threatened fauna species recorded within a 5km radius of the surface facilities investigation area.....	6
3	The likelihood of threatened fauna using the surface facilities investigation area .....	7
4	Profiles for threatened fauna determined as having a 'Possible' likelihood of using the surface facilities investigation area .....	8
5	Threatened flora profile for <i>Tetratheca juncea</i> .....	12
6	Detailed maps and descriptions of vegetation communities MU1-MU30.....	13
7	Capture and observation data and historical data – surface facilities investigation area .....	25
8	Birds species recorded across the surface investigation area .....	34
9	7-part Tests of Significance .....	35
10	Commonwealth EPBC Act 1999 .....	51
11	Dendrogram using PATN (Belbin 1989) analysing the vegetative plot data from the Abel Underground Mine area .....	54
12	Species of flora identified during the field assessment – Abel Underground Mine area .....	55
13	Fauna species considered likely to be present - Abel Underground Mine area .....	62
14	Species of bird recorded at Pambalong Nature Reserve .....	70

### LIST OF FIGURES

Figure J1:	Vegetation communities - conveyor and stockpile expansion areas .....	13
Figure J2	Vegetative communities as mapped across the Abel surface area. ....	14

## 1 Flora species - surface facilities study area

Family Name	Scientific Name	Common Name
Acanthaceae	<i>Brunoniella australis</i>	Blue Trumpet
Acanthaceae	<i>Pseuderanthemum variabile</i>	Pastel Flower
Adiantaceae	<i>Cheilanthes sieberi</i>	Mulga Fern
Anthericaceae	<i>Laxmannia gracilis</i>	Slender Wire Lily
Anthericaceae	<i>Thysanotus tuberosus</i>	Fringe Lily
Apiaceae	<i>Platysace ericoides</i>	Heath Platysace
Apocynaceae	<i>Parsonsia straminea</i> var. <i>straminea</i>	Silkpod
Araliaceae	<i>Polyscias sambucifolia</i> subsp <i>A</i>	Elderberry Ash
Asteraceae	* <i>Euchiton coarctatum</i>	Cudweed
Asteraceae	* <i>Hypochoeris radicata</i>	Catsear
Asteraceae	* <i>Senecio madagascariensis</i>	Fireweed
Asteraceae	* <i>Taraxacum officinale</i>	Dandelion
Asteraceae	<i>Cassinia</i> sp.	
Asteraceae	<i>Lagenifera stipitata</i>	Blue Bottle Daisy
Asteraceae	<i>Ozothamnus diosmifolius</i>	White dogwood
Asteraceae	<i>Vittadinia cuneata</i>	Fuzzweed
Bignoniaceae	<i>Pandorea pandorana</i> ssp <i>pandorana</i>	Wonga Wonga Vine
Blechnaceae	<i>Blechnum indicum</i>	Swamp Water Fern
Casuarinaceae	<i>Allocasuarina littoralis</i>	Black Oak
Casuarinaceae	<i>Allocasuarina torulosa</i>	Forest Oak
Celastraceae	<i>Maytenus silvestris</i>	Orange bark
Clusiaceae	<i>Hypericum gramineum</i>	St Johns Wort
Cunoniaceae	<i>Ceratopetalum gummiferum</i>	Christmas Bush
Cyperaceae	<i>Cyperus polystachyos</i>	
Cyperaceae	<i>Gahnia radula</i>	
Cyperaceae	<i>Gahnia clarkei</i>	Black Saw Sedge
Cyperaceae	<i>Lepidosperma laterale</i>	Variable Sword-sedge
Cyperaceae	<i>Ptilothrix deusta</i>	Ptilothrix
Dennstaedtiaceae	<i>Pteridium esculentum</i>	Bracken Fern
Dilleniaceae	<i>Hibbertia aspera</i>	
Dilleniaceae	<i>Hibbertia linearis</i>	
Dilleniaceae	<i>Hibbertia pedunculata</i>	
Dilleniaceae	<i>Hibbertia scandens</i>	Twinning Guinea
Ericaceae	<i>Leucopogan juniperinus</i>	Beard heath
Ericaceae	<i>Monotoca scoparia</i>	
Euphorbiaceae	<i>Breynia oblongifolia</i>	Coffee Bush
Euphorbiaceae	<i>Glochidion ferdinandi</i>	Cheese Tree
Fabaceae	* <i>Trifolium repens</i>	White Clover
Fabaceae	<i>Bossiaea rhombifolia</i> subsp <i>rhombifolia</i>	
Fabaceae	<i>Daviesia ulicifolia</i>	Gorse Bitter-pea
Fabaceae	<i>Dillwynia retorta</i>	
Fabaceae	<i>Glycine clandestina</i>	Twinning glycine
Fabaceae	<i>Hardenbergia violacea</i>	Purple twining pea
Fabaceae	<i>Hovea linearis</i>	Narrow-leaf hovea
Fabaceae	<i>Kennedia rubicunda</i>	Red Kennedy Pea

Family Name	Scientific Name	Common Name
Fabaceae	<i>Pultenaea euchila</i>	
Fabaceae	<i>Pultenaea paleacea</i>	
Fabaceae	<i>Pultenaea villosa</i>	
Fabaceae	<i>Acacia brownii</i>	Heath Wattle
Fabaceae	<i>Acacia elongata</i>	
Fabaceae	<i>Acacia falcata</i>	Sickle Wattle
Fabaceae	<i>Acacia longifolia</i>	Sydney Golden Wattle
Fabaceae	<i>Acacia myrtifolia</i>	
Fabaceae	<i>Acacia parvipinnula</i>	Green Wattle
Fabaceae	<i>Acacia suaveolens</i>	Sweet Wattle
Fabaceae	<i>Acacia ulicifolia</i>	Prickly Moses
Goodeniaceae	<i>Dampiera purpurea</i>	
Goodeniaceae	<i>Goodenia heterophylla</i> subsp. <i>heterophylla</i>	
Goodeniaceae	<i>Goodenia paniculata</i>	
Goodeniaceae	<i>Goodenia rotundifolia</i>	
Halgoraceae	<i>Gonocarpus teucroides</i>	Raspwort
Juncaceae	<i>Juncus continuus</i>	
Juncaceae	<i>Juncus usitatus</i>	Common Rush
Lauraceae	* <i>Cinnamomum camphora</i>	Camphor Laurel
Lauraceae	<i>Cassythia glabella</i> forma <i>glabella</i>	Devils twine
Lobeliaceae	<i>Pratia purpurascens</i>	White root
Loganiaceae	<i>Mitrasacme polymorpha</i>	
Lomandraceae	<i>Lomandra filiformis</i> subsp. <i>coriacea</i>	Wattle Mat Rush
Lomandraceae	<i>Lomandra filiformis</i> subsp. <i>filiformis</i>	
Lomandraceae	<i>Lomandra glauca</i>	
Lomandraceae	<i>Lomandra longifolia</i>	
Lomandraceae	<i>Lomandra multiflora</i>	Iron Grass
Lomandraceae	<i>Lomandra obliqua</i>	Fishbone
Loranthaceae	<i>Dendrophthoe vitellina</i>	Mistletoe
Malvaceae	* <i>Sida rhombifolia</i>	Paddy's Lucerne
Myrtaceae	<i>Angophora bakeri</i>	Small-leaved apple
Myrtaceae	<i>Angophora costata</i>	Smooth-barked apple
Myrtaceae	<i>Babingtonia pluriflora</i>	Tall Baeckea
Myrtaceae	<i>Backhousia myrtifolia</i>	Grey Myrtle
Myrtaceae	<i>Callistemon pinifolius</i>	
Myrtaceae	<i>Callistemon rigidus</i>	
Myrtaceae	<i>Corymbia gummifera</i>	Red Bloodwood
Myrtaceae	<i>Corymbia maculata</i>	Spotted Gum
Myrtaceae	<i>Eucalyptus acmenoides</i>	White mahogany
Myrtaceae	<i>Eucalyptus eugenioides</i>	
Myrtaceae	<i>Eucalyptus paniculata</i>	Grey Ironbark
Myrtaceae	<i>Eucalyptus punctata</i>	Grey Gum
Myrtaceae	<i>Eucalyptus resinifera</i> subsp. <i>resinifera</i>	Red Mahogany
Myrtaceae	<i>Eucalyptus siderophloia</i>	
Myrtaceae	<i>Leptospermum polygalifolium</i> subsp.	Tea-tree
Myrtaceae	<i>Leptospermum trinervium</i>	Flakey-barked tea-tree
Myrtaceae	<i>Melaleuca decora</i>	
Myrtaceae	<i>Melaleuca ericifolia</i>	Swamp paper-bark

Family Name	Scientific Name	Common Name
Myrtaceae	<i>Melaleuca nodosa</i>	
Myrtaceae	<i>Melaleuca sieberi</i>	
Myrtaceae	<i>Melaleuca thymifolia</i>	Thyme Honey-myrtle
Myrtaceae	<i>Micromyrtus ciliata</i>	Fringed Heath-myrtle
Myrtaceae	<i>Syncarpia glomulifera</i>	Turpentine
Oleaceae	<i>Notelaea longifolia</i>	Mock olive
Orchidaceae	<i>Dipodium punctatum</i>	Hyacinth orchid
Orchidaceae	<i>Thelymitra sp.</i>	Sun Orchid
Oxalidaceae	<i>Oxalis exilis</i>	
Phormiaceae	<i>Dianella caerulea var caerulea</i>	Paroo Lily
Phormiaceae	<i>Dianella longifolia var. longifolia</i>	Flax Lily
Pittosporaceae	<i>Billardiera scandens</i>	Apple-berry dumpling
Pittosporaceae	<i>Bursaria spinosa</i>	Box Thorn
Pittosporaceae	<i>Pittosporum revolutum</i>	Hairy pittosporum
Pittosporaceae	<i>Pittosporum undulatum</i>	
Plantaginaceae	* <i>Plantago lanceolatus</i>	Lambs Tongue
Poaceae	* <i>Andropogon virginicus</i>	
Poaceae	* <i>Briza minor</i>	
Poaceae	* <i>Chloris gayana</i>	Rhodes Grass
Poaceae	* <i>Cortaderia selloana</i>	Pampas Grass
Poaceae	* <i>Melinis repens</i>	
Poaceae	* <i>Paspalum dilatatum</i>	Paspalum
Poaceae	* <i>Pennisetum clandestinum</i>	Kikuyu
Poaceae	* <i>Sporobolus africanus</i>	Parramatta Grass
Poaceae	<i>Aristida vagans</i>	Three-awned Spear
Poaceae	<i>Dichelacne micrantha</i>	Shorthair Plumegrass
Poaceae	<i>Digitaria ramularis</i>	
Poaceae	<i>Echinopogan caespitosus</i>	Tufted Hedgehog
Poaceae	<i>Entolasia stricta</i>	Wiry panic
Poaceae	<i>Eragrostis brownii</i>	Browns Lovegrass
Poaceae	<i>Imperata cylindrica var. major</i>	Bladey grass
Poaceae	<i>Joycea pallida</i>	Silvertop Wallaby
Poaceae	<i>Notodanthonia longifolia</i>	
Poaceae	<i>Oplismenus imbecillis</i>	
Poaceae	<i>Ottochloa gracillima</i>	
Poaceae	<i>Panicum simile</i>	Two Colour Panic
Poaceae	<i>Themeda australis</i>	Kangaroo Grass
Proteaceae	<i>Banksia spinulosa var. collina</i>	
Proteaceae	<i>Grevillea montana</i>	
Proteaceae	<i>Hakea laevipes subsp. laevipes</i>	
Proteaceae	<i>Hakea sericea</i>	Silky Hakea
Proteaceae	<i>Lambertia formosa</i>	Mountain devil
Proteaceae	<i>Lomatia silaifolia</i>	
Proteaceae	<i>Persoonia levis</i>	broad leaved geebung
Proteaceae	<i>Persoonia linearis</i>	Narrow leaved
Ranunculaceae	<i>Clematis glycinoides</i>	Old Mans Beard
Rhamnaceae	<i>Alphitonia exelsa</i>	Red Ash
Rubiaceae	<i>Pomax umbellata</i>	Pomax

<b>Family Name</b>	<b>Scientific Name</b>	<b>Common Name</b>
Rutaceae	<i>Melicope micrococca</i>	
Santalaceae	<i>Exocarpos cupressiformis</i>	Native Cherry
Schizaeaceae	<i>Schizaea bifida</i>	Forked Comb Fern
Solanaceae	<i>Duboisia myoporoides</i>	Corkwood
Solanaceae	<i>Solanum prinophyllum</i>	Forest Nightshade
Stylidiaceae	<i>Stylidium graminifolium</i>	Trigger Plant
Thymelaeaceae	<i>Pimelea linifolia subsp. linifolia</i>	Slender Rice Flower
Typhaceae	<i>Typha orientalis</i>	Bulrush
Verbenaceae	* <i>Verbena bonariensis</i>	Purple Top
Verbenaceae	<i>Lantana camara</i>	
Violaceae	<i>Hybanthus monopetalus</i>	Slender Violet-bush
Vitaceae	<i>Cissus hypoglauca</i>	Five-leaf Water Vine
Xanthorrhoeaceae	<i>Xanthorrhoea latifolia subsp latifolia</i>	
Xanthorrhoeaceae	<i>Xanthorrhoea macronema</i>	
Zamiaceae	<i>Macrozamia reducta</i>	

## 2 Threatened fauna species recorded within a 5km radius of the surface facilities investigation area

(from Atlas of NSW Wildlife database)

Class	Family	Species	Common Name	Status
<b>Frogs</b>				
Amphibia	Hylidae	<i>Litoria aurea</i>	Green and Golden Bell Frog	E1
<b>Birds</b>				
Aves	Acanthizidae	<i>Pyrrholaemus sagittatus</i>	Speckled Warbler	V
Aves	Accipitridae	<i>Hamirostra melanosternon</i>	Black-breasted Buzzard	V
Aves	Accipitridae	<i>Lophoictinia isura</i>	Square-tailed Kite	V
Aves	Anatidae	<i>Stictonetta naevosa</i>	Freckled Duck	V
Aves	Anseranatidae	<i>Anseranas semipalmata</i>	Magpie Goose	E1
Aves	Ardeidae	<i>Botaurus poiciloptilus</i>	Australasian Bittern	V
Aves	Cacatuidae	<i>Calyptrorhynchus lathamii</i>	Glossy Black-Cockatoo	V
Aves	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	V
Aves	Climacteridae	<i>Climacteris picumnus</i>	Brown Treecreeper	V
Aves	Columbidae	<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V
Aves	Haematopodidae	<i>Haematopus longirostris</i>	Pied Oystercatcher	V
Aves	Jacanidae	<i>Irediparra gallinacea</i>	Comb-crested Jacana	V
Aves	Meliphagidae	<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subsp.)	V
Aves	Meliphagidae	<i>Xanthomyza phrygia</i>	Regent Honeyeater	V
Aves	Petroicidae	<i>Melanodryas cucullata</i>	Hooded Robin	V
Aves	Psittacidae	<i>Lathamus discolor</i>	Swift Parrot	E1
Aves	Psittacidae	<i>Neophema pulchella</i>	Turquoise Parrot	V
Aves	Rostratulidae	<i>Rostratula benghalensis australis</i>	Painted Snipe (Australian subspecies)	E1
Aves	Strigidae	<i>Ninox connivens</i>	Barking Owl	V
Aves	Tytonidae	<i>Tyto novaehollandiae</i>	Masked Owl	E1
<b>Marsupials</b>				
Mammalia	Petauridae	<i>Petaurus australis</i>	Yellow-bellied Glider	V
Mammalia	Petauridae	<i>Petaurus norfolcensis</i>	Squirrel Glider	V
Mammalia	Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	V
<b>Megachiropteran Bats</b>				
Mammalia	Pteropodidae	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V
<b>Microchiropteran Bats</b>				
Mammalia	Emballonuridae	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V
Mammalia	Molossidae	<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	V
Mammalia	Vespertilionidae	<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V
Mammalia	Vespertilionidae	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V
Mammalia	Vespertilionidae	<i>Miniopterus australis</i>	Little Bentwing-bat	V
Mammalia	Vespertilionidae	<i>Miniopterus schreibersii oceanensis</i>	Eastern Bent-wing Bat	V
Mammalia	Vespertilionidae	<i>Myotis adversus</i>	Large-footed Myotis	V
Mammalia	Vespertilionidae	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V
<b>Flowering Plants</b>				
Magnoliopsida	Tremandraceae	<i>Tetradlea juncea</i>	Black-eyed Susan	V



### 3 The likelihood of threatened fauna using the surface facilities investigation area

Species	Common Name	Likelihood	7-part test applied
<i>Litoria aurea</i>	Green and Golden Bell Frog	No suitable habitat	No
<i>Pyrrholaemus sagittatus</i>	Speckled Warbler	Possible	Yes
<i>Hamirostra melanosternon</i>	Black-breasted Buzzard	Unlikely	No
<i>Lophoictinia isura</i>	Square-tailed Kite	Unlikely	No
<i>Stictonetta naevosa</i>	Freckled Duck	No suitable habitat	No
<i>Anseranas semipalmata</i>	Magpie Goose	No suitable habitat	No
<i>Botaurus poiciloptilus</i>	Australasian Bittern	No suitable habitat	No
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	Possible	Yes
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	No suitable habitat	No
<i>Climacteris picumnus</i>	Brown Treecreeper	Possible	Yes
<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	Unlikely	No
<i>Haematopus longirostris</i>	Pied Oystercatcher	No suitable habitat	No
<i>Irediparra gallinacea</i>	Comb-crested Jacana	No suitable habitat	No
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subsp.)	Possible	Yes
<i>Xanthomyza phrygia</i>	Regent Honeyeater	Possible	Yes
<i>Melanodryas cucullata</i>	Hooded Robin	Unlikely	No
<i>Lathamus discolor</i>	Swift Parrot	Possible	Yes
<i>Neophema pulchella</i>	Turquoise Parrot	Unlikely	No
<i>Rostratula benghalensis australis</i>	Painted Snipe (Australian subsp)	No suitable habitat	No
<i>Ninox connivens</i>	Barking Owl	Unlikely	No
<i>Tyto novaehollandiae</i>	Masked Owl	Possible	Yes
<i>Petaurus australis</i>	Yellow-bellied Glider	Unlikely	No
<i>Petaurus norfolcensis</i>	Squirrel Glider	Possible	Yes
<i>Phascolarctos cinereus</i>	Koala	Unlikely	No
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Possible	Yes
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	Possible	Yes
<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	Possible	Yes
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	Possible	Yes
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	Possible	Yes
<i>Miniopterus australis</i>	Little Bentwing-bat	Possible	Yes
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bent-wing Bat	Possible	Yes
<i>Myotis adversus</i>	Large-footed Myotis	Possible	Yes
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	Possible	Yes



## **4 Profiles for threatened fauna determined as having a 'Possible' likelihood of using the surface facilities investigation area**

### **Threatened fauna profiles**

Ecological information is here summarised as a guide to the habitat requirements of the threatened species to be considered in later tests of significance and impact.

#### **4.1 Speckled Warbler**

*Chthonicola sagittatus*

The Speckled Warbler can be found in the forested areas of eastern Australia from mid Queensland to Victoria and is a small finch-sized bird that forages amongst ground litter for invertebrates. It is dependant on fallen logs and low ground and shrub cover for foraging and nest building and has been shown to be absent from habitat where few or no fallen logs were present (Barrett et al 2003). Domed nests are made of grass and bark and are built on the ground in a small depression made by the bird and located under cover such as a log or low dense shrub (Gardner 2002; Gardner et al 2003).

#### **4.2 Glossy Black-Cockatoo**

*Calyptorhynchus lathamii*

Occurs primarily in south-eastern Australia, from Shoalwater Bay in central-southern Queensland to the Victorian border region with a highly restricted subspecies occurring on Kangaroo Island in South Australia (Joseph 1990). The Glossy Black-Cockatoo is one of the bird-worlds most specialised feeders being almost entirely dependant on the fruit of *Allocasuarina* (She-oak) species. Consequently this bird requires a forest habitat containing these trees in sufficient numbers (NPWS 1999, Garnett et al 2000) along with old-growth trees having suitable nesting hollows. The presence of oak species (commonly *Allocasuarina littoralis* and *Allocasuarina torulosa* in eastern forests) does not necessarily mean that the habitat is suitable for these birds with research showing that not all fruit on these oaks have a sufficient nutrient content (Clout 1989, Crowley & Garnett 2001, Wild et al 2002). The cockatoos remain together as a pair for most of the year and are often accompanied by the young from the last breeding season. The breeding season is through the cooler months of February to July with one egg only being laid (Garnett et al 2000) and often the next breeding season is missed if the young from the previous year is still dependent.

#### **4.3 Brown Treecreeper**

*Climacteris picumnus victoriana*

This is the eastern sub-species of a bird that is distributed throughout the majority of Queensland, NSW, Victoria and into South Australia. The subspecies *victoriana* is found in scattered locations along the eastern parts of NSW and Victoria. The preferred habitat is temperate eucalypt woodland and dry sclerophyll forest (Schodde & Mason 1999). While the majority of the tree creeper and sitella species forage primarily under the bark of trees, the Brown Treecreeper spends a considerable amount of time feeding on the ground. Habitat fragmentation has had a significant impact on the decline of the species and this appears to be due to disrupted dispersal patterns (Walters et al 1999).

#### **4.4 Regent Honeyeater**

*Xanthomyza phrygia*

This bird was once widespread through southeast Australia. Now it is predominantly found in limited areas of northeast Victoria and central-east New South Wales. It is a nomadic feeder and can be found elsewhere through its previous range where there is suitable blossom occurring (Franklin et al. 1989).

The preferred habitat of this bird is eucalypt woodland and open forest of temperate regions. Nectar and insects are the main food sources and the bird only remains in areas while the nectar source lasts.

#### **4.5 Black-chinned Honeyeater**

##### *Melithreptis gularis*

The New Atlas of Australian Birds (Barrett *et al* 2003) shows that the Black-chinned Honeyeater has been recorded from northern WA through the NT, QLD, NSW to VIC in coastal and sub-coastal areas. Reports are sporadic throughout the range of the bird however the most records come from the north western parts of Australia. The eastern subspecies *Melithreptis gularis gularis* is listed as Vulnerable in Schedule 2 of the *NSW Threatened Species Conservation Act 1995* and occurs along the east coast of Australia from south eastern QLD to VIC. This honey-eater is easily confused with the more common White-naped Honeyeater and mixed flocks of the two species are often seen. Garnett & Crowley (2002) note that clearing and fragmentation of the favoured woodland and forest habitat are the main threats to the species.

#### **4.6 Swift Parrot**

##### *Lathamus discolor*

This parrot breeds in Tasmania and migrates to southeastern Australia for the winter months (Barrett *et al* 2003). It is dependant on Blue Gums in Tasmania for both flower nectar and for nesting hollows and there has been large scale clearing of these trees in Tasmania over many years. A study in Victoria (MacNally & Horrocks 2000) showed that the Swift Parrot is as dependant on invertebrate food sources such as leaf lerps as they are on nectar and in fact no relationship could be established between the occurrence of these birds and eucalypt flowering.

#### **4.7 Masked Owl**

##### *Tyto novaehollandiae*

The Masked Owl can be found around the vegetated coastal area of most of Australia. Its diet consists almost entirely of small terrestrial mammals and some birds and this relates to the type of habitat preferred with the bird generally being found in open woodland and forest with an open understorey and sparse ground cover. (Kavanagh 2002a&b, Kavanagh & Stanton 2002).

#### **4.8 Squirrel Glider**

##### *Petaurus norfolcensis*

Occurs on the coast and ranges of eastern Australia, from northern Queensland to the Victorian/ South Australian border, and also extends into the western slopes and plains. The Squirrel Glider inhabits dry sclerophyll forest and woodland, and is generally absent from the dense coastal ranges. More recently, however, the species has been recorded in a number of coastal locations and confusion with the similar Sugar Glider is attributed as the main reason for the apparent lack of historical coastal records.

One of the reasons that the Squirrel Glider has been considered vulnerable in NSW is that its diet is specialised and while it will eat insects and the occasional birds egg the greater part of the diet is nectar, pollen and gum exudates particularly from wattles, and the amount of habitat that supports these food resources has been significantly reduced. The Squirrel Glider requires hollows in standing trees for roosting and nesting purposes and have home ranges of from 2-3ha to 13ha have been reported. (Quinn 1995; SWC 1996; Rowston 1998; Suckling 2000; Holland 2001; Smith 2002).

#### **4.9 Grey-headed Flying-fox**

##### *Pteropus poliocephalus*

Occurs along the eastern seaboard of Australia roosting in communal colony sites which are used permanently, annually or occasionally depending on food availability

(Tidemann 2000). Colonies can vary considerably in size from hundreds to many thousands of individuals, and fluctuate according to food resources (Parry-Jones & Augée 1991; Tidemann 2000). Fruits from numerous rainforest trees and other myrtaceous species form a large component of their diet, and consequently mass nomadic movements occur throughout their range in response to fruit availability. Large colonies are very vocal even during the day, and can significantly damage roost trees by their sheer weight of numbers.

“The Grey-headed flying fox must be acknowledged as being highly significant to the health and maintenance of many ecosystems in eastern Australia. The species performs the ecosystem services of pollination and seed dispersal for a wide range of native trees, including commercially important hardwood and rainforest species. It thus contributes directly to reproduction, regeneration and the evolutionary processes of forest ecosystems. Flying-foxes are unique in the large distances they disperse pollen and seeds. The population of Grey-headed flying fox must be of sufficient size for this to continue. If numbers were reduced to small or localised groups, then rainforest seed dispersal and hardwood pollination processes would be severely curtailed (Eby 2000)”.

#### **4.10 Yellow-bellied Sheath-tail Bat**

##### *Saccolaimus flaviventris*

This bat is to be found in a wide range throughout Australia only being absent from the southwest quarter of SA to southern WA and throughout this range it inhabits a similarly wide range of vegetative habitat. They are an adaptive roosting species and have been found under eaves of houses, in animal burrows in the ground and in tree hollows for example. Its reported rarity may be in part due to the fact that it flies high and fast and is not often captured. (Churchill 1998, Richards 2000b).

#### **4.11 Eastern Free-tail Bat**

##### *Mormopterus sp.*

While this bat is regarded as a separate species, the taxonomy is yet to be resolved. It can be found along the eastern seaboard from central Victoria to north Queensland and can only be found in Australia. The bat can be found in a wide range of forest and woodland habitats where it forages for insects. It prefers tree and limb hollows for denning. (Churchill 1998; Allison & Hoyer 2000).

#### **4.12 Little Bent-wing Bat**

##### *Miniopterus australis*

Occurs along the east coast of Australia, from Cape York south to coastal northern NSW. The species also occurs in New Caledonia, New Guinea, the Philippines, and the Indo-Malayan archipelago. The Little Bent-wing Bat generally occupies well-wooded habitats throughout its range, roosting during the day in caves and similar locations. As with other Bent-wing bats, this species depends on specific nursery sites in which to raise its young, and only five of these sites were known of in 1983. In central Queensland one of these nursery colonies numbers 100,000 adult bats. They forage for insects in generally well-wooded habitat of a variety of forms from swamp forest, dry forest to rain forest. (Churchill 1998, Dwyer 2001a).

#### **4.13 Eastern Bent-wing Bat**

##### *Miniopterus schreibersii oceanensis*

Is widely distributed on the coast and ranges of eastern Australia, from Cape York Peninsula, south to Victoria and eastern South Australia. The species is also present in northern Western Australia and the Northern Territory. Within New South Wales, it extends from the coast to the western slopes of the Great Dividing Range. These bats roost in caves and man-made structures such as culverts, mine shafts and farm sheds. They are territorial, moving within a 300 km radius of a maternity cave. They forage for insects in generally well-wooded habitat of a variety of forms from swamp forest, dry forest to rain forest. (Churchill 1998, Dwyer 2001b).

#### **4.14 Large-footed Myotis**

##### *Myotis adversus*

Also known as the Fishing Bat, this bat is the only confirmed Australian representative of the most widely spread genus of Microchiropteran bat worldwide. It can be found within 100 km of the coast from the Kimberly in Western Australia to south eastern South Australia. Foraging is commonly over water with the bats skimming the surface and using their large hind feet to scoop aquatic insects and even small fish. They can be found roosting in a variety of locations that include caves, bridges, tree hollows, and even dense foliage (Churchill 1998, Richards 2000a).

#### **4.15 Greater Broad-nosed Bat**

##### *Scoteanax rueppellii*

Occurs along the coast and ranges of eastern Australia, from northern Queensland to the New South Wales/ Victorian border. This species appears to be most frequent in the river systems draining the Great Dividing Range. Tree-lined creeks, and the junctions of woodland and cleared paddocks, are favoured hunting areas for the Greater Broad-nosed Bat, although it may also forage in rainforest environments, flying as low as one metre above the surface of a creek. The species normally roosts in tree hollows, but roosting records in the ceilings of old buildings also exist (Churchill 1998;Hoye & Richards 2000).

## 5 Threatened flora profile for *Tetratheca juncea*

*Tetratheca juncea* Smith (Tremandraceae) is a terrestrial herbaceous plant endemic to NSW and listed under Schedule 2 of the NSW *Threatened Species Conservation Act* 1995 as Vulnerable and having a ROTAP coding of 3VCa (Briggs and Leigh 1995). It is also listed as Vulnerable in the *Commonwealth Environment Protection and Biodiversity Conservation Act* 1999. Thompson (1976), in a revision of the *Tetratheca* genus, noted that there were records from the late 1800's of the plant occurring in suburbs of Sydney, from Port Jackson and suburbs to the south. *T. juncea* is now known to exist only from the Wyong area to Bulahdelah and inland to the edge of the main ranges with the greatest concentration of records being from the Wyong and Lake Macquarie local government areas (Payne 2000).

*Tetratheca juncea* propagates through both rhizomal spread and seed development and germination (Thompson 1976, Payne 2000). Propagation by seed appears to be limited by a dispersal mechanism that is most probably by ants collecting the seed for the lipid rich elaiosome (Brew *et al.* 1989, Boeswinkel 1999).

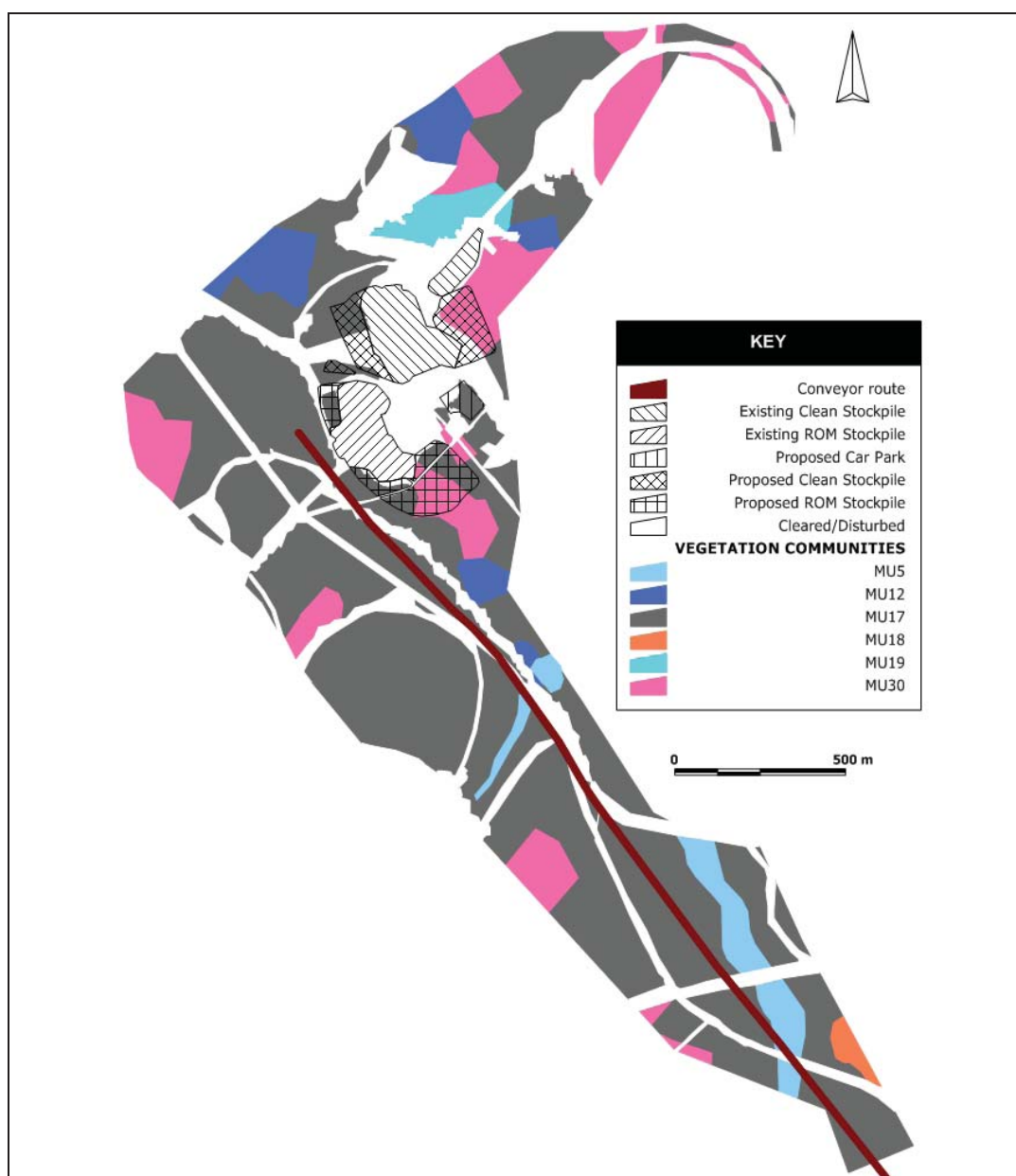
*Tetratheca juncea* is distinguished from other members of the *Tetratheca* genus by having generally leafless stems that have a distinctly angular, winged structure (Thompson 1976). The flowers of *T. juncea* however share the four-petalled, pink form that is characteristic of the genus. The flowering period for *T. juncea* is generally reported as being from mid to late winter through to late summer (Gardner & Murray 1992). The flowers grow from nodes on the mostly leafless stem and are commonly solitary but occasionally in pairs with each flower facing downward, suspended on a peduncle of about 10mm length. The four petals range in colour from mauve through pink to almost white (Thompson 1976, Payne 2000).

Driscoll (2003) used GIS analysis of 400 records (compiled from Payne 2000, Bartier *et al.* 2001, and S. Bell & C. Driscoll unpub) and showed that *T. juncea* has been reported from 16 separate, and often widely differing, vegetation community types as defined in NPWS (2000). However over 60% of records were from within *Coastal Plains Smooth barked Apple Woodland* (MU30) about 14% from *Coastal Plains Scribbly Gum Woodland* (MU31) and about 11% from *Coastal Foothills Spotted Gum-Ironbark Forest* (MU15). These results indicate that within the range of its occurrence, *T. juncea* should be considered as possibly occurring in most common vegetation communities.



## 6 Detailed maps and descriptions of vegetation communities MU1-MU30

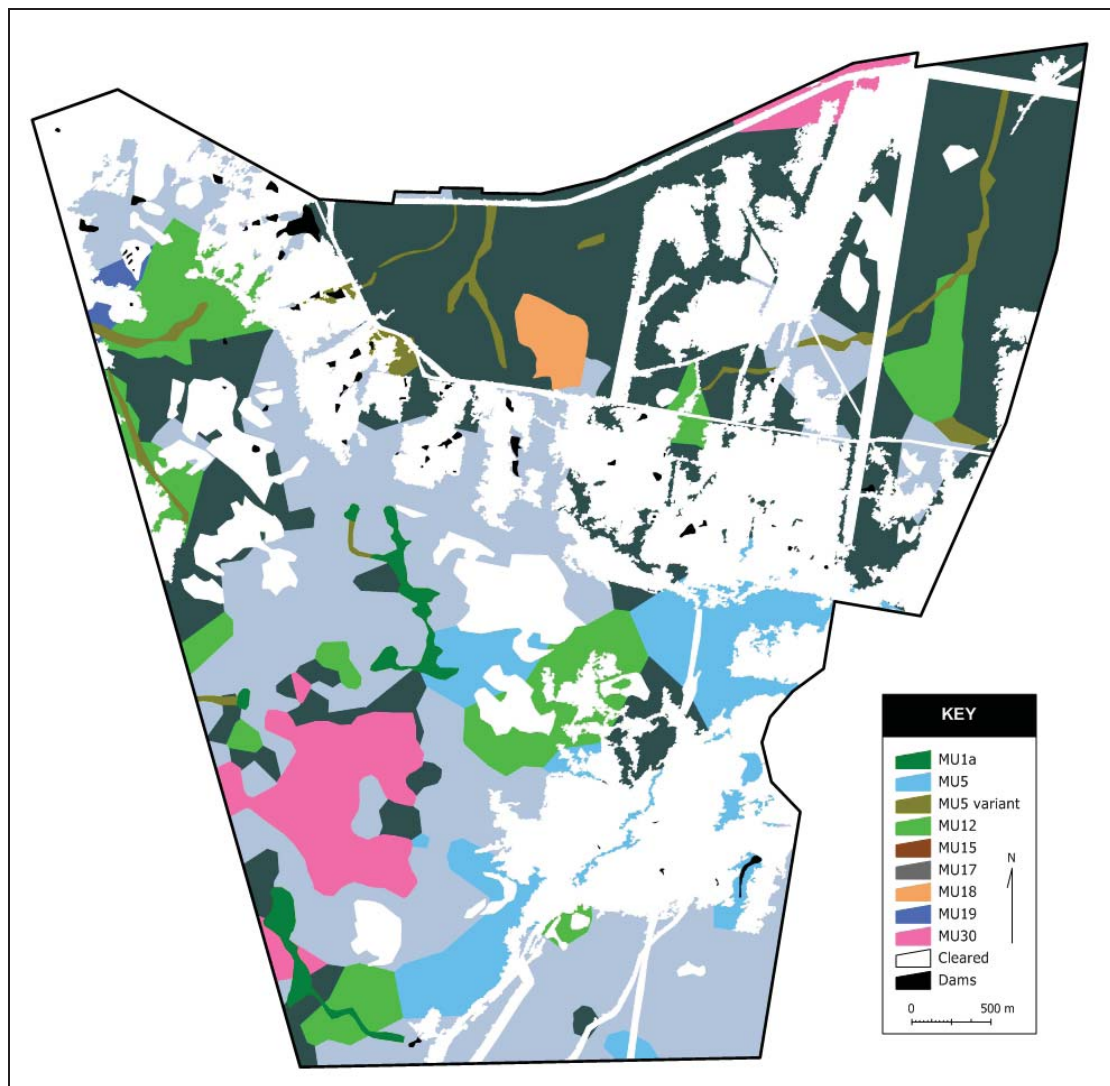
Map Unit	Description
MU1	Sub-tropical Rainforest
MU5	Alluvial Tall Moist Forest
MU12	Hunter Valley Moist Forest
MU17	Lower Hunter Spotted Gum – Ironbark Forest
MU18	Central Hunter Ironbark – Spotted Gum - Grey Box Forest
MU19	Hunter Lowlands Redgum Forest
MU30	Coastal Plains Smooth-barked Apple Woodland



**Figure J1: Vegetation communities - conveyor and stockpile expansion areas**

**Figure J2 Vegetative communities as mapped across the Abel surface area.**

Map Unit	Description
MU1	Sub-tropical Rainforest
MU5	Alluvial Tall Moist Forest
MU12	Hunter Valley Moist Forest
MU17	Lower Hunter Spotted Gum – Ironbark Forest
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MU19	Hunter Lowlands Redgum Forest
MU30	Coastal Plains Smooth-barked Apple Woodland





## 6.1 MU1 Subtropical Rainforest

The deeper gullies, notably the Long Gully network and an unnamed gully to the south, support a distinct type of rainforest that is not common within the lower Hunter Valley or Central Coast. This rainforest is best described as sub-tropical rainforest, due to the prominence of a large number of trees with affinities to these rainforest types. Typical of these are the Red Cedar (*Toona ciliata*), Giant Stinging Tree (*Dendrocnide excelsa*), Shining Stinging Tree (*Dendrocnide photinophylla*), Illawarra Flame Tree (*Brachychiton acerifolius*), Baloghia (*Baloghia inophylla*), and various Figs (*Ficus* spp.). However, palms and stranglers, which typify true sub-tropical rainforests, are of low abundance within the Project Abel area, suggesting that these rainforests lie on the dryer end of the subtropical rainforest scale. The Abel sub-tropical rainforests fall most closely into the *Ficus* spp. – *Dysoxylum fraserianum* – *Toona* – *Dendrocnide* sub alliance of Floyd (1990), however there are also affinities with several others. Floyd (1990) states that this sub alliance is inadequately conserved across its range.

Floyd (1990) notes that subtropical rainforest within Australia is confined to the favourable areas along the east coast from southern Queensland to isolated pockets on the South Coast of New South Wales. Prior to European settlement, New South Wales would have contained most of the subtropical rainforest in Australia. Within the Hunter, notable areas of subtropical rainforest include the eastern slopes of Barrington Tops (Floyd 1990), the Liverpool Range (Fisher 1985; Hill et al 2001) and the deeper canyons of Wollemi National Park (Floyd 1984; Bell submitted) where basalt-enriched soils prevail. Smaller occurrences of subtropical rainforest are present within Watagans National Park (Gambrill 1979; Bell & Driscoll 2006) and in Bow Wow Creek gorge at Mulbring (Bell & Murray 2000). Historically, it seems likely that much of the Black Hill area supported this subtropical rainforest, and that Red Cedar was prominent among it.

Within the regional vegetation classification of NPWS (2000), the Project Abel sub-tropical rainforests would form part of Map Unit 1a: Coastal Warm Temperate – Sub Tropical Rainforest, of which 3175 ha was mapped as extant. However, given that this map unit also includes rainforest more akin to Warm Temperate, and that the NPWS (2000) mapping is a computer model, this estimate is unlikely to be reliable.

A reclassification (Bell & Driscoll unpub) of vegetation using more than 1100 survey sites within the lower Hunter and Central Coast highlighted the uniqueness of the Abel rainforests in the region, with a distinct clade of sites from the Project Abel area and the nearby Bow Wow Gorge. The dominance of Red Cedar, Giant Stinging Trees and a variety of other rainforest species, including Figs, distinguish this group from other rainforests in the Watagan Mountains and the lowlands on the Central Coast.

The introduction of Lantana to the region has created a threat to the rainforest and restricted its extent by dominating the margins. Any opening of the forest canopy as a result of a fallen tree for example, becomes overtaken by lantana. Further damage has occurred as a consequence of a substantial amount of sediment having been deposited in the gullies below two quarries, one above Long Gully and the other above the southern gully. This sediment has reduced the amount of potential breeding habitat for the threatened frog *Myxophyes balbus*.

### 6.1.1 Typical Floristic Composition of the Project Abel Subtropical Rainforest

The species composition below is based on seven 0.04ha survey plots positioned at various locations in Long Gully and its tributaries. It should be seen as representative of the diversity present within the sub-tropical rainforest there.

Canopy	<i>Dendrocnide excelsa</i> , <i>Alphitonia excelsa</i> , <i>Toona ciliata</i> , <i>Emmenosperma alphitonoides</i> , <i>Baloghia inophylla</i> , <i>Elaeocarpus obovatus</i> , <i>Dendrocnide photinophylla</i> , <i>Cryptocarya microneura</i> , <i>Alectryon subcinereus</i> , <i>Brachychiton acerifolius</i> , <i>Parachidendron pruinosum</i> , <i>Neolitsea dealbata</i> , <i>Ficus watkinsoniana</i> , <i>Ficus macrophylla</i> , <i>Euroschinus falcata</i> , <i>Podocarpus elatus</i>
Mid-strata	<i>Diploglottis australis</i> , <i>Wilkea huegeliana</i> , <i>Mallotus philipensis</i> , <i>Diospyros australis</i> , <i>Hibiscus heterophyllous</i> , <i>Streblus brunonianus</i> , <i>Claoxylon australis</i> , <i>Alchornia ilicifolia</i> , <i>Gossia acmenoides</i> , <i>Daphnandra</i> sp. A, <i>Commersonia fraseri</i> , <i>Eupomatia laurina</i> , <i>Guioa semiglaucula</i> , <i>Alangium villosum</i> subsp. <i>polyosmoides</i> , <i>Drypetes australasica</i> , <i>Rhysotoechia bifoliolata</i> , <i>Acacia maidenii</i> , <i>Ficus coronata</i> , <i>Acmena smithii</i> , <i>Cryptocarya rigida</i> , <i>Mischocarpus australis</i>
Ground	<i>Oplismenus imbecillis</i> , <i>Gymnostachys anceps</i> , <i>Cyperus tetraphyllus</i> , <i>Aneilema acuminata</i> , <i>Pittosporum multiflorum</i> , <i>Clerodendrum tomentosum</i> , <i>Pepperomia leptostachya</i> , <i>Solanum aviculare</i> , <i>Hymenosporum flavum</i> , <i>Alpinia caerulea</i> , <i>Carex longibrachiata</i> , <i>Oxalis chnoodes</i> , <i>Stellaria flaccida</i>
Ground Ferns	<i>Adiantum formosum</i> , <i>Arthropteris tenella</i> , <i>Pellaea falcata</i> , <i>Doodia aspera</i> , <i>Calochlaena dubia</i> , <i>Lastreopsis acuminata</i> , <i>Adiantum hispidulum</i> , <i>Pellaea paradoxa</i> , <i>Lastreopsis decomposita</i> , <i>Asplenium attenuatum</i>
Epiphytes	<i>Asplenium australasicum</i> , <i>Pyrrosia rupestris</i> , <i>Dendrobium gracilicaule</i> , <i>Dictymia brownii</i> , <i>Grammitis billardieri</i> , <i>Microsorium scandens</i> , <i>Sarcochilus falcatus</i>
Vines	<i>Tetrastigma nitens</i> , <i>Embelia australiana</i> , <i>Aphanopetalum resinum</i> , <i>Dioscorea transversa</i> , <i>Ripogonum album</i> , <i>Morinda jasminoides</i> , <i>Capparis arborea</i> , <i>Parsonsia straminea</i> , <i>Pandorea pandorana</i> , <i>Marsdenia rostrata</i> , <i>Cissus antarctica</i> , <i>Maclura cocchinensis</i> , <i>Marsdenia flavescent</i> , <i>Legenophora moorei</i> , <i>Stephania japonica</i> var. <i>discolor</i>

### 6.1.2 Endangered Ecological Community status

There are currently two Endangered Ecological Communities (EEC's) that potentially have some relevance to the Project Abel sub-tropical rainforests, one of which has not yet been finally determined by the NSW Scientific Committee:

- Lowland Rainforest on Floodplains of the NSW North Coast bioregion ("Floodplain Rainforest" - Final Determination)

- Lowland Rainforest of the NSW North Coast and Sydney Basin bioregion (“Lowland Rainforest” - Preliminary Determination)

*These two assemblages meet in or around the Hunter Valley, and hence it is appropriate that both be reviewed in the light of this study. Of the two, the rainforests of Project Abel are most similar to the Lowland Rainforest EEC, which is yet to be finally determined. The Abel rainforest is most closely aligned with Floyd’s (1990) Ficus spp - Dysoxylon fraserianum – Toona – Dendrocnide sub alliance (No 15), which is included in the determination of the Lowland Rainforest EEC. Sixty-five percent of the 108 plant taxa listed for that EEC occur at Abel; while only 42% of the 38 taxa for the Floodplain Rainforest EEC are present. Appendix zz shows the distribution of plant taxa relevant to each EEC in relation to the Abel rainforest.*

### 6.1.3 3. Significant Plant Taxa

A number of rainforest taxa present within the Project Abel rainforests occur at their known distributional limits, or extend these limits beyond what has been previously published. Table 1 documents these species, the identities of some of which are awaiting confirmation from the National Herbarium. In addition, two species of fern are considered rare or endangered, however these too are awaiting confirmation.

**Table 1 Significant species from the Abel rainforest.**

SPECIES	Williams et al (1984)	Harden (1991-1993)
<b>Threatened Species</b>		
<i>Arthropteris palisotii</i> (TSC - End)	-	North from Comboyne Plateau
<b>Rare Species</b>		
<i>Christella hispidula</i>	-	Rare in NSW
<b>Range extensions</b>		
<i>Capparis arborea</i>	North from Hunter River	North from the Hunter Valley
<i>Drypetes australasica</i>	North from Dungog	North from Dungog
<i>Ficus watkinsoniana</i>	North from Williams River	North from Williams River
<i>Mallotus philippensis</i>	North from Dungog	Chiefly north from Hunter River
<i>Mischocarpus australis</i>	North from Williams River	North from Newcastle district
<i>Randia benthamiana</i>	North from Taree	North from Forster
<i>Rhysotoechia bifoliolata</i>	North from Hunter River	North from Hunter River
<i>bifoliolata</i>		

SPECIES	Williams et al (1984)	Harden (1991-1993)
<b>Range limits</b>		
<i>Alangium villosum</i> ssp	North from Newcastle	North from Newcastle
<i>polyosmoides</i>		
<i>Daphnandra</i> sp A	North from the Hunter	North from the Newcastle district
<i>Dendrocnide photinophylla</i>	North from Gloucester (+Wheeny Ck)	North from Richmond; not common south of Seal Rocks
<i>Embelia australiana</i>	North from Upper Williams River	North from Wyong district

**Table 2 Combined list of species common to the Abel rainforest, and the two endangered ecological communities**

Species	ABEL Rainforest	Lowland Rainforest EEC	Floodplain Rainforest EEC
<i>Acacia irrorata</i>	Abel	✓	
<i>Acacia melanoxylon</i>		✓	
<i>Acmena smithii</i>	Abel	✓	
<i>Adiantum formosum</i>	Abel	✓	
<i>Alchornea ilicifolia</i>	Abel	✓	
<i>Alectryon</i> spp.	Abel	✓	
<i>Alphitonia excelsa</i>	Abel	✓	
<i>Alphitonia petrei</i>		✓	
<i>Alpinia caerulea</i>	Abel	✓	
<i>Aphananthe philippinensis</i>			✓
<i>Araucaria cunninghamii</i>		✓	✓
<i>Archidendron</i> spp.		✓	
<i>Archontophoenix cunninghamiana</i>		✓	✓
<i>Arthropteris</i> spp.	Abel		✓
<i>Arytera</i> spp.		✓	
<i>Asplenium</i> spp.	Abel	✓	
<i>Austromyrtus bidwillii</i>			✓
<i>Backhousia</i> spp.	Abel	✓	
<i>Brachychiton acerifolius</i>	Abel	✓	
<i>Brachychiton discolor</i>		✓	
<i>Breynia oblongifolia</i>	Abel	✓	
<i>Caldcluvia paniculosa</i>		✓	
<i>Callerya australis</i>		✓	
<i>Capparis arborea</i>	Abel	✓	
<i>Cassine australe</i>	Abel	✓	
<i>Castanospermum australe</i>		✓	✓
<i>Cayratia clematidea</i>	Abel	✓	
<i>Ceratopetalum apetalum</i>	Abel	✓	✓
<i>Choricarpia leptopetala</i>	Abel	✓	
<i>Cinnamomum oliveri</i>		✓	

Species	ABEL Rainforest	Lowland Rainforest EEC	Floodplain Rainforest EEC
<i>Cissus</i> spp.	Abel	✓	
<i>Citronella moorei</i>		✓	
<i>Claoxylon australe</i>	Abel	✓	
<i>Clerodendrum tomentosum</i>	Abel	✓	
<i>Cordyline</i> spp.	Abel	✓	
<i>Cryptocarya obovata</i>			✓
<i>Cyathea cooperi</i>			✓
<i>Cyclophyllum longipetalum</i>		✓	
<i>Daphnandra</i> spp.	Abel	✓	
<i>Dendrocnide excelsa</i>	Abel	✓	✓
<i>Denhamia</i> spp.		✓	
<i>Diospyros</i> spp.	Abel	✓	
<i>Diploglottis australis</i>	Abel	✓	
<i>Doodia aspera</i>	Abel	✓	
<i>Doodia caudata</i>	Abel	✓	
<i>Doryphora sassafras</i>		✓	
<i>Drypetes deplanchii</i>	Abel	✓	
<i>Dysoxylum fraserianum</i>	Abel	✓	
<i>Dysoxylum molissimum</i>			✓
<i>Dysoxylum muelleri</i>		✓	
<i>Ehretia acuminata</i>		✓	
<i>Elaeocarpus grandis</i>			✓
<i>Elaeocarpus obovatus</i>	Abel		✓
<i>Elaeocarpus</i> spp.		✓	
<i>Elatostemna reticulatum</i>			✓
<i>Elatostachys nervosa</i>		✓	
<i>Endiandra</i> spp.		✓	
<i>Euroschinus falcata</i>	Abel	✓	
<i>Ficus coronata</i>	Abel		✓
<i>Ficus macrophylla</i>	Abel		✓
<i>Ficus obliqua</i>	Abel		✓
<i>Ficus</i> spp.		✓	
<i>Ficus superba</i> var. <i>henneana</i>			✓
<i>Ficus watkinsiana</i>	Abel		✓
<i>Flagellaria indica</i>	Abel	✓	
<i>Flindersia schottiana</i>			✓
<i>Flindersia</i> spp.		✓	
<i>Flindersia xanthoxyla</i>			✓
<i>Gossia</i> spp.		✓	
<i>Grevillea robusta</i>			✓
<i>Guoia semiglauc</i>	Abel	✓	
<i>Heritiera</i> spp.		✓	
<i>Heritiera trifoliata</i>		✓	✓
<i>Jasminum volubile</i>		✓	
<i>Lastreopsis</i> spp.	Abel	✓	
<i>Lenwebbia prominens</i>		✓	
<i>Linospadix monostachyus</i>			✓

Species	ABEL Rainforest	Lowland Rainforest EEC	Floodplain Rainforest EEC
<i>Litsea australis</i>		✓	
<i>Litsea reticulata</i>		✓	
<i>Livistona australis</i>	Abel	✓	✓
<i>Lophostemon confertus</i>		✓	
<i>Maclura cochinchinesis</i>	Abel	✓	
<i>Malaisia scandens</i>	Abel	✓	
<i>Mallotus discolor</i>		✓	
<i>Mallotus philippensis</i>	Abel	✓	
<i>Marsdenia spp.</i>	Abel	✓	
<i>Melia azederach</i>		✓	
<i>Melicope spp.</i>	Abel	✓	
<i>Microsorium scandens</i>	Abel		✓
<i>Morinda jasminoides</i>	Abel	✓	
<i>Neolitsea australiensis</i>		✓	
<i>Neolitsea dealbata</i>	Abel	✓	
<i>Notelaea spp.</i>	Abel	✓	
<i>Omalanthus populifolius</i>	Abel	✓	
<i>Pandorea pandorana</i>	Abel	✓	
<i>Pararchidendron pruinoseum</i>	Abel	✓	
<i>Parsonsia spp.</i>	Abel	✓	
<i>Passiflora spp.</i>	Abel	✓	
<i>Pellaea falcata</i>	Abel	✓	
<i>Peperomia tetraphylla</i>	Abel	✓	
<i>Piper novae-hollandiae</i>	Abel	✓	✓
<i>Pittosporum multiflorum</i>	Abel	✓	
<i>Platynerium spp.</i>	Abel	✓	
<i>Plectranthus spp.</i>	Abel	✓	
<i>Podocarpus elatus</i>	Abel	✓	
<i>Pollia crispata</i>	Abel	✓	✓
<i>Polyscias elegans</i>		✓	
<i>Pothos longipes</i>			✓
<i>Pouteria australe</i>	Abel	✓	
<i>Pteris umbrosa</i>	Abel	✓	
<i>Pyrrosia spp.</i>	Abel	✓	
<i>Randia chartacea</i>			✓
<i>Rapanea spp.</i>	Abel	✓	
<i>Rhodamnia spp.</i>	Abel	✓	
<i>Ripogonum spp.</i>	Abel	✓	
<i>Rubus spp.</i>	Abel	✓	
<i>Sarcomelicope simplicifolia</i>	Abel	✓	
<i>Schizomeria ovata</i>	Abel	✓	
<i>Scolopia braunii</i>	Abel	✓	
<i>Sloanea australis</i>		✓	✓
<i>Sloanea woollsii</i>		✓	✓
<i>Smilax australis</i>	Abel	✓	
<i>Sterculia quadrifida</i>		✓	
<i>Streblus brunonianus</i>	Abel	✓	✓



Species	ABEL Rainforest	Lowland Rainforest EEC	Floodplain Rainforest EEC
<i>Syzygium australe</i>	Abel		✓
<i>Syzygium francisii</i>			✓
<i>Syzygium spp.</i>		✓	
<i>Tetrastigma nitens</i>	Abel	✓	
<i>Toona ciliata</i>	Abel	✓	✓
<i>Trema aspera</i>	Abel	✓	
<i>Tristaniopsis laurina</i>	Abel	✓	✓
<i>Waterhousea floribunda</i>			✓

## 6.2 MU5 Alluvial Tall Moist Forest

Restricted to narrow drainage lines and dominated by *Eucalyptus acmenoides*, *Eucalyptus siderophloia*, *Eucalyptus resinifera* with a midstorey of *Melaleuca styphelioides*, *Backhousia myrtifolia*, *Alphitonia excelsa*, *Glochidion ferdinandi* and *Allocasuarina torulosa*. Difficult to separate clearly from MU12 in a number of areas, the presence of *Melaleuca styphelioides* being a distinguishing feature of MU5.

Typically found in sheltered gullies and along drainage lines.

Canopy	<i>Eucalyptus acmenoides</i> , <i>Syncarpia glomulifera</i> subsp. <i>glomulifera</i> , <i>Melaleuca styphelioides</i> , <i>Acmena smithii</i> , <i>Backhousia myrtifolia</i> , <i>Sarcomelicope simplicifolia</i> var. <i>simplicifolia</i> , <i>Cryptocarya microneura</i> , <i>Guioa semiglauca</i> , <i>Corymbia maculata</i> , <i>Eucalyptus saligna</i>
Mid	<i>Rapanea variabilis</i> , <i>Neolitsea dealbata</i> , <i>Alphitonia excelsa</i> , <i>Alectryon subcinereus</i> , <i>Baloghia inophylla</i> , <i>Diospyros austris</i> , <i>Cryptocarya rigida</i> , <i>Glochidion ferdinandi</i> var. <i>ferdinandi</i> , <i>Eupomatia laurina</i> , <i>Scolopia braunii</i> , <i>Cassine australis</i>
Lower	<i>Adiantum formosum</i> , <i>Pittosporum multiflorum</i> , <i>Oplismenus imbecillus</i> , <i>Doodia aspera</i> , <i>Calochlaena dubia</i> , <i>Blechnum cartilagineum</i> , <i>Carex longibrachiata</i> , <i>Lomandra longifolia</i>

## 6.3 MU12 Hunter Valley Moist Forest

Found on more sheltered aspects allowing for less drying. Dominated by *Syncarpia glomulifera*, *Corymbia maculata*, *Eucalyptus punctata*, *Allocasuarina torulosa* with a midstorey of *Glochidion ferdinandi*, *Backhousia myrtifolia*. A grassy ground cover of *Imperata cylindrica* and *Entolasia stricta* was common.

Typically found on the rises above gullies and drainage lines where the aspect allows for the retention of moisture.

Canopy	<i>Corymbia maculata</i> , <i>Eucalyptus acmenoides</i> , <i>Eucalyptus punctata</i> , <i>Eucalyptus fergusonii</i> subsp. <i>dorsiventralis</i> , <i>Eucalyptus siderophloia</i> , <i>Syncarpia glomulifera</i> subsp. <i>glomulifera</i>
Mid	<i>Synoum glandulosum</i> , <i>Guioa semiglauca</i> , <i>Cryptocarya rigida</i> , <i>Alectryon subcinereus</i> , <i>Rhodamnia rubescens</i>



Lower *Doodia aspera*, *Oplismenus imbecillus*, *Pellaea paradoxa*, *Desmodium gunnii*, *Cissua hypoglauca*, *Adiantum hispidulum*, *Calochlaena dubia*, *Pyrossia rupestris*, *Pellaea falcata*, *Marsdenia suaveolens*, *Smilax australis*

#### 6.4 MU15 Coastal Foothills Spotted Gum- Ironbark Forest

Typically found on ridges and exposed hillsides.

Canopy *Corymbia maculata*, *Eucalyptus fergusonii* subsp. *dorsiventralis*, *Eucalyptus crebra*, *Eucalyptus umbra*, *Allocasuarina torulosa*, *Eucalyptus propinqua*

Mid *Daviesia ulicifolia* subsp. *ulicifolia*, *Persoonia linearis*, *Rapanea variabilis*, *Syncarpia glomulifera* subsp. *glomulifera*, *Acacia fimbriata*, *Leptospermum polygalifolium* subsp. *cismontanum*

Lower *Microlaena stipoides* var. *stipoides*, *Entolasia stricta*, *Lepidosperma laterale*, *Lomandra longifolia*, *Imperata cylindrica* var. *major*, *Dichondra repens*, *Lomandra multiflora* subsp. *multiflora*, *Opercularia diphylla*, *Aristida vagans*, *Goodenia heterophylla* var. *heterophylla*

#### 6.5 MU17 Lower Hunter Spotted Gum – Ironbark Forest

The overstorey was dominated by *Corymbia maculata*, *Eucalyptus fibrosa*, *Eucalyptus umbra* and *Eucalyptus punctata*. A low shrub layer of *Daviesia ulicifolia* and *Bursaria spinosa* was common along with *Acacia elongata* and *Grevillea montana*. Ground cover was made up of the grasses *Joycea pallida*, *Entolasia stricta*, *Themeda australis*, *Imperata cylindrica* and *Aristida vagans*. The presence of the grass *Joycea pallida*, widespread in the Bloomfield property, does not fall within the NPWS 2000 description of MU17.

Typically found on ridges and exposed hillsides.

Canopy *Corymbia maculata*, *Eucalyptus fibrosa*, *Eucalyptus umbra*, *Eucalyptus punctata*

Mid *Bursaria spinosa*, *Acacia falcata*, *Acacia fimbriata*, *Daviesia ulicifolia* subsp. *ulicifolia*, *Pultenaea villosa*, *Macrozamia reducta*, *Melaleuca nodosa*

Lower *Themeda australis*, *Dichondra repens*, *Microlaena stipoides* var. *stipoides*, *Entolasia stricta*, *Lepidosperma laterale*, *Aristida vagans*, *Lomandra confertifolia* subsp. *pallida*, *Lomandra filiformis* subsp. *coriacea*, *Pratia purpurascens*, *Lomandra multiflora* subsp. *multiflora*, *Phyllanthus hirtellus*, *Joycea pallida*, *Cymbopogon refractus*, *Imperata cylindrica* var. *major*

#### 6.6 MU18 Central Hunter Ironbark – Spotted Gum - Grey Box Forest

A small area with an overstorey of *Eucalyptus moluccana*, *Corymbia maculata* and *Eucalyptus fibrosa*. Not typical of MU18 as defined in NPWS 2000 which has *Eucalyptus crebra* ironbarks as a co-dominant overstorey component.

One area of 20 hectares contains this community which has been classed as MU18 although the typical MU18 from the central Hunter Valley has *Eucalyptus crebra* rather than *Eucalyptus fibrosa* as part of the canopy.

Canopy	<i>Corymbia maculata</i> , <i>Eucalyptus moluccana</i> , <i>Eucalyptus fibrosa</i>
Mid	<i>Acacia fimbriata</i> , <i>Acacia falcata</i> , <i>Bursaria spinosa</i> , <i>Pultenaea euchila</i>
Lower	<i>Themeda australis</i> , <i>Entolasia stricta</i> , <i>Lomandra confertifolia</i> subsp. <i>pallida</i> , <i>Lomandra multiflora</i> subsp. <i>multiflora</i> , <i>Dichondra repens</i> , <i>Pratia purpurascens</i> , <i>Aristida vagans</i> , <i>Brachycome multifida</i> var. <i>multifida</i> , <i>Solanum prinophyllum</i> , <i>Fimbristylis dichotoma</i> , <i>Microlaena stipoides</i> var. <i>stipoides</i>

### 6.7 MU19 Hunter Lowlands Redgum Forest

This small remnant was not strictly speaking MU19 in that the dominant Redgum was *Eucalyptus amplifolia* rather than *Eucalyptus tereticornis*. As is generally the case with Redgum communities in the Hunter, these areas were highly disturbed along drainage lines.

Small and disturbed remnants only, amounting to 6 hectares were present at the edge of open farmland in the north western portion of the investigation area.

Canopy	<i>Eucalyptus tereticornis</i> , <i>Eucalyptus punctata</i> , <i>Angophora floribunda</i> , <i>Eucalyptus crebra</i> , <i>Eucalyptus moluccana</i> , <i>Corymbia maculata</i>
Mid	<i>Breynia oblongifolia</i> , <i>Leucopogon juniperinus</i> , <i>Daviesia ulicifolia</i> , and <i>Jacksonia scoparia</i>
Lower	<i>Microlaena stipoides</i> var. <i>stipoides</i> , <i>Cymbopogon refractus</i> , <i>Echinopogon caespitosus</i> var. <i>caespitosus</i> , <i>Cheilanthes sieberi</i> , <i>Pratia purpurascens</i> .

### 6.8 MU30 Coastal Plains Smooth-barked Apple Woodland

The areas that were the most typical of MU30 had an overstorey dominated by *Angophora costata*, *Corymbia gummifera* and *Eucalyptus punctata*. The shrub layer was commonly dominated by *Banksia spinulosa*, *Bossiaea rhombifolia* and *Leptospermum trinervium*. A midstorey of *Ceratopetalum gummiferum* was present in some localised patches. Ground cover were the grasses *Anisopogon avenaceus*, *Entolasia stricta* and *Imperata cylindrica*. Less typical and not uncommon, were areas where the overstorey included *Angophora bakeri* and *Eucalyptus capitellata*.

The larger part of this community was found on a broad plateau area on the top of the ridge system.

Canopy	<i>Angophora costata</i> , <i>Corymbia gummifera</i> , <i>Eucalyptus sparsifolia</i> , <i>Eucalyptus umbra</i> , <i>Eucalyptus resinifera</i> , <i>Allocasuarina torulosa</i> , <i>Eucalyptus fibrosa</i>
Mid	<i>Leptospermum polygalifolium</i> subsp. <i>cismontanum</i> , <i>Pteridium esculentum</i> , <i>Acacia implexa</i> , <i>Banksia spinulosa</i> var. <i>collina</i> , <i>Epacris</i>

*pulchella*, *Daviesia ulicifolia* subsp. *ulicifolia*, *Hibbertia aspera* subsp. *aspera*

Lower      *Themeda australis*, *Joycea pallida*, *Pultenaea palacae*, *Entolasia stricta*, *Lomandra obliqua*, *Imperata cylindrica* var. *major*, *Panicum simile*, *Aristida vagans*, *Tetradlea juncea*, *Phyllanthus hirtellus*, *Xanthorrhoea latifolia* subsp. *latifolia*

## 7 Capture and observation data and historical data – surface facilities investigation area

Notes:

1. Transect locations shown on Figure 6.8 – Volume 1.
2. Historical data from the permanent annual monitoring quadrats established on the Donaldson Coal property.

### 7.1.1 Transect 1

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence
Little Forest Bat	<i>Vespadelus vulturnus</i>	Harp Trap	6		
Brown Antechinus		Elliot A Ground	2		
NO CAPTURES		Elliot B Tree			
NO CAPTURES		Elliot B Ground			
Brushtail Possum	<i>Trichosurus vulpecula</i>	Cage Trap	2		
Brown Antechinus	<i>Antechinus stuartii</i>	Hair Tubes	1 Wafer sample		Possible
Sugar glider	<i>Petaurus breviceps</i>	Spotlighting	1		
NO RESPONSE		Owl Call Back			
Eastern Freetail Bat	<i>Mormopterus sp. 2</i>	Anabat		V	Probable
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	Anabat			Possible
Chocolate Wattled Bat	<i>Chalinolobus morio</i>	Anabat			Confident
Little Forest Bat	<i>Vespadelus vulturnus</i>	Anabat			Confident

### 7.1.2 Transect 2

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence
Little Forest Bat	<i>Vespadelus vulturnus</i>	Harp Trap	8		
Brown Antechinus	<i>Antechinus stuartii</i>	Elliot A Ground	2		
NO CAPTURES		Elliot B Tree			
NO CAPTURES		Elliot B Ground			
NO CAPTURES		Cage Trap			
Sugar / Squirrel glider	<i>Petaurus sp.</i>	Hair Tubes			High genus, most likely sp. <i>breviceps</i> (Sugar Glider)
NO SIGHTINGS		Spotlighting			
NO RESPONSE		Owl Call			

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence
		Back			
Eastern Freetail Bat	<i>Mormopterus norfolkensis</i>	Anabat		V	Probable
Little Bent-wing Bat	<i>Miniopterus australis</i>	Anabat		V	Probable
Eastern Forest Bat	<i>Vespadelus pumilus</i>	Anabat			Possible
Eastern Broadnosed Bat	<i>Scotorepens orion</i>	Anabat			Confident
Little Forest Bat	<i>Vespadelus vulturnus</i>	Anabat			Confident

### 7.1.3 Transect 3

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence
Little Forest Bat	<i>Vespadelus vulturnus</i>	Harp Trap	9		
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>	Harp Trap	1		
Eastern Broadnosed Bat	<i>Scotorepens orion</i>	Harp Trap	1		
Brown Antechinus	<i>Antechinus stuartii</i>	Elliot A Ground	3		
NO CAPTURES		Elliot B Tree			
NO CAPTURES		Elliot B Ground			
Brushtail Possum	<i>Trichosurus vulpecula</i>	Cage Trap	2		
Sugar glider	<i>Petaurus breviceps</i>	Spotlighting	1		
Brushtail Possum	<i>Trichosurus vulpecula</i>	Spotlighting	1		
Perons Tree Frog	<i>Litoria peronii</i>	Spotlighting			
Southern Laughing Tree Frog	<i>Litoria tyleri</i>	Spotlighting			
Striped Marsh Frog	<i>Limnodynastes peroni</i>	Spotlighting			
Sedge Frog / Dwarf Green Tree Frog	<i>Litoria fallax</i>	Spotlighting			
Broad-palmed Tree Frog	<i>Litoria latopalmata</i>	Spotlighting			
Sugar/Squirrel glider	<i>Petaurus sp.</i>	Hair Tubes	1 Wafer sample		High Genus, most likely sp. breviceps (Sugar Glider)
NO RESPONSE		Owl Call Back			
White-striped Mastiff Bat	<i>Tadarida australis</i>	Anabat			Confident
East Coast Freetail Bat	<i>Mormopterus norfolkensis</i>	Anabat		V	Confident
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	Anabat			Probable

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence
Little Forest Bat	<i>Vespadelus vulturnus</i>	Anabat			Confident

#### 7.1.4 Transect 4

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence
Little Forest Bat	<i>Vespadelus vulturnus</i>	Harp Trap	4		
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>	Harp Trap	1		
Gould's Long-eared Bat	<i>Nyctophilus gouldi</i>	Harp Trap	1		
NO CAPTURES		Elliot A Ground			
NO CAPTURES		Elliot B Tree			
Common Ringtail Possum	<i>Pseudocheirus peregrinus</i>	Elliot B Ground	1		
Black Rat	<i>Rattus rattus</i> *	Cage Trap	2		
Brushtail Possum	<i>Trichosurus vulpecula</i>	Cage Trap	1		
Red-bellied Black Snake	<i>Psuedechis porphyriacus</i>	Sighting	1		
Long-nosed Bandicoot	<i>Perameles nasuta</i>	Spotlighting	1		
Spotted Grass Frog	<i>Limnodynastes tasmaniensis</i>	Spotlighting			
Common Eastern Froglet	<i>Crinia signifera</i>	Spotlighting			
Perons Tree Frog		Spotlighting			
Southern Laughing Tree Frog	<i>Litoria tyleri</i>	Spotlighting			
Striped Marsh Frog	<i>Limnodynastes peroni</i>	Spotlighting			
Sedge Frog / Dwarf Green Tree Frog	<i>Litoria fallax</i>	Spotlighting			
Broad-palmed Tree Frog	<i>Litoria latopalmata</i>	Spotlighting			
NO SAMPLES		Hair Tubes			
NO RESPONSE		Owl Call Back			
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	Anabat			Confident
Little Forest Bat	<i>Vespadelus vulturnus</i>	Anabat			Confident

### 7.1.5 Transect 5

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence
Large-footed Myotis	<i>Myotis adversus</i>	Harp	1	V	
Black Rat	<i>Rattus rattus</i> *	Elliot A Ground	1		
NO CAPTURES		Elliot B Tree			
NO CAPTURES		Elliot B Ground			
Black Rat	<i>Rattus rattus</i> *	Cage Trap	1		
No hair samples		Hair Tubes			
Lace Monitor	<i>Varanus varius</i>	sighting	1		
Eastern Brown Snake	<i>Pseudonaja textilis</i>	sighting	1		
Broad-palmed Tree Frog	<i>Litoria latopalmata</i>	Spotlighting			
Sedge Frog	<i>Litoria fallax</i>	Spotlighting			
Striped Marsh Frog	<i>Limnodynastes peroni</i>	Spotlighting			
Nankeen Night Heron	<i>Nycticorax caledonicus</i>	Spotlighting			
NO RESPONSE		Owl Call Back			
East Coast Freetail Bat	<i>Mormopterus norfolkensis</i>	Anabat		V	Probable
Large-footed Myotis	<i>Myotis adversus</i>	Anabat		V	Possible
Little Forest Bat	<i>Vespadelus vulturnus</i>	Anabat			Confident
Greater Broad-nose Bat	<i>Scotorepens rueppellii</i>	Anabat		V	Probable
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	Anabat			Probable
Eastern Broadnosed Bat	<i>Scotorepens orion</i>	Anabat			Probable

### 7.1.6 Transect 6

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence
Little Forest Bat	<i>Vespadelus vulturnus</i>	Harp Trap	48		
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	Harp Trap	3		
Gould's Long-eared Bat	<i>Nyctophilus gouldi</i>	Harp Trap	7		
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>	Harp Trap	9		
Eastern Horseshoe-bat	<i>Rhinolopus megaphyllus</i>	Harp Trap	1		
Brown Antechinus	<i>Antechinus stuartii</i>	Elliot A Ground	2		
Brushtail Possum	<i>Trichosurus vulpecula</i>	Elliot B Tree	1		
Sugar glider	<i>Petaurus breviceps</i>	Elliot B Tree	1		
Squirrel Glider	<i>Petaurus norfolcensis</i>	Elliot B Tree	1	V	



Common Name	Species Name	Method	Total Caught	Status	Level of Confidence
NO CAPTURES		Elliot B Ground			
NO CAPTURES		Cage Trap			
No hair samples		Hair Tubes			
Lace Monitor	<i>Varanus varius</i>	sighting	1		
NO SIGHTINGS		Spotlighting			
NO RESPONSE		Owl Call Back			
Goulds Wattled Bat	<i>Chalinolobus gouldii</i>	Anabat			Confident
Chocolate Wattled Bat	<i>Chalinolobus morio</i>	Anabat			Confident
Little Forest Bat	<i>Vespadelus vulturnus</i>	Anabat			Confident
Inland Broad-nosed Bat	<i>Scotorepens balstoni</i>	Anabat			Probable
Large-footed Myotis	<i>Myotis adversus</i>	Anabat		V	Confident

#### 7.1.7 Donaldson Quadrat 1

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence
Little Forest Bat	<i>Vespadelus vulturnus</i>	Harp Trap	5		
Little Bent-wing Bat	<i>Miniopterus australis</i>	Harp Trap	11	V	
Gould's Long-eared Bat	<i>Nyctophilus gouldi</i>	Harp Trap	1		
Common Bent-wing Bat	<i>Miniopterus schreibersii</i>	Harp Trap	54	V	
Brown Antechinus	<i>Antechinus stuartii</i>	Elliot A Ground	2		
NO CAPTURES		Elliot B Tree			
NO CAPTURES		Elliot B Ground			
Brushtail Possum	<i>Trichosurus vulpecula</i>	Cage Trap	3		
Black Rat	<i>Rattus rattus</i> *	Cage Trap			
Sugar glider	<i>Petaurus sp.</i>	Hair Tubes	1 wafer sample		Probable
Brushtail Possum	<i>Trichosurus vulpecula</i>	Hair Tubes	1 wafer sample		Probable
Sedge Frog	<i>Litoria fallax</i>	Spotlighting			
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>	Spotlighting			
Nankeen Night Heron	<i>Nycticorax caledonicus</i>	Spotlighting			
NO RESPONSE		Owl Call Back			
Chocolate Wattled Bat	<i>Chalinolobus morio</i>	Anabat			Confident
Little Forest Bat	<i>Vespadelus vulturnus</i>	Anabat			Confident
Little Bent-wing Bat	<i>Miniopterus australis</i>	Anabat		V	Confident
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	Anabat			Probable
Eastern Cave Bat	<i>Vespadelus troughtoni</i>	Anabat		V	Probable

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence
Large-footed Myotis	<i>Myotis adversus</i>	Anabat		V	Possible
Eastern Broad-nosed Bat	<i>Scotorepens orion</i>	Anabat			Probable
Common Bent-wing Bat	<i>Miniopterus schreibersii</i>	Anabat		V	Confident

#### 7.1.8 Donaldson Quadrat 9

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>	Harp Trap	1 adult with two		
NO CAPTURES		Elliot A Ground			
Sugar glider	<i>Petaurus breviceps</i>	Elliot B Tree	1		
NO CAPTURES		Elliot B Ground			
Brushtail Possum	<i>Trichosurus vulpecula</i>	Cage Trap	3		
Brushtail Possum	<i>Trichosurus vulpecula</i>	Hair Tubes	1 wafer sample		Confident
NO SIGHTINGS		Spotlighting			
NO RESPONSE		Owl Call Back			
Little Forest Bat	<i>Vespadelus vulturnus</i>	Anabat			Confident
Little Bent-wing Bat	<i>Miniopterus australis</i>	Anabat		V	Confident
Common Bent-wing Bat	<i>Miniopterus schreibersii</i>	Anabat		V	Confident
Chocolate Wattled Bat	<i>Chalinolobus morio</i>	Anabat			Probable

### 7.1.9 Donaldson Quadrat 1 Historical Data

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence	Years
Little Forest Bat	<i>Vespadelus vulturnus</i>	Harp Trap	16			2004
Little Bent-wing Bat	<i>Miniopterus australis</i>	Harp Trap	2			2004
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>	Harp Trap	1			2004
Gould's Long-eared Bat	<i>Nyctophilus gouldi</i>	Harp Trap	1			2004
Common Bent-wing Bat	<i>Miniopterus schreibersii</i>	Harp Trap	5			2004
Brown Antechinus	<i>Antechinus stuartii</i>	Elliot A Ground	59			02/03/04/05
Black Rat	<i>Rattus rattus</i> *	Elliot A Ground	1			2004
Sugar glider	<i>Petaurus breviceps</i>	Elliot B Tree	4			2003
Brushtail Possum	<i>Trichosurus vulpecula</i>	Elliot B Ground	1			2004
Sugar glider	<i>Petaurus breviceps</i>	Elliot B Ground	3			2003
Brown Antechinus	<i>Antechinus stuartii</i>	Elliot B Ground	1			2002
Brushtail Possum	<i>Trichosurus vulpecula</i>	Cage Trap	7			03/04
Black Rat	<i>Rattus rattus</i> *	Cage Trap	2			03/04
Brushtail Possum	<i>Trichosurus vulpecula</i>	Hair Tubes	2 Wafer samples		High	03/04
Brown Antechinus	<i>Antechinus stuartii</i>	Hair Tubes	2 Wafer samples		High	03/04
Common Ringtail Possum	<i>Pseudocheirus peregrinus</i>	Hair Tubes	1 Wafer sample		High	2004
Feathertail Glider	<i>Acrobates pygmaeus</i>	Spotlighting	1			2004
Little Red Flying-fox	<i>Pteropus scapulatus</i>	Spotlighting	1			2004
NO RESPONSE		Owl Call Back				
Chocolate Wattled Bat	<i>Chalinolobus morio</i>	Anabat				02/03/04
Little Forest Bat	<i>Vespadelus vulturnus</i>	Anabat				02/03/04
Little Bent-wing Bat	<i>Miniopterus australis</i>	Anabat		V		02/03/04
White-striped Mastiff Bat		Anabat				2004
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	Anabat				02/03/04

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence	Years
Eastern Cave Bat	<i>Vespadelus troughtoni</i>					
Common Bent-wing Bat	<i>Miniopterus schreibersii</i>	Anabat		V		02/03/04
Large Forest Bat	<i>Vespadelus darlingtoni</i>	Anabat				2002
Little Freetail Bat	<i>Mormopterus sp1</i>	Anabat				2004
Eastern Broad-nosed Bat	<i>Scotorepens orion</i>	Anabat				2004
Eastern Freetail-bat	<i>Mormopterus norfolkensis</i>	Anabat		V		2004

#### 7.1.10 Donaldson Quadrat 9 Historical Data

Common Name	Species Name	Method	Total Caught	Status	Level of Confidence	Years
Little Forest Bat	<i>Vespadelus vulturnus</i>	Harp Trap	1			2004
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	Harp Trap	1			2004
Sugar glider	<i>Petaurus breviceps</i>	Elliot A Ground	2			2003
Black Rat	<i>Rattus rattus*</i>	Elliot B Ground	1			2003
Brushtail Possum	<i>Trichosurus vulpecula</i>	Elliot B Ground	1			2004
Brushtail Possum	<i>Trichosurus vulpecula</i>	Cage Trap	5			03/04
Brushtail Possum	<i>Trichosurus vulpecula</i>	Hair Tubes	1 Wafer sample		High	2004
Sugar / Squirrel glider	<i>Petaurus sp.</i>	Hair Tubes	1 Wafer sample		High Genus, most likely species breviceps (Sugar Glider)	2003
Brown Antechinus	<i>Antechinus stuartii</i>	Hair Tubes	1 Wafer sample		High	2004
Brushtail Possum	<i>Trichosurus vulpecula</i>	Spotlighting	1			2004
Little Red Flying-fox	<i>Pteropus scapulatus</i>	Spotlighting	1			2004
NO RESPONSE		Owl Call Back				
Chocolate Wattled Bat	<i>Chalinolobus morio</i>	Anabat				03/04
Little Forest Bat	<i>Vespadelus vulturnus</i>	Anabat				03/04
Little Bent-wing Bat	<i>Miniopterus australis</i>	Anabat		V		03/04
White-striped Mastiff Bat		Anabat				2004

Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	Anabat				03/04
Little Freetail Bat	<i>Mormopterus sp1</i>	Anabat				2004
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	Anabat		V		2004
Large-footed Myotis	<i>Myotis adversus</i>	Anabat		V		03/04

## 8 Birds species recorded across the surface investigation area

Family	Scientific name	Common Name
<b>Aegothelidae</b>	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar
<b>Ardeidae</b>	<i>Nycticorax caledonicus</i>	Nankeen Night Heron
<b>Artamidae</b>	<i>Cracticus torquatus</i>	Grey Butcherbird
<b>Artamidae</b>	<i>Gymnorhina tibicen</i>	Australian Magpie
<b>Cacatuidae</b>	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo
<b>Cinclosomatidae</b>	<i>Psophodes olivaceus</i>	Eastern Whipbird
<b>Climacteridae</b>	<i>Cormobates leucophaeus</i>	White-throated Treecreeper
<b>Columbidae</b>	<i>Geopelia humeralis</i>	Bar-shouldered Dove
<b>Corvidae</b>	<i>Corvus coronoides</i>	Australian Raven
<b>Cuculidae</b>	<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo
<b>Cuculidae</b>	<i>Eudynamys scolopacea</i>	Common Koel
<b>Cuculidae</b>	<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo
<b>Dicaeidae</b>	<i>Dicaeum hirundinaceum</i>	Mistletoebird
<b>Dicruridae</b>	<i>Monarcha melanopsis</i>	Black-faced Monarch
<b>Dicruridae</b>	<i>Myiagra rubecula</i>	Leaden Flycatcher
<b>Dicruridae</b>	<i>Rhipidura fuliginosa</i>	Grey Fantail
<b>Dicruridae</b>	<i>Rhipidura rufifrons</i>	Rufous Fantail
<b>Halcyonidae</b>	<i>Todiramphus sanctus</i>	Sacred Kingfisher
<b>Maluridae</b>	<i>Malurus cyaneus</i>	Superb Fairy-wren
<b>Maluridae</b>	<i>Malurus lamberti</i>	Variegated Fairy-wren
<b>Meliphagidae</b>	<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill
<b>Meliphagidae</b>	<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater
<b>Meliphagidae</b>	<i>Manorina melanophrys</i>	Bell Miner
<b>Meliphagidae</b>	<i>Meliphaga lewinii</i>	Lewin's Honeyeater
<b>Meliphagidae</b>	<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater
<b>Meliphagidae</b>	<i>Melithreptus lunatus</i>	White-naped Honeyeater
<b>Meliphagidae</b>	<i>Myzomela sanguinolenta</i>	Scarlet Honeyeater
<b>Neosittidae</b>	<i>Daphoenositta chrysoptera</i>	Varied Sittella
<b>Oriolidae</b>	<i>Oriolus sagittatus</i>	Olive-backed Oriole
<b>Pachycephalidae</b>	<i>Colluricincla harmonica</i>	Grey Shrike-thrush
<b>Pachycephalidae</b>	<i>Pachycephala pectoralis</i>	Golden Whistler
<b>Pachycephalidae</b>	<i>Pachycephala rufiventris</i>	Rufous Whistler
<b>Pardalotidae</b>	<i>Acanthiza lineata</i>	Striated Thornbill
<b>Pardalotidae</b>	<i>Gerygone mouki</i>	Brown Gerygone
<b>Pardalotidae</b>	<i>Pardalotus punctatus</i>	Spotted Pardalote
<b>Pardalotidae</b>	<i>Sericornis frontalis</i>	White-browed Scrubwren
<b>Petroicidae</b>	<i>Eopsaltria australis</i>	Eastern Yellow Robin
<b>Zosteropidae</b>	<i>Zosterops lateralis</i>	Silvereye

## 9 7-part Tests of Significance

In order to assess the significance of threatened species considered as likely to be present, or actually being present, in an area and to assess the impact of any proposed disturbance on these species a 7-part test is applied. This test is provided for in the NSW *Threatened Species Conservation Act 1995* as amended by the NSW *Threatened Species Conservation Amendment Act 2002*.

### 9.1 Speckled Warbler

**(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,**

The Speckled Warbler inhabits open woodland that has a mixed shrubby ground cover and a good density of fallen logs. While none of these birds were found to be present in the investigation area, the majority of habitat was suitable.

Conveyor: approximately 6ha of vegetation would be cleared in a narrow strip which would not impact on any local viable population to the extent that the population would be placed at risk of extinction.

Stockpile expansion: approximately 7ha in several small portions would be cleared around the existing stockpile and washery. The required clearing would not impact on any local viable population to the extent that the population would be placed 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,**

There were no endangered populations listed for the investigation areas.

**(c) in the case of an 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**

Not applicable in the consideration of a single species.

**(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,**

Not applicable in the consideration of a single species.

**(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**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

**(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**

Conveyor: the clearing 20m wide clearing would not fragment or isolate other areas of habitat.

Stockpile expansion: the area to be cleared is located at the edge of the current stockpile and so would not involve any fragmentation or isolation of habitat.



- (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,

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared..

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

There would be no impact on the long-term survival of the species as a consequence of this clearing.

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

No critical habitat was present.

- (f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan or threat abatement plan has been prepared for this species.

- (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 clearing of native vegetation is a key threatening process however the clearing involved for the conveyor corridor and the stockpile expansion areas would not have a negative impact on the species.

## 9.2 Glossy Black-Cockatoo

- (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, The Glossy Black-Cockatoo feeds exclusively on the fruit of *Allocasuarina* (Oak) species, very few of which were present in the investigation area.

Conveyor: approximately 6ha of vegetation would be cleared in a narrow strip which would not impact on any local viable population to the extent that the population would be placed at risk of extinction.

Stockpile expansion: approximately 7ha in several small portions would be cleared around the existing stockpile and washery. The required clearing would not impact on any local viable population to the extent that the population would be placed 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,

There were no endangered populations listed for the investigation areas.

- (c) in the case of an 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

Not applicable in the consideration of a single species.

- (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,

Not applicable in the consideration of a single species.

- (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**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

**(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**

Conveyor: the clearing 20m wide clearing would not fragment or isolate other areas of habitat.

Stockpile expansion: the area to be cleared is located at the edge of the current stockpile and so would not involve any fragmentation or isolation of habitat.

**(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,**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

There would be no impact on the long-term survival of the species as a consequence of this clearing.

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

No critical habitat was present.

**(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

No recovery plan or threat abatement plan has been prepared for this species.

**(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 clearing of native vegetation is a key threatening process however the clearing involved for the conveyor corridor and the stockpile expansion areas would not have a negative impact on the species.

### **9.3 Brown Treecreeper**

**(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,**

The Brown Treecreeper inhabits open woodland with a sparse shrub and ground cover. While none were found in the investigation area there was suitable habitat present.

Conveyor: approximately 6ha of vegetation would be cleared in a narrow strip which would not impact on any local viable population to the extent that the population would be placed at risk of extinction.

Stockpile expansion: approximately 7ha in several small portions would be cleared around the existing stockpile and washery. The required clearing would not impact on any local viable population to the extent that the population would be placed 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,**

There were no endangered populations listed for the investigation areas.

**(c) in the case of an 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**

Not applicable in the consideration of a single species.

**(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,**

Not applicable in the consideration of a single species.

**(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**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

**(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**

Conveyor: the clearing 20m wide clearing would not fragment or isolate other areas of habitat.

Stockpile expansion: the area to be cleared is located at the edge of the current stockpile and so would not involve any fragmentation or isolation of habitat.

**(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,**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

There would be no impact on the long-term survival of the species as a consequence of this clearing.

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

No critical habitat was present.

**(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

No recovery plan or threat abatement plan has been prepared for this species.

**(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 clearing of native vegetation is a key threatening process however the clearing involved for the conveyor corridor and the stockpile expansion areas would not have a negative impact on the species.

#### **9.4 Black-chinned Honeyeater**

**(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,**

The Black-chinned Honeyeater is an itinerant bird feeding on insects and nectar from the shrub layer to the top canopy. While none were found there was suitable habitat throughout the investigation area.

Conveyor: approximately 6ha of vegetation would be cleared in a narrow strip which would not impact on any local viable population to the extent that the population would be placed at risk of extinction.

Stockpile expansion: approximately 7ha in several small portions would be cleared around the existing stockpile and washery. The required clearing would not impact on any local viable population to the extent that the population would be placed 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,**

There were no endangered populations listed for the investigation areas.

**(c) in the case of an 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**

Not applicable in the consideration of a single species.

**(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,**

Not applicable in the consideration of a single species.

**(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**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

**(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**

Conveyor: the clearing 20m wide clearing would not fragment or isolate other areas of habitat.

Stockpile expansion: the area to be cleared is located at the edge of the current stockpile and so would not involve any fragmentation or isolation of habitat.

**(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,**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

There would be no impact on the long-term survival of the species as a consequence of this clearing.

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

No critical habitat was present.

**(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

No recovery plan or threat abatement plan has been prepared for this species.

**(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 clearing of native vegetation is a key threatening process however the clearing involved for the conveyor corridor and the stockpile expansion areas would not have a negative impact on the species.

## **9.5 Regent Honeyeater**

**(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,**  
The Regent Honeyeater is a winter migrant to the area and feeds on nectar and insects, generally in flowering eucalypts.

Conveyor: approximately 6ha of vegetation would be cleared in a narrow strip which would not impact on any local viable population to the extent that the population would be placed at risk of extinction.

Stockpile expansion: approximately 7ha in several small portions would be cleared around the existing stockpile and washery. The required clearing would not impact on any local viable population to the extent that the population would be placed 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,**

There were no endangered populations listed for the investigation areas.

**(c) in the case of an 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**

Not applicable in the consideration of a single species.

**(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,**

Not applicable in the consideration of a single species.

**(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**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

**(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**

Conveyor: the clearing 20m wide clearing would not fragment or isolate other areas of habitat.

Stockpile expansion: the area to be cleared is located at the edge of the current stockpile and so would not involve any fragmentation or isolation of habitat.



- (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,**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

There would be no impact on the long-term survival of the species as a consequence of this clearing.

- (e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),**

No critical habitat was present.

- (f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

No recovery plan or threat abatement plan has been prepared for this species.

- (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 clearing of native vegetation is a key threatening process however the clearing involved for the conveyor corridor and the stockpile expansion areas would not have a negative impact on the species.

## **9.6 Swift Parrot**

- (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,**

The Swift Parrot is a winter migrant to the area and feeds on nectar and lerps in eucalypts. There would be no viable local population of these birds in the area however the available food resources could be important to the species.

Conveyor: approximately 6ha of vegetation would be cleared in a narrow strip which would not impact on any local viable population to the extent that the population would be placed at risk of extinction.

Stockpile expansion: approximately 7ha in several small portions would be cleared around the existing stockpile and washery. The required clearing would not impact on any local viable population to the extent that the population would be placed 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,**

There were no endangered populations listed for the investigation areas.

- (c) in the case of an 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**

Not applicable in the consideration of a single species.

- (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,**

Not applicable in the consideration of a single species.

- (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**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

**(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**

Conveyor: the clearing 20m wide clearing would not fragment or isolate other areas of habitat.

Stockpile expansion: the area to be cleared is located at the edge of the current stockpile and so would not involve any fragmentation or isolation of habitat.

**(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,**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

There would be no impact on the long-term survival of the species as a consequence of this clearing.

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

No critical habitat was present.

**(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

No recovery plan or threat abatement plan has been prepared for this species.

**(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 clearing of native vegetation is a key threatening process however the clearing involved for the conveyor corridor and the stockpile expansion areas would not have a negative impact on the species.

## **9.7 Masked 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,**

The Masked Owl prefers dry forest habitat and the majority of the habitat in the investigation area would be suitable for this bird.

Conveyor: approximately 6ha of vegetation would be cleared in a narrow strip which would not impact on any local viable population to the extent that the population would be placed at risk of extinction.

Stockpile expansion: approximately 7ha in several small portions would be cleared around the existing stockpile and washery. The required clearing would not impact on any local viable population to the extent that the population would be placed 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,**

There were no endangered populations listed for the investigation areas.



**(c) in the case of an 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**

Not applicable in the consideration of a single species.

**(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,**

Not applicable in the consideration of a single species.

**(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**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

**(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**

Conveyor: the clearing 20m wide clearing would not fragment or isolate other areas of habitat.

Stockpile expansion: the area to be cleared is located at the edge of the current stockpile and so would not involve any fragmentation or isolation of habitat.

**(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,**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

There would be no impact on the long-term survival of the species as a consequence of this clearing.

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

No critical habitat was present.

**(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

No recovery plan or threat abatement plan has been prepared for this species.

**(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 clearing of native vegetation is a key threatening process however the clearing involved for the conveyor corridor and the stockpile expansion areas would not have a negative impact on the species.

## **9.8 Squirrel Glider**

**(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,**

The Squirrel Glider prefers a forest or woodland habitat with a shrubby understorey. Suitable habitat exists throughout and a Squirrel Glider was captured in the western edge of the investigation area.

Conveyor: approximately 6ha of vegetation would be cleared in a narrow strip which would not impact on any local viable population to the extent that the population would be placed at risk of extinction.

Stockpile expansion: approximately 7ha in several small portions would be cleared around the existing stockpile and washery. The required clearing would not impact on any local viable population to the extent that the population would be placed 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,**

There were no endangered populations listed for the investigation areas.

**(c) in the case of an 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**

Not applicable in the consideration of a single species.

**(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,**

Not applicable in the consideration of a single species.

**(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**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

**(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**

Conveyor: the clearing 20m wide clearing would not fragment or isolate other areas of habitat.

Stockpile expansion: the area to be cleared is located at the edge of the current stockpile and so would not involve any fragmentation or isolation of habitat.

**(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,**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

There would be no impact on the long-term survival of the species as a consequence of this clearing.

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

No critical habitat was present.

**(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

No recovery plan or threat abatement plan has been prepared for this species.

**(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 clearing of native vegetation is a key threatening process however the clearing involved for the conveyor corridor and the stockpile expansion areas would not have a negative impact on the species.

## **9.9 Grey-headed Flying-fox**

**(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,**

The Grey-headed Flying-fox is an opportunistic feeder on the blossom of eucalypts and would be found in the investigation area during flowering of Spotted Gum and Red Bloodwood in particular.

Conveyor: approximately 6ha of vegetation would be cleared in a narrow strip which not impact on any local viable population to the extent that the population would be placed at risk of extinction.

Stockpile expansion: approximately 7ha in several small portions would be cleared around the existing stockpile and washery. The required clearing would not impact on any local viable population to the extent that the population would be placed 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,**

There were no endangered populations listed for the investigation areas.

**(c) in the case of an 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**

Not applicable in the consideration of a single species.

**(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,**

Not applicable in the consideration of a single species.

**(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**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

**(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**

Conveyor: the clearing 20m wide clearing would not fragment or isolate other areas of habitat.

Stockpile expansion: the area to be cleared is located at the edge of the current stockpile and so would not involve any fragmentation or isolation of habitat.

**(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,**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

There would be no impact on the long-term survival of the species as a consequence of this clearing.

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

No critical habitat was present.

**(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

No recovery plan or threat abatement plan has been prepared for this species.

**(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 clearing of native vegetation is a key threatening process however the clearing involved for the conveyor corridor and the stockpile expansion areas would not have a negative impact on the species.

## 9.10 Bats

Yellow-bellied Sheath-tail-bat  
Eastern Freetail-bat  
Greater Broad-nosed Bat  
Eastern False Pipistrelle  
Little Bentwing-bat  
Eastern Bent-wing Bat  
Large-footed Myotis  
Large-eared Pied Bat

**(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,**

These insectivorous bats forage for insects at night beneath and above the tree canopy as well as along the cleared edges

Conveyor: approximately 6ha of vegetation would be cleared in a narrow strip which not impact on any local viable population to the extent that the population would be placed at risk of extinction.

Stockpile expansion: approximately 7ha in several small portions would be cleared around the existing stockpile and washery. The required clearing would not impact on any local viable population to the extent that the population would be placed 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,**

There were no endangered populations listed for the investigation areas.

**(c) in the case of an 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**

Not applicable in the consideration of a single species.

**(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,**

Not applicable in the consideration of a single species.

**(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**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

**(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**

Conveyor: the 20m wide clearing would not fragment or isolate other areas of habitat.

Stockpile expansion: the area to be cleared is located at the edge of the current stockpile and washery areas and so would not involve any fragmentation or isolation of habitat.

- (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,**

Conveyor: a narrow strip 20m wide, approximately 6ha in area, would be cleared.

Stockpile expansion: several small areas totalling about 7ha in area would be cleared around the existing stockpile and washery.

There would be no impact on the long-term survival of these species as a consequence of this clearing.

- (e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),**

No critical habitat was present.

- (f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

No recovery plan or threat abatement plan has been prepared for these species.

- (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 clearing of native vegetation is a key threatening process however the clearing involved for the conveyor corridor and the stockpile expansion areas would not have a negative impact on the species.

#### **9.11 Lower Hunter Spotted Gum – Ironbark forest**

- (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,**  
Not applicable to the consideration of an endangered community.

- (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,**

Not applicable to the consideration of an endangered community.

- (c) in the case of an 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**

Approximately 8ha would be cleared from a total of around 1200ha and this would not place the local occurrence of the community at risk of extinction.

- (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 proposed clearing would not modify the composition of the large area of the community that would be remaining. Its local occurrence would not be placed at risk of extinction.

- (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**

Conveyor: approximately 4 hectares of LHSGIF would be cleared in narrow strips 20m wide.



Stockpile expansion: approximately 4 hectares of LHSGIF would be cleared in several small patches around the perimeter of the existing coal storage and handling areas

**(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**

Conveyor: the 20m wide clearing would not fragment or isolate other areas of habitat.

Stockpile expansion: the areas to be cleared are located at the edge of the current stockpile and so would not result in any fragmentation or isolation of habitat.

**(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,**

Mapping of the vegetation communities extant on the Donaldson and Bloomfield properties (Driscoll & Bell 2005; Driscoll & Bell in progress) shows that there is around 1200ha of vegetation of a similar composition to MU17, Lower Hunter Spotted Gum – Ironbark Forest.

Conveyor: approximately 4 hectares of LHSGIF would be cleared in narrow strips 20m wide and this would not impact on the long-term survival of the community in this locality.

Stockpile expansion: approximately 4 hectares of LHSGIF would be cleared in several small patches around the perimeter of the existing coal storage and washery areas. This would not impact on the long-term survival of the community in this locality.

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

No critical habitat was present.

**(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

No recovery plan has been prepared for Lower Hunter Spotted Gum – Ironbark Forest.

**(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 clearing of native vegetation is a key threatening process however the clearing involved for the conveyor corridor and the stockpile expansion areas would not have a negative impact on the local or regional status of this endangered community.

## **9.12 Tetratheca juncea**

**(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,** Despite targeted searches having been conducted during the flowering season for the species, no *Tetratheca juncea* were recorded in or near the investigation area. Consequently a viable local population did not exist in the area.

**(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,**

No endangered population of *Tetratheca juncea* was present.

**(c) in the case of an 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**

Not applicable in the consideration of a single species.

**(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,**

Not applicable in the consideration of a single species.

**(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**

The most likely habitat for the species was the MU30 Coastal Plains Smooth-barked Apple Woodland of which it is proposed that about 3ha be cleared for stockpile expansion.

**(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**

No habitat fragmentation or isolation would occur.

**(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,**

Several extensive populations of *Tetratheca juncea* occur in the immediate region: around the Stony Pinch Reservoir and at the western end of the Donaldson property. The removal of about 3ha of potential habitat would not impact on the species in the area.

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

No critical habitat was present.

**(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,**

No recovery plan has been prepared for *Tetratheca juncea*

**(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 clearing of native vegetation is a key threatening process however the clearing involved for the conveyor corridor and the stockpile expansion areas would not have a negative impact on the local or regional status of this species.

## 10 Commonwealth EPBC Act 1999

This section provides consideration of wetlands of international importance (RAMSAR wetlands), listed migratory species and listed threatened species and populations in accordance with the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*.

### 10.1 Wetlands of international importance (Ramsar wetlands)

No wetlands of international importance (Ramsar wetlands) were present in the investigation area.

### 10.2 Listed migratory species

The Rufous fantail (*Rhipidura rufifrons*) was recorded in the investigation area and is listed under the Bonn convention (Australia is a range state).

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*

The Rufous Fantail prefers moist forest habitat and was found in riparian vegetation in the investigation area. The small amount of this habitat to be cleared would not have a significant impact on this bird.

- *result in invasive species that is harmful to the migratory species becoming established in an area of important habitat of the migratory species, or*

No invasive species detrimental to this bird would become established as a consequence of the construction of the conveyor corridor.

- *seriously disrupt the life-cycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of the species.*

There would be no impact on the life cycle of this bird.

### 10.3 Listed threatened species and populations

#### 10.3.1 Endangered species

##### Swift Parrot

##### Regent Honeyeater

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

- ***lead to a long-term decrease in the size of a population, or***

Both species are migratory to the area and are opportunistic feeders on blossom. There would be no significant impact on the available resources for these birds in the area brought about through the loss of about 11ha of vegetation.

- ***reduce the area of occupancy of the species, or***

There potential area of occupancy of the species would not be reduced.

- ***fragment an existing population into two or more populations, or***

No population fragmentation would occur.

- ***adversely affect habitat critical to the survival of a species, or***

No critical habitat would be affected.

- ***disrupt the breeding cycle of a population, or***

The breeding cycle of these birds would not be disrupted.

- ***modify, destroy, remove, isolate or decrease the availability or quality of***

***habitat to the extent that the species is likely to decline, or***

The clearing for the construction of the conveyor and stockpile expansion areas would not result in habitat fragmentation or isolation. There would be no detrimental impact on the species.

- ***result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat, or***

The clearing for the construction of the conveyor and stockpile expansion areas would not result in invasive species becoming established in the potential foraging habitat for these birds.

- ***interfere with the recovery of the species.***

There would be no interference with the recovery of the species.

### 10.3.2 Vulnerable Species

#### Grey-headed Flying Fox

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- ***lead to a long-term decrease in the size of an important population of a species, or***

The clearing for the construction of the conveyor and stockpile expansion areas would not place pressure on the viability of an important population of the species.

- ***reduce the area of occupancy of an important population, or***

The area of occupancy of the species would not be reduced.

- ***fragment an existing important population into two or more populations, or***

No population fragmentation would occur.

- ***adversely affect habitat critical to the survival of a species, or***

No critical habitat would be affected.

- ***disrupt the breeding cycle of an important population, or***

Disruption to the breeding cycle of these bats would not occur.

- ***modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or***

The clearing for the construction of the conveyor and stockpile expansion areas would not result in habitat fragmentation or isolation. There would be no detrimental impact on the species.

- ***result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat, or***

The clearing for the construction of the conveyor and stockpile expansion areas would not result in invasive species becoming established in the potential foraging habitat for these bats.

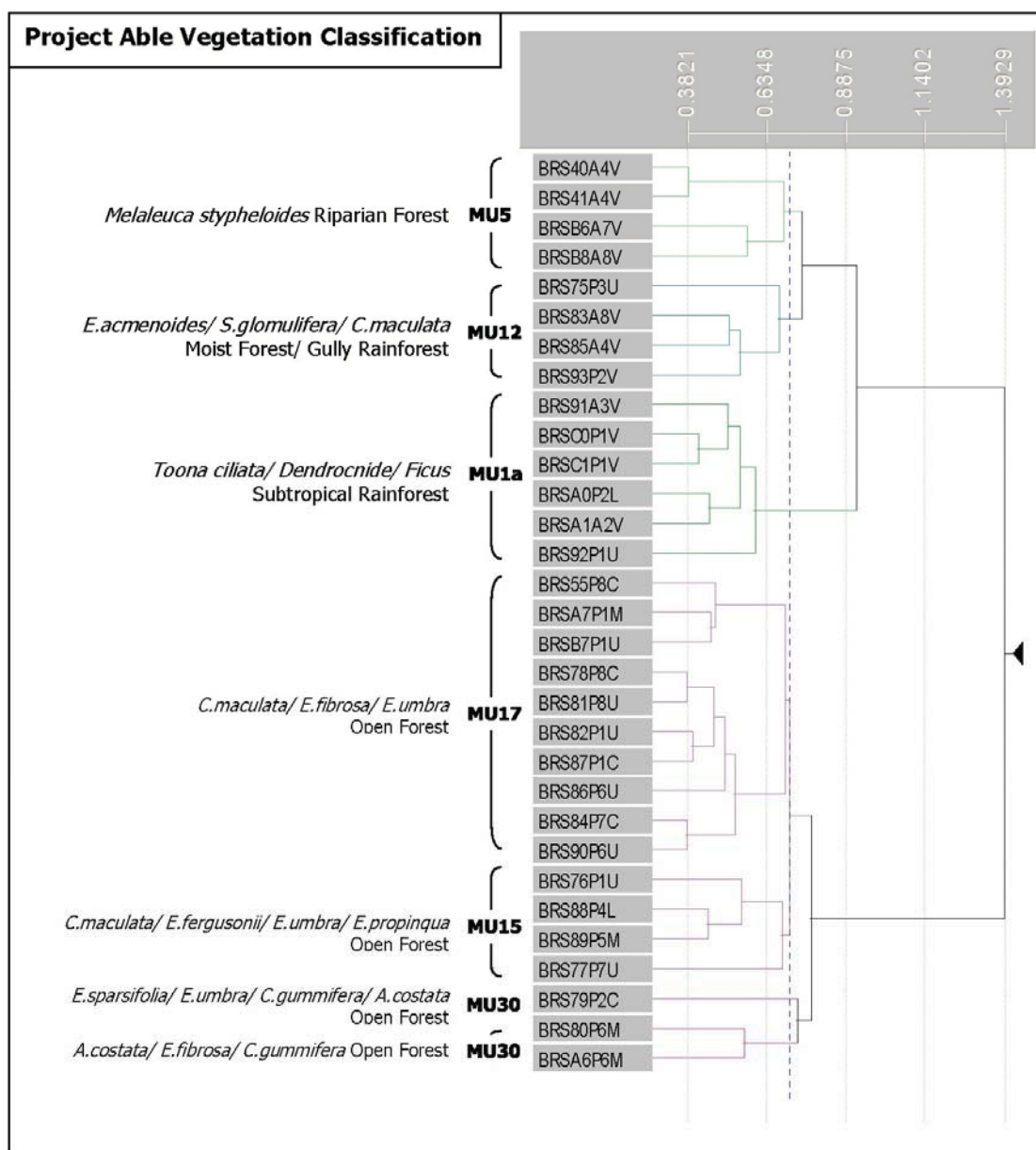
- ***interferes substantially with the recovery of the species.***

There would be no interference with the recovery of the species.

#### **10.4 Conclusion**

The results of the tests of significance for both the NSW *Threatened Species Conservation Act 1995* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* show that there would be no significant impact on any threatened species or endangered ecological communities resulting from the works associated with the construction of the coal conveyor and the expansion of the coal stockpile areas at the Bloomfield CHPP.

11 Dendrogram using PATN (Belbin 1989) analysing the vegetative plot data from the Abel Underground Mine area



## 12 Species of flora identified during the field assessment – Abel Underground Mine area

Class	Family	Species
Ferns (Filicopsida)	Adiantaceae	<b>Adiantum aethiopicum</b>
		<i>Adiantum diaphanum</i>
		<i>Adiantum formosum</i>
		<i>Adiantum hispidulum</i>
		<i>Cheilanthes austrotenuifolia</i>
		<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>
		<i>Pellaea falcata</i>
		<i>Pellaea nana</i>
		<i>Pellaea paradoxa</i>
	Aspleniaceae	<i>Asplenium attenuatum</i> var <i>attenuatum</i>
		<i>Asplenium australasicum</i> forma <i>australasicum</i>
		<i>Asplenium flabellifolium</i>
	Blechnaceae	<i>Blechnum cartilagineum</i>
		<i>Doodia aspera</i>
		<i>Doodia caudata</i>
	Cyatheaceae	<i>Cyathea australis</i>
	Davalliaceae	<i>Arthropteris palisotii</i>
		<i>Arthropteris tenella</i>
	Dennstaedtiaceae	<i>Pteridium esculentum</i>
	Dicksoniaceae	<i>Calochlaena dubia</i>
	Dryopteridaceae	<i>Lastreopsis acuminata</i>
		<i>Lastreopsis decomposita</i>
		<i>Polystichum australiense</i>
	Grammitaceae	<i>Grammitis billardieri</i>
	Lindsaeaceae	<i>Lindsaea microphylla</i>
	Polypodiaceae	<i>Dictymia brownii</i>
		<i>Microsorium scandens</i>
		<i>Pyrrosia rupestris</i>
		<i>Pteris umbrosa</i>
	Thelypteridaceae	<i>Christella dentata</i>
		<i>Christella hispidula</i>
Cycads (Cycadopsida)	Zamiaceae	<i>Macrozamia reducta</i>
Conifers (Coniferopsida)	Podocarpaceae	<i>Podocarpus elatus</i>
Flowering Plants (Dicotyledons)	Acanthaceae	<i>Brunoniella australis</i>
		<i>Pseuderanthemum variabile</i>
	Alangiaceae	<i>Alangium villosum</i> subsp. <i>polyosmoides</i>
	Anacardiaceae	<i>Euroschinus falcata</i> var. <i>falcata</i>
	Apiaceae	<i>Daucus glochidiatus</i>
		<i>Hydrocotyle laxiflora</i>
		<i>Hydrocotyle tripartita</i>
	Apocynaceae	<i>Melodinus australis</i>
		<i>Parsonsia straminea</i>
		<i>Astrotricha latifolia</i>
	Araliaceae	

Class	Family	Species
		<i>Polyscias sambucifolia</i> subsp. A
	Asclepiadaceae	<i>Marsdenia flavescent</i>
		<i>Marsdenia rostrata</i>
		<i>Marsdenia suaveolens</i>
		<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i>
		<i>Tylophora barbata</i>
	Asteraceae	<i>Ageratina adenophora</i> *
		<i>Brachyscome multifida</i> var. <i>multifida</i>
		<i>Lagenifera stipitata</i>
		<i>Senecio prenanthoides</i>
		<i>Sigesbeckia orientalis</i> subsp. <i>orientalis</i>
		<i>Vernonia cinerea</i> var. <i>cinerea</i>
		<i>Vittadinia cuneata</i> var. <i>cuneata</i>
		<i>Youngia japonica</i>
	Basellaceae	<i>Anredera cordifolia</i> *
	Bignoniaceae	<i>Pandorea pandorana</i>
	Capparaceae	<i>Capparis arborea</i>
	Caryophyllaceae	<i>Stellaria flaccida</i>
	Casuarinaceae	<i>Allocasuarina torulosa</i>
	Celastraceae	<i>Cassine australis</i> var. <i>australis</i>
		<i>Celastrus australis</i>
		<i>Maytenus silvestris</i>
	Chenopodiaceae	<i>Einadia hastata</i>
	Convolvulaceae	<i>Dichondra repens</i>
		<i>Polymeria calycina</i>
	Cunoniaceae	<i>Aphanopetalum resinosum</i>
		<i>Callicoma serratifolia</i>
		<i>Ceratopetalum apetalum</i>
		<i>Schizomeria ovata</i>
	Dilleniaceae	<i>Hibbertia aspera</i> subsp. <i>aspera</i>
		<i>Hibbertia dentata</i>
		<i>Hibbertia empetrifolia</i> subsp. <i>empetrifolia</i>
		<i>Hibbertia riparia</i>
		<i>Hibbertia scandens</i>
	Ebenaceae	<i>Diospyros australis</i>
	Elaeocarpaceae	<i>Elaeocarpus obovatus</i>
	Epacridaceae	<i>Epacris pulchella</i>
		<i>Leucopogon lanceolatus</i> var. <i>lanceolatus</i>
		<i>Trochocarpa laurina</i>
	Euphorbiaceae	<i>Alchornea ilicifolia</i>
		<i>Baloghia inophylla</i>
		<i>Beyeria viscosa</i>
		<i>Breynia oblongifolia</i>
		<i>Claoxylon australe</i>
		<i>Croton verreauxii</i>
		<i>Drypetes deplanchei</i> subsp. <i>deplanchei</i>
		<i>Glochidion ferdinandi</i> var. <i>ferdinandi</i>
		<i>Mallotus philippensis</i>
		<i>Omalthus populifolius</i>
		<i>Phyllanthus gunnii</i>



Class	Family	Species
		<i>Phyllanthus hirtellus</i>
		<i>Poranthera microphylla</i>
	Eupomatiaceae	<i>Eupomatia laurina</i>
	Fabaceae (Faboideae)	<i>Daviesia ulicifolia</i> subsp. <i>ulicifolia</i>
		<i>Desmodium brachypodum</i>
		<i>Desmodium gunnii</i>
		<i>Desmodium rhytidophyllum</i>
		<i>Glycine clandestina</i>
		<i>Glycine microphylla</i>
		<i>Glycine tabacina</i>
		<i>Hardenbergia violacea</i>
		<i>Hovea longifolia</i>
		<i>Indigofera australis</i>
		<i>Kennedia rubicunda</i>
		<i>Mirbelia rubiifolia</i>
		<i>Podolobium ilicifolium</i>
		<i>Pultenaea paleacea</i>
		<i>Pultenaea spinosa</i>
		<i>Pultenaea villosa</i>
	Fabaceae (Mimosoideae)	<i>Acacia fimbriata</i>
		<i>Acacia implexa</i>
		<i>Acacia irrorata</i> subsp. <i>irrorata</i>
		<i>Acacia linifolia</i>
		<i>Acacia longifolia</i> subsp. <i>longifolia</i>
		<i>Acacia maidenii</i>
		<i>Pararchidendron pruinsum</i> var. <i>pruinsum</i>
	Flacourtiaceae	<i>Scolopia braunii</i>
	Geraniaceae	<i>Geranium homeanum</i>
		<i>Pelargonium inodorum</i>
	Goodeniaceae	<i>Goodenia hederacea</i> subsp. <i>hederacea</i>
		<i>Goodenia heterophylla</i> subsp. <i>heterophylla</i>
	Haloragaceae	<i>Gonocarpus tetragynus</i>
	Lamiaceae	<i>Plectranthus parviflorus</i>
		<i>Scutellaria humilis</i>
	Lauraceae	<i>Cassytha glabella</i> forma <i>glabella</i>
		<i>Cassytha pubescens</i>
		<i>Cryptocarya microneura</i>
		<i>Cryptocarya obovata</i>
		<i>Cryptocarya rigida</i>
		<i>Neolitsea dealbata</i>
	Lobeliaceae	<i>Lobelia alata</i> var. <i>alata</i>
		<i>Pratia purpurascens</i>
	Loganiaceae	<i>Logania albiflora</i>
		<i>Logania pusilla</i>
	Loranthaceae	<i>Dendrophthoe vitellina</i>
	Malvaceae	<i>Abutilon oxycarpum</i> var. <i>oxycarpum</i>
		<i>Hibiscus heterophyllus</i> subsp. <i>heterophyllus</i>
		<i>Howittia trilocularis</i>

<b>Class</b>	<b>Family</b>	<b>Species</b>
	Meliaceae	<i>Dysoxylum fraserianum</i>
		<i>Synoum glandulosum</i> subsp. <i>glandulosum</i>
		<i>Toona ciliata</i>
	Menispermaceae	<i>Legnephora moorei</i>
		<i>Sarcopetalum harveyanum</i>
		<i>Stephania japonica</i> var. <i>discolor</i>
	Monimiaceae	<i>Daphnandra species A</i>
		<i>Hedycarya angustifolia</i>
		<i>Wilkiea huegeliana</i>
	Moraceae	<i>Ficus coronata</i>
		<i>Ficus fraseri</i>
		<i>Ficus macrophylla</i> subsp. <i>macrophylla</i>
		<i>Ficus obliqua</i>
		<i>Ficus rubiginosa</i>
		<i>Ficus watkinsiana</i>
		<i>Maclura cochinchinensis</i>
		<i>Morus alba</i>
		<i>Streblus brunonianus</i>
		<i>Trophis scandens</i> subsp. <i>scandens</i>
	Myrsinaceae	<i>Embelia australiana</i>
		<i>Rapanea howittiana</i>
		<i>Rapanea variabilis</i>
	Myrtaceae	<i>Acmena smithii</i>
		<i>Angophora costata</i>
		<i>Babingtonia similis</i>
		<i>Backhousia myrtifolia</i>
		<i>Callistemon rigidus</i>
		<i>Callistemon salignus</i>
		<i>Callistemon shiressii</i>
		<i>Corymbia gummifera</i>
		<i>Corymbia maculata</i>
		<i>Eucalyptus acmenoides</i>
		<i>Eucalyptus beyeriana</i>
		<i>Eucalyptus canaliculata</i>
		<i>Eucalyptus crebra</i>
		<i>Eucalyptus fergusonii</i> subsp. <i>dorsiventralis</i>
		<i>Eucalyptus fibrosa</i>
		<i>Eucalyptus grandis</i>
		<i>Eucalyptus nicholii</i>
		<i>Eucalyptus paniculata</i> subsp. <i>paniculata</i>
		<i>Eucalyptus propinqua</i>
		<i>Eucalyptus punctata</i>
		<i>Eucalyptus resinifera</i> subsp. <i>resinifera</i>
		<i>Eucalyptus saligna</i>
		<i>Eucalyptus siderophloia</i>
		<i>Eucalyptus sparsifolia</i>
		<i>Eucalyptus umbra</i>
		<i>Gossia acmenoides</i>
		<i>Leptospermum polygalifolium</i> subsp. <i>cismontanum</i>
		<i>Melaleuca nodosa</i>

Class	Family	Species
		<i>Melaleuca styphelioides</i>
		<i>Rhodamnia rubescens</i>
		<i>Syncarpia glomulifera</i> subsp. <i>glomulifera</i>
		<i>Syzygium australe</i>
	Oleaceae	<i>Ligustrum sinense</i> *
		<i>Notelaea longifolia</i> forma <i>longifolia</i>
		<i>Notelaea venosa</i>
	Oxalidaceae	<i>Oxalis chnoodes</i>
		<i>Oxalis perennans</i>
	Passifloraceae	<i>Passiflora edulis</i> *
		<i>Passiflora herbertiana</i> subsp. <i>herbertiana</i>
	Peperomiaceae	<i>Peperomia blanda</i> var. <i>floribunda</i>
	Pittosporaceae	<i>Billardiera scandens</i>
		<i>Billardiera mutabilis</i>
		<i>Bursaria spinosa</i>
		<i>Hymenosporum flavum</i>
		<i>Pittosporum multiflorum</i>
		<i>Pittosporum revolutum</i>
		<i>Pittosporum undulatum</i>
	Polygonaceae	<i>Muehlenbeckia gracillima</i>
	Proteaceae	<i>Banksia spinulosa</i> var. <i>collina</i>
		<i>Hakea bakeriana</i>
		<i>Lambertia formosa</i>
		<i>Persoonia levis</i>
		<i>Persoonia linearis</i>
		<i>Stenocarpus salignus</i>
	Ranunculaceae	<i>Clematis glycinoides</i> var. <i>glycinoides</i>
	Rhamnaceae	<i>Alphitonia excelsa</i>
		<i>Emmenosperma alphitonioides</i>
	Rosaceae	<i>Rubus moluccanus</i> var. <i>trilobus</i>
		<i>Rubus parvifolius</i>
		<i>Rubus rosifolius</i>
	Rubiaceae	<i>Galium binifolium</i>
		<i>Galium propinquum</i>
		<i>Morinda jasminoides</i>
		<i>Opercularia diphylla</i>
		<i>Pomax umbellata</i>
		<i>Randia benthamiana</i> (?)
	Rutaceae	<i>Acronychia oblongifolia</i>
		<i>Correa reflexa</i> var. <i>reflexa</i>
		<i>Melicope micrococca</i>
		<i>Phebalium squamulosum</i> subsp. <i>squamulosum</i>
		<i>Sarcomelicope simplicifolia</i> subsp. <i>simplicifolia</i>
	Sapindaceae	<i>Alectryon subcinereus</i>
		<i>Diploglottis australis</i>
		<i>Guioa semiglauca</i>
		<i>Mischocarpus australis</i>
		<i>Rhysotoechia bifoliolata</i> subsp. <i>bifoliolata</i>
	Sapotaceae	<i>Pouteria australis</i>
	Scrophulariaceae	<i>Veronica plebeia</i>

Class	Family	Species
	Solanaceae	<i>Solanum aviculare</i>
		<i>Solanum brownii</i>
		<i>Solanum mauritianum</i> *
		<i>Solanum prinophyllum</i>
	Sterculiaceae	<i>Brachychiton acerifolius</i>
		<i>Brachychiton populneus</i> subsp. <i>populneus</i>
		<i>Commersonia fraseri</i>
	Stylidiaceae	<i>Stylidium graminifolium</i>
	Symplocaceae	<i>Symplocos thwaitesii</i>
	Thymelaeaceae	<i>Pimelea linifolia</i> subsp. <i>linifolia</i>
	Tremandraceae	<i>Tetratheca juncea</i>
	Urticaceae	<i>Dendrocnide excelsa</i>
		<i>Dendrocnide photinophylla</i>
	Verbenaceae	<i>Clerodendrum tomentosum</i>
		<i>Lantana camara</i> *
	Violaceae	<i>Viola betonicifolia</i>
		<i>Viola hederacea</i> forma C
	Vitaceae	<i>Cayratia clematidea</i>
		<i>Cissus antarctica</i>
		<i>Cissus hypoglauca</i>
		<i>Tetrastigma nitens</i>
Flowering Plants	Anthericaceae	<i>Arthropodium minus</i>
(Monocotyledons)		<i>Caesia parviflora</i> var. <i>parviflora</i>
		<i>Thysanotus tuberosus</i> subsp. <i>tuberosus</i>
	Araceae	<i>Gymnostachys anceps</i>
	Arecaceae	<i>Livistona australis</i>
	Commelinaceae	<i>Aneilema acuminatum</i>
		<i>Pollia crispata</i>
		<i>Tradescantia albiflora</i> *
	Cyperaceae	<i>Carex brunnea</i>
		<i>Carex declinata</i>
		<i>Carex longebrachiata</i>
		<i>Cyperus enervis</i>
		<i>Cyperus imbecillis</i>
		<i>Cyperus laevis</i>
		<i>Cyperus tetraphyllus</i>
		<i>Gahnia aspera</i>
		<i>Gahnia melanocarpa</i>
		<i>Isolepis inundata</i>
		<i>Isolepis platycarpa</i>
		<i>Lepidosperma laterale</i>
		<i>Ptilothrix deusta</i>
		<i>Scleria mackaviensis</i>
	Dioscoreaceae	<i>Dioscorea transversa</i>
	Iridaceae	<i>Libertia paniculata</i>
		<i>Patersonia sericea</i>
	Lomandraceae	<i>Lomandra confertifolia</i> subsp. <i>pallida</i>
		<i>Lomandra confertifolia</i> subsp. <i>rubiginosa</i>
		<i>Lomandra cylindrica</i>
		<i>Lomandra filiformis</i> subsp. <i>coriacea</i>
		<i>Lomandra filiformis</i> subsp. <i>filiformis</i>

Class	Family	Species
		<i>Lomandra glauca</i>
		<i>Lomandra longifolia</i>
		<i>Lomandra multiflora</i> subsp. <i>multiflora</i>
		<i>Lomandra obliqua</i>
	Luzuriagaceae	<i>Eustrephus latifolius</i>
		<i>Geitonoplesium cymosum</i>
	Orchidaceae	<i>Caladenia catenata</i>
		<i>Calochilus robertsonii</i>
		<i>Cymbidium suave</i>
		<i>Dendrobium aemulum</i>
		<i>Dendrobium gracilicaule</i>
		<i>Plectorrhiza tridentata</i>
		<i>Sarcochilus australis</i>
		<i>Sarcochilus falcatus</i>
	Phormiaceae	<i>Dianella caerulea</i> var. <i>assera</i>
		<i>Dianella revoluta</i> var. <i>revoluta</i>
	Poaceae	<i>Aristida vagans</i>
		<i>Cenchrus caliculatus</i>
		<i>Cortaderia selloana</i> *
		<i>Cymbopogon refractus</i>
		<i>Dichelachne micrantha</i>
		<i>Digitaria ramularis</i>
		<i>Entolasia marginata</i>
		<i>Entolasia stricta</i>
		<i>Eragrostis brownii</i>
		<i>Imperata cylindrica</i> var. <i>major</i>
		<i>Joycea pallida</i>
		<i>Microlaena stipoides</i> var. <i>stipoides</i>
		<i>Oplismenus aemulus</i>
		<i>Oplismenus imbecillis</i>
		<i>Panicum effusum</i>
		<i>Panicum simile</i>
		<i>Paspalidium distans</i>
		<i>Poa affinis</i>
		<i>Poa labillardierei</i> var. <i>labillardierei</i>
		<i>Themeda australis</i>
	Ripogonaceae	<i>Ripogonum album</i>
		<i>Ripogonum fawcettianum</i>
	Smilacaceae	<i>Smilax australis</i>
		<i>Smilax glycyphylla</i>
	Xanthorrhoeaceae	<i>Xanthorrhoea latifolia</i> subsp. <i>latifolia</i>
		<i>Xanthorrhoea macronema</i>
	Zingiberaceae	<i>Alpinia caerulea</i>

### 13 Fauna species considered likely to be present - Abel Underground Mine area

KEY: STRF = Sub-tropical Rainforest; V = Vulnerable NSW TSC Act; VC = Vulnerable Commonwealth EPBC Act, E = Endangered NSW TSC Act; EC = Endangered Commonwealth EPBC Act, I = Introduced; \* = recorded during the field investigation.

#### Mammals

Common Name	Scientific Name	Status	STRF	Moist Forest	Dry Forest	Cleared
<b>Megachiropteran Bats</b>						
Grey-headed Flying Fox	<i>Pteropus poliocephalus</i>	V, VC	✓	✓	✓	✓
Little Red Flying Fox	<i>Pteropus scapulatus</i>		✓	✓	✓	
<b>Microchiropteran Bats</b>						
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>		✓	✓	✓	✓
Chocolate Wattled Bat	<i>Chalinolobus morio</i>		✓	✓	✓	✓
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	V	✓	✓	✓	✓
Little Bent-wing Bat	<i>Miniopterus australis</i>	V	✓	✓	✓	✓
Common Bent-wing Bat	<i>Miniopterus schreibersii</i>	V	✓	✓	✓	✓
Eastern Freetail Bat	<i>Mormopterus norfolkensis</i>	V	✓	✓	✓	✓
Large-footed Myotis	<i>Myotis adversus</i>	V	✓	✓	✓	✓
White-striped Freetailed-bat	<i>Nyctinomus australis</i>			✓	✓	✓
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>		✓	✓	✓	✓
Gould's Long-eared Bat	<i>Nyctophilus gouldi</i>		✓	✓	✓	✓
Eastern Horseshoe Bat	<i>Rhinolophus megaphyllus</i>		✓	✓	✓	✓
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	V	✓	✓	✓	✓
Eastern Broad-nosed Bat	<i>Scoteanax orion</i>		✓	✓	✓	✓
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	V	✓	✓	✓	✓
Large Forest Bat *	<i>Vespadelus darlingtoni</i>		✓	✓	✓	✓
Southern Forest Bat	<i>Vespadelus regulus</i>		✓	✓	✓	✓
Little Forest Bat	<i>Vespadelus vulturinus</i>		✓	✓	✓	✓
<b>Eutherian Mammals</b>						
Dingo, Domestic Dog	<i>Canis lupus dingo</i>	I	✓	✓	✓	✓
Cat	<i>Felis cattus</i>	I	✓	✓	✓	✓
Brown Hare	<i>Lepus capensis</i>	I			✓	✓
House Mouse	<i>Mus musculus</i>	I				✓
Rabbit	<i>Oryctolagus cuniculus</i>	I				✓
Bush Rat	<i>Rattus fuscipes</i>			✓	✓	
Swamp Rat	<i>Rattus lutreolus</i>			✓		
Black Rat	<i>Rattus rattus</i>	I		✓	✓	
Fox	<i>Vulpes vulpes</i>	I	✓	✓	✓	✓
<b>Marsupials</b>						
Feathertail Glider	<i>Acrobates pygmaeus</i>			✓	✓	
Yellow-footed Antechinus	<i>Antechinus flavipes</i>		✓	✓	✓	
Brown Antechinus	<i>Antechinus stuartii</i>		✓	✓	✓	
Dusky Antechinus	<i>Antechinus swainsonii</i>		✓	✓		
Eastern Pygmy Possum	<i>Cercartetus nanus</i>	V			✓	

Common Name	Scientific Name	Status	STRF	Moist Forest	Dry Forest	Cleared
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	V, EC	✓	✓	✓	
Northern Brown Bandicoot	<i>Isodon macrourus</i>		✓	✓	✓	✓
*Eastern Grey Kangaroo	<i>Macropus giganteus</i>			✓	✓	✓
*Red-necked Wallaby	<i>Macropus rufogriseus</i>			✓	✓	✓
Long-nosed Bandicoot	<i>Perameles nasuta</i>		✓	✓	✓	✓
Greater Glider	<i>Petauroides volans</i>			✓	✓	
Yellow-bellied Glider	<i>Petaurus australis</i>	V		✓	✓	
Sugar Glider	<i>Petaurus breviceps</i>			✓	✓	
Squirrel Glider	<i>Petaurus norfolcensis</i>	V		✓	✓	
Common Ringtail Possum	<i>Pseudocheirus peregrinus</i>		✓	✓	✓	
Common Dunnart	<i>Sminthopsis murina</i>				✓	
Mountain Brushtail Possum	<i>Trichosurus caninus</i>		✓	✓		
Common Brushtail Possum	<i>Trichosurus vulpecula</i>		✓	✓	✓	
*Common Wombat	<i>Vombatus ursinus</i>				✓	✓
*Swamp Wallaby	<i>Wallabia bicolor</i>		✓	✓	✓	
<b>Monotremes</b>						
Short-beaked Echidna	<i>Tachyglossus aculeata</i>			✓	✓	
Platypus	<i>Ornithorhynchus anatinus</i>			✓		

### Amphibians and Reptiles

Common Name	Scientific Name	Status	STRF	Moist Forest	Dry Forest	Cleared	Dams
<b>Amphibians</b>							
Tusked Frog	<i>Adelotus brevis</i>		✓	✓	✓		✓
*Common Eastern Froglet	<i>Crinia signifera</i>			✓	✓	✓	✓
Pobblebonk frog	<i>Limnodynastes dumerilii grayi</i>		✓	✓	✓	✓	✓
Striped Marsh Frog	<i>Limnodynastes peronii</i>		✓	✓	✓	✓	✓
Spotted Grass Frog	<i>Limnodynastes tasmaniensis</i>			✓		✓	✓
Green & Golden Bell Frog	<i>Litoria aurea</i>	E, VC					✓
Green-thighed Frog	<i>Litoria brevipalmata</i>	V	✓	✓	✓		
Common Green Tree Frog	<i>Litoria caerulea</i>			✓	✓	✓	✓
Bleating Tree Frog	<i>Litoria dentata</i>			✓			✓
Dwarf Green Tree Frog	<i>Litoria fallax</i>			✓	✓		✓
Broad-palmed Frog	<i>Litoria latopalmata</i>			✓		✓	✓
*Peron's Tree Frog	<i>Litoria peronii</i>		✓	✓	✓		✓
Leaf Green Tree Frog	<i>Litoria phyllochroa</i>		✓	✓			
Whirring Tree Frog	<i>Litoria revelata</i>			✓			✓
Tyler's Tree Frog	<i>Litoria tyleri</i>			✓			✓
Whistling Tree Frog	<i>Litoria verreauxii</i>			✓			✓
Rocky River Frog	<i>Litoria wilcoxii</i>			✓	✓		
Stuttering Frog	<i>Mixophyes balbus</i>	V, VC	✓				
Great Barred Frog	<i>Mixophyes fasciolatus</i>		✓				
Giant Barred Frog	<i>Mixophyes iteratus</i>	E, EC	✓				



Common Name	Scientific Name	Status	STRF	Moist Forest	Dry Forest	Cleared	Dams
Ornate Borrowing Frog	<i>Ophistodon ornatus</i>		✓	✓			
Brown Toadlet	<i>Pseudophryne bibroni</i>			✓	✓		✓
Red-backed Toadlet	<i>Pseudophryne coriacea</i>		✓	✓	✓		
Dusky Toadlet	<i>Uperolea fusca</i>			✓	✓	✓	✓
Smooth Toadlet	<i>Uperolea laevisgata</i>			✓	✓	✓	✓
<b>Reptiles</b>							
Common Death Adder	<i>Acanthophis antarcticus</i>				✓		
Red-throated Skink	<i>Acritoscincus platynotum</i>				✓		
*Jacky Lizard	<i>Amphibolurus muricatus</i>			✓	✓		
Brown Tree Snake	<i>Boiga irregularis</i>			✓	✓		
Southern Dwarf Tree Snake	<i>Cacophis krefftii</i>		✓	✓			
Golden-crowned Snake	<i>Cacophis squamulosus</i>		✓	✓			
Litter Skink	<i>Carlia foliorum</i>				✓		
Southern Rainbow Skink	<i>Carlia tetradactyla</i>				✓		
Long-necked Turtle	<i>Chelodina longicollis</i>		✓	✓			✓
Wall Lizard	<i>Cryptoblepharus virgatus</i>				✓		
Robust Ctenotus	<i>Ctenotus robustus</i>				✓		
Copper-tailed Skink	<i>Ctenotus taeniolatus</i>			✓	✓		
*Pink-tongued Lizard	<i>Cyclodomorphus gerrardii</i>		✓				
Eastern She-oak Skink	<i>Cyclodomorphus michaeli</i>			✓	✓		
Yellow-faced Whip Snake	<i>Demansia psammophis</i>			✓	✓		
Green Tree Snake	<i>Dendrelaphis punctulata</i>		✓	✓	✓		
Eastern Stone Gecko	<i>Diplodactylus vittatus</i>			✓	✓		
Land Mullet	<i>Egernia major</i>			✓	✓		
Tree Skink	<i>Egernia striolata</i>				✓		
White's Skink	<i>Egernia whitii</i>				✓		
Eastern Water Skink	<i>Eulamprus quoyii</i>			✓	✓		✓
Greater Bar-sided Skink	<i>Eulamprus tenuis</i>		✓	✓	✓		
Red-naped Snake	<i>Furina diadema</i>			✓	✓		
Marsh Snake	<i>Hemiaspis signata</i>		✓	✓			
Pale-headed Snake	<i>Hoplocephalus bitorquatus</i>	V	✓	✓			
Stephen's Banded Snake	<i>Hoplocephalus stephensii</i>	V	✓	✓			
Southern Angle-headed Dragon	<i>Hypsilurus spinipes</i>			✓			
*Garden Sunskink	<i>Lampropholis delicata</i>			✓	✓	✓	✓
*Grass Sun Skink	<i>Lampropholis guichenoti</i>		✓	✓	✓		
Burton's Legless Lizard	<i>Lialis burtonis</i>			✓	✓		
Diamond/Carpet Python	<i>Morelia spilota</i>			✓			
Tiger Snake	<i>Notechis scutatus</i>		✓	✓	✓		
Lesueur's Velvet Gecko	<i>Oedura lesueurii</i>				✓		
Broad-tailed Gecko	<i>Phyllurus platurus</i>			✓			✓
Eastern Water Dragon	<i>Physignathus lesueurii</i>			✓			✓
Eastern Bearded Dragon	<i>Pogona barbata</i>				✓		
Red-bellied Black Snake	<i>Pseudechis porphyriacus</i>		✓	✓	✓	✓	✓
Eastern Brown Snake	<i>Pseudonaja textilis</i>				✓	✓	
Common Scaly Foot	<i>Pygopus lepidopodus</i>			✓	✓		
Blackish Blind Snake	<i>Ramphotyphlops nigriscens</i>			✓	✓		
Blind Snake	<i>Ramphotyphlops proximus</i>			✓			✓
Mountain Dragon	<i>Rankinia diemensis</i>			✓		✓	

Common Name	Scientific Name	Status	STRF	Moist Forest	Dry Forest	Cleared	Dams
Eastern Small-eyed Snake	<i>Rhinoplocephalus nigrescens</i>			✓	✓		
Three-toed Skink	<i>Saiphos equalis</i>		✓	✓			
Weasel Skink	<i>Saproscincus mustelinus</i>			✓			
Common Blue-tongue Lizard	<i>Tiliqua scincoides</i>			✓	✓		
*Lace Monitor	<i>Varanus varius</i>		✓	✓	✓		✓
Bandy Bandy	<i>Vermicella annulata</i>			✓	✓		

### Birds

Common Name	Scientific name	Status	STRF	Moist Forest	Dry Forest	Cleared	Dams
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>				✓	✓	
*Striated Thornbill	<i>Acanthiza lineata</i>			✓	✓		
*Yellow Thornbill	<i>Acanthiza nana</i>			✓	✓		
*Brown Thornbill	<i>Acanthiza pusilla</i>			✓	✓		
Buff-rumped Thornbill	<i>Acanthiza reguloides</i>				✓		
*Eastern Spinebill	<i>Acanthorhynchus tenuirostris</i>				✓		
Collared Sparrowhawk	<i>Accipiter cirrocephalus</i>			✓	✓	✓	
*Brown Goshawk	<i>Accipiter fasciatus</i>			✓	✓	✓	
Grey Goshawk	<i>Accipiter novaehollandiae</i>			✓	✓	✓	
Common Myna <sup>I</sup>	<i>Acridotheres tristis</i>	I				✓	
*Australian Owlet-nightjar	<i>Aegotheles cristatus</i>			✓	✓		
Green Catbird	<i>Ailuroedus crassirostris</i>		✓	✓			
Skylark	<i>Alauda arvensis</i>					✓	
Azure Kingfisher	<i>Alcedo azurea</i>			✓			
*Australian Brush-turkey	<i>Alectura lathami</i>		✓				
Australian King-Parrot	<i>Alisterus scapularis</i>			✓	✓		
Chestnut Teal	<i>Anas castanea</i>						✓
Grey Teal	<i>Anas gracilis</i>						✓
Pacific Black Duck	<i>Anas superciliosa</i>						✓
*Red Wattlebird	<i>Anthochaera carnunculata</i>				✓		
Richard's Pipit	<i>Anthus novaeseelandiae</i>					✓	
*Wedge-tailed Eagle	<i>Aquila audax</i>			✓	✓	✓	
Great Egret	<i>Ardea alba</i>						✓
Cattle Egret	<i>Ardea ibis</i>					✓	
White-necked Heron	<i>Ardea pacifica</i>						✓
Dusky Woodswallow	<i>Artamus cyanopterus</i>					✓	
White-breasted Woodswallow	<i>Artamus leucorhynchus</i>					✓	
Pacific Baza	<i>Aviceda subcristata</i>		✓	✓	✓		
Hardhead	<i>Aythya australis</i>						✓
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>						
Galah	<i>Cacatua roseicapilla</i>					✓	
Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>			✓	✓		

Common Name	Scientific name	Status	STRF	Moist Forest	Dry Forest	Cleared	Dams
Brush Cuckoo	<i>Cacomantis variolosus</i>			✓	✓		
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	V		✓	✓		
Yellow-tailed Black-Cockatoo	<i>Calyptorhynchus funereus</i>			✓	✓		
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	V		✓	✓		
Pheasant Coucal	<i>Centropus phasianinus</i>					✓	
Australian Wood Duck	<i>Chenonetta jubata</i>						✓
Horsfield's Bronze-Cuckoo	<i>Chrysococcyx basalis</i>			✓	✓		
Shining Bronze-Cuckoo	<i>Chrysococcyx lucidus</i>			✓	✓		
Speckled Warbler	<i>Chthonicola sagittata</i>	V			✓		
Spotted Quail-thrush	<i>Cinclosoma punctatum</i>				✓		
Golden-headed Cisticola	<i>Cisticola exilis</i>					✓	
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	V			✓		
*Grey Shrike-thrush	<i>Colluricincla harmonica</i>			✓	✓		
White-headed Pigeon	<i>Columba leucomela</i>			✓			
*Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>			✓	✓		
White-bellied Cuckoo-shrike	<i>Coracina papuensis</i>				✓		
*Cicadabird	<i>Coracina tenuirostris</i>			✓	✓		
*White-winged Chough	<i>Corcorax melanorhamphos</i>				✓	✓	
*White-throated Treecreeper	<i>Cormobates leucophaeus</i>			✓	✓		
*Australian Raven	<i>Corvus coronoides</i>			✓	✓		
King Quail	<i>Coturnix chinensis</i>				✓	✓	
Brown Quail	<i>Coturnix ypsilophora</i>				✓	✓	
Pied Butcherbird	<i>Cracticus nigrogularis</i>				✓		
*Grey Butcherbird	<i>Cracticus torquatus</i>				✓		
Pallid Cuckoo	<i>Cuculus pallidus</i>				✓	✓	
*Laughing Kookaburra	<i>Dacelo novaeguineae</i>			✓	✓	✓	
*Varied Sittella	<i>Daphoenositta chrysoptera</i>			✓	✓		
*Mistletoebird	<i>Dicaeum hirundinaceum</i>			✓	✓		
Spangled Drongo	<i>Dicrurus bracteatus</i>			✓	✓		
Little Egret	<i>Egretta garzetta</i>						✓
White-faced Heron	<i>Egretta novaehollandiae</i>						✓
Black-shouldered Kite	<i>Elanus axillaris</i>					✓	
*Eastern Yellow Robin	<i>Eopsaltria australis</i>			✓	✓		
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	E					✓
Common Koel	<i>Eudynamis scolopacea</i>			✓	✓		
White-throated Nightjar	<i>Eurostopodus mystacalis</i>				✓		
*Dollarbird	<i>Eurystomus orientalis</i>				✓		
Brown Falcon	<i>Falco berigora</i>				✓	✓	
Nankeen Kestrel	<i>Falco cenchroides</i>					✓	

Common Name	Scientific name	Status	STRF	Moist Forest	Dry Forest	Cleared	Dams
Australian Hobby	<i>Falco longipennis</i>					✓	
Peregrine Falcon	<i>Falco peregrinus</i>			✓	✓	✓	
Black Falcon	<i>Falco subniger</i>				✓	✓	
Crested Shrike-tit	<i>Falcunculus frontatus</i>			✓			
Latham's Snipe	<i>Gallinago hardwickii</i>					✓	✓
Dusky Moorhen	<i>Gallinula tenebrosa</i>						✓
Black-tailed Native-hen	<i>Gallinula ventralis</i>						✓
Buff-banded Rail	<i>Gallirallus philippensis</i>						✓
*Bar-shouldered Dove	<i>Geopelia humeralis</i>			✓	✓		
Brown Gerygone	<i>Gerygone mouki</i>				✓		
White-throated Gerygone	<i>Gerygone olivacea</i>			✓	✓		
Musk Lorikeet	<i>Glossopsitta concinna</i>			✓	✓		
Little Lorikeet	<i>Glossopsitta pusilla</i>			✓	✓		
Magpie-lark	<i>Grallina cyanoleuca</i>				✓	✓	
*Australian Magpie	<i>Gymnorhina tibicen</i>				✓	✓	
Little Eagle	<i>Hieraaetus morphnoides</i>			✓	✓		
Black-winged Stilt	<i>Himantopus himantopus</i>						✓
Fairy Martin	<i>Hirundo ariel</i>					✓	
Welcome Swallow	<i>Hirundo neoxena</i>					✓	
Tree Martin	<i>Hirundo nigricans</i>					✓	
White-winged Triller	<i>Lalage sueurii</i>				✓		
Swift Parrot	<i>Lathamus discolor</i>	E, EC			✓		
*Wonga Pigeon	<i>Leucosarcia melanoleuca</i>			✓	✓		
Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>			✓	✓		
Fuscous Honeyeater	<i>Lichenostomus fuscus</i>				✓		
Yellow-tufted Honeyeater	<i>Lichenostomus melanops</i>			✓	✓		
Chestnut-breasted Mannikin	<i>Lonchura castaneothorax</i>					✓	
Topknot Pigeon	<i>Lopholaimus antarcticus</i>		✓	✓			
*Brown Cuckoo-Dove	<i>Macropygia amboinensis</i>		✓	✓	✓		
*Superb Fairy-wren	<i>Malurus cyaneus</i>				✓		
*Variegated Fairy-wren	<i>Malurus lamberti</i>				✓		
*Noisy Miner	<i>Manorina melanocephala</i>				✓		
*Bell Miner	<i>Manorina melanophrys</i>			✓			
Hooded Robin (south-eastern form)	<i>Melanodryas cucullata cucullata</i>	V			✓		
*Lewin's Honeyeater	<i>Meliphaga lewinii</i>			✓	✓		
*Brown-headed Honeyeater	<i>Melithreptus brevirostris</i>			✓	✓		
Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>	V		✓	✓		
*White-naped Honeyeater	<i>Melithreptus lunatus</i>			✓	✓		

Common Name	Scientific name	Status	STRF	Moist Forest	Dry Forest	Cleared	Dams
*Superb Lyrebird	<i>Menura novaehollandiae</i>			✓	✓		
Rainbow Bee-eater	<i>Merops ornatus</i>				✓	✓	
Jacky Winter	<i>Microeca fascinans</i>				✓	✓	
*Black-faced Monarch	<i>Monarcha melanopsis</i>		✓	✓	✓		
Spectacled Monarch	<i>Monarcha trivirgatus</i>			✓			
Satin Flycatcher	<i>Myiagra cyanoleuca</i>			✓	✓		
Restless Flycatcher	<i>Myiagra inquieta</i>				✓		
*Leaden Flycatcher	<i>Myiagra rubecula</i>				✓	✓	
*Scarlet Honeyeater	<i>Myzomela sanguinolenta</i>				✓		
*Red-browed Finch	<i>Neochmia temporalis</i>			✓	✓	✓	
Turquoise Parrot	<i>Neophema pulchella</i>	V			✓	✓	
Barking Owl	<i>Ninox connivens</i>		✓	✓			
Southern Boobook	<i>Ninox novaeseelandiae</i>		✓	✓	✓		
*Powerful Owl	<i>Ninox strenua</i>	V	✓	✓			
*Olive-backed Oriole	<i>Oriolus sagittatus</i>			✓	✓		
Blue-billed Duck	<i>Oxyura australis</i>	V					✓
*Golden Whistler	<i>Pachycephala pectoralis</i>			✓	✓		
*Rufous Whistler	<i>Pachycephala rufiventris</i>			✓	✓		
*Spotted Pardalote	<i>Pardalotus punctatus</i>			✓	✓		
*Striated Pardalote	<i>Pardalotus striatus</i>				✓		
Scarlet Robin	<i>Petroica multicolor</i>					✓	
Flame Robin	<i>Petroica phoenicea</i>					✓	
*Rose Robin	<i>Petroica rosea</i>				✓		
Little Pied Cormorant	<i>Phalacrocorax melanoleucos</i>						✓
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>						✓
Common Bronzewing	<i>Phaps chalcoptera</i>				✓		
Brush Bronzewing	<i>Phaps elegans</i>			✓	✓		
Little Friarbird	<i>Philemon citreogularis</i>				✓		
*Noisy Friarbird	<i>Philemon corniculatus</i>			✓	✓		
Yellow-billed Spoonbill	<i>Platalea flavipes</i>						✓
Royal Spoonbill	<i>Platalea regia</i>						✓
*Crimson Rosella	<i>Platycercus elegans</i>			✓			
*Eastern Rosella	<i>Platycercus eximius</i>			✓	✓	✓	
Striped Honeyeater	<i>Plectorhyncha lanceolata</i>				✓		
Tawny Frogmouth	<i>Podargus strigoides</i>			✓	✓		
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</i>	V			✓	✓	
Purple Swampphen	<i>Porphyrio porphyrio</i>						✓
Red-rumped Parrot	<i>Psephotus haematonotus</i>				✓	✓	
*Eastern Whipbird	<i>Psophodes olivaceus</i>		✓	✓	✓		
Wompoo Fruit-Dove	<i>Ptilinopus magnificus</i>	V	✓	✓			
Superb Fruit-Dove	<i>Ptilinopus superbus</i>	V	✓	✓			
Satin Bowerbird	<i>Ptilonorhynchus violaceus</i>			✓	✓		

Common Name	Scientific name	Status	STRF	Moist Forest	Dry Forest	Cleared	Dams
Lewin's Rail	<i>Rallus pectoralis</i>						✓
*Grey Fantail	<i>Rhipidura fuliginosa</i>			✓	✓		
Willie Wagtail	<i>Rhipidura leucophrys</i>				✓	✓	
*Rufous Fantail	<i>Rhipidura rufifrons</i>		✓	✓			
Painted Snipe	<i>Rostratula benghalensis</i>	E, VC					✓
*Channel-billed Cuckoo	<i>Scythrops novaehollandiae</i>			✓	✓		
*Yellow-throated Scrubwren	<i>Sericornis citreogularis</i>		✓				
*White-browed Scrubwren	<i>Sericornis frontalis</i>			✓	✓		
Large-billed Scrubwren	<i>Sericornis magnirostris</i>		✓				
Figbird	<i>Sphecotheres viridis</i>			✓	✓		
*Pied Currawong	<i>Strepera graculina</i>			✓	✓		
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>						✓
Double-barred Finch	<i>Taeniopygia bichenovii</i>				✓	✓	
Australian White Ibis	<i>Threskiornis molucca</i>					✓	
Straw-necked Ibis	<i>Threskiornis spinicollis</i>					✓	
*Sacred Kingfisher	<i>Todiramphus sanctus</i>			✓	✓	✓	
Scaly-breasted Lorikeet	<i>Trichoglossus chlorolepidotus</i>			✓	✓		
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>			✓	✓		
Red-chested Button-quail	<i>Turnix pyrrhothorax</i>				✓		
Painted Button-quail	<i>Turnix varia</i>				✓		
Barn Owl	<i>Tyto alba</i>				✓	✓	
Grass Owl	<i>Tyto capensis</i>	V				✓	
Masked Owl	<i>Tyto novaehollandiae</i>	V			✓		
*Sooty Owl	<i>Tyto tenebricosa</i>	V	✓	✓			
Masked Lapwing	<i>Vanellus miles</i>					✓	
Regent Honeyeater	<i>Xanthomyza phrygia</i>	E, EC			✓		
Bassian Thrush	<i>Zosterops lunulata</i>		✓	✓			
*Silvereye	<i>Zosterops lateralis</i>		✓	✓	✓		



## 14 Species of bird recorded at Pambalong Nature Reserve

Recorded by various bird observers over the period 2001 – 2006 (Source <http://bioacoustics.cse.unsw.edu.au/birding-aus/>)

Family	Species	Common Name
<b>Accipitridae</b>	<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk
<b>Accipitridae</b>	<i>Accipiter novaehollandiae</i>	Grey Goshawk
<b>Accipitridae</b>	<i>Aquila audax</i>	Wedge-tailed Eagle
<b>Accipitridae</b>	<i>Circus approximans</i>	Swamp Harrier
<b>Accipitridae</b>	<i>Elanus axillaris</i>	Black-shouldered Kite
<b>Accipitridae</b>	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle
<b>Accipitridae</b>	<i>Haliastur sphenurus</i>	Whistling Kite
<b>Accipitridae</b>	<i>Hieraaetus morphnoides</i>	Little Eagle
<b>Alcedinidae</b>	<i>Alcedo azurea</i>	Azure Kingfisher
<b>Anatidae</b>	<i>Anas castanea</i>	Chestnut Teal
<b>Anatidae</b>	<i>Anas gracilis</i>	Grey Teal
<b>Anatidae</b>	<i>Anas rhynchotis</i>	Australasian Shoveler
<b>Anatidae</b>	<i>Anas superciliosa</i>	Pacific Black Duck
<b>Anatidae</b>	<i>Aythya australis</i>	Hardhead
<b>Anatidae</b>	<i>Cygnus atratus</i>	Black Swan
<b>Anatidae</b>	<i>Dendrocygna arcuata</i>	Wandering Whistling-Duck
<b>Anatidae</b>	<i>Dendrocygna eytoni</i>	Plumed Whistling-Duck
<b>Anatidae</b>	<i>Stictonetta naevosa</i>	Freckled Duck <sup>V-TSCAct</sup>
<b>Anseranatidae</b>	<i>Anseranas semipalmata</i>	Magpie Goose <sup>V-TSCAct</sup>
<b>Ardeidae</b>	<i>Ardea ibis</i>	Cattle Egret
<b>Ardeidae</b>	<i>Ardea intermedia</i>	Intermediate Egret
<b>Ardeidae</b>	<i>Ardea pacifica</i>	White-necked Heron
<b>Ardeidae</b>	<i>Egretta novaehollandiae</i>	White-faced Heron
<b>Artamidae</b>	<i>Artamus leucorhynchus</i>	White-breasted Woodswallow
<b>Centropodidae</b>	<i>Centropus phasianinus</i>	Pheasant Coucal
<b>Charadriidae</b>	<i>Elsemyornis melanops</i>	Black-fronted Dotterel
<b>Charadriidae</b>	<i>Erythrogonyx cinctus</i>	Red-kneed Dotterel
<b>Charadriidae</b>	<i>Vanellus miles</i>	Masked Lapwing
<b>Coraciidae</b>	<i>Eurystomus orientalis</i>	Dollarbird
<b>Cuculidae</b>	<i>Cuculus pallidus</i>	Pallid Cuckoo
<b>Dicruridae</b>	<i>Dicrurus bracteatus</i>	Spangled Drongo
<b>Dicruridae</b>	<i>Grallina cyanoleuca</i>	Magpie-lark
<b>Dicruridae</b>	<i>Myiagra rubecula</i>	Leaden Flycatcher
<b>Falconidae</b>	<i>Falco berigora</i>	Brown Falcon
<b>Falconidae</b>	<i>Falco cenchroides</i>	Nankeen Kestrel
<b>Falconidae</b>	<i>Falco longipennis</i>	Australian Hobby
<b>Falconidae</b>	<i>Falco peregrinus</i>	Peregrine Falcon
<b>Halcyonidae</b>	<i>Todiramphus sanctus</i>	Sacred Kingfisher
<b>Hirundinidae</b>	<i>Hirundo neoxena</i>	Welcome Swallow
<b>Hirundinidae</b>	<i>Hirundo nigricans</i>	Tree Martin
<b>Jacaniidae</b>	<i>Irediparra gallinacea</i>	Comb-crested Jacana <sup>V-TSCAct</sup>
<b>Maluridae</b>	<i>Malurus lamberti</i>	Variegated Fairy-wren
<b>Maluridae</b>	<i>Stipiturus malachurus</i>	Southern Emu-wren
<b>Pachycephalidae</b>	<i>Pachycephala rufiventris</i>	Rufous Whistler



<b>Family</b>	<b>Species</b>	<b>Common Name</b>
<b>Pardalotidae</b>	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill
<b>Passeridae</b>	<i>Lonchura castaneothorax</i>	Chestnut-breasted Mannikin
<b>Phasianidae</b>	<i>Coturnix ypsilophora</i>	Brown Quail
<b>Rallidae</b>	<i>Gallinula ventralis</i>	Black-tailed Native-hen
<b>Rallidae</b>	<i>Gallirallus philippensis</i>	Buff-banded Rail
<b>Rallidae</b>	<i>Porphyrio porphyrio</i>	Purple Swamphen
<b>Recurvirostridae</b>	<i>Himantopus himantopus</i>	Black-winged Stilt
<b>Recurvirostridae</b>	<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet
<b>Scolopacidae</b>	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper
<b>Scolopacidae</b>	<i>Calidris ruficollis</i>	Red-necked Stint
<b>Scolopacidae</b>	<i>Gallinago hardwickii</i>	Latham's Snipe
<b>Threskiornithidae</b>	<i>Platalea flavipes</i>	Yellow-billed Spoonbill
<b>Threskiornithidae</b>	<i>Platalea regia</i>	Royal Spoonbill
<b>Threskiornithidae</b>	<i>Plegadis falcinellus</i>	Glossy Ibis
<b>Threskiornithidae</b>	<i>Threskiornis molucca</i>	Australian White Ibis
<b>Threskiornithidae</b>	<i>Threskiornis spinicollis</i>	Straw-necked Ibis

