WARNING
No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from RPS Newcastle

Legend

- Development Estate
- Conservation Estate
- RTA Land

Threatened Flora Species

- *Arthropteris palisotii (Ecobiological Record 2006)*
- *Callistemon linearifolius*
- *Area of Callistemon linearifolius*
- *Eucalyptus nicholii*
- *Tetratheca juncea*
- *Rutidosis heterogama*
- *Syzygium paniculatum*

ROTAP Species

- *Callistemon shiressii (RPSHSO 2007)*
- *Callistemon shiressii (Ecobiological Record 2006)*

N

STOCKRINGTON

Sydney Newcastle Freeway

MINMI

SEAHAMPTON

Newcastle Link Road

Mount Sugarloaf

0 1 2km

SCALE: 1: 27000 AT A3 SIZE

TITLE: FIGURE 3-4 THREATENED FLORA SPECIES RECORDED

LOCATION: NORTHERN CONSERVATION LAND

DATUM: N/A
PROJECTION: MGA ZONE 56 (GDA 94)

DATE: 7/02/2011
PURPOSE: EAR

LAYOUT REF: J:\JOBS\24k\24530 Hunter Valley\2010 Works\Drafting\Ecology\Northern Lands\Cons Estate \24530-2 Figure 3-4 Threatened Flora Species Records
VERSION (PLAN BY): D (A.P-M.D-N.W)

CLIENT: Coal & Allied Industries Ltd
JOB REF: 24530-2

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
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3.1.9 Groundwater Dependent Ecosystems

GDE's is a broad definition covering all ecosystems which are dependent upon groundwater either permanently or occasionally to survive (DLWC, 2002). Several of the vegetation communities on the Conservation Estates have been identified as GDE's, and these include Freshwater Wetland Complex, Swamp Mahogany Paperbark Forest, Swamp Oak Rushland Forest, HVMF, HLRF and ATMF (Refer to Figure 3-5). Identification of GDE's depends upon the location of the vegetation communities in relation to groundwater. GDE's are typically the communities which are located in drainage depression, swamps and creeklines, where groundwater comes up to the surface.

Matthei (1995) has mapped the several soil landscapes within the Conservation Estates and these include Cockle Creek (alluvial), Wyong (alluvial), Stockrington (coalluvial), Cedar Hill (coalluvial), Sugarloaf (coalluvial), Killingworth (erosional), Bolwarra Heights (erosional) Beresfield (residual), Hamilton (Residual), Rivermead (Residual), Awaba (associated) and Bobs Farm (estuarine). The erosional soils of Killingworth are mapped at the higher elevations and are likely to be comprised of clay soil overlying weathered rock. The soil landscapes of Beresfield, Rivermead and Hamilton have been mapped in the northern portion of the Conservation Estates at the high elevations adjoining Hexham Swamp. These soil landscapes are similar to Killingworth in that residual clay loams occur over weathered rock. Similarly the Stockrington, Cedar Hill and Sugarloaf coalluvial would occur over weathered rock.

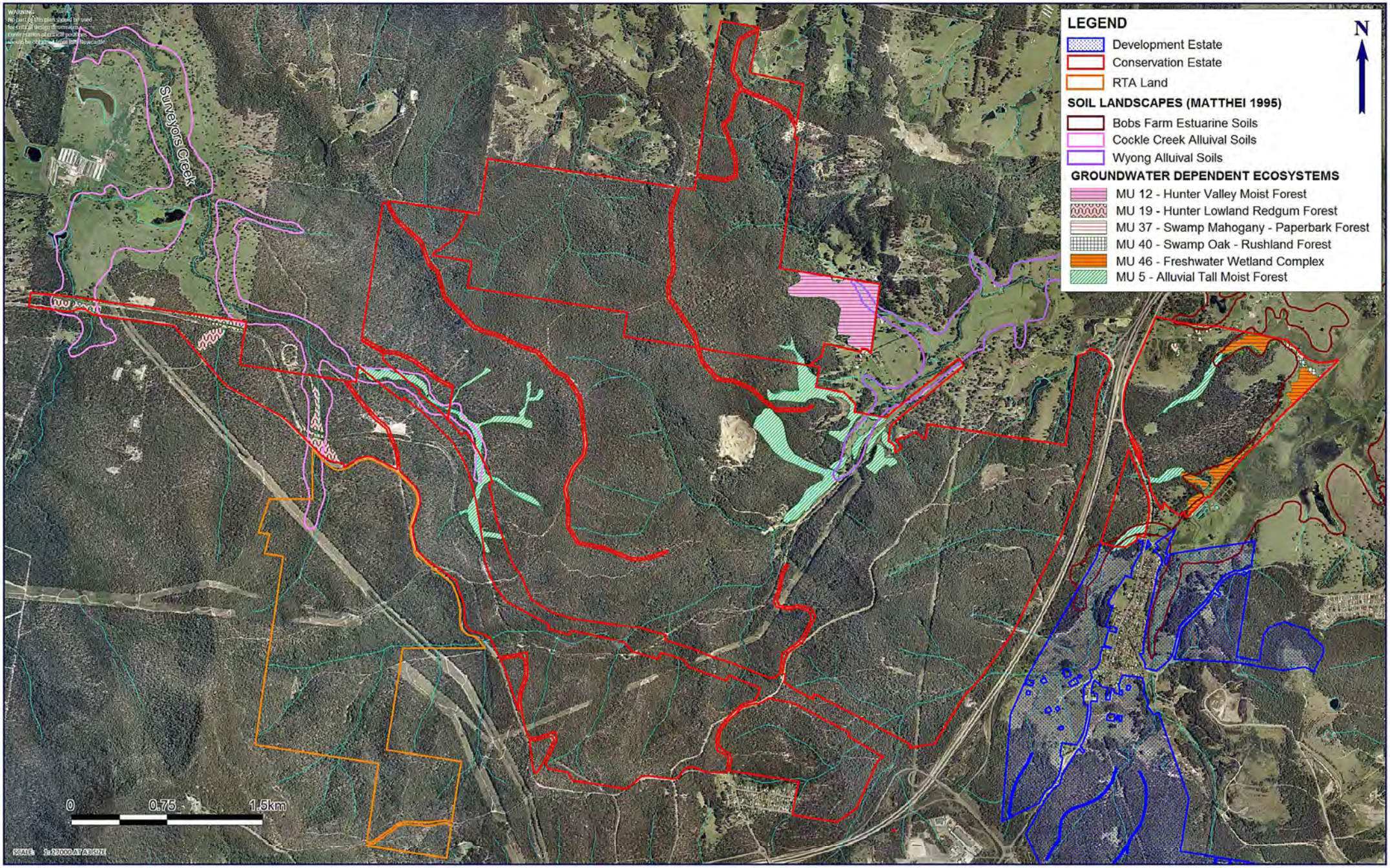
However, lower lying areas at Tank Paddock in the Conservation Estates are likely to have regular inundation due to the close proximity to Hexham Swamp where the groundwater table is often on the surface. Hexham Swamp is part of the floodplain of the Hunter River. The estuarine soils of Bobs Farm are subject to water logging and have permanently high water tables, this soil landscape is mapped in the Tank Paddock in the north eastern portion of the Conservation Estate and adjoining Hexham Swamp. The alluvial soil landscapes of Cockle Creek and Wyong within Surveyors Creek (west) and Blue Gum Creek (east) are likely to contain unconfined alluvial aquifers.

Six vegetation communities within the Conservation Estates are classified as GDE's and these include, Freshwater Wetland Complex, Swamp Mahogany Paperbark Forest, Swamp Oak Rushland Forest, HVMF, HLRF and ATMF. These vegetation communities occur on the estuarine soils of Bob's Farm and the alluvial soils of Cockle Creek and Wyong. The remaining vegetation communities are not likely to be dependent upon groundwater and are most likely to be a result of surface runoff rather than groundwater dependence.

GDE's have been classified into several different types according to DLWC (2006). These classes take into consideration aquifer, ecological and geomorphic types. The aquifers present would be unconsolidated alluvial aquifers classed as A1 with Hypogean habitat. Table 3-2 below outlines the GDE types, classes and sub-classes as per DLWC (2006) which occur within the Conservation Estates.

Table 3-2: GDE's Types and Classes for Conservation Estates

Vegetation Community at Conservation Estate	GDE TYPE	Class	Description of Class	Habitat
Alluvial Tall Moist Forest (northern occurrences)	Riparian & Terrestrial Vegetation (T)	T1	Riparian Vegetation Community	Terrestrial
Hunter Valley Moist Forest	Riparian & Terrestrial Vegetation (T)	T1	Riparian Vegetation Community	Terrestrial
Hunter Lowland Redgum Forest	Riparian & Terrestrial Vegetation (T)	T1	Riparian Vegetation Community	Terrestrial
Swamp Oak Rushland Forest	Riparian & Terrestrial Vegetation (T)	T1	Riparian Vegetation Community	Terrestrial
Swamp Mahogany Paperbark Forest	Riparian & Terrestrial Vegetation (T)	T1`	Riparian Vegetation Community	Terrestrial
Freshwater Wetland Complex	Wetlands (W)	W2	Coastal Floodplain Freshwater Forested Wetland	Epigean



TITLE: FIGURE 3-5 GROUNDWATER DEPENDENT ECOSYSTEMS

LOCATION: CONSERVATION ESTATES

DATUM: N/A
PROJECTION: MGA ZONE 56 (GDA 94)

DATE: 7/02/2011
PURPOSE: EAR

J:\JOBS\24K\24530 Hunter Valley\2010 Works\Drafting\Ecology\Northern Lands\Cons Estate\
LAYOUT REF: 24530-2 Figure 3-5 Groundwater Dependent Ecosystems
VERSION (PLAN BY): D (A.P-M.D-N.W)

CLIENT: Coal & Allied Industries Ltd
JOB REF: 24530-2

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3.2 Fauna

Of 58 threatened fauna species previously recorded within 10km (DECCW Atlas of NSW Wildlife Data 2010) of the Conservation Estates. A total of 13 of these species are highly unlikely to occur within the Stockrington and Tank Paddock Conservation Estates due to the absence of suitable habitat. Of the remaining 45 species (listed below), four were recorded during fauna surveys (indicated by an asterisk '*') or previous surveys (Atlas of NSW Wildlife data 2010) (indicated by a double asterisk '**'). Assessment of habitat potential within Conservation Estates found that a further 24 species have a moderate or greater opportunity of occurring within the Conservation Estates (indicated by a triple asterisk '***').

Litoria aurea	Green and Golden Bell Frog***
Litoria brevipalmata	Green-thighed Frog***
Varanus rosenbergi	Heath Monitor
Ephippiorhynchus asiaticus	Black-necked Stork***
Botaurus poiciloptilus	Australasian Bittern***
Ixobrychus flavicollis	Black Bittern***
Oxyura australis	Blue-billed Duck
Anseranas semipalmata	Magpie Goose***
Stictonetta naevosa	Freckled Duck***
Irediparra gallinaceae	Comb-crested Jacana***
Rostratula australis	Australian Painted Snipe***
Lophoictinia isura	Square-tailed Kite***
Callocephalon fimbriatum	Gang-Gang Cockatoo* **
Calyptorhynchus lathami	Glossy Black-Cockatoo
Melanodryas cucullata	Hooded Robin
Stagonopleura guttata	Diamond Firetail
Pomatostomus temporalis	Grey-crowned Babbler
Chthonicola sagittatus	Speckled Warbler**
Climacteris picumnus	Brown Treecreeper* **
Melithreptus gularis	Black-chinned Honeyeater* **
Anthochaera phrygia	Regent Honeyeater***
Lathamus discolor	Swift Parrot***
Neophema pulchella	Turquoise Parrot
Ninox connivens	Barking Owl
Ninox strenua	Powerful Owl* **
Tyto novaehollandiae	Masked Owl**
Tyto tenebricosa	Sooty Owl***
Ptilinopus magnificus	Wompoo Fruit-Dove**
Ptilinopus regina	Rose-crowned Fruit-Dove***
Ptilinopus superbus	Superb Fruit-Dove
Dasyurus maculatus	Spotted-tailed Quoll***
Phascogale tapoatafa	Brush-tailed Phascogale
Petaurus australis	Yellow-bellied Glider**
Petaurus norfolcensis	Squirrel Glider**

Phascolarctos cinereus	Koala* ***
Pteropus poliocephalus	Grey-headed Flying-fox**
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat***
Miniopterus australis	Little Bentwing-bat**
Mormopterus norfolkensis	Eastern Freetail-bat***
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat***
Falsistrellus tasmaniensis	Eastern False Pipistrelle***
Chalinolobus dwyeri	Large-eared Pied Bat***
Myotis adversus	Large-footed Myotis***
Scoteanax rueppellii	Greater Broad-nosed Bat***
Vespadelus troughtoni	Eastern Cave Bat***

In addition to the above threatened species a further thirteen threatened wetland, estuarine and inland fauna species have been recorded within a 10 km perimeter buffer of the Conservation Estates. These species have appeared in wider locality searches as consequence of the Conservation Estate's proximity to estuarine and wetland habitats and rare local records of inland species. These species have not been included within the above 10 km threatened species list, as Conservation Estates are unlikely to represent refuge areas for these species on at least an intermittent basis.

Charadrius leschenaultia	Greater Sand-plover
Calidris tenuirostris	Great Knot
Chelodina mydas	Green Turtle
Charadrius mongolus	Lesser Sand-plover
Pterodroma leucoptera	Gould's Petrel
Pterodroma solandri	Providence Petrel
Sterna albifrons	Little Tern
Haematopus longirostris	Pied Oystercatcher
Pandion cristatus	Osprey
Hamirostra melanosternon	Black-breasted Buzzard
Limicola falcinellus	Broad-billed Sandpiper
Limosa limosa	Black-tailed Godwit
Xenus cinerius	Terek Sandpiper

The results of opportunistic surveys for potential fauna are presented below.

3.2.1 Terrestrial Mammals

Few terrestrial mammals were noted during opportunistic fauna surveys within the Conservation Estates apart from a single *Antechinus stuartii* individual and both Swamp and Red-necked Wallabies. Common Wombat scats were noted within Stockrington Conservation Estate. Due to the lack of formal surveys for small terrestrial mammals habitat assessment was utilised to determine the potential for Conservation Estates to support populations of small to medium terrestrial mammals.

3.2.2 Arboreal Mammals

No formal surveys were conducted for arboreal mammals, although habitat assessment and secondary indications suggest that the Stockrington Conservation Estate is likely to support healthy populations of arboreal mammals. The existence of large tracts of unbroken forest interspersed by wet gullies containing understorey structural complexity strongly suggests that the Conservation Estates would support healthy populations of common arboreal mammals, such as *Pseudocheirus peregrinus* (Common Ringtail Possum) and *Trichosurus vulpecula* (Common Brush-tailed Possum). Concentrations of glider feeding scars in some areas of the Conservation Estates suggest that the Conservation Estates also supports glider species in at least some areas of the Conservation Estates. Feeding scars occurring on *Corymbia gummifera* (Red Bloodwood) in Coastal Foothills Spotted Gum Ironbark Forest and Coastal Plains Smooth-barked Apple Woodland within Stockrington lands were consistent with those made by *Petaurus breviceps* (Sugar Glider) or *P. norfolcensis* (Squirrel Glider). The similarity of these species makes it difficult to distinguish between the feeding marks with sufficient confidence to identify the originator of observed marks. Elsewhere, within Stockrington Lands, larger feeding marks, on *Eucalyptus punctata* (Grey Gum), occurring adjacent to riparian communities suggest the presence of *Petaurus australis* (Yellow-bellied Glider), although the presence of this species cannot be confidently confirmed on this evidence alone due to the lack of the characteristic "vee" feeding marks that this species usually makes. The occurrence of local records (Atlas of NSW Wildlife data 2010) further suggests the presence of *P. australis.*

On habitat assessment alone the Stockrington lands are considered as being of sufficient quality in extent, maturity and complexity to support all three petaurids noted above and indeed *Petauroides volans* (Greater Glider) and *Acrobates pygmaeus* (Feathertail Glider). Due to such evidence, the precautionary principle should apply and the presence of all locally occurring glider species should be assumed within Stockrington Conservation Estate. The condition of habitat occurring within Tank Paddock Conservation Estate suggests that the site would support *T. vulpecula*, *P. peregrinus*, *P. breviceps* and *A. pygmaeus*, although the Conservation Estates contains sufficient habitat to support *P. norfolcensis* and potentially *P*. *australis* within ATMF and adjacent communities. Certainly the observed presence of a roosting *Ninox strenua* (Powerful Owl) suggests that the Conservation Estates supports a healthy arboreal mammal population. *P. norfolcensis* and *P. australis* are listed as Vulnerable under the *TSC Act 1995*.

The presence of almost pure stands of *E. punctata* (Grey Gum) in some areas of the Stockrington Estates suggests that the Conservation Estates potentially represents a part of the range of a sparse population of *Phascolarctos cinereus* (Koala) occurring in the forests to the south of the Hunter River. Thus while performing flora surveys a koala scat was located within a dense stand of *Eucalyptus propinqua* (Small-fruited Grey Gum) trees in the Northern portion of the conservation estate (Refer to Figure 3-7). The Stockrington lands are likely to represent part of a green corridor linking the Watagan forests to denser Koala populations occurring to the north of the Hunter River. That such a corridor is used by Koalas is evidenced by the presence of a single individual in forest adjacent to the

Wallsend – Newcastle Link Road in 2007 where no recent Koala records previously existed and a single koala scat in the conservation estate.

3.2.3 Bats

Due to the lack of formal surveys for bats habitat assessment was utilised to determine the potential for Conservation Estates to support populations of bats. The Stockrington and Tank Paddock Conservation Estates contain a variety of habitat opportunities for both Microchiropteran and Megachiropteran bat species.

Foraging habitat for flying-foxes such as the Grey-headed Flying-fox (*Pteropus poliocephalus*) and Little Red Flying-fox (*Pteropus scapulatus*) exists within flowering canopy trees across the Conservation Estates. Due to the large size of these estates it is likely that foraging opportunities exist year round. Potential roosting habitat for flying-foxes exist in gully forests within the Conservation Estates, although, no roosts were found during surveys or are known to occur.

A range of foraging and roosting habitats exist within the Conservation Estates for insectivorous Microchiropteran bats. Clutter tolerant species such as Long-eared Bats (*Nyctophilus gouldii* and *N. geoffroyi*.) are likely to utilise the low to mid stratum of forested areas. Whilst forest edges and forest canopy would provide foraging habitats for species more suited to fast flight in more open habitats such as Freetail Bats (*Mormopterus* sp.), White Striped Freetail Bat (*Tadarida australis*) and Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*). Other forest bats such as *Vespedelus* sp. and Bentwing Bats (*Miniopterus* sp.) are likely to make use of tracks through forests and woodland habitats,

Roosting habitat for hollow-dwelling bat species including the threatened East Coast Freetail Bat (*Mormopterus norfolkensis*) and Greater Broad-nosed Bat (*Scoteanax rueppelli*) exist within hollow-bearing trees within the Conservation Estates. Potential roosting habitat within old mine shafts and rocky outcrops exists within the Conservation Estates exists for cave roosting species such as the threatened Little Bentwing Bat (*Miniopterus australis*) and Eastern Bentwing Bat (*Miniopterus schriebersii*).

3.2.4 Avifauna

Many terrestrial avifauna groups are represented within the Conservation Estates, due to the diversity of habitats represented across the Stockrington and Tank Paddock lands. Both sites contain dry open sclerophyllous communities although these habitats exhibit greater diversity and extent within the Stockrington section. These dry sclerophyll communities contain most expected common species, apart from those species that were not present during surveys due to their migratory habits. The higher than average quality of dry forest habitats within Stockrington lands is evidenced by the presence of two regionally significant species (Bell & Murray 2001), being *Hylacola pyrrhopygia* (Chestnut-rumped Heathwren) and *Falcunculus frontatus* (Crested Shrike-tit) and two threatened species, being *Melithreptus gularis gularis* (Black-chinned Honeyeater) and *Climacteris picumnus* (Brown Treecreeper).

The Crested Shrike-tit is sparsely present in mesic and riparian communities and where

these habitats interface with dry communities. The full status of the Chestnut-rumped Heathwren is not currently known within the Conservation Estates, but if the dry sclerophyll habitat it was recorded in along George Booth Drive is an indicator of its presence elsewhere in the vicinity, there are large areas of similar or better habitat for this species in the south-western portion of the Stockrington lands.

The Black-chinned Honeyeater and Brown Treecreeper are listed as Vulnerable under the *TSC Act 1995*. A single Brown Treecreeper was observed at the confluence of Lower Hunter Spotted Gum Ironbark Forest and Hunter Lowland Redgum Forest along George Booth Drive. This species is normally recorded further west, but the presence of *E. fibrosa* (Broad-leaved Ironbark) communities mixing with riparian habitat in these forests appears to be a factor in the area's ability to support this species. Likewise, the presence of Black-chinned Honeyeaters in the same vicinity is likely an association with *E. fibrosa* and increased understorey complexity offered by adjacent riparian habitat. These observations represent some of the most easterly records for these species in the Hunter Valley and as such represent observations at the limits of the range for both of these species.

Broad riparian communities in this vicinity have been noted to support a high diversity of honeyeater species, which suggests that other threatened species such as *Anthochaera phrygia* (Regent Honeyeater) and *Lathamus discolor* (Swift Parrot) may utilise these habitats on a seasonal basis when local blossom events occur. The Swift Parrot and Regent Honeyeater are listed as Endangered under the *TSC Act 1995*.

Callocephalon fimbriatum (Gang-Gang Cockatoo) was recorded on three occasions in the southwest section of Stockrington lands and although small numbers were observed on two occasions, 22 individuals were recorded on a third occasion suggesting that the area may be important for this species on a seasonal basis for foraging purposes. The Gang-Gang Cockatoo is listed as Vulnerable under the *TSC Act 1995*.

Both the Stockrington and Tank Paddock lands contain areas ATMF, although these habitats are more extensive within Stockrington lands and it also contains areas of Subtropical Rainforest and HVMF. A locally rare species, *Monarcha trivirgatus* (Spectacled Monarch), was observed in ATMF at Tank Paddock and *Ninox strenua* (Powerful Owl) was also observed roosting in the same vicinity. Extensive avian surveys have not been conducted within mesic vegetation communities in the Stockrington lands, but these habitats are relatively well developed and are therefore expected to provide habitat opportunities for wet forest bird species. Scats were found within rainforest in Long Gully that are considered to belong to *Alectura lathami* (Australian Brush-turkey), which is some indication of the potential for the rainforest there to support wet forest bird species.

3.2.5 Nocturnal Birds

Observations of nocturnal avian species were limited to incidental observations of individual birds during vegetation surveys. *Podargus strigoides* (Tawny Frogmouth) was observed on a number of occasions within Stockrington lands, although this common dry

forest species and the equally common *Aegotheles cristata* (Australian Owlet-nightjar) are expected to be widespread across Conservation Estates. *Ninox strenua* (Powerful Owl) was observed roosting within ATMF at Tank Paddock, but there is also abundant suitable habitat for this species across all Conservation Estates. The Powerful Owl is listed as Vulnerable under the *TSC Act 1995*.

3.2.6 Swift Parrot and Regent Honeyeater Target Survey Results

The widespread occurrence of *Corymbia maculata* (Spotted Gum) across large areas of both proposed Development and Conservation Estates suggests that these lands have the potential to attract Swift Parrots during those seasons when Spotted Gum is an important winter flowering species within the central to lower Hunter Valley. Additionally, the occurrence of riparian forests containing *Eucalyptus tereticornis* (Forest Redgum) which were observed to have a high avian diversity, in conjunction with ridgetop areas of *Corymbia maculata* (Spotted Gum) are considered to be potential habitat for Regent Honeyeater. Investigation of forests containing Spotted Gum during 2008 surveys found that there were only occasional Spotted Gums flowering, which were attracting small widespread parties of Noisy Friarbirds. Within the Developments Estates no Lorikeet species were observed while small numbers of Little Lorikeets were observed to be feeding on Spotted Gum within the Conservation Estates. Extensive ATMF habitats within the Conservation Estates were attracting Little Lorikeets, although no lorikeets were observed within the Development Estates in this habitat. Red Gum communities in the southwest of the Conservation Estates contained a diversity of honeyeater species, although some species were found to use adjacent Spotted Gum / Ironbark assemblages and appeared to benefit from the greater structural richness brought about by the interface between these communities. Forest Red Gum blossom was found to be in relatively short supply and as a consequence there were few nectivorous species attracted to the limited blossom. No Swift Parrots or Regent Honeyeaters were observed within either the Conservation or Development Estates during the 2008 surveys.

Although no Swift Parrots or Regent Honeyeaters were observed within the Coal & Allied lands during the 2008 survey these results are not considered to be a faithful indication of the capacity of these lands to support the Swift Parrot or Regent Honeyeaters. Overall the Conservation Estates exhibit greater habitat opportunities for these species, due to the greater extent of widespread habitat, predominantly Spotted Gum-Ironbark assemblages, ATMF, and the inclusion of riparian Forest Red Gum communities, which are likely to represent focal habitat points for these species during seasons when they occur within the locality. The absence of both of these species from the Conservation Estates during the winter of 2008 is consistent with the paucity of coastal and Lower Hunter records for both of these species during the 2008 season. There have been few Swift Parrot records within the region compared with previous years and no Regent Honeyeaters during the 2008 winter period. Evaluation of potential habitats within Conservation Estates suggests that there is a good probability that both of these species would use the Conservation Estates during favourable years within the region. However, the same assumptions are not considered to apply to the Development Estates, due to the smaller amounts of suitable habitat, lack of Forest Red Gum habitats and the somewhat isolated and to some extent fragmented nature of these lands in comparison with the extent of the Conservation

Estates and their continuity to large significant forest areas in the regional context.

3.2.7 Herpetofauna

A limited number of herpetofauna were observed during opportunistic surveys owing largely to the generally cool conditions when vegetation surveys were conducted and, in the case of frogs at least, the lack of surveys during nocturnal hours. However, common reptile species, such as *Pseudechis porphyriacus* (Red-bellied Black Snake), *Lampropholis delicata* (Grass Skink), *Varanus varius* (Lace Monitor), *Amphibolurus muricatus* (Jacky Lizard) and the frog species *Litoria latopalmata* (Broad-palmed Frog) and *Pseudophryne coriacea* (Red-backed Toadlet) were observed during surveys. A discussion on the potential for Conservation Estates to represent potential habitat for locally occurring herpetiles is contained in Section 4.3.

WARNING
No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from RPS Newcastle.

Legend

- Conservation Estate
- Development Estate
- Koala Scat Location
- Powerful Owl Roosting Site
- Gang-gang Cockatoo

Development Estate Threatened Species Records

- Greyheaded Flyingfox
- Little Bentwing Bat
- Powerful Owl
- Squirrel Glider

EcoBiological 2006

- Powerful Owl
- Sooty Owl

N

0 1 2km

SCALE: 1: 27000 AT A3 SIZE

TITLE: FIGURE 3-6 THREATENED FAUNA SPECIES

LOCATION: CONSERVATION ESTATES

DATUM: N/A
PROJECTION: MGA ZONE 56 (GDA 94)

DATE: 7/02/2011
PURPOSE: EAR

LAYOUT REF: J:\JOBS\24k\24530 Hunter Valley\2010 Works\Drafting\Ecology\Northern Lands\Cons Estate \24530-2 Figure 3-6 Threatened Fauna Species
VERSION (PLAN BY): D (A.P-M.D-N.W)

CLIENT: Coal & Allied Industries Ltd
JOB REF: 24530-2

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3.3 Habitat Survey

3.3.1 Flora Habitat

The vegetation communities present throughout the Conservation Estates at Stockrington and Tank Paddock offer a number of suitable habitat types for a relatively diverse representation of native flora communities and species occurring in the Lower Hunter Region. A number of geomorphological factors contribute to those vegetation communities present within these lands. These factors include the geology, soils, elevation and rainfall patterns, and are further diversified by topological context in relation to slope, aspect and substrate permeability. The geomorphological influences underlying these Conservation Estates provide suitable conditions for ten native vegetation communities, being:-

- Coastal Foothills Spotted Gum - Ironbark Forest (CFSGIF);
- Coastal Plains Smooth-barked Apple Woodland (CPSBAW);
- **Lower Hunter Spotted Gum Ironbark Forest (LHSGIF);**
- Hunter Valley Moist Forest (HVMF);
- Alluvial Tall Moist Forest (ATMF);
- **Subtropical Rainforest (STRF);**
- **Hunter Lowland Redgum Forest (HLRF);**
- **Swamp Oak Rushland Forest (SORF);**
- **Swamp Mahogany-Paperbark Forest (SMPF)** and
- **Freshwater Wetland Complex**.

A number of vegetation communities within the Conservation Estates are of significance due to their listing as Endangered Ecological Communities (EEC) under the *TSC Act 1995*, including LHSGIF, STRF (EEC – Lowland Rainforest of the NSW North Coast and Sydney Basin Bioregion), HLRF, SORF (EEC – Swamp Oak Floodplain Forest on Coastal Floodplains), SMPF (EEC – Swamp Sclerophyll Forest on Coastal Floodplains) and Freshwater Wetland Complex (EEC – Freshwater Wetlands on Coastal Floodplains). Apart from those species already afforded protection under the *TSC Act 1995*, ATMF, CFSGIF, HVMF and CPSBAW are recognised in the *Lower Hunter and Central Coast Regional biodiversity Strategy* (Payne 1998) as vegetation communities of Regional Significance due to either their riparian and/or *Eucalyptus salinga*, *Corymbia maculata* or *Angophora costata* associations.

Apart from these naturally occurring vegetation communities there are areas within the Conservation Estates that have been cleared to facilitate energy and transport infrastructure and road works material quarrying and associated maintenance and accessibility requirements. These cleared areas are characterised by disturbed substrates and high levels of light, which provide opportunities for exotic weeds and

colonists from adjacent native vegetation communities.

A number of threatened flora species are known to occur regionally within vegetation communities occurring within Conservation Estates at Stockrington and Tank Paddock which are listed in Table 3-3 below. There are a number of ROTAP listed flora that have the potential to occur within Conservation Estates at Stockrington and Tank Paddock, which are listed in Table 3-4 below.

The condition of the vegetation communities varies across the Conservation Estates with some areas exhibiting degradation with proximity to tracks, infrastructure easements and lands cleared for previous land-use practices. The edges of ATMF and HVMF offer opportunities for mesic vegetation, including serious introduced weeds like *Lantana camara* (Lantana). Other than those opportunities for weeds occurring within cleared easements, vegetation community disturbances within the Conservation Estates are by and large limited to edge effects associated with access tracks and small occasional incidences of rubbish dumping.

Table 3-3: Potential Threatened Flora Habitat

Threatened Species / Community	MU15 CFSGIF	MU 30 CPSBAW	MU 17 LHSGIF	MU 12 HVMF	MU5 ATMF	STRF	MU 19 HLRF	MU 40 SORF	MU 37 SMPF	MU 46 FWC
Acacia bynoeana		+								
Angophora inopina	+	+								
Arthropteris palisotii						+				
Caladenia tessellata		+								
Callistemon linearifolius	+	+	+							
Cryptostylis hunteriana		+								
Cynanchum elegans				+		+				
Dendrobium melaleucaphilum					+	+				
Diuris praecox		+	+							
Eucalyptus glaucina			+				+			
Grevillea parviflora ssp. *parviflora*	+	+	+							
Melaleuca biconvexa	+			+	+				+	
Rutidosis heterogama			+							
Syzygium paniculatum				+	+					
Tetratheca juncea	+	+								
Zanichellia palustris										+

Table 3-4: Potential ROTAP Species Habitat

ROTAP Species / Community	MU15 CFSGIF	MU 30 CPSBAW	MU 17 LHSGIF	MU 12 HVMF	MU5 ATMF	STRF	MU 19 HLRF	MU 40 SORF	MU 37 SMPF	MU 46 FWC
Callistemon shiressii				+	+					
Eucalyptus fergusonii ssp. *fergusonii*	+		+							
Grevillea montana	+		+							
Macrozamia flexuosa	+	+	+							

3.3.2 Fauna Habitat

Fauna potentially occurring within the Conservation Estates varies with respect to vegetation quality, density and community form. The Conservation Estates represents vegetation communities encompassing both wet and dry sclerophyll vegetation associations as well as rainforest community associations. The variation in vegetation within the Conservation Estates provides habitat for a diversity of common fauna species and opportunities for a moderate – high number of threatened fauna species.

Eucalypt and other dominant trees flowering times have potential to supply nectar and foraging opportunities for a diversity of species throughout the majority of the year. Dominant tree species and flowering period are contained in Table 3-5 below.

Table 3-5: Dominant Tree Species and Flowering Period

Threatened Flora Species	TSC listed	EPBC listed	Habitats (But not confined to) Map units REMS	Potential Threatened Fauna Species that May be attracted by Blossom	Flowering Period (Best time to Survey) in Months of the Year J F M A M J J A S O N D
Angophora costata	NA	NA	15 & 17	Micro bats (insects), gliders.	
Corymbia maculata	NA	NA	12, 15 & 17	Micro bats (insects), Flying Foxes, Gliders, Regent Honeyeater, Swift Parrot	
Eucalyptus acmenoides	NA	NA	5 & 12	Micro bats (insects), Flying Foxes, Gliders	
*Eucalyptus fergusonii subsp. dorsiventralis**	NA	NA	12 & 17	Micro bats (insects), Flying Foxes, Gliders, Regent Honeyeater, Swift Parrot	
Eucalyptus fibrosa	NA	NA	17	Micro bats (insects), Flying Foxes, Gliders, Regent Honeyeater, Swift Parrot	
Eucalyptus globoidea	NA	NA	17	Micro bats (insects), Flying Foxes, Gliders, Regent Honeyeater, Swift Parrot	
Eucalyptus grandis	NA	NA	5	Micro bats (insects), Flying Foxes, Gliders, Regent Honeyeater, Swift Parrot	
Eucalyptus paniculata	NA	NA	5	Micro bats (insects), Flying Foxes, Gliders, Regent Honeyeater, Swift Parrot	
Eucalyptus propinqua	NA	NA	5, 12 & 15	Micro bats (insects), Flying Foxes, Gliders	
Eucalyptus punctata	NA	NA	5, 12 & 15	Micro bats (insects), Flying Foxes, Gliders, Regent Honeyeater	
Eucalyptus robusta	NA	NA	37	Micro bats (insects), Flying Foxes, Gliders, Regent Honeyeater, Swift Parrot	
Eucalyptus tereticornis	NA	NA	18	Micro bats (insects), Flying Foxes, Gliders, Regent Honeyeater, Swift Parrot	

Dark shading represents core flowering times for canopy trees as reported in the literature and light shading represents those times when flowering has been noted by RPS HSO ecologists outside these core flowering periods.

Note: The cleared areas occurring within the Conservation Estates are considered to be insignificant in terms of providing habitat for native fauna species aside from providing foraging habitat along the ecotone between cleared and forested areas (such as for hunting bats).

Terrestrial Mammals

The Open Forest communities within the Conservation Estates provide suitable habitat for a number of common terrestrial mammals, including small marsupials, rodents and the Echidna. Within dry forest communities understorey complexity is variable with the most suitable opportunities for terrestrial mammals occurring where understorey densities are highest and forest debris is present. Densities of understorey vegetation within the Conservation Estates vary from moderate to moderately high. General understorey density variations within the Conservation Estates largely follow a pattern of more open understoreys on dry or north facing ridges and slopes and higher densities on south facing and lower slopes where dry communities merge with riparian and wet forest communities in the gullies and flats. Open forest habitats offer grazing opportunities for herbivorous fauna, such as Macropods and Wombats.

ATMF within the Conservation Estates has a complex understorey of ground cover species, vine thickets and in some area stands of *Lantana camara* (Lantana). The density of understorey vegetation provides habitat opportunities for terrestrial mammals including marsupial and rodent species guilds. These wet forest habitats offer foraging niches for bandicoots and shelter for wallabies where they may retire during daylight hours from more open grazing habitats.

In addition to ATMF and Dry open forest habitats within the Conservation Estates, major gullies within the site, particularly in the head of Long Gully, Blue Gum Creek and its western tributaries and to a lesser extent the headwaters of Buttai Creek, contain stands (some sizeable) of rainforest. The extent and relative isolation of rainforest stands and associated sclerophyllous forests within the Conservation Estates (particularly Stockrington lands) offer potential habitat opportunities for more secretive terrestrial fauna such as *Dasyurus maculatus* (Spotted-tailed Quoll).

Habitat within these Conservation Estates for terrestrial mammals (particularly Stockrington) are of considerably greater quality than those occurring within Development Estate lands at Black Hill and Minmi/Link Road. This is due to a number of factors not the least of which is the large and continuous stand of vegetation these lands represent and the broad continuous linkages they possess to more southerly areas of the Sugarloaf Range and as a consequence the Watagans further to the south. Moreover, forest habitats within the Conservation Estates exhibit a greater variation in canopy tree age cohort with greater densities of hollow-bearing trees occurring within these habitats. On the whole, understorey strata exhibit greater densities and complexity than those within the above mentioned Development Estates, which is likely to promote greater population densities and diversity in terrestrial mammal populations.

Arboreal Mammals

There are large areas of dry forest within the proposed Conservation Estates that exhibit a diversity of age cohort within canopy tree species, suggesting that these areas of the Conservation Estates have not been cleared in the recent past. Consequently large areas of these lands are covered in forests containing trees of sufficient maturity to develop hollows, which provide shelter and nesting opportunities for arboreal mammals. The large, mature and continuous nature of much of the forested lands within the Stockrington Conservation Estate are able to provide a continuous succession of foraging opportunities throughout the year for glider and possum species. The quality of onsite forest habitats suggests that they support good populations of arboreal mammals. Open forest habitats over much of the Tank Paddock lands are of relatively low maturity, which suggests that they have limited capacity to contain hollow-bearing trees, but these habitat attributes occur more reliably within wet sclerophyll forest communities occurring along the gullies traversing the southern portion of the site and traversing the site from the northeast to the southwest.

Open and cleared areas containing a low diversity and density of Eucalypt species hold limited habitat for arboreal species.

Bats

The wooded and adjacent open areas within the Conservation Estates provide extensive insectivorous foraging habitat for Microchiropteran bat species. The mix of dominant tree species occurring within the Conservation Estates has the potential to provide a continuous supply of nectar throughout the year, thus attracting insect populations for a range of microchiropteran bats that have been recorded within the locality. Furthermore, there are substantial areas of both wet and dry forest communities offering a wide diversity of hunting niche for the majority of Microchiropteran species that have been recorded within the Lower Hunter Valley. There are low to high incidences of hollow-bearing trees within the Conservation Estates forests, offering a range of hollow sizes and including the smaller hollows favoured by hollow-dwelling Microchiropteran bats. The Conservation Estates is continuous with forests spilling off the Sugarloaf Range to the south, and represents a significant area of unbroken core habitat for locally occurring bat populations. There are caves occurring along the rocky watercourse of Blue Gum Creek, which may provide roosting opportunities for cave-dwelling Microchiropteran bats and known roosting opportunities for Microchiropteran bat species occur within the Sugarloaf Range to the south.

Canopy trees within the Conservation Estates offer blossom foraging opportunities for Grey-headed Flying-foxes and rainforest trees occurring in the gullies provide seasonal fruit resources for this species. Flying-foxes travel widely to access foraging resources and the continuity of onsite habitats with those in adjacent ranges represents a significant contribution to core habitat for local populations of flying-foxes. Although no roosting camps of flying-foxes were observed within proposed Conservation Estates during ecological surveys, there are a number of significant gullies within Stockrington lands that appear to offer potential locations for flying-fox roosting camps.

Frogs

Stockrington Conservation Estates encompass the headwaters of Buttai and Surveyors Creeks in the west and the western tributaries of Blue Gum Creek in the east including Long Gully. These creek heads represent relatively steep and relatively small catchments offering largely ephemeral water flows, although there are flat areas where more permanent pools persist. The wet nature of these gullies would make them highly suitable Conservation Estates for frog species including potential habitat for locally occurring threatened frog species. There are few wetland habitats within these catchments although there are a number of dams that have been colonised by wetland vegetation, which would provide microhabitat opportunities for common frog species. The Blue Gum Creek valley cuts through the eastern portion of the Conservation Estates and is characterised by rocky channel beds which may provide habitat for wet forest frog species, including those that prefer rocky creekline habitats such as *Mixophyes* species. The Tank Paddock Conservation Estate occurs on the south western fringe of the Hexham floodplain with areas of wetland habitat entering the Conservation Estates where mesic forested drainage lines interface with floodplain habitats. Floodplain habitats and lower mesic drainage lines are likely to provide a diversity of habitat niches for common frog species.

Reptiles

Habitat within the Conservation Estates has potential for representing significant shelter and foraging opportunities for a diversity of reptile species. This can be attributed to the complexity of understorey strata and the high incidence of forest debris in the ground cover layer.

Semi to permanent wetlands and dams are likely to provide year round habitat, where ephemeral ponds are associated with creeklines and drainage lines within the Conservation Estates there are intermittent foraging opportunities for common snake and turtle species. Wooded areas are likely to represent habitat for common lizard and snake species. The extent and diversity of forest habitats within the Conservation Estates suggest that they may provide suitable habitat for regional threatened reptile species, such as the Pale-headed Snake and Stephen's Banded Snake.

Avifauna

The wooded areas provide suitable foraging resources (e.g. Invertebrate habitat and blossom), nesting and roosting opportunities for a variety of sedentary and migratory birds. Hollow-bearing trees occurring across the Conservation Estates may provide nesting habitat for hollow dependant birds such as Forest Owls, Treecreepers, Parrots, Pardalotes, Kingfishers and Woodswallows.

Dry sclerophyllous forests within the Conservation Estates are continuous within the extensive forests and woodlands of the Sugarloaf Range to the south. The resulting continuity of forest represents extensive habitats for those species requiring large home range areas to persist. Furthermore, large continuous forest areas provide unhindered regional corridors for nomadic birds such as nectivorous species as they respond to local blossoming events.

Although understorey habitat varies in density across the Conservation Estates, there are

large areas of dry forest characterised by well-developed understorey strata and these habitats provide abundant opportunities for small avian species for both foraging, shelter and nesting purposes.

The regular juxtaposition of both dry and mesic or riparian forest types within the Conservation Estates increases the niche potential for both wet and dry forest bird groups due to the ecotonal areas created by overlapping adjacent vegetation communities. The hilly nature of the Conservation Estates has created a relatively wide range of micro-habitats for vegetation communities, due to the interplay of slope, aspect, soil type and thus wind / sun, exposure / shelter and moisture retention. This has resulted in a mosaic of habitat opportunities for a wide range of locally occurring birds including threatened and regionally significant species.

The diversity of vegetation communities across the Conservation Estates ensures a diverse mosaic of canopy species offering blossom resources throughout the year. The presence of Ironbarks in some communities, particularly in the southwest along George Booth Drive, appear to be important to the persistence of threatened species such as the Brown Treecreeper and Black-chinned Honeyeater.

Riparian habitats in the southwest provide dense understorey strata and blossom producing species in the canopy, which attracts a diversity of honeyeater species, offering intermittent foraging opportunities for threatened nectivorous species such as the Regent Honeyeater and Swift Parrot. The quality of this mosaic of habitats provide opportunities for regionally significant species such as Chestnut-rumped Heathwren and Crested Shrike-tit. Mid-storey resources and canopy fruits provide foraging opportunities for threatened cockatoo species, including the Gang-Gang Cockatoo and Glossy Black Cockatoo.

Subtropical Rainforest patches are sufficiently developed to attract nomadic fruit-doves including threatened species that intermittently occur locally.

3.4 Habitat Mapping

Habitat condition mapping (Figure 3-7) has been undertaken based on the results of field assessment coupled with the results of floristic investigations and RPS HSO Ecology staff combined observations and experience. To optimise the habitat mapping for display and analysis, habitat quality has been divided into the five categories outlined below, based on the habitat assessment elements discussed previously Section 2.4. The habitat assessment elements are; hollow-bearing tree density, Eucalypt diversity, Allocasuarina species density, Proteaceae species density, structural diversity and fallen timber density. Refer to Table 3-6 below for total areas of habitat category.

Note: The habitat quality has been delineated with reference to but does not follow the delineated vegetation community boundaries.

High – Quality habitat with native flora showing no significant disturbance with old growth elements, intact understorey and year round foraging opportunities preferable to

significant and threatened fauna species that includes forest owls, arboreal mammals, avifauna (includes EEC with no weed incursion and areas perceived to have regionally unique floristic representations or fauna habitat).

Above average – Quality habitat with native flora showing little to no disturbance with moderate level of key elements. These areas are likely to be utilised by native fauna species, including threatened species, as part of a larger home range (includes EEC with minor weed incursion).

Average quality – Habitat with dominant native community with low – moderate disturbance levels within elements, and includes areas of recent fire disturbance where understorey diversity is low with long term natural regeneration likely (also includes EEC with moderate weed incursion).

Below average – Habitat representing a native vegetation community with high weed incursion and other disturbances and low level of foraging opportunities (includes EEC with severe weed incursions and disused tracks with signs of native regeneration).

Low – Cleared land dominated by exotic flora species and representing preferred habitat for exotic fauna species (includes highly disturbed and frequently used tracks).

Table 3-6: Habitat in Conservation Estates

Habitat	Habitat Outcome (ha)	
	Area in Minmi Link Rd Conservation Estate	Area in Black Hill Conservation Estate
1 – High	211.15	174.87
2 – Above Ave	1133.18	265.74
3 – Average	82.91	47.69
4 – Below Ave	1.88	0.32
5 – Low	131.88	55.82

WARNING
No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from RPs Newcastle.
Note that this Vegetation Community Map depicts clearly defined boundaries between vegetation communities that are the product of individual interpretation and are not distinguished by clearly defined boundaries on the ground. Therefore, this map should only be treated as an indication of approximate peripheries between delineated vegetation communities. Caution should therefore be exercised when using this data for purposes requiring high levels of accuracy. Furthermore, no account for intergrading areas between delineated vegetation communities has been made.

Legend

- Conservation Estate
- Development Estate
- RTA Land

HABITAT CATEGORY

- 1 - High
- 2 - Above Average
- 3 - Average
- 4 - Below Average
- 5 - Low

N

0 1 2km

SCALE: 1: 30000 AT A3 SIZE

TITLE: FIGURE 3-7 HABITAT CONDITION MAP

LOCATION: CONSERVATION ESTATES

DATUM: N/A
PROJECTION: MGA ZONE 56 (GDA 94)

DATE: 7/01/2011
PURPOSE: EAR

LAYOUT REF: J:\JOBS\24k\24530 Hunter Valley\2010 Works\Drafting\Ecology\Northern Lands\Cons Estate \24530-2 Figure 3-7 Habitat Condition Mapping
VERSION (PLAN BY): D A3 (A.P - M.D-N.W)

CLIENT: Coal & Allied Industries Ltd
JOB REF: 24530-2

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au

3.5 Identification of Threatened Species, Populations and Ecological Communities

Those threatened flora and fauna species (listed under the *TSC Act* and the *EPBC Act*) that have been gazetted / recorded from within the region of the Conservation Estates have been considered within Ecological Inventory Report. EEC's and Endangered Populations known from the broader area have also been identified. Each species / community / population is considered for its potential to occur within the Conservation Estate. This Ecological Inventory Report deals with each species / community / population separately and identifies the ecological parameters of significance associated with the overall proposal.

'Species' or **'EEC / Population'** – Lists each threatened species / EEC / population known from the vicinity of the Conservation Estates. The status of each threatened species under the *TSC Act* and *EPBC Act* is also provided.

'Habitat Description and Known Populations' or **'Habitat Description and Known Stands / Populations'** – Provides a brief account of the species / community / population and the preferred habitat attributes required for the existence / survival of each species / community / population.

'Chance of Occurrence within Conservation Estates'– Assesses the likelihood of each species / community / population to occur within the site in terms of the aforementioned habitat description and taking into account local habitat preferences, results of recent field investigations, data gained from various sources and previously gained knowledge via fieldwork undertaken within other ecological assessments in the locality.

Table 3-7: Threatened Species Assessment

Species	Habitat Description and Known Populations	Chance of Occurrence within Conservation Estate
Plants		
Acacia bynoeana Bynoe's Wattle (E, V*)	Small, prostrate shrub found in low heath and open woodland, generally on loamy clays and sand. Occurs from the Lower Hunter south to the Southern Highlands. Within the Hunter Sub-bioregion it has been found in several locations within the Cessnock LGA where it has been found growing in Kurri Sand Swamp Woodland (KSSW). Has also been recently recorded as isolated populations within Yellow Bloodwood Woodland and Blue-leaved Stringybark Woodland near Ellalong. Locally, it is known to occur with Coastal Plains Scribbly Gum Woodland.	**Low** The survey did not record this species within the proposed development area. Habitat within the Development Estate can be considered sub-optimal at best, as this species prefers woodland habitats. Thus it is unlikely that this species will occur due to the lack of suitable habitat.
Arthropteris palisotii Lesser Creeping Fern (E)	Occurs in North-eastern NSW and also in Queensland. The Lesser Creeping Fern grows on trees. Its creeping stem is branched and wiry and covered with dark scales. Spores are borne on the underside of the leaflets in circular clumps. Occurs in rainforest, mainly on tree trunks.	**High** EcoBiological (2006) recorded this species within the Subtroprical Rainforest vegetation community within the Stockrington Conservation Estates.
Angophora inopina Charmhaven Apple (V, V*)	Small to medium tree found in shallow sandy soils in open woodland, swamp woodland and wet heath. The main occurrences of this species are in the Wyong and Lake Macquarie LGA's (from Charmhaven to Wyee and Morisset, and north to near Toronto), with disjunct populations also in Port Stephens LGA (south of Karuah).	**Low** This species was not detected during any of the surveys and the Conservation Estate lacks potential habitat for this species. Therefore it is highly unlikely for this species to occur within the Conservation Estates.
Callistemon linearifolius (V)	Shrub that grows in dry sclerophyll forest on the coast and adjacent ranges. Significant populations recently found within the Lower Hunter, including Werakata National Park. Re-sprouting/juvenile specimens difficult to distinguish from other *Callistemon* species such as *C. rigidus* or *C. linearis* without the aid of flowering parts. Locally this species has been recorded where dry forest habitats interface with salt tolerant vegetation communities, such as Swamp Oak Rushland Forest and Riparian Melaleuca forest.	**High** A large population of at least 355 specimens were located within the Lower Hunter Spotted Gum Ironbark Forest in the north of the Stockrington Conservation Estates. In addition approx 313 ha of potential habitat for this species occurs within the Conservation Estates.
Caladenia tessallata Tessellated Spider Orchid (E, V*)	A small terrestrial orchid, which regrows its single leaf on an annual basis. It is known to occur in grassy woodland and locally it has potential to occur within Coastal Plains Scribbly Gum Woodland. It has been recorded within Munmorah State Recreation Area to the south of the Development Estate.	**Moderate** Potential habitats for *Caladenia tessellata* include dry sclerophyll forests such as Lower Hunter Spotted Gum-Ironbark Forest, Coastal Plains Smooth-barked Apple Woodland, Coastal Foothills Spotted Gum-Ironbark Forest and Hunter Valley Moist Forest (approximately 1694.54ha). However, some of the vegetation communities contain sub-optimal micro-habitat and other factors such as aspect and topography would also influence the suitability of habitat for this cryptic orchid. Due to the cryptic nature of this species, it is relatively difficult to locate in the field and as such its presence within the Development Estate cannot be discounted.
Cryptostylis hunteriana Leafless Tongue Orchid (V, V*)	A cryptic Saprophytic orchid species that flowers between December and February. Distribution limits N-Gibraltar Range S- south of Eden. Grows in a variety of habitats from tall open forests to swamp heath on sandy soils	**Moderate** The preferred habitat for this species is Coastal Plains Scribbly Gum Woodland, however this species has been recorded within Coastal Plains Smooth Barked Apple Forest at Freemans Waterhole (Bell, 2004), which is present within the Conservation Estate. This species generally occurs with other species of the same genus such as *Cryptostylis subulata* and *Cryptostylis erecta*. Neither of these species were recorded within the Conservation Estates. Thus the habitat present within the Conservation Estate is considered to be sub-optimal. However due to the cryptic nature of this species, it is relatively difficult to locate in the field and as such its presence cannot be discounted.
Cynanchum elegans White-flowered Wax Plant (E, E*)	Occurs scattered along the NSW Northern Coast south to Wollongong usually in dry, littoral or subtropical rainforest and occasionally Melaleuca scrub or woodland. A climbing or twining plant species that flowers from August to May with peak flowering in November. One record within the Atlas of NSW Wildlife data occurs within the Lower Hunter Region and Central Coast at Green Point to the north of Belmont.	**Low - Moderate** Potential habitat within the subtropical rainforest vegetation communities within the Stockrington conservation estate. Thus it is considered the chance of occurrence to be moderate.
Dendrobium melaleucaphilum Spider Orchid (E)	Epiphytic orchid growing mostly growing on *Melaleuca styphelioides*, but occasionally on rainforest trees or rocks. Extends from south of the Blue Mountains to Queensland. Preferred habitat is coastal swamp forests.	**Low – Moderate** Although the favoured host plant for this orchid, *Melaleuca styphelioides*, was recorded within the Conservation Estates during flora surveys, there are no known records for this orchid species in the Newcastle area. The majority of the habitat of Alluvial Tall Moist occurs within the drainage lines of both the Tank Paddock and Stockrington Conservation Estates. Nevertheless,

Species	Habitat Description and Known Populations	Chance of Occurrence within Conservation Estate
		due to the occurrence of potential habitat its presence within the Conservation Estates cannot be totally discounted.
Diuris praecox Newcastle Doubletail (V, V*)	Found predominantly in coastal Eucalypt forests on hilltops or slopes. This species has been recorded at a number of dry forest locations to the southeast of Lake Macquarie.	**Moderate** There is opportunity for this species to occur within open forest habitats within the Conservation Estates. However, this species was not identified during the flora surveys, however targeted surveys were not undertaken within the Conservation Estate. Potential habitats for *Diuris praecox* include dry sclerophyll forests such as Lower Hunter Spotted Gum-Ironbark Forest, Coastal Plains Smooth-barked Apple Woodland, Coastal Foothills Spotted Gum-Ironbark Forest and Hunter Valley Moist Forest (approximately 1694.54ha). Due to the cryptic nature of this species, it is relatively difficult to locate in the field and as such its presence within the Conservation Estates cannot be discounted.
Eucalyptus camfieldii Camfield's Stringybark (V, V*)	Tree or mallee to 10m high, but often less. Rare and localised, in coastal shrub heath on sandy soils on sandstone, often restricted drainage. Records from the Hunter Sub-bioregion are largely in near-coastal areas from the Port Stephens LGA to the Central Coast. An isolated stand of trees consistent with this species has been recorded near Kurri Kurri (K. Hill pers. comm.). A local record to the east of the site is reported in the Atlas of NSW Wildlife data.	**Low** The Conservation Estates lack potential habitat (sandy soils and shrub heath) suitable for this species. Therefore it is considered highly unlikely for this species to occur.
Eucalyptus glaucina Slaty Red Gum (V, V*)	Red Gum species that grows in grassy woodland on deep, fertile and moist soils. Recorded within Hunter Lowland Redgum Forest and Central Hunter Ironbark Spotted Gum Grey Box Forest communities in the lower Central Hunter. Interbreeding known to occur between this species and *E. tereticornis*.	**Moderate** Potential habitat for this species occurs within the Hunter Lowland Redgum Forest which occurs in the both the Tank Paddock and Stockrington Conservation Estates. No individuals of this species were recorded during the flora surveys, however no targeted surveys were undertaken within the Conservation Estates. Thus it is considered that this species has a moderate chance of occurrence within the Hunter Lowland Redgum Forest habitats within the Conservation Estates.
Eucalyptus parramattensis ssp. decadens Drooping Red Gum (V, V*)	Red Gum species that grows in dry sclerophyll woodland on sandy soils, often in low damp sites. Locally, this species occurs almost exclusively in association with Kurri Sand Swamp Woodland and Tomago Sand Swamp Woodland and ecotonal areas, but a small disjunct stand of stunted individuals have been recently recorded within coastal heath in the Lake Macquarie LGA (RPS HSO pers. obs.).	**Low** The Conservation Estates lack potential habitat (dry sclerophyll woodland on sandy soils) suitable for this species. Therefore it is considered highly unlikely for this species to occur.
Grevillea parviflora subsp. *parviflora* Small Flowered Grevillea (V, V*)	Occurs in light, clayey soils in woodlands and open forests. Most plants appear capable of suckering from a rootstock. Relatively widespread within the Cessnock LGA where it has been recorded in LHSGIF. Occurs within Werakata National Park. Much confusion surrounds the taxonomy of this species and other similar *Grevillea* taxa (S. Bell *pers. comm.*), and a NPWS-funded study of the species is currently in progress.	**High** Approximately 105 individuals of this species were located within the Coastal Plains Smooth-barked Apple Woodland to the west of the Stockrington Conservation Estates. In addition there is 1360.52ha of habitat in the form of Coastal Plains Smooth-barked Apple and Lower Hunter Spotted Gum Ironbark Forest present within the Conservation Estates.
Melaleuca biconvexa Biconvex Paperbark (V, V*)	A shrub to small tree, which grows in poorly drained areas from Jervis Bay to Port Macquarie. Records in the Hunter Region are confined to western Lake Macquarie (Atlas of NSW Wildlife data).	**Low - Moderate** The majority of records of this species occur to the west of Lake Macquarie and the Central Coast, with some scattered records also occurring at Wallsend and Cardiff. Whilst potential habitat exists in the Alluvial Tall Moist Forest vegetation community within the Conservation Estates, the species was not recorded during flora surveys. Thus it is considered unlikely for this species to occur due to lack of local records.
Microtis angusii Angus's Onion Orchid (E, E*)	Record from the Terry Hill's district of Sydney. Occurs upon disturbed soil horizons that were originally ridgetop lateritic soils supporting a distinctive open to low open forest community, Duffy's Forest Vegetation Community, which is listed as an EEC. Suspected occurrences in the southern Lake Macquarie hinterland are derived from a tentative record by Bell (1998) in the Lake Macquarie State Recreation area, which occurs to the south of Gwandalan.	**Low - Moderate** The presence of records within the central coast area and the occurrence of habitat, as described from other locations where this species has been recorded, suggests that this species may have sub-optimal habitat within both the Conservation Estates.
Rulingia prostrata Dwarf Kerrawang (E, E*)	A prostrate shrub forming mats greater than 1m in width and occurring within heath, dry sclerophyll and coastal sands around Tomago.	**Low** The survey did not record this species within the proposed Conservation Estates. The Conservation Estates lacks potential habitat (coastal sands) suitable for this species.
Rutidosis heterogama	Small Asteraceous herb occurring in the Hunter Region growing in disturbed areas and adjacent	**High**

Species	Habitat Description and Known Populations	Chance of Occurrence within Conservation Estate
Heath Wrinklewort (V, V*)	parcels of bushland within the Cessnock LGA. This species is also noted as occurring within coastal heathland habitats between Wyong and Evans Head on sandy substrates or moist areas within open forest.	It is estimated that over 1000-1500 individual plants were recorded during field visits and the actual extant population is expected to be far greater as targeted surveys were not undertaken. Potential habitat exists within the Lower Hunter Spotted Gum Ironbark forest community (313.12ha) within the Conservation Estate.
Syzygium paniculatum Magenta Lilly Pilly (V, V*)	A shrub to small tree found in sub-tropical and littoral rainforest on sandy soils or sheltered gullies mostly near water courses. Distribution between Bulahdelah and Jervis Bay. Hunter Region records confined to the Lake Macquarie hinterland (Atlas of NSW Wildlife data).	**High** One individual of this species was detected within a disturbed section of Blue Gum Creek in the south east of the Stockrington Conservation Estate. In addition there is habitat present in the form of Subtropical Rainforest and Alluvial Tall Moist Forest.
Tetratheca juncea Black-eyed Susan (V, V*)	Occurs in a variety of forested and heathy habitats. Locally found in Open Forests and Woodlands with dense, undisturbed understorey, often in association with *Angophora costata* / *Corymbia gummifera* on slopes with south-easterly aspects. A number of records exist from the local area including several records from the proposed Conservation Estates within the Tank Paddock Development Estate (Atlas of NSW Wildlife data).	**High** Approximately 352 *Tetratheca juncea* plant clumps were located during field visits in 2005, late 2007 and 2008 (Refer to Figure 3-4). The population is estimated to be considerably larger as the majority of the surveys were performed outside of the flowering period for this species. It is estimated that 256 ha of habitat within the Conservation Estates, remains to be surveyed. Thus, it is considered that this population will be significantly larger than what has been recorded during the vegetation surveys.
Zannichellia palustris (E)	A submerged monoecious weakly rhizomatous aquatic annual or perennial plant. Within Australia it is known only from the Murray River estuary in South Australia and the Lower Hunter region in NSW. This species occurs in fresh to brackish, still to slow moving waters. *Z. palustris* has been collected from Ironbark Creek (Shortland), Black Creek (Cessnock), Kooragang Island and from near Belmont. None of the known sites of this species are formally protected and none are managed in any way for the conservation of the species. This species is ROTAP-coded 3R+, indicating that the species occurs overseas.	**Moderate** The survey did not record this species within the Conservation Estate. However, potential habitat of 11.89ha does occur within the Freshwater Wetland Complex within Tank Paddock Conservation Estate
Herpetofauna		
Litoria aurea Green and Golden Bell Frog (E, V*)	Inhabits swamps, lagoons, streams and ponds as well as dams, drains and storm water basins. Thought to be displaced from more established sites by other frog species, thus explaining its existence on disturbed sites. Previously widespread within the Sydney Basin Bio-region, but now sparsely distributed within the Lower Hunter and Central Coast areas.	**Moderate** Although there is habitat occurring around dams and along lower watercourses within the site, this species only persists in the region within sites exhibiting a saline influence and the population has contracted to a number of select locations in the region. However, Tank Paddock Conservation Estates which occurs adjacent to Hexham Swamp offers suitable habitat for the species.
Litoria brevipalmata Green-thighed Tree Frog (V)	Occurs in isolated localities from the NSW Central coast to south-east Queensland. They occur in a range of habitats from rainforest and moist Eucalypt forest to dry eucalypt forest and heath. Breeding occurs following heavy rainfall events in late spring and summer, with frogs congregating around large, temporary pools where males generally only call for one or two nights. This species has been recorded from only one location in the Hunter River catchment, being along creekline habitat within the HEZ study area (Harper Somers O'Sullivan 2004a). Populations of this species are also known to exist regionally within the Watagan National Park (Ehmann, 1997) and Cooranbong (Atlas of NSW Wildlife data).	**Moderate** Riparian and wetland habitats within the site are commensurate with potential habitat for this species and its presence within the site cannot be discounted.
Varanus rosenbergi Heath Monitor (V)	Inhabits a range of habitats, including coastal heaths, woodland and sclerophyll forests. It shelters in self-made burrows or in hollow logs and rock crevices and is known to be semi-arboreal. Its range extends from southern Western Australia through South Australia. The Victorian and NSW populations are isolated from these western populations and from each other. Within NSW, populations are known from the Canberra region north to Wondabyne.	**Low** The survey did not record this species within the proposed conservation estate. Unlikely to occur due to its more southerly occurrence.
Avifauna		
Ixobrychus flavicollis Black Bittern (V)	Solitary species, living near water (estuarine to brackish) in mangroves and other trees which need to form only a narrow fringe of cover. A riparian species that occasionally ventures into the open within estuarine habitats. Sedentary resident along Dora and Stockton Creeks in western Lake Macquarie, but is likely to occur in any brackish to estuarine forested coastal creeks in the lower NSW coast.	**Moderate** Tank Paddock Conservation Estate contains potential wetland habitat for this species.
Botaurus poiciloptilus	The Australasian Bittern is confined to Australia and New Zealand. Within Australia this species occurs in the southeast and southwest with the occasional vagrant in the northwest of Australia.	**Moderate**

Species	Habitat Description and Known Populations	Chance of Occurrence within Conservation Estate
Australian Bittern (V)	It favours permanent fresh-waters dominated by sedges, rushes, reeds or cutting grasses (e.g. Phragmites, Scirpus, Eleocharis, Juncus, Typha, Baumea and Gahnia). Feeds on insects, small fish, eels, frogs and other aquatic life, sometimes in ricefields. It is partly nocturnal in habits, and, keeping as it does to the depths of reedy swamps, is seldom seen during the day. There is an anecdotal record for this species within the proposed Conservation Estates of Tank Paddock.	Tank Paddock Conservation Estate contains potential wetland habitat for this species.
Ephippiorhynchus asiaticus Black-necked Stork (E)	Inhabits swamps associated with river systems and large permanent pools but sometimes appears on the coast or in estuaries. It has also been recorded on farm dams and sewage treatment ponds. Within the Hunter Region it occurs spasmodically on freshwater or estuarine wetlands.	**Moderate** Tank Paddock Conservation Estate contains potential wetland habitat for this species.
Lophoictinia isura Square-tailed Kite (V)	Inhabits open forests and woodlands, particularly those on fertile soils with abundant passerines. They may also range in nearby open habitats but not into extensive treeless regions. This species is notably absent from alpine regions and small isolated remnant woodlands in large open areas. Records exist from the Cessnock and Maitland LGA's and there are records for this species from Cooranbong in the southwest of the Lake Macquarie LGA (Atlas of NSW Wildlife data; HBOC records). Records for this species within the Lower Hunter are generally limited to Autumn.	**Low – Moderate** Due to the generalist habitat requirements of this species, it could potentially occur within the site on a seasonal basis. Records in the Hunter Sub-bioregion are generally sparse and it would be difficult to locate during targeted surveys.
Callocephalon fimbriatum Gang-gang Cockatoo (V)	Occurs in forests and woodlands where it forages on the seed capsules of Eucalypts. Sedentary, seasonally nomadic or part-migratory, this species shows a general trend to leave highland habitats in winter for more lowland districts. Requires large Eucalypt tree hollows for nesting. Records exist from the Watagan Mountains and adjacent lowlands and foot hills (Atlas of NSW Wildlife data).	**High** The species was recorded in three locations within the Stockrington Conservation Estates during surveys.
Calyptorhynchus lathami Glossy Black-Cockatoo (V)	Occurs in forests and woodlands where it forages predominantly on *Allocasuarina* cones. Requires large Eucalypt tree hollows for nesting. Records within the Hunter Sub-bioregion predominantly from relatively undisturbed forested areas on the ranges such as the Watagan Forests, with isolated records from the valley floor remnants.	**Moderate** This species was not recorded within the site during fauna surveys; however, the known feed tree *Allocasuarina littoralis* occurs widely within the site. Therefore, this species may use habitat within the development estate on at least an intermittent basis.
Melanodryas cucullata subsp. *cucullata* Hooded Robin (V)	Ranges from about Mundubbera, Qld, to the Spencer Gulf, SA, intergrading with other subspecies through the northern Murray-Darling Basin (Garnett *et al*, 2000). They occupy drier Eucalypt forest, woodland and scrub as well as grasses and low shrubs. The species is a quiet, shy and largely sedentary bird, most often observed in pairs or small groups. The size of territories throughout Australia has been estimated to be between 5 to 50 hectares. Established pairs keep to their territory year round, banding into family groups only briefly after breeding. (Schodde and Tidemann, 1986).	**Low** This species was not recorded within the site during fauna surveys. Although a record for this species occurs within the Minmi/Link Rd Development Estate nearby (Atlas of NSW Wildlife data), habitat within the Conservation Estates is not considered suitable for this species and occurs outside its current distribution within the Hunter Valley. Therefore, chance of occurrence is considered low.
Stagonopleura guttata Diamond Firetail (V)	Small Finch occupying open woodlands / forests and associated habitats with grassy understorey. Generally found west of the Divide or in drier semi-coastal areas such as the upper Hunter Valley. Appears unable to persist in remnants less than 200ha. Local records for this species are rare, but it has been recorded in the Cessnock LGA during sustained dry periods.	**Low** This species was not recorded within the Conservation Estate during fauna surveys. Despite occurrences within the Lower Hunter Region (Atlas of NSW Wildlife data) this species occurs sparsely across the western to central Hunter, and as such it is unlikely to occur in the Lower Hunter on more than a rare occasion.
Pomatostomus temporalis temporalis Grey-crowned Babbler (V)	Ranges from SA to Cape York Peninsula, Qld, generally in areas receiving an average annual rainfall between 250 and 1000 mm. The Grey-crowned Babbler inhabits open Eucalypt woodlands with a grassy groundcover and sparse, tall shrub layer. Also be observed along streams in cleared areas and grassy road verges (Morcombe, 2000). Forages mainly on insects and spiders in leaf litter and soil, but also venturing into vegetation. Within the Lower Hunter Valley, this species is known from Werakata National Park (University of Newcastle 2001). It has been recorded in Wollemi, Goulburn River and Yengo National Parks (Atlas of NSW Wildlife; authors pers. obs.).	**Low** This species was not recorded within the site during fauna surveys and there are no records for this species within the locality of the site. The site is dominated by eucalypt forests and lacks this species' preferred open woodland habitat. Therefore, the chance of occurrence is considered low.
Chthonicola sagittatus Speckled Warbler (V)	Occurs in South-Eastern Australia, from South-West Victoria through eastern New South Wales to Central Queensland, mostly on the western slopes and tablelands of the Great Dividing Range, and in the drier areas of coast. Lives in a wide range of Eucalypt dominated vegetation that has a grassy and shrubby understorey often on rocky ridges or gullies (Garnett *et al*, 2000). Within the Lower Hunter Valley, this species is known from Werakata National Park, the HEZ, Elderslie and North Rothbury (Harper Somers O'Sullivan 2004). Records also exist from Wollemi, Goulburn River, Dharug and Yengo National Parks (Atlas of NSW Wildlife).	**Low - Moderate** This species was not recorded within the site during fauna surveys. Habitat within the site is considered sub-optimal for this species and Lower Hunter records for this species do not occur further east than the Sugarloaf Range. However, records occur at the western extremity of lands to be retained for conservation purposes at Stockrington (Atlas of NSW Wildlife data).

Species	Habitat Description and Known Populations	Chance of Occurrence within Conservation Estate
Climacteris picumnus subsp. *victoriae* Brown Treecreeper (V)	Occurs through central NSW on the western side of the Great Dividing Range and sparsely scattered to the east of the Range in drier areas such as the Cumberland Plain of Western Sydney, and in parts of the Hunter, Clarence, Richmond and Snowy River valleys. Frequents drier forests and woodlands, particularly open woodland lacking a dense understorey, but also grasslands where there are sufficient logs, stumps and dead trees nearby. Within the Lower Hunter Valley, this species is known from Werakata National Park, Rothbury, the HEZ and Ellalong (Atlas of NSW Wildlife).	**High** This species was recorded within the west of the Stockrington Conservation Estates during surveys. Although this species is known to occur within Lower Hunter Spotted Gum Ironbark Forest in the Cessnock LGA, birds east of the Sugarloaf population are rare. Other records also occur at the western extremity of lands to be retained for conservation purposes at Stockrington (Atlas of NSW Wildlife data).
Melithreptus gularis gularis Black-chinned Honeyeater (V)	Occurs in eastern Australia, along the inland slopes of the Great Dividing Range, extending to the coast between Sydney and Newcastle, NSW, and north to Rockhampton, Qld. Occupies dry Eucalypt woodland within an annual rainfall range between 400-700 mm, particularly within associations containing Ironbark and Box species (Garnett *et al*, 2000). Within the Lower Hunter Valley, this species is known from Werakata National Park the HEZ and Ellalong lagoon (Harper Somers O'Sullivan 2004). Additionally, substantial and regular records of this species were noted from the Spotted Gum / Ironbark associations in the Cessnock / Kurri Kurri area during 2005 (HSO Ecologists pers. obs.).	**High** This species was recorded within the west of the Stockrington Conservation Estates during surveys. Although this species is known to occur within Lower Hunter Spotted Gum Ironbark Forest in the Cessnock LGA, birds east of the Sugarloaf population are rare. Other records also occur at the south-western extremity of lands to be retained for conservation purposes at Stockrington (Atlas of NSW Wildlife data)
Anthochaera phrygia Regent Honeyeater (E, E*)	Nomadic Honeyeater that disperses to non-breeding areas, including the coast, in winter, where flowering trees are sought. Within the Lake Macquarie LGA this species is generally associated with *Eucalyptus robusta* (Swamp Mahogany). Local occurrences are during winter months when this species flowers, although their stronghold is west of the great divide and it appears that movements to the coast only occur when foraging resources fail in the west and, to some extent, the Central to Lower Hunter Valley.	**Moderate** This species was not recorded within the Conservation Estate during surveys. Due to its high mobility and the presence of both *Corymbia maculata* on ridges and *Eucalyptus tereticornis* in some gullies which were found to contain a high diversity of avifauna speciesthe likelihood of this species using the Conservation Estates on an intermittent basis cannot be discounted.
Lathamus discolor Swift Parrot (E, E*)	On the mainland this species frequents Eucalypt forests and woodlands with large trees having high nectar production during winter. Mainland winter foraging sites often vary from year to year. Nests only in Tasmania. When recorded within the Lake Macquarie LGA this species is often associated with winter flowering eucalypt species such as *E. robusta* and *E. tereticornis* (Author pers. obs.), but they are known to forego nectar resources for lerps, which occur on a variety of eucalypt species. Locally this species has been recorded on Point Wollstonecraft and Nord's Wharf to the west (Atlas of NSW Wildlife data).	**Moderate** This species was not recorded within the Conservation Estate during targeted survey. Due to the occurrence of records within the wider locality of the Conservation Estate, its high mobility and the presence of a wide variety of canopy tree species representing a potential food source, the likelihood of this species using the Conservation Estates on an intermittent basis cannot be discounted.
Neophema discolor Turquoise Parrot (V)	Turquoise Parrot is typically recorded west of the Great Divide on the tablelands and western slopes, extending to the coastal districts through the dry forest corridor of the Hunter Valley (Crome & Shields, 1992). The species occurs in eucalypts woodlands and open forests, with a ground cover of grasses and low understorey of shrubs (NPWS, 2002). This species forages primarily on the seeds of shrubs, grasses and herbs, both native and introduced, and the spore cases of mosses. Breeding pairs nest in small hollow branches of Eucalypts.	**Low** This species was not recorded within the site during fauna survey. Within the Hunter Region this species occurs sparsely across the western to central Hunter, and as such it is unlikely to occur east of the Sugarloaf Range.
Glossopsitta pusilla Little Lorikeet (V)	*Glossopsitta pusilla* extends from Cairns to Adelaide coastally and to inland locations. Commonly found in dry, open eucalypt forests and woodlands. Can be found in roadside vegetation to woodland remnants. *G. pusilla* feeds on abundant flowering Eucalypts, but will also take nectar from, *Melaleuca* sp and *Mistletoe* sp. *Eucalyptus albens* (White Box) and *E. meliodora* (Yellow Box) are favoured food sources on the western slopes in NSW. On the eastern slopes and coastal areas favoured food sources are *Corymbia maculata* (Spotted Gum), *E. fibrosa* (Broad-leaved Ironbark), *E. robusta* (Swamp Mahogany) and *E. pilularis* (Blackbutt). Nesting takes place in hollow bearing trees.	**High** This species was recorded within the northern area of the site. Habitat within the site is considered suitable for both foraging and roosting and records occur within the locality.
Ninox connivens Barking Owl (V)	Occurs in forests, woodlands, and savannah and riverine woodland although more open country is favoured for foraging and large hollow-bearing eucalypts for breeding. The Barking Owl is widespread within New South Wales, with records from coastal areas along with the slopes, plains, tablelands, and far western plains. Hollands (1991) regards the habitat of this species as open country with a choice of large trees for roosting and nesting. Prey species taken includes arrange of mammals and birds, as well as invertebrates (Readers Digest 1982). Usually occupies permanent territories, generally greater than 100 ha.	**Low** Not recorded during owl call back and nocturnal spotlighting surveys. A number of widely scattered records for this species occur within the Lower Hunter, both to the east and to the west of the site, and as such the chance of its occurrence on a rare occasion cannot be discounted. However, the possibility that the site is part of the home range of individuals or pairs is considered unlikely.
Ninox strenua Powerful Owl	Occurs in sclerophyll forests and woodlands where suitable prey species occur (being predominantly arboreal mammals). Requires large hollows, usually in Eucalypt trees, for nesting. Roosts in dense vegetation within such areas. Records from the Hunter Sub-bioregion	**High** A roosting bird was recorded within the Tank Paddock Conservation Estate during associated fauna surveys, records and suitable habitat also exists within the Stockrington Conservation

Species	Habitat Description and Known Populations	Chance of Occurrence within Conservation Estate
(V)	are fairly widespread (HBOC records; HSO ecologists pers. obs.).	Estate.
Tyto novaehollandiae Masked Owl (V)	Found in a range of habitats, locally within sclerophyll forests and woodlands where appropriate / preferred prey species occur (being predominantly terrestrial mammals). Requires large Eucalypt hollows for nesting and prefers to roost in these hollows as well. Records from the Hunter Sub-bioregion are fairly widespread within the sub-coastal districts and often of road kill birds (HBOC records; RPS HSO ecologists pers. obs.).	**Moderate - High** There are anecdotal records of sightings within the proposed Conservation Estates of Tank Paddock (Green Corridor Coalition) and suitable habitat exists within both the Stockrington and Tank Paddock Conservation Estates. Hollows of sufficient size to represent potential breeding sites for this species were noted during habitat assessment within the Conservation Estates.
Tyto tenebricosa *Sooty* Owl (V)	Occurs in wet Eucalypt forest and rainforest with tall emergent trees, often in easterly facing gullies. Within these areas this species hunts for a range of mainly mammalian prey at all levels of the forest strata. Roosts in tree hollow or dense canopy vegetation. Also nests in large Eucalypt tree hollows. Most Hunter records exist from the Watagan mountains (Atlas of NSW Wildlife data), but this species has also been observed to the southwest of Awaba (RPS HSO ecologist pers. obs.).	**Moderate - High** The Stockrington Conservation Estates contain wet sclerophyll and rainforest habitat that is suitable for the species and the species has been recorded previously (EcoBiological 2006).
Ptilinopus magnificus Wompoo Fruit Dove (V)	Ranges from Cape York (Qld.) along the coast and ranges south to the Hunter River (NSW.), with the southern end of the range decreasing having once extended to Nowra. This Fruit-Dove is a frugivorous rainforest specialist inhabiting the canopy of sub-tropical, warm-temperate and depauperate rainforests. Occasionally it will stray to fruiting trees outside of rainforest areas. Breeding occurs between July and December and is linked to the fruiting cycles of favoured feed trees including figs, laurels, myrtles and native tamarind. This species prefers relatively undisturbed to completely undisturbed rainforest	**Moderate** Potential habitat for this species exists within Subtropical Rainforest within the Stockrington Conservation Estates and records exist within the western portion (Atlas of NSW data). However, it was not recorded during surveys.
Ptilinopus regina Rose-crowned Fruit Dove (V)	Ranges through Eastern Australia, from Cape York south to the vicinity of Port Stephens. Occasionally it extends into Victoria. The Rose-crowned Fruit Dove generally lives in rainforest, though it also frequents brushes of coastal districts as well as forests and mangroves. It usually feeds on figs or other fruit and berry-bearing trees.	**Moderate** Potential habitat for this species exists within Subtropical Rainforest within the Stockrington Conservation Estates. However, it was not recorded during surveys.
Ptilinopus superbus Superb Fruit Dove (V)	Occurs from north-eastern rainforest, forest and mangroves north of Cardwell, Qld; becoming uncommon nomads or non-breeding migrants further south to the Hunter River, with rare sightings recorded south to Tasmania. It is mainly a rainforest inhabitant but will feed in adjacent mangroves or Eucalypt forest, venturing into coastal brushes also at various times of the year. It usually feeds on figs or other fruit and berry-bearing trees.	**Low - Moderate** Highly marginal potential habitat for this species exists within Subtropical Rainforest within the Stockrington Conservation Estates. However, it was not recorded during surveys.
Mammals		
Dasyurus maculatus Spotted-tailed Quoll (V, V*)	Found sparsely across a relatively wide variety of habitats from coastal heathland to rainforest habitats. This species creates a den in fallen hollow logs or among rocky outcrops. Generally, it does not occur in otherwise suitable habitats that are in close proximity to urban development. Local records for this species only occur with a level of regularity within large tracts of undisturbed forest as occurs in ranges surrounding the region.	**Moderate** Potential habitat for this species exists within the Stockrington Conservation Estates
Phascogale tapoatafa Brush-tailed Phascogale (V)	Inhabits dry open forest and woodlands, often in areas with sparse groundcover. It is one of the most arboreal Dasyurids and mainly hunts invertebrates, although some vertebrate prey is taken on occasion. Utilises small tree hollows for nesting and refuge sites.	**Low** Whilst habitat within the site is considered to be marginally suitable for this species previous records of this species are limited to areas north of the Hunter river (Atlas of NSW Wildlife data). Therefore, the chance of occurrence is considered to be low.
Petaurus australis Yellow-bellied Glider (V)	Usually associated with tall, mature wet Eucalypt forest. Also known from tall dry open forest and mature woodland. The diverse diet of this species is primarily made up of Eucalypt nectar, sap, honey dew, manna and invertebrates found under decorticating bark and pollen. Tree hollows for nest sites are essential, as are suitable food trees in close proximity. Most records in the Lower Hunter Region occur in the Watagan Mountains and other areas exhibiting significant stands of forest (Atlas of NSW Wildlife data).	**Moderate** Atlas of NSW Wildlife records occur within proposed Conservation Estates west of Stockrington. However, no evidence of occupation was observed during site inspections.
Petaurus norfolcensis Squirrel Glider	Occurs in Eucalypt forests and woodlands where it feeds on sap exudates and blossoms. In these areas tree hollows are utilised for nesting sites. Also requires winter foraging resources when the availability of normal food resources may be limited, such as winter-flowering shrub	**Moderate** Suitable foraging and denning habitat exists within the Conservation Estates for this species.

Species	Habitat Description and Known Populations	Chance of Occurrence within Conservation Estate
(V)	and small tree species. Widely distributed across the lower Hunter Sub-bioregion, few records from the Upper Hunter (Atlas of NSW Wildlife data).	
Phascolarctos cinereus Koala (V)	Occurs in forests and woodlands where it requires suitable feed trees (particularly *Eucalyptus* spp.) and habitat linkages. Will occasionally cross open areas, although it becomes more vulnerable to predator attack and road mortality during these excursions. Records from the Hunter Sub-bioregion are generally scarce, with a small number of records from Cessnock, Singleton and Muswellbrook LGA's. Within the Greater Hunter Region it is largely confined to the Port Stephens area, the Lake Macquarie hinterland and the Watagan Mountains (Atlas of NSW Wildlife data).	**High** A Koala scat was recorded within the Stockrington Conservation Estate during surveys and confirmed via scat analysis (Barbara Triggs). Scattered local records exist and it is considered likely that the species occurs at either very low densities or individuals are moving through the area.
Pteropus poliocephalus Grey-headed Flying-fox (V, V*)	Forages over a large area for nectar / fruits etc. Seasonally roosts in communal base camps situated within wet sclerophyll forests or rainforest. Frequently observed to forage in flowering Eucalypts. May occur anywhere within the Hunter Sub-bioregion where food or roosting resources are available.	**Moderate - High** Due to the presence of foraging habitat within flowering canopy species across the Conservation Estates and the high mobility of the species, it is considered highly likely that the species would regularly utilise the site. Furthermore, potential roosting camp habitat occurs within a number of the gullies within the Stockrington Conservation Estates.
Miniopterus schreibersii subsp. *oceanensis* Eastern Bentwing-Bat (V)	This species utilises a range of habitats for foraging, including rainforest, wet and dry sclerophyll forests, woodlands and open grasslands. Requires caves or similar structures for roosting habitat. Widely distributed across the Hunter Sub-bioregion, particularly in sub-coastal districts (Atlas of NSW Wildlife data). A number of records for this species occur within the vicinity of the site.	**High** The species was recorded within proposed Conservation Estates at Stockrington, which also contains potential cave roosting habitat in disused rail tunnels and rocky outcrops.
Miniopterus australis Little Bentwing-bat (V)	Prefers to forage in well-vegetated areas, such as within wet and dry sclerophyll forests and rainforests. Requires caves or similar structures for roosting habitat. Largely confined to more coastal areas in the Hunter region. A number of records for this species occur within the local area (Atlas of NSW Wildlife data).	**High** The species was recorded within proposed Conservation Estates at Stockrington, which also contains potential cave roosting habitat in disused rail tunnels and rocky outcrops.
Mormopterus norfolkensis Eastern Freetail-bat (V)	This species forages predominantly in dry forests and woodlands east of the divide. It roosts in tree hollows, under bark and within man-made structures. Found within a scattered distribution across the Lower Hunter Region. Locally it occurs within the Lake Macquarie hinterland (Atlas of NSW Wildlife data).	**Moderate** Due to the high mobility of this species the presence of potential foraging and roosting habitat within the Conservation Estate, it is likely that this species occurs within the site on at least an intermittent basis. Hollow-bearing trees within the Conservation Estates represent potential roosting habitats for the species.
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat (V)	Occurs in a range of habitats from rainforest to arid shrubland, roosts in tree-hollows. Near coastal records occur to the south in the Wyong and Gosford LGAs (Atlas of NSW Wildlife data).	**Moderate** Due to the high mobility of this species the presence of potential foraging and roosting habitat within the Conservation Estate, it is likely that this species occurs within the site on at least an intermittent basis. Hollow-bearing trees within the Conservation Estates represent potential roosting habitats for the species.
Falsistrellus tasmaniensis Eastern False Pipistrelle (V)	This species is found in a variety of forest types such as open forests, woodlands and wetter sclerophyll forests (usually with trees >20m). This species roosts in tree hollows. Few records occur within the Hunter Sub-bioregion.	**Moderate** Due to the high mobility of this species the presence of potential foraging and roosting habitat within the Conservation Estate, it is likely that this species occurs within the site on at least an intermittent basis. Hollow-bearing trees within the Conservation Estates represent potential roosting habitats for the species.
Chalinolobus dwyeri Large-eared Pied Bat (V)	This species forages in tall open forests, including dry forests and the edges of rainforest. It roosts in mine shafts and similar structures. Hunter Region records for this species are largely confined to the Watagan Mountains (Atlas of NSW Wildlife data).	**Moderate** Due to the high mobility of this species the presence of potential foraging and roosting habitat within the Conservation Estate, it is likely that this species occurs within the site on at least an intermittent basis. Hollow-bearing trees within the Conservation Estates represent potential roosting habitats for the species.
Myotis adversus Large-footed Myotis (V)	Usually found near bodies of water, including estuaries, lakes, reservoirs, rivers and large streams, often in close proximity to their roost site. Roosts in colonies of between a dozen and several hundred individuals in caves, mines and disused railway tunnels (Atlas of NSW Wildlife data).	**Moderate** Suitable open water foraging habitats for this species exist within large dams and wide areas of Blue Gum Creek within Stockrington Conservation Estates and wetland habitats of Tank Paddock for this species. Furthermore, suitable roosting habitat for the species exists within

Species	Habitat Description and Known Populations	Chance of Occurrence within Conservation Estate
		disused railway tunnels and rocky outcrops within the Stockrington Conservation Estates.
Scoteanax rueppellii Greater Broad-nosed Bat (V)	Forages in moister gullies and wet sclerophyll forests as well as in lightly wooded areas and open spaces / ecotones. This species roosts in tree hollows and is relatively widespread within the Lower Hunter Region (Atlas of NSW Wildlife data).	**Moderate** Due to the high mobility of this species the presence of potential foraging and roosting habitat within the Conservation Estate, it is likely that this species occurs within the site on at least an intermittent basis. Hollow-bearing trees within the Conservation Estates represent potential roosting habitats for the species.
Vespadelus troughtoni Eastern Cave Bat (V)	A cave dweller, known from wet sclerophyll forest and tropical woodlands from the coast and Dividing Range to the drier forests of the semi-arid zone. It has been found roosting in small groups in sandstone overhangs, in mine tunnels and occasionally in buildings. In all situations, the roost sites are frequently in reasonably well-lit areas. The distribution of this species is largely to the north of the Hunter (Strahan 1995), with one record at Windermere Park in south-western Lake Macquarie (Atlas of NSW Wildlife data).	**Moderate** Due to the high mobility of this species and the presence of potential foraging habitat within the Conservation Estate, it is likely that this species occurs within the site on at least an intermittent basis. Potential cave roosting habitat exists in disused rail tunnels and rocky outcrops within the Stockrington Conservation Estates
Endangered Ecological Communities		
Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bio-regions	Associated with periodic or semi-permanent inundation by freshwater, although there may be minor saline influence in some wetlands. They typically occur on silts, muds or humic loams in depressions, flats, drainage lines, backswamps, lagoons and lakes associated with coastal floodplains. Wetlands or parts of wetlands that lack standing water most of the time are usually dominated by dense grassland or sedgeland vegetation, often forming a turf less than 0.5 metre tall and dominated by amphibious plants including *Paspalum distichum*, *Leersia hexandra* and *Carex appressa*. Wetlands or parts of wetlands subject to regular inundation and drying may include large emergent sedges over 1 metre tall, such as *Baumea articulata, Eleocharis equisetina* and *Lepironia articulata*. Correlates with LHCCREMS Map Unit (MU) 46 – 'Freshwater Wetland Complex'.	**High** The geomorphological characteristics and the flora species composition of this vegetation community were found to occur within several wetland communities within Tank Paddock Conservation Estates.
Lower Hunter Redgum Forest in the Sydney Basin and NSW Coast Bioregions	Fund on gentle slopes arising from depressions and drainage flats on Permian sediments of the Hunter Valley floor in the Sydney Basin and NSW North Coast Bioregions. Recorded from the local government areas of Maitland, Cessnock and Port Stephens (in the Sydney Basin Bioregion) and Muswellbrook and Singleton (in the NSW North Coast Bioregion) but may occur elsewhere in these bioregions. Common canopy tree species are *Eucalyptus tereticornis* (Forest Red Gum) and *E. punctata* (Grey Gum). Other frequently occurring canopy species are *Angophora costata*, *Corymbia maculata*, *E. crebra* and *E. moluccana*. The mid-storey is open and characterised by sparse shrubs such as *Breynia oblongifolia*, *Leucopogon juniperinus*, *Daviesia ulicifolia* and *Jacksonia scoparia*. The ground cover typically comprises grasses and herbs. Correlates with LCCREMS Map Unit (MU) 19 'Hunter Lowland Redgum Forest'.	**High** The geomorphological characteristics and the species composition of this vegetation community were found to occur within both the Stockrington and Tank Paddock Conservation Estates.
Lower Hunter Spotted Gum - Ironbark Forest in the Sydney Basin Bioregion.	This community is dominated by *Corymbia maculata* (Spotted Gum) and *Eucalyptus fibrosa* (Broad-leaved Ironbark) with occasional occurrences of *E. punctata* (Grey Gum) and *E. crebra* (Grey Ironbark). Several distinctions have been noted within the LHCCREMS community profiles between this community and other Spotted Gum / Ironbark associations, often characterised by the dominant canopy composition, range, soil type and topography (NPWS 2000). Within the Lower Hunter, the peak of distribution occurs within the forested areas between Beresfield and Cessnock. On the basis of revised vegetation mapping conducted in 2002, a total of 32,366ha of LHSGIF has been mapped within the LHCCREMS study area boundary. Correlates with LCCREMS Map Unit (MU) 17.	**High** The geomorphological characteristics and the species composition of this vegetation community were found to occur over within the Conservation Estates. This EEC was the dominant vegetation community in both the Tank Paddock and Stockrington Conservation Estates.
Lowland Rainforest of the NSW North Coast and Sydney Bioregion	Lowland Rainforest, in a relatively undisturbed state, has a closed canopy, characterised by a high diversity of trees whose leaves may be mesophyllous and encompass a wide variety of shapes and sizes. Typically, the trees form three major strata: Emergents, canopy and sub-canopy which, combined with variations in crown shapes and sizes results in an irregular canopy appearance. The trees are taxonomically diverse at the genus and family levels, and some may have buttressed roots. A range of plant growth forms are present in Lowland Rainforest, including palms, vines and vascular epiphytes. In disturbed stands of this community the canopy cover may be broken, or the canopy may be smothered by exotic vines. The Hawkesbury River notionally marks the southern limit of Lowland Rainforest in the NSW North Coast and Sydney Basin bioregions.	**High** The geomorphological characteristics and the species composition of this vegetation community were found to occur within deeply incised gullies within the northern portion of the Stockrington Conservation Estates.

Species	Habitat Description and Known Populations	Chance of Occurrence within Conservation Estate
Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bio-regions	This community is associated with periodically inundated flats, drainage lines, lake margins and estuarine fringes associated with coastal floodplains, typically occurring on grey-black clay-loams and sandy loams. Usually occurring below 20 m altitude.	**High** The geomorphological characteristics and the species composition of this vegetation community were found to occur in a small area within the Tank Paddock Conservation Estates.
Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bio-regions	The community is associated with humic clay or sandy loams on waterlogged or episodically flooded alluvial flats and drainage lines within coastal floodplains. It is generally characterised by an open to dense canopy of Eucalypts and / or Paperbarks. Canopy heights generally vary from 8m to 25m depending on species composition. In the Hunter Region the canopy often contains *Eucalyptus robusta* and / or *Melaleuca quinquinervia* although other species, such as *Casuarina glauca*, *Eucalyptus resinifera* subsp. *hemilampra* and *Livistona australis* may be present.	**High** The geomorphological characteristics and the species composition of this vegetation community were found to occur in a small area within the Tank Paddock Conservation Estates.

Notes: (V) = Vulnerable Species listed under the *Threatened Species Conservation Act 1995*.
(E) = Endangered Species listed under the *Threatened Species Conservation Act 1995*.
(V*) = Vulnerable Species listed under the *Commonwealth EPBC Act 1999*.
(E*) = Endangered Species listed under the *Commonwealth EPBC Act 1999*.
(CE*) = Critically Endangered Species listed under the *Commonwealth EPBC Act 1999*.
(M*) = Migratory Species listed under the *Commonwealth EPBC Act 1999*.

4 Discussion

The Lower Hunter Region's vegetation is of bio-geographic significance as it supports a transition between the northern and southern plant and animal assemblages. This north-south link is not evident elsewhere in the Hunter Valley. The Region also forms an east-west migratory pathway and a drought refuge for inland species.

The preservation of large vegetated areas that are linked to other similar areas has been recognised as fundamentally important to achieving long term regional biodiversity outcomes in the Lower Hunter region. The two most valued of these areas in the Lower Hunter contain large land areas owned and controlled by Coal & Allied. The firstly, is the green corridor that links the Watagans and Yengo National Parks with the coastal plains of the Tomago Sandbeds, Stockton Bight and Port Stephens and secondly, the Wallarah Peninsula lands provide a regionally significant break between urban areas, and contain areas of high biodiversity, scenic amenity and heritage value.

The Coal & Allied lands to be dedicated form both large vegetated areas in their own right, and complete linkage of identified regional corridors in key areas.

In addition to their important strategic location in a wider landscape context, the Conservation Estates contain valuable biodiversity resources. They contain and will conserve a range of important vegetation communities, including six Endangered Ecological Communities (EEC) and other vegetation types that have been depleted in the region. These EEC's are listed below:-

- Freshwater Wetlands on Coastal Floodplains;
- Swamp Sclerophyll Forests on Coastal Floodplains;
- Swamp Oak Floodplain Forest on Coastal Floodplains;
- Lowland Rainforest;
- Hunter Lowland Redgum Forest; and
- Lower Hunter Spotted Gum Ironbark Forest.

Several threatened plant species have been recorded within the Conservation Estates, including the following

- *Arthropteris palisotii* (Recorded by EcoBiological 2006)*;*
- *Callistemon linearifolius;*
- *Eucalyptus nicholii;*
- *Grevillea parviflora* subsp. *parviflora*;
- *Rutidosis heterogama;*
- *Syzygium paniculatum;*

- *Tetratheca juncea* (Black-eyed Susan).

Two of the threatened flora species recorded in the Conservation Estates are considered to be planted specimens and not naturally occurring, being *Eucalyptus nicholii* and *Syzygium paniculatum*, although *S. paniculatum* may have been transported to its position in a disturbed area by natural means.

In addition to the abovementioned threatened species two rare (ROTAP) species *Callistemon shiressii* and *Eucalyptus fergusonii* subsp. *dorsiventralis* were also identified within the Conservation Estates.

A wide diversity of threatened fauna species have been recorded within the varied habitats of the conservation estate and these are as follows:-

- Powerful Owl (EcoBiological 2006);
- Sooty Owl (EcoBiological 2006);
- Koala;
- Gang Gang Cockatoo
- Brown Treecreeper
- Black-chinned Honeyeater

The diverse nature of both the landform settings, varying from coastal ranges forests, rainforests and woodlands to wetlands, provides a diverse array of habitats and resources for native fauna. The Conservation Estates are known to contain important populations of numerous threatened fauna species, including birds, mammals and herpetofauna. The conservation of these lands will provide secure regional biodiversity gene pools, and also through linkages facilitate valuable genetic material exchange and other key processes associated with sustainable ecological population dynamics.

In summary, the Coal & Allied conservation dedications provide outcomes that contribute to meeting the Environmental Protection goals outlined in the Sustainability Criteria contained within the Lower Hunter Regional Strategy. Such includes:

- Outcomes consistent with the Draft Lower Hunter Regional Conservation Plan;
- Maintains/improves areas of regionally significant biodiversity;
- Maintains environmental areas for air & water quality; and
- Protects areas of Aboriginal cultural heritage value and historical heritage value.

These outcomes:

- Conserve in perpetuity key strategic parcels of land that complete long sought after regional biodiversity conservation corridors and buffer areas;
- Provide large intact areas of conserved habitat that will function as regional biodiversity gene pools;

- Protect an important array of vegetation communities, flora and fauna species, and natural landscape assets, including threatened species and EEC's; and
- Contribute significantly to the successful implementation of the Lower Hunter Regional Conservation Plan.

5 Conclusion

This ecological inventory of the Stockrington and Tank Paddock Conservation Estates has been undertaken to support the Minmi/Link Road and Black Hill Development Estates as part of the proposal for Coal & Allied surplus Northern Estates. The Stockrington and Tank Paddock Conservation Estates are an integral part of the Watagan to Stockton Corridor which will achieve regional conservation outcomes. Furthermore, suitable actions are proposed to minimise potentially deleterious permanent and ongoing impacts to the conservation lands.

The field and desktop studies have recorded the following parameters of ecological significance within the Conservation Estates:

- native vegetation commensurate with those listed as EEC's;
- threatened flora species recorded within and adjacent to the proposed development;
- threatened fauna species recorded within and adjacent to the proposed development;
- habitat for threatened flora and fauna species known from within and adjacent to the proposed development; and
- other areas containing native vegetation with varying degrees of modification / degradation.

The large areas of Conservation Estates at Stockrington and Tank Paddock that will be set aside as part of the proposed developments provide excellent ecological outcomes across the site. The Stockrington Conservation Estate will contribute a large portion of land to conservation in perpetuity, which will in essence formalise the Watagan to Stockton Corridor. The importance of the conservation of Tank Paddock as part of the Conservation Estates will result in maintaining a vegetation corridor from Hexham Swamp and the Hunter Estuary to the Watagan Mountains and the Sugarloaf Range. This large tract of native vegetation will provide habitat for a wide variety of native flora and fauna.

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Appendix 1

Flora Species List

Table 1 Flora Species for the Conservation Estates

Class/Subclass	Family	Scientific Name	Common Name
Filicopsida	Adiantaceae	*Adiantum aethiopicum*	Common Maidenhair
		Adiantum diaphanum	Filmy Maidenhair
		Adiantum formosum	Giant Maidenhair
		Adiantum hispidulum	Rough Maidenhair
	Aspleniaceae	*Asplenium australasicum*	Birds Nest Fern
	Azollaceae	*Azolla pinnata*	Ferny Azolla
	Blechnaceae	*Blechnum cartilagineum*	Gristle Fern
		Blechnum indicum	-
		Blechnum nudum	-
		Doodia aspera	Rasp Fern
	Davalliaceae	***Arthropteris palisotii (E) (EcoBiological 2006)***	-
		Arthropteris tenella	Jointed Fern
		*Nephrolepis cordifolia**	Fish-bone Fern
	Dennstaedtiaceae	*Pteridium esculentum*	Bracken
	Dicksoniaceae	*Calochlaena dubia*	False Bracken
	Dryopteridaceae	*Lastreopsis acuminata*	Shiny Shield-fern
		Lastreopsis decomposita	Trim Shield Fern
	Lindsaeaceae	*Lindsaea linearis*	Screw Fern
		Lindsaea microphylla	Lacy Wedge-fern
	Polypodiaceae	*Dictymia brownii*	-
		Microsorum scandens	Fragrant Fern
	Sinopteridaceae	*Cheilanthes sieberi* subsp. *sieberi*	Poison Rock Fern
		Pellaea falcata	Sickle Fern
		Pellaea paradoxa	-
Coniferopsida	Pinaceae	*Pinus radiata**	Radiata or Monterey Pine
	Podocarpaceae	*Podocarpus elatus*	Plum Pine
Cycadopsida	Zamiaceae	*Macrozamia reducta*	Burrawang
Magnoliidae	Acanthaceae	*Brunoniella australis*	Blue Trumpet
		Pseuderanthemum variabile	Pastel Flower
		*Thunbergia alata**	Black-eyed Susan
	Alismataceae	*Alisma plantago-aquatica*	Water Plantain
	Anacardiaceae	*Euroschinus falcata* var. *falcata*	Ribbonwood
	Apiaceae	*Apium leptophyllum**	Slender Celery
		Centella asiatica	Swamp Pennywort
		*Ciclospermum leptophyllum**	Slender Celery
		*Foeniculum vulgare**	Fennel
		*Hydrocotyle bonariensis**	Kurnell Curse / Pennywort
		Hydrocotyle geraniifolia	Forest Pennywort
		Hydrocotyle laxiflora	Stinking Pennywort
		Hydrocotyle peduncularis	Pennywort
Magnoliidae	Apiaceae	*Hydrocotyle tripartita*	Pennywort

Class/Subclass	Family	Scientific Name	Common Name
		Trachymene incisa subsp. *incisa*	Native Parsnip
	Apocynaceae	*Melodinus australis*	-
		Parsonsia straminea	Common Silkpod
	Araliaceae	*Astrotricha latifolia*	Broad-leaf Star-hair
		Polyscias sambucifolia	Elderberry Panax
	Asclepiadaceae	*Marsdenia rostrata*	Common Milk Vine
		Marsdenia suaveolens	Scented Marsdenia
		Tylophora barbata	Bearded Tylophora
	Asteraceae	*Ageratina adenophorum**	Crofton Weed
		*Aster subulatus**	Wild Aster
		*Bidens pilosa**	Cobbler's Pegs
		Brachycome multifida var. *multifida*	Cut-leaved Daisy
		Carduus nutans subsp. n*utans*	Nodding Thistle
		Chrysanthemoides monilifera subsp. *rotundata**	Boneseed
		Chrysocephalum apiculatum	Common Everlasting
		*Cirsium vulgare**	Spear Thistle
		*Conyza bonariensis**	Flax-leaf Fleabane
		*Gnaphalium americanum**	Cudweed
		*Hypochaeris radicata**	Flatweed
		Lagenifera stipitata	-
		Olearia microphylla	
		Onopordum acanthium subsp. *acanthium*	Scotch Thistle
		Ozothamnus diosmifolius	Ball Everlasting
		***Rutidosis heterogama* (EV)**	**-**
		Senecio hispidulus var. *dissectus*	Fireweed
		Senecio linearifolius	Fireweed
		*Senecio madagascariensis**	Fireweed
		Sigesbeckia orientalis	Indian Weed
		*Soliva sessilis**	Jojo
		*Sonchus oleraceus**	Common Sow-thistle
		*Taraxacum officinale**	Dandelion
		Vernonia cinerea var. *cinerea*	-
		Vittadinia cuneata var. cuneata	Fuzzweed
	Balsaminaceae	*Impatiens walleriana**	Busy Lizzie
	Basellaceae	*Anredera cordifolia**	Madiera Vine
	Bignoniaceae	*Pandorea pandorana*	Wonga Vine
	Brassicaceae	*Raphanus raphanistrum**	Wild Radish
	Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell
		Wahlenbergia gracilis	Australian Bluebell
	Capparaceae	*Capparis arborea*	Brush Caper Berry
	Carophyllaceae	*Cerastium glomeratum**	Mouse-ear Chickweed
Magnoliidae	Caryophyllaceae	*Stellaria flaccida*	Forest Starwort

Class/Subclass	Family	Scientific Name	Common Name
		*Stellaria media**	Common Chickweed
	Casuarinaceae	*Allocasuarina littoralis*	Black She-oak
		Allocasuarina torulosa	Forest Oak
		Casuarina glauca	Swamp Oak
	Celastraceae	*Cassine australis var. australis*	Red Olive Plum
		Maytenus silvestris	-
	Cesalpinioideae	*Senna pendula* var. *glabrata**	-
	Chenopodiaceae	*Einadia hastata*	Berry Saltbush
	Commelinaceae	*Commelina cyanea*	Scurvy Weed
		*Tradescantia fluminensis**	Wandering Jew
	Convolvulaceae	*Dichondra repens*	Kidney Weed
		*Ipomoea cairica**	Blue Morning Glory
		Polymeria calycina	Bindweed
	Cucurbitaceae	*Sicyos australis*	Star Cucumber
	Cunoniaceae	*Aphanopetalum resinosum*	Gum Vine
		Ceratopetalum apetalum	Coachwood
		Schizomeria ovata	Crab Apple
	Dilleniaceae	*Hibbertia aspera*	Rough Guinea Flower
		Hibbertia dentata	Twining Guinea Flower
		Hibbertia empetrifolia subsp. uncinata	-
		Hibbertia pedunculata	-
		Hibbertia scandens	Climbing Guinea-flower
	Droseraceae	*Drosera peltata*	Sundew
	Ebenaceae	*Diospyros australis*	Black Plum
	Eleocarpaceae	*Elaeocarpus reticulatus*	Blueberry Ash
	Epacridaceae	*Acrotriche divaricata*	Ground-berry
		Epacris pulchella	NSW Coral Heath
		Leucopogon juniperinus	Prickly Beard-heath
		Leucopogon lanceolatus	Lance-leaf Beard-heath
		Lissanthe strigosa subsp *strigosa*	Peach Heath
		Trochocarpa laurina	Tree Heath
	Escallionaceae	*Abrophyllum ornans*	Native Tamarind
	Euphorbiaceae	*Breynia oblongifolia*	Coffee Bush
		Claoxylon australe	Brittlewood
		Croton verreauxii	Native Cascarilla
		*Euphorbia peplus**	Spurge
		Glochidion ferdinandii	Cheese Tree
	Euphorbiaceae	*Omalanthus populifolius*	Bleeding Heart
		Phyllanthus gunnii	Spurge
		Phyllanthus hirtellus	Thyme Spurge
		Poranthera microphylla	
Magnoliidae	Euphorbiaceae	*Eupomatia laurina*	Bolwarra

Class/Subclass	Family	Scientific Name	Common Name
	Fabaceae	*Bossiaea prostrata*	-
		Daviesia squarrosa	-
		Daviesia ulicifolia	Gorse Bitter Pea
		Desmodium gunii	-
		Desmodium rhytidophyllum	-
		Desmodium varians	-
		Dillwynia retorta var. *retorta*	Eggs and Bacon
		*Erythrina X sykesii**	Coral Tree
		Glycine clandestina	Twining Glycine
		Glycine tabacina	Twining Glycine
		Gompholobium grandiflorum	Golden Glory Pea
		Gompholobium latifolium	Broad-leaf Wedge-pea
		Hardenbergia violacea	False Sarsparilla
		Hovea linearis	-
		Indigofera australis	Native Indigo
		Jacksonia scoparia	Dogwood
		Kennedia rubicunda	Dusky Coral Pea
		Millettia australis	Native Wisteria
		Mirbelia rubiifolia	-
		Podolobium ilicifolium	Prickly Shaggy Pea
		Podolobium scandens	Netted Shaggy Pea
		Pultenaea spinosa	
		Pultenaea cunninghamii	-
		Pultenaea daphnoides	Large-leaf Bush Pea
		Pultenaea paleacea var. *paleacea*	-
		Pultenaea retusa	-
		Pultenaea villosa	-
		*Trifolium arvense**	Haresfoot Clover
		*Trifolium dubium**	Yellow Suckling Clover
		*Trifolium repens**	White Clover
		Vicia sativa subsp. *sativa**	Common Vetch
	Flacourtiaceae	*Scolopia braunii*	Flintwood
	Gentianaceae	*Centaurium tenuiflorum*	-
	Geraniaceae	*Geranium homeanum*	Northern Cranesbill
	Goodeniaceae	*Goodenia hederacea* subsp. *hederacea*	Ivy-leaved Goodenia
		Goodenia heterophylla subsp. *heterophylla*	Variable Leaved Goodenia
	Goodeniaceae	*Goodenia ovata*	-
		Goodenia rotundifolia	-
	Goodeniaceae	*Scaevola ramosissima*	Purple Fan Flower
	Haloragaceae	*Gonocarpus tetragynus*	Raspwort
		*Myriophyllum aquaticum**	Brazilian Water Milfoil
Magnoliidae	Lamiaceae	*Plectranthus parviflorus*	Cockspur Flower

Class/Subclass	Family	Scientific Name	Common Name
		Prostanthera incisa	-
		Scutellaria mollis	Soft Skull Cap
		*Stachys arvensis**	Stagger Weed
	Lauraceae	*Cassytha glabella* forma *glabella*	Slender Devil's Twine
		Cassytha pubescens	Common Devil's Twine
		*Cinnamomum camphora**	Camphor Laurel
		Cryptocarya glaucescens	Jackwood
		Cryptocarya microneura	Murrogun
		Cryptocarya rigida	Rose Maple
		Neolitsea australiensis	Green Bolly Gum
	Lobeliaceae	*Pratia purpurascens*	Whiteroot
	Loranthaceae	*Dendrophthoe vitellina*	Mistletoe
		Muellerina eucalyptoides	Mistletoe
	Malvaceae	*Hibiscus heterophyllus*	Native Rosella
		Howittia trilocularis	Blue Howitta
		*Malva parviflora**	Small-flowered Mallow
		*Modiola caroliniana**	Red-flowered Mallow
		*Sida rhombifolia**	Paddy's Lucerne
	Meliaceae	*Melia azedarach* var. *australasica*	White Cedar
		Synoum glandulosum	Scentless Rosewood
		Toona ciliata	Red Cedar
	Menispermiaceae	*Sarcopetalum harveyanum*	Pearl Vine
		Stephania japonica var. *discolor*	Snake Vine
	Menyanthaceae	*Villarsia exaltata*	Yellow Marsh Flower
	Mimosaceae	*Acacia binervata*	Two-veined Hickory
		Acacia elongata	-
		Acacia falcata	Sickle Wattle
		Acacia fimbriata	Fringed Wattle
		Acacia floribunda	Sally Wattle
		Acacia implexa	Hickory
		Acacia irrorata subsp. *irrorata*	Green Wattle
		Acacia linifolia	Flax Wattle
		Acacia longifolia var. *longifolia*	Sydney Golden Wattle
		Acacia maidenii	Maiden's Wattle
		Acacia myrtifolia	Red Stem Wattle
		Acacia parramattensis	Sydney Green Wattle
	Mimosaceae	*Acacia suaveolens*	Sweet Scented Wattle
		Acacia terminalis subsp. augustifolia	Sunshine Wattle
		Acacia ulicifolia	Prickly Moses
		Pararchidendron pruinosum var. *pruinosum*	Snow Wood
	Monimiaceae	*Doryphora sassafras*	Sassafras
Magnoliidae	Monimiaceae	*Wilkiea heugeliana*	Wilkiea

Class/Subclass	Family	Scientific Name	Common Name
	Moraceae	*Ficus coronata*	Sandpaper Fig
		Ficus fraseri	-
		Ficus rubiginosa	Port Jackson Fig
		Ficus watkinsiana	Strangler Fig
		Maclura cochinchinensis	-
	Myoporaceae	*Eremophila debilis*	Winter Apple
	Myrsinaceae	*Embelia australiana*	Embelia
		Rapanea howittiana	Brush Muttonwood
		Rapanea variabilis	Muttonwood
	Myrtaceae	*Acmena smithii*	Lillypilly
		Angophora bakeri	Narrow-leaved Apple
		Angophora costata	Smooth-barked Apple
		Angophora floribunda	Rough-barked Apple
		Babingtonia similis	-
		Backhousia myrtifolia	Grey Myrtle
		Baloghia inophylla	Brush Bloodwood
		Callistemon citrinus	Crimson Bottlebrush
		***Callistemon linearifolius* (V)**	**Crimson Bottlebrush**
		Callistemon linearis	Narrow-leaved Bottlebrush
		Callistemon rigidus	Stiff Bottlebrush
		Callistemon salignus	Willow Bottlebrush
		***Callistemon shiressii* (R)**	-
		Corymbia gummifera	Red Bloodwood
		Corymbia maculata	Spotted Gum
		Eucalyptus acmenoides	White Mahogany
		Eucalyptus capitellata	Brown Stringybark
		Eucalyptus crebra	Narrow-leaved Ironbark
		***Eucalyptus fergusonii subsp. dorsiventralis* (R)**	-
		Eucalyptus fibrosa	Broad Leaved Ironbark
		Eucalyptus globoidea	White Stringybark
		Eucalyptus grandis	Flooded gum
		Eucalyptus moluccana	Grey Box
		***Eucalyptus nicholii* (EV)**	**Narrow-leaved Black Peppermint**
		Eucalyptus paniculata subsp. *paniculata*	Grey Ironbark
		Eucalyptus pilularis	Blackbutt
		Eucalyptus piperita subsp. *piperita*	Sydney Peppermint
		Eucalyptus propinqua var. *propinqua*	Small Fruited Grey Gum
		Eucalyptus punctata	Grey Gum
		Eucalyptus resinifera subsp. *resinifera*	Red Mahogany
Magnoliidae	Myrtaceae	*Eucalyptus robusta*	Swamp Mahogany

Class/Subclass	Family	Scientific Name	Common Name
		Eucalyptus saligna	Sydney Blue Gum
		Eucalyptus siderophloia	Northern Grey Ironbark
		Eucalyptus sparsifolia	Narrow-leaved Stringybark
		Eucalyptus tereticornis	Forest Red Gum
		Eucalyptus umbra subsp. *umbra*	Broad-leaved White Mahogany
		Kunzea ambigua	Tick Bush
		Leptospermum parvifolium	Small-leaved Tea-tree
		Leptospermum polygalifolium subsp. *polygalifolium*	Lemon Scented Tea-tree
		Leptospermum trinervium	Flaky-barked Tea-tree
		Melaleuca decora	-
		Melaleuca ericifolia	Swamp Paperbark
		Melaleuca linearifolia	Snow in Summer
		Melaleuca nodosa	Ball Honey Myrtle
		Melaleuca quinquenervia	Broad-leaved Paperbark
		Melaleuca stypheloides	Prickly-leaved Tea Tree
		Neolitsea dealbata	White Bolly Gum
		Rhodamnia rubescens	Brush Turpentine
		Syncarpia glomulifera	Turpentine
		Syzygium australe	Brush Cherry
		***Syzygium paniculatum* (EV)**	**Magenta Lilly Pilly**
	Ochnaceae	*Ochna serrulata**	Mickey Mouse Plant
	Oleaceae	*Ligustrum sinense**	Small-leaved Privet
		Notelaea longifolia	Mock Olive
		Notelaea ovata	Mock Olive
		Notelaea venosa	Veined Mock Olive
	Onagraceae	*Ludwigia peploides* subsp. *montevidensis*	Water Primrose
	Oxalidaceae	*Oxalis corniculata**	Yellow Wood Sorrel
		*Oxalis latifolia**	Pink Fishtail
		Oxalis perennans	-
	Passifloraceae	*Passiflora herbertiana*	Native Passionfruit
	Philydraceae	*Philydrum lanuginosum*	Woolly Frogmouth
	Phytolaccaceae	*Phytolacca octandra**	Inkweed
	Piperaceae	*Piper novae-hollandiae*	Pepper Vine
	Pittosporaceae	*Billardiera scandens* var. *scandens*	Apple Dumplings
		Bursaria spinosa var. *spinosa*	Blackthorn
	Pittosporaceae	*Hymenosporum flavum*	Native Frangipani
		Pittosporum multiflorum	Orange Thorn
		Pittosporum revolutum	Yellow Pittosporum
		Pittosporum undulatum	Sweet Pittosporum
	Plantaginaceae	*Plantago debilis*	Slender Plantain
Magnoliidae	Plantaginaceae	*Plantago lanceolata**	Ribwort

Class/Subclass	Family	Scientific Name	Common Name
	Polygalaceae	*Comesperma sphaerocarpum*	-
		Muehlenbeckia gracillima	Slender Lignum
		Persicaria decipiens	Slender Knotweed
		Persicaria lapathifolia	Pale Knotweed
		Persicaria strigosa	-
		*Rumex crispus**	Curled Dock
	Polypodiaceae	*Platycerium bifurcatum* subsp. *bifurcatum*	Elkhorn
		Pyrrosia rupestris	Rock Felt Fern
	Primulaceae	*Anagallis arvensis var. caerulea**	Blue Pimpernel
		*Anagallis arvensis**	Scarlet Pimpernel
	Proteaceae	*Banksia spinulosa* var. *collina*	Hairpin Banksia
		***Grevillea parviflora* subsp. *parviflora* (EV)**	**-**
		Grevillea robusta	Silky Oak
		Hakea sericea	Needlebush
		Isopogon anemonifolius	Flat-leaved Drumsticks
		Lambertia formosa	Mountain Devil
		Persoonia levis	Broad-leaved Geebung
		Persoonia linearis	Narrow-leaved Geebung
	Pteridaceae	*Pteris umbrosa*	Jungle Brake
	Ranunculaceae	*Clematis aristata*	Old Man's Beard
		Ranunculus inundatus	River Buttercup
	Rhamnaceae	*Alphitonia excelsa*	Red Ash
	Rosaceae	*Prunus persica**	Peach Tree
		Rubus moluccanus var. trilobus	Broad-leaf Bramble
		Rubus parvifolius	Native Raspberry
		Rubus rosifolius	Forest Bramble
		*Rubus ulmifolius**	Blackberry
	Rubiaceae	*Galium binifolium*	-
		Galium proquinquum	Bedstraw
		Morinda jasminoides	-
		Opercularia aspera	Common Stinkweed
		Pomax umbellata	Pomax
		*Richardia brasiliensis**	White Eye
	Rutaceae	*Acronychia oblongifolia*	Common Acronychia
		Boronia polygalifolia	Milkwort Boronia
	Rutaceae	*Correa reflexa*	Native Fuschia
		Geijera salicifolia var. *latifolia*	Broad-leaved Brush Wilga
		Melicope micrococca	White Euodia
		Phebalium squamulosum subsp. *squamulosum*	-
		Zieria smithii	Sandfly Zieria
Magnoliidae	Santalaceae	*Exocarpos cupressiformis*	Native Cherry

Class/Subclass	Family	Scientific Name	Common Name
		Exocarpos strictus	Pale Ballart
		Alectryon subcinereus	Native Quince
		Diploglottis australis	Native Tamarind
		Dodonaea triquetra	Hop Bush
		Guioa semiglauca	Guioa
		Mischocarpus australis	Red Pear Fruit
	Sapotaceae	*Planchonella australis*	Black Apple
	Scrophulariaceae	*Gratiola latifolia*	-
		Veronica plebia	Creeping Speedwell
	Solanaceae	*Physalis peruviana**	Cape Gooseberry
		*Solanum mauritianum**	Wild Tobacco
		*Solanum nigrum**	Black Nightshade
		Solanum prinophyllum	Forest Nightshade
		Solanum pungetium	Eastern Nightshade
		Solanum stelligerum	Devil's Needles
	Sterculiaceae	*Brachychiton acerifolius*	Illawarra Flame Tree
		Brachychiton populneus	Kurrajong
		Commersonia fraseri	Brush Kurrajong
	Strelitzeaceae	*Streblus brunonianus*	Whalebone Tree
	Stylidiaceae	*Stylidium graminifolium*	Trigger Plant
	Thelypteridaceae	*Christella dentata*	-
	Thymelaeaceae	*Pimelea linifolia* subsp. *linifolia*	Slender Rice Flower
	Tremandraceae	***Tetratheca juncea* (EV)**	**Black-eyed Susan**
	Ulmaceae	*Trema tomentosa* var. *viridis*	Native Peach
	Urticaceae	*Dendrocnide excelsa*	Giant Stinging Tree
		Dendrocnide photinophylla	Shiny-leaved Stinging Tree
		Urtica incisa	Stinging Nettle
	Verbenaceae	*Clerodendrum tomentosum*	Hairy Clerodendrum
		*Lantana camara**	Lantana
		*Verbena bonariensis**	Purpletop
		*Verbena rigida**	Veined Verbena
	Violaceae	*Hybanthus monopetalus*	Slender Violet
		Hybanthus stellarioides	
		Viola betonicifolia	-
	Violaceae	*Viola hederacea*	Ivy-leaved Violet
	Vitaceae	*Cayratia clematidea*	Slender Grape
	Vitaceae	*Cissus antarctica*	Native Grape
		Cissus hypoglauca	Water Vine
		Tetrastigma nitens	Three-leaved Water Vine
	Winteraceae	*Tasmannia insipida*	-
Liliidae	Anthericaceae	*Arthropodium milleflorum*	Pale Vanilla Lily
		Arthropodium minus	Small Vanilla Lily
Liliidae	Anthericaceae	*Caesia parviflora* var. *parviflora*	Pale Grass Lily

Class/Subclass	Family	Scientific Name	Common Name
		Thysanotus tuberosus	Fringed Lily
		Tricoryne elatior	Yellow Rush Lily
	Araceae	*Gymnostachys anceps*	Settlers Flax
	Arecaceae	*Livistona australis*	Cabbage Tree Palm
	Asparagaceae	*Protasparagus aethiopicus**	Asparagus Fern
	Asteliaceae	*Cordyline stricta*	Narrow-leaf Palm Lily
	Cyperaceae	*Baumea articulata*	Jointed Twig-Rush
		Carex appressa	Tall Sedge
		Carex fascicularis	Tassel Sedge
		Carex inversa	Knob Sedge
		Carex longebrachiata	Bergalia Tussock
		*Cyperus brevifolius**	Mullumbimby Couch
		Cyperus difformis	Variable Flat-sedge
		*Cyperus eragrostis**	Umbrella Sedge
		Cyperus polystachyos	-
		Cyperus sphaeroideus	-
		Cyperus tetraphyllus	=
		Eleocharis sphacelata	Tall Spike-rush
		Fimbristylis dichotoma	Common Fringe-rush
		Gahnia aspera	Saw Sedge
		Gahnia clarkei	Tall Saw-sedge
		Gahnia melanocarpa	Black-fruit Saw-sedge
		Gahnia radula	-
		Gahnia sieberiana	Red-fruited Saw-sedge
		Isolepis nodosa	-
		Lepidosperma laterale	Variable Sword-sedge
		Ptilothrix deusta	-
		Schoenus brevifolius	Bog-rush
		Schoenus melanostachys	Black Bog Rush
	Dioscoreaceae	*Dioscorea transversa*	Native Yam
	Doryanthaceae	*Doryanthes excelsa*	Gymea Lily
	Hypoxidaceae	*Hypoxis hygrometrica*	Golden Star
	Iridaceae	*Libertia paniculata*	Branching Grass-flag
	Juncaceae	*Juncus acutus**	-
		*Juncus cognatus**	-
		Juncus mollis	-
	Juncaceae	*Juncus subsecundus*	Finger Rush
		Juncus usitatus	Common Rush
	Juncaginaceae	*Triglochin microtuberosum*	Water Ribbons
		Triglochin procerum	Water Ribbons
	Liliaceae	*Lilium formosanum**	Formosan Lily
	Lomandraceae	*Lomandra confertifolia* subsp. *rubiginosa*	-

Class/Subclass	Family	Scientific Name	Common Name
Liliidae	Lomandraceae	*Lomandra confertifolia var. pallida*	-
		Lomandra cylindrica	-
		Lomandra filiformis subsp. *coriacea*	Wattle Mat-rush
		Lomandra filiformis subsp. *filiformis*	Wattle Mat-rush
		Lomandra glauca subsp. *glauca*	-
		Lomandra longifolia	Spiky-headed Mat-rush
		Lomandra multiflora	Many-flowered Mat-rush
		Lomandra obliqua	Twisted Mat-rush
	Luzuriagaceae	*Eustrephus latifolius*	Wombat Berry
		Geitonoplesium cymosum	Scrambling Lily
	Orchidaceae	*Acianthus fornicatus*	Pixie Caps
		Caladenia carnea	Pink Finger Orchid
		Caladenia catenata	White Finger Orchid
		Calochilus campestris	Copper Beard Orchid
		Calochilus robertsonii	Purplish Beard Orchid
		Cymbidium suave	Native Cymbidium
		Dendrobium gracilicaule	-
		Dipodium punctatum	Hyacinth Orchid
		Microtis parviflora	Slender Onion Orchid
		Pterostylis baptistii	King Greenhood
		Pterostylis curta	Blunt Greenhood
		Pterostylis longifolia	-
		Pterostylis nutans	Nodding Greenhood
		Pterostylis ophioglossa	Snake's Tongue Greenhood
		Pterostylis sp.	Greenhood
		Thelymitra purpurata	Sun Orchid
		Thelymitra sp.	Sun Orchid
	Phormiaceae	*Dianella caerulea* var. *producta*	Blue Flax Lily
		Dianella revoluta var. *revoluta*	Spreading Flax Lily
	Poaceae	*Andropogon virginicus**	Whisky Grass
		Aristida calycina	Wire Grass
		Aristida ramosa	Wire Grass
		Aristida vagans	Three-awn Speargrass
		Austrodanthonia linkii var. *fulva*	Wallaby Grass
		Austrodanthonia tenuior	Wallaby Grass
		Austrostipa pubescens	Tall Speargrass
		Austrostipa ramosissima	Stout Bamboo Grass
		*Avena fatua**	Wild Oats
		*Axonopus affinis**	Narrow-leaved Carpet Grass
		Bothriochloa decipiens	Redleg Grass
Liliidae	Poaceae	*Bothriochloa macra*	-
		*Briza maxima**	Quaking Grass

Class/Subclass	Family	Scientific Name	Common Name
		*Briza minor**	Shivery Grass
		*Briza subaristata**	-
		*Bromus molliformis**	Soft Brome
		*Chloris gayana**	Rhodes Grass
		*Cortaderia selloana**	Pampas Grass
		Cymbopogon refractus	Barbwire Grass
		Cynodon dactylon	Common Couch
		Deyeuxia quadriseta	Reed Bent Grass
		Dichelachne micrantha	Short-hair Plume Grass
		Digitaria parviflora	Small-flowered Finger Grass
		Echinopogon caespitosus var. *caespitosus*	Tufted Hedgehog Grass
		Echinopogon ovatus	Forest Hedgehog Grass
		*Ehrharta erecta**	Panic Veldtgrass
		Entolasia marginata	Bordered Panic
		Entolasia stricta	Wiry Panic
		Eragrostis benthamii	Bentham's Love Grass
		Eragrostis brownii	Brown's Lovegrass
		*Eragrostis curvula**	African Lovegrass
		Eragrostis tenuifolia	
		*Hyparrhenia hirta**	Coolatai Grass
		Imperata cylindrica var. *major*	Blady Grass
		Joycea pallida	Silvertop Wallaby grass
		Lachnagrostis aemulus	Blown Grass
		*Lolium perrenne**	Perennial Ryegrass
		*Melinus repens**	Red Natal Grass
		Microlaena stipoides var. *stipoides*	Weeping Rice Grass
		Oplismenus aemulus	Basket Grass
		Oplismenus imbecillis	-
		*Panicum maximum**	Guinea Grass
		Panicum simile	Two Colour Panic
		Paspalidium distans	-
		*Paspalum dilatatum**	Paspalum
		Paspalum distichum	Water Couch
		*Paspalum urvellei**	Vasey Grass
		*Pennisetum clandestinum**	Kikuyu
		Phragmites australis	Common Reed
		Poa affinis	-
		*Poa annua**	Winter Grass
		Poa labillardieri var. *labillardieri*	Tussock Grass
		*Setaria gracilis**	Slender Pigeon Grass
Liliidae	Poaceae	*Setaria pumila**	Pale Pigeon Grass
		*Sporobolus africanus**	Parramatta Grass