FLORA AND FAUNA ASSESSMENT REPORT

PROPOSED DEVELOPMENT
LOT 2 DP 541090
BRADLEY ROAD
GLENMORE PARK

MARCH 2013
(REF: 3022F)

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PREFACE

This Flora and Fauna Assessment Report has been prepared by *Conacher Environmental Group* to identify the flora and fauna characteristics of land within Lot 2, DP 541090, Bradley Road, Glenmore Park.

This report provides an assessment of existing habitats and the potential for the proposed activity to significantly impact on threatened species according to the provisions of Section 5(A) of *the Environmental Planning and Assessment Act* 1979 (*EP&A Act*).

PROJECT TEAM

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SECTION 1

INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

Conacher Environmental Group has been engaged to prepare a Flora and Fauna Assessment Report for a proposed land clearing within Lot 2 DP 541090, Bradley Road, Glenmore Park.

Previous surveys, incorporating the subject site area, were undertaken as part of the Ecological Assessment prepared by Conacher Travers (2003) for the Glenmore Park Southern Expansion Release Area.

This Flora and Fauna Assessment Report has been prepared to identify the flora and fauna characteristics of the site and to determine whether or not a Species Impact Statement should be prepared for development according to the provisions of Section 5(A) of the *Environmental Planning & Assessment Act* 1979 (*EP&A Act*), the *Threatened Species Conservation Act* 1995 (*TSC Act*) and the *Environment Protection & Biodiversity Conservation Act* 1999 (*EPBC Act*).

1.2 SITE CHARACTERISTICS

The planning and cadastral details of the subject site are provided in Table 1.1.

TABLE 1.1
SITE DETAILS

Location	Lot 2 DP 541090, Bradley Road, Glenmore Park
Area	Approximately 10.1 hectares
Grid Reference	286230 E 6256880 N
Local Government Area	Penrith
Existing Land Use	Rural residential
Proposed Development	Residential subdivision

1.3 PROPOSED DEVELOPMENT

The proposed development is for a residential subdivision. Although the current proposal is for the subdivision of land and provision of roads and services, assessments within this report have taken into account the potential future construction of dwellings and associated infrastructure such as driveway access, landscaping, asset protection zones, and the provision of services within each new allotment. As part of the proposal a biodiversity corridor will be retained within the western section of the site and will be subject to will be subject to revegetation works in accordance with the Glenmore Park Stage 2 Development Contributions Plan 2007. Detailed plans of the proposed development have been provided as separate documentation to this report.

SECTION 2

FLORA CHARACTERISTICS

2.1 THREATENED FLORA SPECIES

A search of the Bionet Atlas of NSW Wildlife (NSW OEH 2013) was undertaken to identify records of threatened flora species located within 5km of the site. This allowed for a specific search for threatened flora to be undertaken determining if any threatened flora species were present within the subject site. Details on threatened flora species listed within the *EPBC Act* (1999) and the *TSC Act* (1995), with a known or possible occurrence within the local area, are provided in Table 2.1.

TABLE 2.1
THREATENED FLORA SPECIES OF THE AREA

Species	TSC Act	EPBC Act	Growth Form and Habitat Requirements	Comments
Dillwynia tenuifolia	V	-	Erect shrub 0.6-1 m high. In Western Sydney grows in Castlereagh Ironbark Forest, Shale Gravel Transition Forest on tertiary alluvium or laterised clays. At Yengo grows in disturbed escarpment woodland on Narrabeen sandstone.	No suitable habitat present.
Eucalyptus benthamii	V	V	Tree to 40m. Restricted to wet open forest on sandy alluvial soils along valley floors at an elevation of 140-750m. The soils are shallow to moderately deep, <100 cm, and are well-drained alluvial sands and gravels along stream channels, small terraces and alluvial flats. Known from two main locations, at Bents Basin and in the Kedumba Valley.	No suitable habitat present.
Grevillea juniperina subsp. juniperina	V	-	Erect to spreading shrub 0.5-1.5 metres tall. Grows on reddish clay to sandy soils derived from Wianamatta Shale and Tertiary alluvium (often with shale influence). Soils are of the Blacktown and Berkshire Park soil landscapes and typically contain lateritic ironstone gravels. It is generally found in flat or gently sloping, low-lying sites between 30-70 m asl.	Suitable habitat present.

TABLE 2.1 THREATENED FLORA SPECIES OF THE AREA				
Species	**TSC Act**	**EPBC Act**	**Growth Form and Habitat Requirements**	**Comments**
Persoonia nutans	E	E	Confined to aeolian and alluvial sediments and occurs in a range of sclerophyll forest and woodland vegetation communities, with the majority of individuals occurring within Agnes Banks Woodland or Castlereagh Scribbly Gum Woodland.	No suitable habitat present.
Pimelea spicata	E	E	Occurs on soil derived from Wianamatta Shale in Cumberland Plain Woodland. Also occurs in open forest and coastal grassland communities in the Illawarra region.	Suitable habitat present.
Pultenaea parviflora	E	V	Erect shrub. Occurs within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays.	No suitable habitat present.
Ext = Extinct P. Ext = Presumed Extinct CE = Critically Endangered E = Endangered V = Vulnerable Species				

No threatened flora species were observed within the subject site during surveys.

The threatened flora species observed or identified in Table 2.1 as having suitable habitat within the subject site, are assessed under the 7 part test of significance as outlined in Section 4 and provided in Appendix 1 of this Report.

2.2 THREATENED FLORA POPULATIONS & ECOLOGICAL COMMUNITIES

2.2.1 Threatened Flora Populations

The following endangered flora populations occur within the local government area:

- *Marsdenia viridiflora* R. Br. subsp. *viridiflora* population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas.

This species was not observed on the subject site. It is therefore considered that no endangered flora population is present on the subject site.

2.2.2 Threatened Ecological Communities

Details regarding the habitat attributes and indicative species for the Threatened Ecological Communities known to occur in the local government area are provided in Table 2.2.

TABLE 2.2 THREATENED ECOLOGICAL COMMUNITIES OF THE AREA				
Name	**TSC Act**	**EPBC Act**	**Habitat Requirements**	**Comments**
Agnes Banks Woodland in the Sydney Basin Bioregions (ABW)	E		**Geology / Soils:** Wind-blown sand which overlay Tertiary Alluvium deposits. **Topography:** Variable, includes low woodland on higher ridges to sedge-type vegetation in low lying depressions. **Characteristic Species:** *Eucalyptus sclerophylla, Angophora bakeri.*	No suitable habitat present.
Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion	V		**Geology / Soils:** Tertiary alluvium or adjoining sites located on shale or Holocene alluvium. Found on sandy soils. **Topography:** Low lying flat terrain. **Characteristic Species:** *Eucalyptus parramattensis* subsp. *parramattensis, Angophora bakeri* and *Eucalyptus sclerophylla.*	No suitable habitat present.
Castlereagh Swamp Woodland Community (CSWC)	E		**Geology / Soils:** Clay soils associated with Tertiary alluvium. **Topography**: Poorly-drained depressions and creeklines. **Characteristic Species**: *Eucalyptus parramattensis* subsp. *parramattensis* and *Melaleuca decora.*	No suitable habitat present.
Cooks River / Castlereagh Ironbark Forest in the Sydney Basin Bioregion (CRCIF)	E		**Geology / Soils:** Occurs on clay soils on Tertiary alluvium, or on shale soils on Wianamatta Shale including the Birrong Soil Landscape and associated lowlands. **Topography**: Shale lowlands. **Characteristic Species:** *Eucalyptus fibrosa* and *Melaleuca decora.*	No suitable habitat present.
Cumberland Plain Woodland in the Sydney Basin Bioregion (CPW)	CE	CE	**Geology / Soils:** Clay soils derived from Wianamatta Group geology, or more rarely alluvial substrates. **Topography:** Flat to undulating or hilly terrain on the Cumberland Plain. **Characteristic Species:** *Eucalyptus moluccana* and *Eucalyptus tereticornis.*	Suitable habitat present. Observed during surveys.
Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregion (FWCF)	E		**Geology / Soils:** Silts, muds or humic loams. **Topography:** Depressions, flats, drainage lines, backswamps, lagoons and lakes associated with coastal floodplains. **Characteristic Species:** Composition is variable and dependent on water regime. May include amphibious grasses and sedges, emergent floating herbs and emergent tall sedges and floating and submerged aquatic herbs.	No suitable habitat present.

TABLE 2.2 THREATENED ECOLOGICAL COMMUNITIES OF THE AREA				
Name	**TSC Act**	**EPBC Act**	**Habitat Requirements**	**Comments**
Moist Shale Woodland in the Sydney Basin bioregion (MSW)			**Geology / Soils:** soils derived from Wianamatta Shale. **Topography:** Higher country in the southern half of the Cumberland Plain. **Characteristic Species:** The canopy generally has trees of *Eucalyptus tereticornis* and *Eucalyptus moluccana,* with *Eucalyptus crebra* and *Corymbia maculata* occurring occasionally.	No suitable habitat present.
River-Flat Eucalypt Forest on Coastal Floodplains of the North Coast, Sydney basin and South East Corner bioregions (REFCF)	E		**Geology / Soils:** Silts, clay-loams and sandy loams. **Topography:** Periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains. **Characteristic Species:** Eucalypt canopy with species belonging to the genus Angophora or the sections Exsertaria or Transversaria of the genus Eucalyptus. Has low abundance of *E. robusta*, Casuarina and Melaleuca species and a groundcover of soft-leaved forbs and grasses.	No suitable habitat present.
Shale/Sandstone Transition Forest in the Sydney Basin Bioregion (SSTF)	E	E	**Geology / Soils:** Transitional areas between the clay soils derived from Wianamatta Shale and the sandy soils derived from Hawkesbury Sandstone **Topography:** Margins of the Cumberland Plain. **Characteristic Species:** *Eucalyptus punctata, E. resinifera, E. globoidea, E. eugenioides, E. sparsifolia, E. agglomerata.*	No suitable habitat present.
Shale Gravel Transition Forest in the Sydney Basin Bioregion (SGTS)	E	CE	**Geology / Soils:** Shallow deposits of Tertiary alluvium overlying shale soils, or localised concentrations of iron indurated gravel. **Topography:** Sideslopes and areas where shale soils intergrade with gravels. **Characteristic Species:** *Eucalyptus fibrosa, Eucalyptus moluccana, Eucalyptus tereticornis* and *Melaleuca decora.*	No suitable habitat present.
Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions (SOFF)	E		**Geology / Soils:** Waterlogged or periodically inundated grey-black clay-loams and sandy loams, where the groundwater is saline or sub-saline. **Topography:** Flats, drainage lines, lake margins and estuarine fringes associated with coastal floodplains. **Characteristic Species:** *Casuarina glauca.*	No suitable habitat present.
CE = Critically Endangered E = Endangered V = Vulnerable				

The critically endangered ecological community (EEC), Cumberland Plain Woodland in the Sydney Basin Bioregion (CPW) was observed within the subject site during surveys. This EEC corresponds to the Disturbed Narrow-leaved Ironbark / Grey Box Woodland vegetation community shown in Figure 2.1. This EEC is assessed under the 7 part test of significance, as outlined in Section 4 and provided in Appendix 1 of this Report.

2.3 VEGETATION SURVEY METHODOLOGY

To determine the likely and actual occurrence of flora species and plant communities on the subject site, field survey work was undertaken to supplement literature reviews and previous flora surveys of the area. The methods utilised for the flora survey are outlined as follows.

Literature Review

- A review of available literature for the area was undertaken to obtain reference material and background information for this study. These documents are listed in the References section of this Report.

- A search of the Bionet Atlas of NSW Wildlife (NSW OEH 2013) was undertaken to identify records of threatened flora species located within 10km of the site. This enabled the preparation of a predictive list of threatened flora species that could possibly occur within the habitats found on the site.

Aerial Photograph Interpretation

- Aerial photographs were utilised to identify the extent of vegetation with respect to the site and surrounding areas.

Flora Surveys

- A field survey which consisted of foot traverses within vegetated areas was conducted according to Cropper (1993) to identify the occurrence of flora species and the extent and location of vegetation communities present across the subject site.

- A detailed flora survey consisting of systematic flora searches was conducted across the subject site on 6th March 2013 generally incorporating the methodologies of DEC (2004).

- Two 10m x 40m (400m^2) quadrat was sampled within the subject site for all flora species.

- A total of Four 100m vegetation transects were surveyed within the site as shown in Figure 2.1. Targeted meander surveys were also conducted across the subject site for all flora species.

- Meander transects were undertaken across the entire site to enable recording of flora species and targeted searches for threatened flora species.

- Specimens of plants not readily identified in the field were collected for identification.

- Specimens of plants tentatively identified as threatened species are sent to the Sydney Royal Botanic Gardens for confirmation of the identification.

- All vascular plants were identified using keys and nomenclature in Harden (1994), Harden and Murray (2000) and Harden (2002). Wherever they were known, changes to nomenclature and classification have been incorporated into the results.

Vegetation Community Nomenclature

- Identification of vegetation formations and classes was undertaken in accordance with Keith (2004). Further classification was then applied according to species composition and the structural classifications of Specht *et al* (1995).

- Corresponding units of available vegetation mapping were referenced where available.

- Corresponding Endangered Ecological Communities listed on both the *TSC Act* (1995) and *Environmental Protection and Biodiversity Conservation Act* (1999) (EPBC) are also provided if relevant.

Seasonality

The flowering times of cryptic threatened flora and the dates of seasonally targeted searches are provided in Table 2.3.

TABLE 2.3
FLOWERING TIMES OF CRYPTIC FLORA

SPECIES	FLOWERING PERIOD*	SURVEYED
Pimelea spicata	Sporadic (recorded from March – April and June to September)	6 March 2013
* The flowering period may differ (earlier or later) due to annual differences in seasonal patterns.		

2.4 VEGETATION COMMUNITY DESCRIPTIONS AND FLORA SPECIES

The vegetation within the site consists of Disturbed Narrow-leaved Ironbark / Grey Box Woodland, Exotic Pasture Vegetation and Dams / Aquatic Vegetation. Vegetation community descriptions are provided below, and vegetation community locations are shown in Figure 2.1.

No threatened flora species were observed during surveys. A detailed species list is provided in Table 2.4.

DISTURBED NARROW-LEAVED IRONBARK / GREY BOX WOODLAND

Structure:

Canopy: To 20 metres high, with 30% Projected Foliage Cover (PFC).

Sub-canopy: To 10 metres high, with 30% PFC.

Shrubs: To 3 metres high, with 80% PFC.

Groundlayer: To 1 metres high, with 10% PFC.

Floristics:
(Characteristic Species)

Canopy: *Eucalyptus crebra, Eucalyptus moluccana* and occasional specimens of *Eucalyptus tereticornis.*

Sub-canopy: *Acacia parramattensis* and *Eucalyptus crebra*.

Shrubs: *Bursaria spinosa* and *Lycium ferosissimum*.

Groundlayer: Microlaena stypheloides, Aristida ramosa, Themeda australis, *Paspalidium* spp. and Dichondra repens.

Weeds: *Lycium ferosissimum, Olea europaea* ssp. *cuspidata*

Classification:
The bushland areas of the site are mapped by Tozer (2003) as Map Unit 9 Shale Hills Woodland and Map Unit 10 Shale Plains Woodland.

This vegetation community also corresponds to the critically endangered ecological community Cumberland Plain Woodland in the Sydney Basin Bioregion as listed within the *TSC Act* (1995) and the EPBC Act (1999).

Variation:
This community generally occurs as a regenerating form of the Cumberland Plain Woodland CEEC throughout. Greater densities and numbers of weed species were observed within the edge areas of this community.

Disturbance:
Most of this community appears to have been largely cleared, probably to establish grazing land many years ago. It has subsequently regenerated from remnant canopy trees, the soil seed bank and remnant ground covers.

Weed Invasion:
Weed invasion is low throughout this community, with the exception of edge areas which intergrade with the adjoining areas of Exotic Pasture Vegetation.

Location and Distribution:
The areas mapped as this vegetation type comprise islands of predominantly native vegetation separated by cleared areas of exotic grasses. This community occupies approximately 3.6 hectares of the subject site as shown in Figure 2.1.

EXOTIC PASTURE VEGETATION

This community encompasses the areas of the site which contain cleared land with predominantly exotic pasture areas and occasional native shrubs such as *Bursaria spinosa* which have seeded from adjoining bushland. This community is not representative of any locally occurring natural vegetation type and occupies approximately 6 hectares of the subject site.

DAMS / AQUATIC VEGETATION

Three dams are present within the site and contain areas of open water fringed by *Typha orientalis*. The dams occupy approximately 0.5 hectares of the subject site.

TABLE 2.4
FLORA SPECIES OBSERVED ON THE SUBJECT SITE

Family	Scientific Name	Common Name
Canopy Trees		
Bignoniaceae	*Jacaranda mimosifolia**	Jacaranda

TABLE 2.4 FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
Myrtaceae	*Eucalyptus crebra*	Narrow-leaved Ironbark
	Eucalyptus moluccana	Grey Box
	Eucalyptus tereticornis	Forest Red Gum
Proteaceae	*Grevillea robusta**	Silky Oak
Small Trees		
Cupressaceae	*Cupressus* sp*	Cypress
Fabaceae	*Acacia parramattensis*	Parramatta Wattle
Myrtaceae	*Eucalyptus crebra*	Narrow-leaved Ironbark
	Eucalyptus moluccana	Grey Box
	Eucalyptus tereticornis	Forest Red Gum
Oleaceae	*Ligustrum lucidum**	Large-leaved Privet
Shrubs		
Myrtaceae	*Eucalyptus crebra*	saplings
	Eucalyptus tereticornis	saplings
Oleaceae	*Olea europaea ssp cuspidata**	African Olive
Pittosporaceae	*Bursaria spinosa*	Blackthorn
Solanaceae	*Lycium ferosissimum**	African Boxthorn
Verbenaceae	*Lantana camara**	Lantana
Herbs - Ferns		
Sinopteridaceae	*Cheilanthes distans*	
	Cheilanthes sieberi	Rock Fern
Herbs - Dicots		
Acanthaceae	*Brunoniella australis*	Purple Trumpet
Amaranthaceae	*Gomphrena celosioides**	Gomphrena Weed
Apiaceae	*Centella asiatica*	Pennywort
Asclepiadaceae	*Gomphocarpus fruticosus**	Milkweed
Asteraceae	*Aster subulatus**	Wild Aster
	*Bidens pilosa**	Farmers Friends
	*Bidens subalternans**	
	Calotis lappulacea	
	*Cirsium vulgare**	Spear Thistle
	*Conyza bonariensis**	a Fleabane
	*Gnaphalium americanum**	a Cudweed
	*Hypochaeris microcephala**	
	*Hypochaeris radicata**	Flatweed
	*Senecio madagascariensis**	Fireweed
	Sigesbeckia orientalis	
	Solenogyne bellioides	
	*Sonchus oleraceus**	Sow Thistle
Cactaceae	*Opuntia stricta**	Prickly Pear
Campanulaceae	*Wahlenbergia communis*	a Bluebell

TABLE 2.4 FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
	Wahlenbergia gracilis	a Bluebell
Chenopodiaceae	*Einadia trigonos*	Fishweed
Clusiaceae	*Hypericum perforatum**	St Johns Wort
Convolvulaceae	*Dichondra repens*	Kidney Plant
Euphorbiaceae	*Phyllanthus virgatus*	
Fabaceae	*Desmodium brachypodum*	
	Desmodium varians	Tick Trefoil
Geraniaceae	*Geranium solanderi*	a Storksbill
Lamiaceae	*Ajuga australis*	Australian Bugle
	Mentha satureoides	
Lobeliaceae	*Pratia purpuascens*	White Root
Malvaceae	*Sida rhombifolia**	Paddys Lucerne
Onagraceae	*Ludwigia peploides ssp montevidensis*	
Oxalidaceae	*Oxalis perennans*	
	*Oxalis sp.**	
Pittosporaceae	*Bursaria spinosa*	seedlings
Plantaginaceae	*Plantago gaudichaudii*	
	*Plantago lanceolata**	Lambs Tongue
Polygonaceae	*Rumex brownii*	
Portulaccaceae	*Portulacca oleracea**	Pigweed
Primulaceae	*Anagallis arvensis**	Scarlet Pipernel
Rubiaceae	*Asperula conferta*	Common Bedstraw
	*Richardia stellaria**	
Solanaceae	*Solanum campanulatum**	
	*Solanum nigrum**	Blackberry Nightshade
	Solanum prinophyllum	
	*Solanum pseudocapsicum**	
Stackhousiaceae	*Stackhousia viminea*	
Verbenaceae	*Verbena bonariensis/rigida**	Purpletop
Herbs - Monocots		
Anthericaceae	*Arthopodium milliflorum*	
Commelinaceae	*Commelina cyanea*	Blue Wandering Jew
Cyperaceae	*Carex inversa*	
	*Cyperus brevis**	
	*Cyperus eragrostis**	
	Cyperus gracilis	
	Elaeocharis cylindrostachys	
	Fimbristylis dichontoma	
	Scleria mackaviensis	
Hygrometricaceae	*Hypoxis hygrometrica var hygrometrica*	Golden Weather-grass
Juncaceae	*Juncus acutus**	
	Juncus prismatocarpus	
	Juncus usitatus	
Lomandraceae	*Lomandra filiformis ssp. filiformis*	Wattle Mat-rush

TABLE 2.4 FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
Poaceae	*Aristida ramosa*	
	Aristida vagans	Tree-awned Grass
	Austrodanthonia tenuior	Wallaby Grass
	*Axonopus affinis**	Carpet Grass
	Bothriochloa decipiens	
	Bothriochloa macra	Red Leg Grass
	*Chloris gayana**	Rhodes Grass
	Chloris truncata	Windmill Grass
	Chloris ventricosa	Small Windmill Grass
	Cymbopogon refracta	Barb-wire Grass
	*Cynodon dactylon**	Couch
	Dichelachne micrantha	Plume Grass
	*Eragrostis curvula**	African Love-grass
	Eragrostis leptostachya	Paddock Love-grass
	Eriochoa pseudoaccrotricha	
	Microlaena stipoides	Weeping Meadow-grass
	Oplismenus aemulus	Basket Grass
	Panicum diffusa	
	Panicum effusum	
	*Panicum schinzii**	
	Paspalidium distans	
	Paspalidium gracile	Slender Panic
	*Paspalum dilatatum**	Paspalum
	Paspalum distichum	Water Couch
	*Pennisetum clandestinum**	Kikuyu
	*Setaria gracilis**	Slender Pigeon Grass
	Sporobolus creber/elongata	Rats Tail Grass
	*Sporobolus indica var capensis**	Parramatta Grass
	Themeda australis	Kangaroo Grass
Typhaceae	*Typha orientalis*	Cumbungi
Vines		
Fabaceae	*Glycine microphylla*	
Note: * indicates introduced species [TS1] indicates threatened species TSC Act (1995) [TS2]indicates threatened species EPBC Act (1999)		

2.5 LOCATION AND DISTRIBUTION OF ADJOINING AND CONTIGUOUS HABITATS

An inspection of the available aerial imagery for the local area, review of available vegetation mapping (Tozer 2003), and field surveys were undertaken to determine the location and distribution of habitats adjoining and contiguous within the subject site.

The vegetation within the subject site is connected to offsite areas of native vegetation to the north-west and south-east of the subject site along Surveyors Creek. These areas are linked to Mulgoa Nature Reserve which occurs to the north west of the subject site, which is mapped as containing a large proportion of the local occurrence of Cumberland Plain Woodland CEEC.

SECTION 3

FAUNA AND FAUNA HABITATS

3.1 THREATENED FAUNA SPECIES

A search of the Bionet Atlas of NSW Wildlife (NSW OEH 2013) was conducted for threatened fauna species recorded within 5km of the subject site. This revealed a number of threatened species that may be present in the area. Details on threatened fauna species listed within the *EPBC Act* (1999) and the *TSC Act* (1995) with a known or possible occurrence within the local area are provided in Table 3.1.

TABLE 3.1
THREATENED FAUNA SPECIES OF THE AREA

Common Name ***Scientific Name***	**TSC Act**	**EPBC Act**	**Preferred Habitat**	**Comments**
Green and Golden Bell Frog *Litoria aurea*	E	V	Breeding habitat consists of shallow (<1m) ponds or slowly moving waterways which undergo disturbance regimes such as fluctuating water flow or inflow of saline water with both areas of open water and dense low vegetation (White and Pyke 2010).	Suitable habitat present.
Black-necked Stork *Ephippiorhynchus asiaticus*	E		Prefers shallow, permanent, freshwater terrestrial wetlands, and surrounding marginal vegetation, including swamps, floodplains, watercourses and billabongs, freshwater meadows, wet heathland, farm dams and shallow floodwaters and adjacent habitats. Also forages within estuaries and along intertidal shorelines, such as saltmarshes, mudflats and sandflats, and mangrove vegetation.	Suitable habitat present.
Australasian Bittern *Botaurus poiciloptilus*	E	E	Inhabits shallow freshwater or brackish wetlands with tall dense beds of reeds, sedges or rush species and swamp edges. Distribution Limit - N-North of Lismore. S- Eden.	No suitable habitat present.
Bush Stone-curlew *Burhinus grallarius*	E	-	Utilises open forests, savannah woodlands, dune scrub, savannah and mangrove fringes.	Suitable habitat present.
Black-tailed Godwit *Limosa limosa*	V	-	A mainly coastal species feeding along estuarine mudflats, beaches, mangroves and lagoons.	No suitable habitat present.
Glossy Black-Cockatoo *Calyptorhynchus lathami*	V		Open forests with *Allocasuarina* species and hollows for nesting.	No suitable habitat present.

TABLE 3.1 THREATENED FAUNA SPECIES OF THE AREA				
Common Name ***Scientific Name***	**TSC Act**	**EPBC Act**	**Preferred Habitat**	**Comments**
Swift Parrot *Lathamus discolor*	E	E	Inhabits eucalypt forests and woodlands with winter flowering eucalypts.	Suitable habitat present.
Barking Owl *Ninox connivens*	V		Inhabits principally woodlands but also open forests and partially cleared land and utilises hollows for nesting.	Suitable habitat present.
Masked Owl Tyto novaehollandiae	V		Open forest & woodlands with cleared areas for hunting and hollow trees or dense vegetation for roosting.	Suitable habitat present.
Sooty Owl *Tyto tenebricosa*	V	-	Tall, dense, wet forests containing trees with very large hollows for roosting and breeding.	No suitable habitat present.
Speckled Warbler *Chthonicola sagittata*	V		Found in temperate eucalypt woodland and open forest including forest edges, wooded farmland and urban areas with mature eucalypts.	Suitable habitat present.
Varied Sittella *Daphoenositta chrysoptera*	V		Prefers open eucalypt woodlands and forests, mallee, inland acacia, coastal tee-tree scrubs, parks and gardens.	Suitable habitat present.
Hooded Robin (south-eastern form) *Melanodryas cucullata cucullata*	V		Found in Eucalypt woodlands, Acacia scrubland, open forest, and open areas adjoining large woodland blocks, with areas of dead timber.	Suitable habitat present.
Scarlet Robin *Petroica boodang*	V		Dry eucalypt forest and woodlands with open understorey during breeding season, dispersing during autumn–winter into open habitats including urban areas.	Suitable habitat present.
Flame Robin *Petroica phoenicea*	V		Upland moist Eucalypt forests and woodlands during breeding season, disperses to open lowland habitats during winter.	Suitable habitat present.
Diamond Firetail *Stagonopleura guttata*	V	-	Found in Eucalypt woodlands, forests and mallee where there is grassy understorey west of the Great Div. also drier coastal woodlands.	Suitable habitat present.
Spotted-tailed Quoll *Dasyurus maculatus*	V	-	Inhabits a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Shelters in hollow-bearing trees, fallen logs, small caves and rock crevices.	No suitable habitat present.
Koala *Phascolarctos cinereus*	V	V	Inhabits both wet & dry eucalypt forest on high nutrient soils containing preferred feed trees.	No suitable habitat present.
Yellow-bellied	V		Inhabits tall mature eucalypt	No suitable

TABLE 3.1 THREATENED FAUNA SPECIES OF THE AREA				
Common Name ***Scientific Name***	**TSC Act**	**EPBC Act**	**Preferred Habitat**	**Comments**
Glider *Petaurus australis*			forests with high nectar producing species and shelters in large hollow bearing trees.	habitat present.
Grey-headed Flying-fox *Pteropus poliocephalus*	V	V	Found in a variety of habitats including rainforest, mangroves, paperbark swamp, wet and dry open forest and cultivated areas. Forms camps commonly found in gullies and in vegetation with a dense canopy.	Suitable habitat present.
Eastern Freetail-bat *Mormopterus norfolkensis*	V		Inhabits eucalypt forest and woodland on the coastal side of the Great Dividing Range. Roosts in tree hollows, under bark and in various man-made structures.	Suitable habitat present.
Large-eared Pied Bat *Chalinolobus dwyeri*	V	V	Warm-temperate to subtropical dry sclerophyll forest and woodland. Roosts in caves, tunnels and tree hollows in colonies.	Suitable habitat present.
Eastern Bentwing-bat *Miniopterus schreibersii oceanensis*	V		Inhabits rainforest, wet and dry sclerophyll forest, open woodland, Melaleuca forests and open grassland. Roosts in caves and man-made structures.	Suitable habitat present.
Southern Myotis *Myotis macropus*	V		Roosts in caves, mines, tunnels, buildings, tree hollows and under bridges. Forages over open water.	Suitable habitat present.
Greater Broad-nosed Bat *Scoteanax rueppellii*	V		Inhabits moist gullies in mature coastal forest, rainforest, open woodland, Melaleuca swamp woodland, wet and dry sclerophyll forest, cleared areas with remnant trees and tree-lined creeks in open areas. Roosts in tree hollows, cracks and fissures in trunks and dead branches, under exfoliating bark, and in man-made structures.	Suitable habitat present.
Cumberland Plain Land Snail *Meridolum corneovirens*	E	-	Inhabits remnant eucalypt woodland of the Cumberland Plan. Shelters under logs, debris, clumps of grass, around base of trees and burrowing into loose soil.	Suitable habitat present.
Ext = Extinct P. Ext = Presumed Extinct CE = Critically Endangered E = Endangered V = Vulnerable Species				

No threatened species were observed within the subject site during surveys.

Threatened fauna species identified in Table 3.1 as having suitable habitat within the subject site are assessed under the 7 part test of significance, as outlined in Section 4 and provided in Appendix 1 of this Report.

3.2 THREATENED FAUNA POPULATIONS

There are no threatened fauna populations listed as occurring within the Penrith LGA. It is therefore considered that no threatened fauna population is present within the subject site.

3.3 FAUNA HABITATS

A range of fauna habitats are present throughout the site. These include:

- Nectar and seed producing trees and shrubs;
- Leaf litter layer;
- Grassy understorey vegetation;
- Fallen timber;
- Hollow-bearing trees;
- Exfoliating split and cracked bark on trees;
- Large piles of dead wood;
- Farm dam; and
- Cleared areas of exotic pasture vegetation.

The vegetation within the subject site consists of woodland vegetation. Four hollow bearing trees were observed within the site. Hollow bearing tree locations are shown in Figure 2.1 and results of the hollow bearing tree assessment are provided in Appendix 3.

Amphibians
Amphibian breeding habitat is mostly the farm dam which contains aquatic vegetation. The dam was infested with mosquito fish (*Gambusia holbrooki)* at the time of survey. An ephemeral creek line is mapped through the site and may provide areas of ponded water during and immediately following rain events, however was dry during surveys. Groundlayer vegetation, and hollow bearing trees also provide suitable shelter for amphibians within the site.

Reptiles
It is considered that the site provides suitable habitat for reptiles. Habitats are mostly confined to areas of leaf-litter and groundcover vegetation, areas around the farm dam and hollow bearing trees.

Birds
The flower, nectar, fruit and seed producing tree and shrub species provide a seasonal foraging resource for bird species. The groundlayer vegetation and areas of bare earth also provide suitable areas of foraging habitat for locally occurring bird species. The farm dam also provides a small area of suitable habitat for freshwater foraging birds. Hollow bearing trees observed provide mostly small (0-10cm) to medium sized (20-40cm) hollows which may be utilised for nesting sites.

Mammals
The flower, nectar, fruit and seed producing tree and shrub species provide a seasonal foraging resource for arboreal mammals and bat species. Hollow bearing trees observed provide mostly small (0-10cm) to medium sized (20-40cm) hollows which may be utilised for den sites for arboreal mammals and microchiropteran bats. Groundlayer vegetation predominantly consists exotic pasture grasses in the cleared areas and Sweet Bursaria and various native grasses and herbs within naturally vegetated areas. This vegetation contains suitable foraging and refuge habitat for a number of terrestrial mammal species. Introduced mammals such as rabbits, hares, foxes and cows were observed within the site.

3.4 FAUNA SURVEY METHODOLOGY

In order to detect the possible occurrence of threatened fauna species the following specific methods targeting these species were employed.

Literature Review

- Review of local resource documents;
- A search of the Bionet Atlas of NSW Wildlife (NSW OEH 2013) was undertaken to identify records of threatened fauna species located within 5km of the site. This enabled the preparation of a predictive list of threatened fauna species that could possibly occur within the habitats found on the site.

Fauna Survey

Due to the large amount of disturbance within the site and surrounding locality and low quality of habitat within the proposed development area, a reduced level of fauna survey was undertaken. In particular trapping for mammals was considered not necessary as part of the fauna survey program.

The methods that were utilised consisted of:

- Diurnal habitat searches for amphibians, reptiles and mammals;
- Diurnal bird census;
- Nocturnal spotlighting for birds, mammals, reptiles and amphibians;
- Recorded call playback for threatened nocturnal bird and mammal species;
- Echolocation call detection for microchiropteran bats (2 recorders per night);
- Snail searches
- Opportunistic observations during the completion of method specific fauna surveys; and
- Hollow bearing tree survey.

Survey duration and weather details during fauna surveys were as follows:

Diurnal Surveys:
06/03/13: 1400 - 1900, 2/8 cloud, 28^{o}C, light to moderate north-east wind, no rain.
11/03/13: 1730 – 1900, 7/8 cloud, 24^{o}C, light easterly breeze, no rain

Nocturnal Surveys:
06/03/13: 1930-2100, 2/8 cloud, 20^{0}C, light to moderate north-east wind, no rain, 2/4 moon.
11/03/13: 1930-2100, 7/8 cloud, 20^{0}C, light east wind, no rain, no moon

Fauna survey locations are shown in Figure 2.1.

3.5 FAUNA OBSERVED

Fauna species observed within the subject site are listed in Table 3.4. No threatened fauna species were observed within the subject site during surveys. All fauna species observed are considered relatively common within the local area.

TABLE 3.3 FAUNA SPECIES OBSERVED AND RECORDED		
Common Name	***Scientific Name***	**Observation Method**
AMPHIBIANS		
Common Eastern Froglet	*Crinia signifera*	Heard Call
Spotted Grass Frog	*Limnodynastes tasmaniensis*	Observed
Eastern Dwarf Tree Frog	*Litoria fallax*	Heard Call
Broad-palmed Frog	*Litoria latopalmata*	Heard Call
REPTILES		
Eastern Water Dragon	*Physignathus lesueurii*	Observed
Pale-flecked Garden Sunskink	*Lampropholis guichenoti*	Observed
BIRDS		
Brown Quail	*Coturnix ypsilophora*	Call
Australian Wood Duck	*Chenonetta jubata*	Observed/ Call
Pacific Black Duck	*Anas superciliosa*	Observed/ Call
Crested Pigeon	*Ocyphaps lophotes*	Observed/ Call
White-faced Heron	*Egretta novaehollandiae*	Observed
Black-shouldered Kite	*Elanus axillaris*	Observed
Rainbow Lorikeet	*Trichoglossus haematodus*	Observed/ Call
Eastern Rosella	*Platycercus eximius*	Observed/ Call
Red-rumped Parrot	*Psephotus haematonotus*	Observed/ Call
Superb Fairy-wren	*Malurus cyaneus*	Observed/ Call
Weebill	*Smicrornis brevirostris*	Observed/ Call
Brown Gerygone	*Gerygone mouki*	Observed/ Call
Yellow Thornbill	*Acanthiza nana*	Observed/ Call
Brown Thornbill	*Acanthiza pusilla*	Observed/ Call
Noisy Miner	*Manorina melanocephala*	Observed/ Call
Red Wattlebird	*Anthochaera carunculata*	Observed/ Call
Grey Butcherbird	*Cracticus torquatus*	Observed/ Call
Australian Magpie	*Cracticus tibicen*	Observed/ Call
Willie Wagtail	*Rhipidura leucophrys*	Observed/ Call
Australian Raven	*Corvus coronoides*	Observed/ Call
Magpie-lark	*Grallina cyanoleuca*	Observed/ Call
Welcome Swallow	*Hirundo neoxena*	Observed/ Call
Common Starling*	*Sturnus vulgaris*	Observed/ Call
Common Myna*	*Sturnus tristis*	Observed/ Call
MAMMALS		
Rabbit *	*Oryctolagus cuniculus*	Observed / Spotlight
Brown Hare *	*Lepus capensis*	Observed
European cattle *	*Bos taurus*	Scat
Fox *	*Vulpes vulpes*	Observed / Spotlight
Gould's Wattled Bat	*Chalinolobus gouldii*	Anabat
Little Forest Bat	*Vespadelus vulturnus*	Anabat
Note: * indicates introduced species TS1 indicates threatened species TSC Act (1995) TS2indicates threatened species EPBC Act (1999)		

SECTION 4

ASSESSMENTS AND CONCLUSIONS

4.1 ENVIRONMENT PROTECTION & BIODIVERSITY CONSERVATION ACT (1999) ASSESSMENT

The *Environment Protection and Biodiversity Conservation Act* (1999) (EPBC Act) is a nationally applicable act administered by the Australian Government. The Act provides a legal framework to protect matters of National Environmental Significance. These include:-

- World heritage sites;
- National heritage places;
- Wetlands of international importance;
- Nationally threatened species and ecological communities;
- Migratory species;
- Commonwealth marine areas;
- Great Barrier Reef Marine Park;
- Nuclear actions.

Under the *EPBC Act* (1999) an action will require approval from the minister if the action has, will have, or is likely to have, a significant impact on a matter of national environmental significance.

A search of the EPBC Act Protected Matters website (SEWPAC 2013) was conducted for matters of national environmental significance recorded within 5km of the subject site. Matters of National Environmental Significance with suitable habitat present, are assessed detail in accordance with the EPBC Act Policy Statement 1.1 *Significant Impact Guidelines* (DEWHA 2009) provided as Appendix 2 to this report. Results of surveys and assessments undertaken are summarised below.

EPBC Act Listed Threatened Species
No threatened flora or fauna species as listed within the *EPBC Act* (1999) were observed within the subject site during surveys.

EPBC Act Listed Threatened Ecological Communities
The threatened ecological community, Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, as listed within the *EPBC Act* (1999) was observed within the subject site.

EPBC Act Listed Migratory Species
No migratory fauna species listed within the *EPBC Act* (1999) were observed within the subject site.

EPBC Act Significant Impact Determination
The proposal will result in a reduction of the extent of the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest Critically Endangered Ecological Community within the site, therefore a referral is recommended to the Department of Sustainability, Environment, Water, Population and Communities to determine whether the proposal is a Controlled Action under the EPBC Act (1999).

4.2 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT (1979)

The *Environmental Planning and Assessment Act* (1979) is a state applicable act administered by the NSW State Government. Section 5(A) of the *EP&A Act* 1979 provides seven factors (referred to as the assessment of significance or 7 part test) which must be taken into account by a consent authority in deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities or their habitats, listed within the *Threatened Species Conservation Act* (1995).

An assessment of significance has been undertaken for threatened species, populations and ecological communities listed within the *TSC Act* (1995), observed or with suitable habitat contained within the subject site. The assessment is provided as Appendix 1 to this report and results of the assessment are summarised below.

TSC Act Listed Threatened Species
No threatened flora or fauna species, as listed within the *TSC Act* (1995), were observed within the subject site during surveys.

The detailed 7 part test of significance completed in Appendix 1 has determined that the proposed development is not likely to have a significant impact on threatened species listed within the *TSC Act* (1995) for the following reasons:

- The proposed development is not likely to have an adverse effect on the life cycle of these threatened species such that a viable population of the species is likely to be placed at risk of extinction.

- An area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the proposed action.

- The area of habitat to be removed or modified by the proposed development is of low importance to the long-term survival of these threatened species in the locality.

TSC Act Listed Threatened Populations
No threatened populations were observed within the subject site;

The proposed development is not likely to have a significant impact on threatened populations listed within the *TSC Act* (1995).

TSC Act Listed Threatened Ecological Communities
The critically endangered ecological community, Cumberland Plain Woodland in the Sydney Basin Bioregion, as listed within the *TSC Act* (1995), occurs within the subject site.

The detailed 7 part test of significance completed in Appendix 1 has determined that the proposed development is not likely to have a significant effect on threatened ecological communities (or their habitats) as listed within the *TSC Act* (1995) for the following reasons:

- The proposed development is not likely to have an adverse effect on the extent or adversely modify the composition of the ecological communities such that the local occurrence is likely to be placed at risk of extinction;

- An area of habitat is not likely to become fragmented or isolated from other areas of habitat as a result of the proposed action; and

- The area of habitat to be removed or modified by the proposed development is of low importance to the long-term survival of EEC's in the locality.

Assessment of Significance Determination
The proposed development is not likely to have a significant effect on threatened species, populations or ecological communities or their habitats. Therefore it is concluded that a Species Impact Statement is not required for the proposed development.

4.3 STATE ENVIRONMENTAL PLANNING POLICIES

SEPP 14 - Coastal Wetlands
The subject site is not included within an area mapped as a wetland in SEPP 14.

SEPP 26 - Littoral Rainforest
The subject site is not included within any area mapped as a littoral rainforest in SEPP 26. The vegetation on-site does not correspond to Littoral Rainforest with respect to species composition and substrate.

SEPP 44 - Koala Habitat Assessment
The Penrith local government area is not listed within Schedule 1 of SEPP 44, therefore the policy does not apply to the subject site.

4.4 SPECIFIC LOCAL GOVERNMENT AREA CONSIDERATIONS

4.4.1 Penrith Development Control Plan 2006 - Glenmore Park Stage 2

The subject site is located within the Glenmore Park Stage 2 area. A Biodiversity Corridor is mapped and will be retained along the western boundary of the subject site along Surveyors Creek.

With regard to the sites natural features the DCP lists several objectives, performance measures and development controls for the identified corridor areas. It is of note that at the site rezoning stage the corridor areas set aside were established as the means for conserving biodiversity by providing linkages along Surveyors Creek to link areas of natural vegetation through retention and rehabilitation works.

4.5 CONCLUSIONS AND RECOMMENDATIONS

Based on the detailed field survey and assessments provided in this report it is concluded that:

i. No threatened species, listed within the *TSC Act* (1995) or the *EPBC Act* (1999), were observed within the subject site during surveys;

ii. No endangered populations were observed within the subject site;

iii. The critically endangered ecological community, Cumberland Plain Woodland within the Sydney Basin Bioregion, was observed within the subject site.

iv. The proposed development is not likely to have a significant effect on threatened species, populations or ecological communities or their habitats; and

v. A Species Impact Statement is not required for the proposed development.

vi. The proposal will result in a reduction of the extent of the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest Critically Endangered Ecological

Community within the site, therefore a referral is recommended to the Department of Sustainability, Environment, Water, Population and Communities.

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APPENDIX 1

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT (1979)
SECTION 5(A) ASSESSMENT

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT (1979)
SECTION 5(A) ASSESSMENT

A1.1 ASSESSMENT OF SIGNIFICANCE / 7 – PART TEST

As identified in Section 5(A) of the *EP&A Act* 1979 the following matters need to be addressed to determine whether or not a significant effect on threatened species, populations or ecological communities or their habitats is likely to result from the proposed development.

For the purposes of the following assessments the definitions of specific terminology and interpretations of the key terms used are as per the DECC (2007) Threatened Species Assessment Guidelines. Further clarification is also provided where deemed appropriate.

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

FLORA

Grevillea juniperina* subsp. *juniperina
Grows on reddish clay to sandy soils derived from Wianamatta Shale and Tertiary alluvium (often with shale influence), typically containing lateritic gravels. Recorded from Cumberland Plain Woodland, Castlereagh Ironbark Woodland, Castlereagh Scribbly Gum Woodland and Shale/Gravel Transition Forest (NSW OEH 2012).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Pimelea spicata
In Western Sydney this species occurs on an undulating topography of substrates derived from Wianamatta Shale in areas supporting, or that previously supported, the Cumberland Plain Woodland Vegetation Community. In the Illawarra region this species is found in open woodland and also in coastal grassland communities with emergent shrubs (NPWS 2004).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

FAUNA

Green and Golden Bell Frog (*Litoria aurea*)
The Green and Golden Bell Frog is largely aquatic and is found among vegetation within or at the edges of permanent water. The males call mainly after rain from spring to autumn while afloat among vegetation, usually in larger permanent dams, swamps and lagoons. Breeding often peaks after heavy rains in January to February (NSW NPWS 1999).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Black-necked Stork (*Ephippiorhynchus asiaticus*)
This species prefers still and permanent, shallow freshwater floodplain habitats including wetlands, swamps, watercourses, farm dams and shallow floodwaters and adjacent areas of grasslands, heathlands, paddocks, and woodlands. This species also forages around estuaries and along intertidal shorelines (Marchant & Higgins 1990).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Bush Stone-curlew (*Burhinus grallarius*)
The Bush Stone-curlew occurs in open woodland with fallen branches, leaf-litter, sparse grass, timber along dry watercourses, sand plains with spinifex and mallee, sandy scrub near beaches, mangrove-fringes, country golf courses, timber remnants on roadsides, plantations and urban areas (Marchant and Higgins 1993).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Swift Parrot (*Lathamus discolor*)
This species feeds mainly on nectar and lerp from eucalypt flowers, particularly Blue Gum (Eucalyptus globulus). On the mainland, the Swift Parrot congregates where winter flowering species such as Yellow Gum, Red Ironbark, Mugga Ironbark, Box Gums and Swamp Gum. This species also occurs within Blackbutt, Forest Red Gum, Swamp Mahogany and Spotted Gum dominated communities along the coast. The Swift Parrot is a migratory species that breeds in Tasmania and its offshore islands in summer. In late March almost the entire population migrates to mainland Australia spreading from Victoria through to central and coastal NSW and south east Queensland (Saunders and Tzaros 2011).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Barking Owl (*Ninox connivens*)
The Barking Owl utilises dry sclerophyll forests and woodlands of tropical, temperate and semi-arid zones, particularly those associated with watercourses, wetlands and forest edges. Nests in large hollows in live eucalypts, often near open country (Higgins 1999).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Masked Owl (*Tyto novaehollandiae*)
The Masked Owl is widespread through forests and woodlands. The Masked Owl is known to utilise forest margins and isolated stands of trees within agricultural land. This species is

often found in heavily disturbed forest where its prey of small and medium sized mammals can be readily obtained. The Masked Owl is dependent upon hollow bearing trees all year round requiring old mature trees with large hollows for breeding and as diurnal roosting sites (Higgins 1999).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Speckled Warbler (*Pyrrholaemus saggitata*)
Speckled Warblers inhabit mainly the grassy ground layer of dry sclerophyll forests and woodlands, often with scattered shrubs in the understorey. This species is mainly insectivorous but will also take seeds and other plant material. They are sedentary with no migratory or seasonal movements known. They nest solitary with large exclusive breeding territories, the boundaries of which change little over successive years. They breed most of the year round with a peak from September to November (Higgins & Peters 2002).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Varied Sittella (*Daphoenositta chrysoptera*)
This species inhabits eucalypt forests and woodlands, especially rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland (Higgins & Peter 2002).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Hooded Robin (*Melanodryas cucullata*)
The Hooded Robin occupies drier eucalypt forest, woodland and scrub, grasses and low shrubs, as well as cleared paddocks with regrowth or stumps. In most areas it is considered to be sedentary, and territorial pairs may be found in the same locality for several years. The size of territories throughout Australia has been estimated as between 5 to 50 hectares (Higgins and Peter 2002).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Scarlet Robin (*Petroica boodang*)
This species inhabits mainly dry eucalypt forest and woodlands with open shrubby and grassy understorey on ridges and slopes during the spring-summer breeding season, dispersing during autumn–winter into open habitats including urban areas (Higgins and Peter 2002).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Flame Robin (*Petroica phoenicea*)
This species inhabits upland wet to moist eucalypt forests and woodlands with an open understorey, often on ridges and slopes to 1800m above sea level during the spring-summer breeding season. During the autumn to winter non breeding season this species disperses to open lowland habitats including grasslands, farmland dry sclerophyll forests and woodlands (Higgins and Peter 2002).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Diamond Firetail (*Stagonopleura guttata*)
The Diamond Firetail inhabits grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus pauciflora Woodlands, open forest, mallee, natural temperate grassland, and in secondary grassland derived from other communities. This species is also often found in riparian areas, and sometimes in lightly wooded farmland (Higgins et al., 2006).

Grey-headed Flying-fox (*Pteropus poliocephalus*)
Grey-headed Flying-foxes roost in camps during the day, which may contain tens of thousands of individuals, and then disperse to surrounding areas to forage at night. This species inhabits a wide range of habitats including rainforest, mangroves, paperbark forests, wet and dry sclerophyll forests and urbanised and agricultural areas. Camps are commonly formed in gullies, typically not far from water and usually in vegetation with a dense canopy. Camps may also be formed in urban parkland areas (Tidemann 1995).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Eastern Freetail Bat (*Mormopterus norfolkensis*)
The Eastern Freetail-bat utilises dry eucalypt forest and woodland on the coastal side of the Great Dividing Range. They show a preference for open spaces in woodland or forest, and are more active in the upper slopes of forest areas rather than in riparian zones. They also forage over large waterways. This species roosts in hollow trees (usually in hollow spouts), under exfoliating bark and in various man-made structures (Churchill 2008).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Large-eared Pied Bat (*Chalinolobus dwyeri*)
In the Sydney Basin this species is most commonly recorded in areas of high fertility soils in wet sclerophyll forest along the edges of sandstone escarpments. This species is also recorded in dry sclerophyll forest and woodlands, sub-alpine woodland, at the edges of rainforest, Callitris forest and within sandstone outcrop country. Large-eared Pied Bats roost in clusters in fairy martin nests and on the ceilings of caves, crevices in cliffs and mines in twilight areas (Churchill 2008).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that

the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*)
Preferred habitats for this species include rainforest, wet and dry sclerophyll forest, open woodland, Melaleuca forests and open grassland. The Eastern Bentwing-bat forages high in forested areas from just above canopy height to many times canopy height. In more open areas such as grasslands, flight may be within a few metres of the ground. Eastern Bentwing-bats are cave dwellers, but will also roost in man-made structures such as road culverts and mines (Churchill 2008).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Southern Myotis (*Myotis macropus*)
The Large-footed Myotis has a strong association with streams and permanent waterways, most commonly within vegetated areas at lower elevations and in flat undulating country. This species forages over water for small insects, fish and invertebrates and have a preference for large pools rather than flowing streams. Roost habitats for this species are near water and include caves, tree hollows, abandoned fairy martin nests, among vegetation, in clumps of Pandanus, and man-made structures including under bridges, in mines, tunnels, road culverts and stormwater drains (Churchill 2008).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Greater Broad-nosed Bat (*Scoteanax rueppellii*)
A wide variety of habitats are utilised by this species including moist gullies in mature coastal forest, rainforest, open woodland, Melaleuca swamp woodland, wet and dry sclerophyll forest, cleared areas with remnant trees and tree-lined creeks in open areas. The Greater Broad-nosed Bat forages about 5m from the edge of isolated trees, forest remnants or along forest crowns with a slow direct flight pattern. This species is known to roost in tree hollows, cracks and fissures in trunks and dead branches, under exfoliating bark, as well as in man-made structures including roofs of old buildings (Churchill 2008).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Cumberland Plain Snail (*Meridolum corneovirens*)
The Cumberland Plain Snail is restricted to remnant Eucalypt woodland of the Cumberland Plain, generally in areas characterised by moist soils together with growths of various species of lichen. This species lives under bark and leaf litter, under logs and in loose soil around grass clumps and the base of trees. It also occasionally shelters under rubbish and can dig several centimetres into soil to escape drought (DECC 2005).

It is considered that suitable habitat for this species is present on the subject site, however this species was not observed within the subject site during surveys. It is considered that the action proposed is not likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

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

No flora or fauna species belonging to an endangered population were observed within the subject site. Therefore the proposed action will not have an adverse effect on the life cycle of any species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

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

i. Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

The critically endangered ecological community, Cumberland Plain Woodland in the Sydney Basin Bioregion occupies approximately 3.6 hectares within the subject site, of which approximately 1.9 hectares will require removal for the proposed development.

Approximately 1.7 hectares of this community will be retained within the southern section of the subject site. Areas of retention were determined at the site rezoning stage where a biodiversity corridor was determined along Surveyors Creek to ensure the retention of vegetation and maintenance of connectivity for the local occurrence of the CPW CEEC. Retained areas of this community will be subject to replanting works and managed as a Biodiversity Corridor.

It is therefore considered that the proposed action is not likely to have an adverse effect on the extent of an ecological community such that its local occurrence is likely to be placed at risk of extinction.

ii. Is likely to substantially and adversely modify the composition such that its local occurrence is likely to be placed at risk of extinction,

The critically endangered ecological community, Cumberland Plain Woodland in the Sydney Basin Bioregion occupies approximately 3.6 hectares within the subject site, of which approximately 1.9 hectares will require removal for the proposed development.

Approximately 1.7 hectares of this community will be retained within the western section of the subject site. Areas of vegetation and habitat retention were determined at the site rezoning stage to enable the establishment of a biodiversity corridor along Surveyors Creek. The biodiversity corridor will ensure the maintenance of connectivity for the local occurrence of the CPW CEEC. Approximately 0.7 hectares of cleared areas within the biodiversity corridor area onsite will be subject to revegetation works in accordance with the Glenmore Park Stage 2 Development Contributions Plan 2007.

It is therefore considered that the proposed action is not likely to have an adverse effect on the extent of an ecological community such that its local occurrence is likely to be placed at risk of extinction.

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

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

The proposed development will require the clearing of 1.9 hectares of Disturbed Narrow-leaved Ironbark / Grey Box Woodland vegetation, 5.3 hectares of previously cleared land which contains Exotic Pasture Vegetation and 0.1 hectares of land containing Dams and Aquatic Vegetation.

The vegetation to be removed within the site provides potential habitat for several locally occurring threatened species and the CPW CEEC.

Areas of vegetation and habitat retention were determined at the site rezoning stage to ensure the retention of vegetation and maintenance of connectivity for the local occurrence of the CPW CEEC. The cleared areas of the biodiversity corridor area within the site will be subject to replanting works in accordance with the Glenmore Park Stage 2 Development Contributions Plan 2007.

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

The vegetation within the subject site is connected to offsite areas of native vegetation to the north-west and south-east of the subject site along Surveyors Creek. These areas are linked to Mulgoa Nature Reserve which occurs to the north west of the subject site, which is mapped as containing a large proportion of the local occurrence of Cumberland Plain Woodland CEEC. Areas of vegetation and habitat retention were determined at the site rezoning stage to ensure the retention of vegetation and maintenance of connectivity for the local occurrence of the CPW CEEC. The cleared areas of the biodiversity corridor area within the site will be subject to replanting works in accordance with the Glenmore Park Stage 2 Development Contributions Plan 2007.

Therefore it is not likely that any area of habitat will become fragmented or isolated from other areas of habitat as a result of the proposed action.

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

No threatened flora or fauna species or threatened populations were observed within the subject site during surveys. The site provides disturbed habitats for locally occurring nomadic type threatened fauna species which may utilise the subject site on occasion. Several disturbed patches of Narrow-leaved Ironbark / Grey Box Woodland vegetation are present within the site and provide habitat for the CPW CEEC.

The habitats within the site have been subject to significant disturbances associated with the use of the site as grazing and industrial land and the dumping of imported fill material. Large areas within the northern section of the site now contain disturbed soil and have very poor potential for regeneration. Cleared areas surrounding the patches of Narrow-leaved Ironbark / Grey Box Woodland vegetation have been subject to extensive pasture improvement works and are dominated by exotic grasses. These areas are also not likely to naturally regenerate.

Areas of vegetation and habitat retention were determined at the site rezoning stage to ensure the retention of vegetation and maintenance of connectivity for local biodiversity including the local occurrence of the CPW CEEC. In addition the cleared areas of the biodiversity corridor area within the site will be subject to replanting works in accordance with the Glenmore Park Stage 2 Development Contributions Plan 2007.

Due to the retention and proposed revegetation of cleared areas within the biodiversity corridor area of the site and the maintenance of connectivity to larger areas of habitats within the Mulgoa Nature Reserve, it is considered not likely that the proposal will significantly affect the stages of the life cycles and reproductive success of the threatened species and ecological communities in the locality.

It is therefore considered that the habitat to be removed, modified, fragmented or isolated is not of significant importance to the long-term survival of the species, population or ecological community in the locality.

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

The subject site has not been classed as critical habitat within the provisions of the Threatened Species Conservation Act (1995). Therefore it is considered that the proposed action will not have an adverse effect on critical habitat (either directly or indirectly).

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

There are Recovery Plans for the following threatened species which are considered to have suitable habitat contained within the subject site:

- Cumberland Plain Approved NSW Recovery Plan (Cumberland Plain Woodland, *Grevillea juniperina* subsp. *juniperina* and Cumberland Plain Land Snail)
- *Pimelea spicata* NSW Recovery Plan
- Green and Golden Bell Frog Draft NSW Recovery Plan;
- Bush Stone-curlew Approved NSW Recovery Plan
- Swift Parrot Approved National Recovery Plan;
- Regent Honeyeater Approved National Recovery Plan;
- Barking Owl (Draft Recovery Plan
- Large Forest Owls Approved NSW Recovery Plan (Masked Owl)
- Grey-headed Flying-fox Draft National Recovery Plan.

The objectives or actions of each recovery plan are listed and addressed for each species below.

Cumberland Plain Recovery Plan

The overall objective of this recovery plan is to provide for the long-term survival and protection of the threatened biodiversity of the Cumberland Plain. The specific recovery objectives are:

- To build a protected area network, comprising public and private lands, focused on the priority conservation lands
- To deliver best practice management for threatened biodiversity across the Cumberland Plain, with a specific focus on the priority conservation lands and public lands where the primary management objectives are compatible with biodiversity conservation
- To develop an understanding and enhanced awareness in the community of the Cumberland Plain's threatened biodiversity, the best practice standards for its management, and the recovery program
- To increase knowledge of the threats to the survival of the Cumberland Plain's threatened biodiversity, and thereby improve capacity to manage these in a strategic and effective manner.

The subject site is not located within the identified Priority Conservation Lands Area and the Recovery Plan states that the implementation of the recovery objectives identified are the responsibility of public authorities. The proposed development is therefore not inconsistent with the recovery plan objectives or actions.

***Pimelea spicata* NSW Approved Recovery Plan**

The overall objective of the recovery plan is to ensure the continued and long-term survival of *this species* in the wild by promoting the *in-situ* conservation of the species across its natural range.

The specific objectives for achieving this are to:

- Conserve P. spicata using land-use and conservation planning mechanisms;
- Identify and minimise the operation of threats at sites where P. spicata occurs;
- Implement a survey and monitoring program that will provide information on the extent and viability of P. spicata;
- Provide the community with information that assists in conserving the species;
- Raise awareness of the species and involve the community in the recovery program; and
- Promote research questions that will assist future management decisions.

This species has not been observed within the subject site. The Plan states that the implementation of the Recovery Plan is the responsibility of public authorities (ie. Local Councils, the Department of Planning and the NSW OEH).

It is considered that the proposed development is not likely to obstruct a public authority from implementing the recovery actions or achieving the recovery objectives identified. The proposed development is therefore not inconsistent with the recovery plan objectives or actions.

Green and Golden Bell Frog *Litoria aurea*
Draft NSW Recovery Plan (NSW Government DEC 2005)

The overall objectives of the plan are to manage threats impacting on currently known populations and to stabilise and prevent further decline of the species.

The specific objectives for achieving this are to:

- Increase the security of key GGBF populations by way of preventing the further loss of GGBF habitat at key populations across the species range and where possible secure opportunities for increasing protection of habitat areas;

- Ensure extant GGBF populations are managed to eliminate or attenuate the operation of factors that are known or discovered to be detrimentally affecting the species;
- Implement habitat management initiatives that are informed by data obtained through investigations into the general biology and ecology of the GGBF through a systematic and coordinated monitoring program;
- Establish, within more than one institution, self-sustaining and representative captive populations (particularly at risk' populations) of the Green and Golden Bell Frog for the primary purpose of maintaining 'insurance' colonies for re-establishment and supplementation of populations of the species; and
- Increase the level of regional and local awareness of the conservation status of the Green and Golden Bell Frog and provide greater opportunity for community involvement in the implementation of this recovery plan.

This species has not been observed within the subject site. The Plan states that the implementation of the Recovery Plan is the responsibility of the Recovery Plan Coordinator and regional coordinators with centralised coordination with the DEC (now OEH).

It is considered that the proposed development is not likely to obstruct the Recovery Plan Coordinator or the OEH from implementing the recovery actions or achieving the recovery objectives identified.

The proposed development is therefore not inconsistent with the recovery plan objectives or actions.

Bush Stone Curlew
The following recovery objectives or actions are listed for this species:

- Expand existing Bush Stone-curlew community conservation programs;
- Raise community recognition of the Bush Stone-curlew and interest in the recovery program;
- Increase the total area of Bush Stone-curlew habitat protected and managed for conservation on public and private lands by 25% in each CMA;
- Supplement declining wild populations with a robust and well-funded captive-breeding and translocation program;
- Ensure the conservation status of the Bush Stone-curlew is adequately recognised under NSW and Commonwealth legislation;
- Ensure that impacts on Bush Stone-curlews and their habitat are accurately assessed during planning and environmental assessment processes;
- Increase understanding of the ecology of the Bush Stone-curlew;
- Increase understanding of threatening processes affecting Bush Stone-curlews;
- Increase understanding of the significance of the Bush Stone-curlew to indigenous Australians;
- Integrate the recovery plan with other conservation plans and programs to maximise the efficient use of resources and benefits to biodiversity;
- Implement a well-funded and coordinated recovery program across NSW.

This species was not observed within the subject site. Potential impacts to suitable Bush Stone-curlew habitats have been assessed as a part of this report. It therefore is considered that the proposed development is not inconsistent with the recovery plan objectives or actions identified.

Swift Parrot National Recovery Plan

Overall objectives

- To change the conservation status of the swift parrot from endangered to vulnerable within 10 years;
- To achieve a demonstrable sustained improvement in the quality of swift parrot habitat to increase carrying capacity.

Specific objectives

- To identify priority habitats and sites across the range of the swift parrot;
- To implement management strategies to protect and improve priority habitats and sites resulting in a sustained improvement in carrying capacity;
- To reduce the incidence of collisions with man-made structures;
- To determine population trends within the breeding range;
- To quantify improvements in carrying capacity by monitoring changes in extent and quality of habitat;
- To increase public awareness about the recovery program and to involve the community in the recovery.

Actions needed

- Identify the extent and quality of foraging habitat.
- Protect and manage the habitat of swift parrots at a landscape scale.
- Reduce the incidence of collisions.
- Monitor population trends and habitat use.
- Keep the public, volunteers and community networks informed
- Manage the recovery process through a recovery team.

The subject site has not been identified as a priority site for this species. Implementation of actions required to meet the objectives listed in the recovery plan are the responsibility of public authorities and are not the responsibility of private landholders. It is considered that the proposed development is not likely to obstruct public authorities from implementing the recovery actions or achieving the recovery objectives identified.

The proposed development is therefore not inconsistent with the recovery plan objectives or actions.

Regent Honeyeater National Recovery Plan (1999-2003)

Long Term Recovery Objectives

The following long-term objectives have been listed within the recovery plan:

- To ensure that the species persists in the wild.
- To achieve a down-listing from nationally endangered to vulnerable by stabilising the population and securing habitat extent and quality in the main areas of occupancy.
- Achieve increasing reporting rates (5%) in areas previously used regularly, eg Munghorn Gap, Bendigo, north-east Melbourne, Eildon area.
- This species was not observed within the subject site and the proposal will result in the retention of areas of suitable habitat for this species. It is therefore considered that the proposal is not inconsistent with the long-term objectives of the recovery plan.

Specific Recovery Objectives

The following Specific Objectives have been listed for the life of the recovery plan (1999-2003)

- Effectively organise and administer the recovery effort to ensure that recovery plan objectives are met.
- Maintain and enhance the value of Regent Honeyeater habitat at the key sites and throughout the former range, by active participation in land-use planning processes and by active vegetation rehabilitation at strategic sites
- Monitor trends in the Regent Honeyeater population size and dispersion across its range to allow assessment of the efficacy of management actions.
- Facilitate research on strategic questions which will enhance the capacity to achieve the long-term objectives. In particular, determine the whereabouts of Regent Honeyeaters during the non-breeding season and during breeding season absences from known sites. Identify important sites and habitat requirements at these times.
- Maintain and increase community awareness, understanding and involvement in the recovery effort.
- Maintain the captive population of Regent Honeyeaters at a size which will provide adequate stock to: provide insurance against the demise of the wild population; continuously improve captive-breeding and husbandry techniques; provide adequate stock for trials of release strategies; and maintain 90% of the wild heterozygosity in the captive population.

The subject site does not contain a key habitat site for this species. The implementation of the objectives listed in the recovery plan is the responsibility of private landholders. It is considered that the proposed development is not likely to obstruct public authorities from achieving the recovery objectives identified.

The proposed development is therefore not inconsistent with the recovery plan objectives.

Actions Required For Each Objective

- Project management: continue to manage the Recovery Team and full-time Coordinator; increase the contribution of the NSW Government to program management; encourage greater input from the Queensland and ACT wildlife agencies; encourage and direct the contributions of Operations Groups centred on regions containing key habitat; increase the effectiveness of collaboration with the Swift Parrot Recovery Team.
- Habitat management: expand the composition, influence and resources of Operations Groups in the four key regions so that they are able to implement regional works plans; prepare regional guidelines for management of Regent Honeyeater habitat and promote them to landholders and agency staff; ensure that regional ecosystem management plans take account of the guidelines. Obtain agreements to undertake cooperative work with landholders to alleviate threats.
- Population monitoring: initiate a population monitoring program at the three main breeding areas; take full advantage of the existing sightings database and the Birds Australia Bird Atlas Project to elucidate distribution patterns and the magnitude of the range reduction over recent decades.
- Ecological research: initiate innovative research into movement patterns, particularly post breeding, and the degree of isolation between breeding populations; investigate the impact of Noisy Miners on population stability and undertake a comparison of resource utilisation between northern NSW and Victoria.

- Community education and participation: conduct a public education program about the species and its requirements, aimed particularly at developing habitat management partnerships with land owners within the range of the species; establish an educational Regent Honeyeater exhibit at Taronga Zoo; produce a semi-annual newsletter.
- Captive management: maintain a viable captive population, spread across at least three ARAZPA Institutions, to act as insurance against the demise of the wild population; conduct trials of hard-release techniques; complete the captive husbandry manual and a guide to ageing and sexing Regent Honeyeaters.

Implementation of actions required to meet the objectives listed in the recovery plan are not the responsibility of private landholders. It is considered that the proposed development is not likely to obstruct public authorities from implementing the recovery actions or achieving the recovery objectives identified.

The proposed development is therefore not inconsistent with the recovery plan objectives or actions.

Draft NSW Recovery Plan for the Barking Owl *Ninox connivens* (NPWS 2003a)

The overall objective of the Draft Recovery Plan is to ensure the long-term persistence of the Barking Owl in NSW over the five year period of the plan.

The following specific recovery objectives have been listed within the recovery plan:

- Increase understanding of the biology, ecology and management of the Barking Owl;
- Increase education and awareness of and involvement in the conservation of the Barking Owl and its habitat in NSW;
- Undertake threat abatement and mitigation;
- Gain efficiencies through links with other conservation plans and conservation groups; and
- Provide organisational support.

This species has not been observed within the subject site. Implementation of actions required to meet the objectives listed in the recovery plan has been identified as the responsibility of the NPWS. It is considered that the proposed development is not likely to obstruct the NPWS from implementing the recovery actions or achieving the recovery objectives identified.

The proposed development is therefore not inconsistent with the recovery plan objectives or actions.

Approved NSW Recovery Plan for the Large Forest Owls (Masked Owl) (DEC NSW 2006b)

The overall objective of the Recovery Plan is to ensure that the status of Large Forest Owls in the wild stabilises or improves as a result of protection and successful management of sufficient good quality habitat on and off-reserve over the five year period of the plan (2006 to 2011).

The following specific recovery objectives have been listed within the recovery plan:

- Assess the distribution and amount of high quality habitat for each owl species across public and private lands to get an estimate of the number and proportion of occupied territories of each species that are, and are not, protected.
- To monitor trends in population parameters (numbers, distribution, territory fidelity and breeding success) across the range of the three species and across different land tenures and disturbance histories.
- To assess the implementation and effectiveness of forest management prescriptions designed to mitigate the impact of timber-harvesting operations on the three owl species and, (if necessary), to use this information to refine the prescriptions so that forestry activities on state forests are not resulting in adverse changes in species abundance and breeding success.
- Ensure the impacts on large forest owls and their habitats are adequately assessed during planning and environmental assessment processes.
- Minimise further loss and fragmentation of habitat by protection and more informed management of significant owl habitat (including protection of individual nest sites).
- To improve the recovery and management of the three large forest owls based on an improved understanding of key areas of their biology and ecology.
- To raise awareness of the conservation requirements of the three large forest owls amongst the broader community, to involve the community in owl conservation efforts and in so doing increase the information base about owl habitats and biology.
- To coordinate the implementation of the recovery plan and continually seek to integrate actions in this plan with actions in other recovery plans or conservation initiatives.

No further objectives or associated actions have been identified under an updated recovery plan. Potential impacts to suitable Large Forest Owl habitats have been assessed as a part of this report. Implementation of actions required to meet the objectives listed in the recovery plan has been identified as the responsibility of the DEC (now OEH) and NSW DPI. It is considered that the proposed development is not likely to obstruct the OEH or the NSW DPI from implementing the recovery actions or achieving the recovery objectives identified.

The proposed development is therefore not inconsistent with the recovery plan objectives or actions.

Grey-headed Flying-fox

The following recovery objectives or actions are listed for this species:

- Identify and protect foraging habitat critical to the survival of Grey-headed Flying-foxes across their range;
- Enhance winter and spring foraging habitat for Grey-headed Flying-foxes;
- Identify, protect and enhance roosting habitat critical to the survival of Grey-headed Flying-foxes;
- Significantly reduce levels of deliberate Grey-headed Flying-fox destruction associated with commercial horticulture;
- Provide information and advice to managers, community groups and members of the public that are involved with controversial flying-fox camps;
- Produce and circulate educational resources to improve public attitudes toward Grey-headed Flying-foxes, promote the recovery program to the wider community and encourage participation in recovery actions;
- Monitor population trends for the Grey-headed Flying-fox;

- Assess the impacts on Grey-headed Flying-foxes of electrocution on powerlines and entanglement in netting and barbed wire, and implement strategies to reduce these impacts;
- Oversee a program of research to improve knowledge of the demographics and population structure of the Grey-headed Flying-fox;
- Maintain a National Recovery Team to oversee the implementation of the Grey-headed Flying-fox National Recovery Plan.

This species was not observed within the subject site during surveys. Potential impacts to suitable Grey-headed Flying-fox habitats have been assessed as a part of this report. It is therefore considered that the proposed development is not inconsistent with the recovery plan objectives or actions identified.

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

An assessment of the likely impact of the proposal on Key Threatening Processes is provided in Table A1.2.

TABLE A1.2
ASSESSMENT OF KEY THREATENING PROCESSES

Key Threatening Processes Listed under the *TSC Act* (1995)	Evidence of Current or Previous Occurrence Observed Within Subject Site	Likely to Occur as a Result of the Proposal	Impact or Occurrence Likely to be Mitigated or Reduced as a Result of the Proposal
Alteration of habitat following subsidence due to longwall mining	No	No	No
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	Yes	No	No
Anthropogenic climate change	No	No	No
Bushrock removal	No	No	No
Clearing of native vegetation	Yes	No	Yes. The retained biodiversity corridor area of the site will be subject to revegetation works.
Competition and grazing by the feral European rabbit (*Oryctolagus cuniculus*)	Yes	No	No
Competition and habitat degradation by feral goats (*Capra hircus*)	No	No	No
Competition from feral honey bees (*Apis mellifera*)	No	No	No
Death or injury to marine species following capture in shark control programs on ocean beaches	No	No	No
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments	No	No	No
Forest Eucalypt dieback associated with over-abundant psyllids and bell miners	No	No	No

TABLE A1.2 ASSESSMENT OF KEY THREATENING PROCESSES			
Key Threatening Processes Listed under the *TSC Act* (1995)	**Evidence of Current or Previous Occurrence Observed Within Subject Site**	**Likely to Occur as a Result of the Proposal**	**Impact or Occurrence Likely to be Mitigated or Reduced as a Result of the Proposal**
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	No	No	No
Herbivory and environmental degradation caused by feral deer	No	No	No
Importation of red imported fire ants (*Solenopsis invicta*)	No	No	No
Infection by psittacine circoviral (beak and feather) disease affecting endangered psittacine species and populations	No	No	No
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	No	No	No
Infection of native plants by *Phytophthora cinnamomi*	No	No	No
Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	No	No	No
Introduction of the large earth bumblebee (*Bombus terrestris*)	No	No	No
Invasion and establishment of exotic vines and scramblers	No	No	No
Invasion and establishment of Scotch broom (*Cytisus scoparius*)	No	No	No
Invasion and establishment of the cane toad (*Bufo marinus*)	No	No	No
Invasion of native plant communities by African Olive *Olea europaea* L. subsp. *cuspidata*	Yes	No	Yes. Likely to be managed within the retained biodiversity corridor area.
Invasion, establishment and spread of *Lantana camara*	Yes	No	Yes. Likely to be managed within the retained biodiversity corridor area.
Invasion of native plant communities by *Chrysanthemoides monilifera* (bitou bush and boneseed)	No	No	No
Invasion of native plant communities by exotic perennial grasses	Yes	No	Yes. Likely to be managed within the retained biodiversity corridor area.
Invasion of the yellow crazy ant (*Anoplolepis gracilipes* (Fr. Smith)) into NSW	No	No	No
Loss of hollow-bearing trees	Yes	Yes	No
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants including aquatic plants	Yes	No	Yes. Likely to be managed within the retained biodiversity corridor area.

TABLE A1.2 ASSESSMENT OF KEY THREATENING PROCESSES			
Key Threatening Processes Listed under the *TSC Act* (1995)	**Evidence of Current or Previous Occurrence Observed Within Subject Site**	**Likely to Occur as a Result of the Proposal**	**Impact or Occurrence Likely to be Mitigated or Reduced as a Result of the Proposal**
Loss or degradation (or both) of sites used for hill-topping by butterflies	No	No	No
Predation and hybridisation of feral dogs (*Canis lupus familiaris*)	No	No	No
Predation by the European red fox (*Vulpes vulpes*)	Yes	No	No
Predation by the feral cat (*Felis catus*)	No	No	No
Predation by *Gambusia holbrooki* (plague minnow or mosquito fish)	Yes	No	No
Predation by the ship rat (*Rattus rattus*) on Lord Howe Island	No	No	No
Predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)	No	No	No
Removal of dead wood and dead trees	Yes	Yes	Dead wood and dead trees are likely to be retained within the retained biodiversity corridor area

The proposal is likely to increase the impact of the key threatening processes 'Clearing of native vegetation', 'Loss of hollow bearing trees' and 'Removal of dead wood and dead trees' within the subject site.

The proposal will provide an opportunity to halt and reverse the impact of several of these key threatening processes within the biodiversity corridor area to be retained. Management initiatives are likely to include revegetation works, replanting of native vegetation and management of the areas for conservation purposes.

A1.2 CONCLUDING COMMENTS

Based on the details provided in the accompanying report, ecological surveys completed and assessment undertaken above it is concluded that:

i. The proposed development is not likely to have a significant effect on threatened species, populations or ecological communities or their habitats;

ii. A Species Impact Statement is not required for the proposed development.

APPENDIX 2

ENVIRONMENTAL PROTECTION AND BIODIVERSITY CONSERVATION ACT (1999) – PROTECTED MATTERS REPORT

A2.1 EPBC Act Assessment

The *Environment Protection and Biodiversity Conservation Act*, (1999) requires that Commonwealth approval be obtained for certain actions. The Act provides an assessment and approvals systems for actions that have a significant impact on matters of National Environment Significance (NES). These may include:-

- World heritage sites;
- National heritage places;
- Wetlands of international importance;
- Nationally threatened species and ecological communities;
- Migratory species;
- Commonwealth marine areas;
- Great Barrier Reef Marine Park;
- Nuclear actions.

Actions are projects, developments, undertakings, activities, series of activities or alteration of any of these. An action that needs Commonwealth approval is known as a controlled action. A controlled action needs approval where the Commonwealth decides the action would have a significant effect on a NES matter.

Where a proposed activity is located in an area identified to be of NES, or such that it is likely to significantly affect threatened species, ecological communities, migratory species or their habitats, the matter needs to be referred to the Department of Sustainability, Environment, Water, Population and Communities (SEWPC). The following assessment of Matters of National Environmental Significance, has been undertaken in accordance with the EPBC Act Policy Statement 1.1 Significant Impact Guidelines (DEWHA 2009).

i. Are there any Matters of National Environmental Significance located in the area of the proposed action?

A search of the EPBC Protected Matters Search Tool (2013) was conducted for matters of national environmental significance recorded within 5km of the subject site. The protected Matters Search Report is provided as Attachment A2.1. Matters of National Environmental Significance observed within the subject site or with suitable habitat present are outlined as follows.

Threatened Species
The following threatened species listed under the *EPBC Act* (1999), identified on the protected matters search, have suitable habitat present within the subject site:

- *Pimelea spicata*;
- Green and Golden Bell Frog;
- Australasian Bittern;
- Painted Snipe;
- Swift Parrot;
- Regent Honeyeater;
- Grey-headed Flying-fox; and
- Large-eared Pied Bat.

No threatened species listed within the EPBC Act (1999) were observed during surveys. The threatened species *Pimelea spicata* and the Green and Golden Bell Frog are sedentary type species which were not observed within the subject site during surveys.

The remaining threatened species identified as having suitable habitat present are nomadic type species and may utilise the habitats present the site or locality on occasion.

Nationally Listed Threatened Ecological Communities
The critically ecological community, Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest, as listed within the EPBC Act (1999) occurs within the subject site.

Nationally Listed Migratory Species
The following migratory species (excluding marine species) listed under the *EPBC Act* (1999), identified on the protected matters search, have suitable habitat present within the subject site:

- Cattle Egret;
- Latham's Snipe;
- Rainbow Bee-eater;
- Fork-tailed Swift;
- White-throated Needletail;

No migratory species listed within the EPBC Act (1999), were observed within the subject site during current surveys, however these species are migratory type species and may occur within the site or locality on occasion.

Ramsar Wetlands of International Importance
No Ramsar Wetlands, were recorded within 5km of the subject site on the EPBC Act Protected Matters Search Report (SEWPaC 2013).

The Commonwealth Marine Environment
No Commonwealth marine areas as listed within the *EPBC Act* (1999) were observed within the subject site or recorded within 5km of the subject site on the EPBC Act Protected Matters Search Report (SEWPaC 2013).

Listed World Heritage Properties
No world heritage properties as listed within the EPBC Act (1999) were observed within the subject site or recorded within 5km of the subject site on the EPBC Act Protected Matters Search Report (SEWPaC 2013).

Listed National Heritage Places
No national heritage places listed within the *EPBC Act* (1999) occur within or adjoining the subject site.

The Great Barrier Reef Marine Park
The subject site is not located within 5km of the Great Barrier Reef Marine Park.

Nuclear Actions
The proposal is not a type of action classed as a nuclear action.

ii. Considering the proposed action at its broadest scope, is there potential for impacts on Matters of National Environmental Significance?

The proposed development will require the removal 1.9 hectares of Disturbed Narrow-leaved Ironbark / Grey Box Woodland as mapped in Figure 2.1, which provides suitable habitat for the Critically Endangered Ecological Community (CEEC) Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest (CPSW-SGTF) and locally occurring nomadic type threatened fauna species and migratory fauna species which may utilise the site and/or locality on occasion.

It is considered that the proposal is not a material and substantial cause of indirect impacts and potential impacts associated with any third party actions are not known or expected to be known and are not an intended outcome of the proposed action.

Further assessment to determine the significance of impacts associated with the proposal is provided in the following sections.

iii. Are there any proposed measures to avoid or reduce impacts on Matters of National Environmental Significance?

Areas of vegetation and habitat retention were determined for the Glenmore Park Stage 2 area at the site rezoning stage to enable the establishment of a biodiversity corridor along Surveyors Creek. Approximately 1.7 hectares of this community will be retained within the biodiversity corridor within the western section of the subject site. The biodiversity corridor will ensure the maintenance of connectivity for the local occurrence of the CPSW-SGTF CEEC. In addition approximately 0.7 hectares of cleared areas within the biodiversity corridor area onsite will be subject to revegetation works with Cumberland Plain Woodland species in accordance with the Glenmore Park Stage 2 Development Contributions Plan 2007.

iv. Are any impacts of the proposed action on Matters of National Environmental Significance likely to be significant impacts?

The proposal will require the removal of potential habitat for several threatened fauna species and migratory fauna species listed within the EPBC Act (1999) which were not observed within the subject site, however have been previously recorded within 5 km of the subject site. These species include the following:

- Australasian Bittern;
- Painted Snipe;
- Swift Parrot;
- Regent Honeyeater;
- Grey-headed Flying-fox; and
- Large-eared Pied Bat.
- Cattle Egret;
- Latham's Snipe;
- Rainbow Bee-eater;
- Fork-tailed Swift; and
- White-throated Needletail

It is considered that the proposed development is not likely to have a significant impact on Matters of National Environmental Significance which were not observed within the subject site as the impacts associated with the proposal are not likely to be important, notable or of consequence due to the highly disturbed condition of the site, the ongoing use and degradation of the site as rural grazing lands and the biodiversity planning mechanisms which have been incorporated into the proposal to mitigate the extent of impacts to biodiversity such as the retention, revegetation and management of a biodiversity corridor within the site and through the Glenmore Park Stage 2 subdivision area.

The proposed development will require the removal of habitat for the CPSW-SGTF CEEC. Criteria identified within the EPBC Act Policy Statement 1.1 *Significant Impact Guidelines* (DEWHA 2009), have been addressed below to determine whether there is a real chance or possibility, that the proposed action is likely to have a significant impact on the CPSW-SGTF CEEC.

Significant impact Criteria
Questions (**in bold**) to determine whether the proposal is likely to have a significant impact on an endangered or critically endangered ecological community are as follows.

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

- ***Reduce the extent of an ecological community;***

The proposed development will reduce the extent of the CPSW-SGTF CEEC by approximately 1.9 hectares within the subject site.

Approximately 1.7 hectares of this community will be retained within the western section of the subject site. Areas of vegetation and habitat retention were determined at the site rezoning stage to enable the establishment of a biodiversity corridor along Surveyors Creek. The biodiversity corridor will ensure the maintenance of connectivity for the local occurrence of the CPSW-SGTF CEEC. Approximately 0.7 hectares of cleared areas within the biodiversity corridor area onsite will be subject to revegetation works in accordance with the Glenmore Park Stage 2 Development Contributions Plan 2007.

- ***Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines;***

The vegetation within the subject site is connected to offsite areas of native vegetation to the north-west and south-east of the subject site along Surveyors Creek. These areas are linked to Mulgoa Nature Reserve which occurs to the north west of the subject site, which is mapped as containing a large proportion of the local occurrence of CPSW-SGTF CEEC. Areas of vegetation and habitat retention were determined at the site rezoning stage to ensure the retention of vegetation and maintenance of connectivity for the local occurrence of the CPSW-SGTF CEEC. The cleared areas of the biodiversity corridor area within the site will be subject to replanting works in accordance with the Glenmore Park Stage 2 Development Contributions Plan 2007.

- ***Adversely affect habitat critical to the survival of an ecological community;***

It is considered that the subject site does not provide habitat critical to the survival of the ecological community necessary for:

- Activities such as foraging, breeding, roosting, or dispersal;
- The long-term maintenance of the ecological community;
- The maintenance of genetic diversity and long term evolutionary development; or
- The reintroduction of populations or recovery of the ecological community.

The subject site does not contain habitat identified in the Cumberland Plain Recovery Plan As a priority conservation land, habitat critical for the ecological community, or habitat listed on the Register of Critical Habitat maintained by the minister under the *EPBC Act*.

It is therefore considered that the proposed action is not likely to adversely affect habitat critical to the survival of an ecological community.

- ***Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns;***

Impacts associated with the proposal are likely to be limited to the removal of vegetation only. Retained areas of vegetation within and adjoining the subject site are not likely to be impacted be direct or indirect impacts to abiotic factors necessary for an ecological community's survival within the site or locality.

- ***Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting;***

The critically endangered ecological community, Cumberland Plain Woodland in the Sydney Basin Bioregion occupies approximately 3.6 hectares within the subject site, of which approximately 1.9 hectares will require removal for the proposed development.

Approximately 1.7 hectares of this community will be retained within the western section of the subject site. Areas of vegetation and habitat retention were determined at the site rezoning stage to enable the establishment of a biodiversity corridor along Surveyors Creek. The biodiversity corridor will ensure the maintenance of connectivity for the local occurrence of the CPW CEEC. Approximately 0.7 hectares of cleared areas within the biodiversity corridor area onsite will be subject to revegetation works in accordance with the Glenmore Park Stage 2 Development Contributions Plan 2007.

It is therefore considered that the proposal is not likely to cause a substantial change in the species composition of the retained occurrence of the ecological community.

- **Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:**
  - **assisting invasive species, that are harmful to the listed ecological community, to become established, or**
  - **causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or;**

The quality and integrity of the 1.7 hectares of the ecological community to be retained within the subject site will be maintained and improved through the retention and management of a biodiversity corridor area. In addition to the retention of approximately 1.7 hectares of the ecological community, approximately 0.7 hectares of cleared areas within the biodiversity corridor area onsite will be subject to revegetation works in accordance with the Glenmore Park Stage 2 Development Contributions Plan 2007.

It is therefore considered that the proposal is not likely to cause a substantial reduction on the quality or integrity of the retained occurrence of the ecological community.

- ***Interfere with the recovery of an ecological community.***

The proposal will result in the removal of approximately 1.9 hectares of habitat for the CPSW-SGTF CEEC, however it is considered that the proposal will not interfere with the recovery of this CEEC within areas identified as priority conservation lands within the Cumberland Plain Recovery plan or within lands reserved and/or zoned for conservation.

Approximately 1.7 hectares of this community will be retained within the western section of the subject site. Areas of vegetation and habitat retention were determined at the site rezoning stage to enable the establishment of a biodiversity corridor along Surveyors Creek. The biodiversity corridor will ensure the maintenance of connectivity for the local occurrence

of the CPSW-SGTF CEEC. Approximately 0.7 hectares of cleared areas within the biodiversity corridor area onsite will be subject to revegetation works in accordance with the Glenmore Park Stage 2 Development Contributions Plan 2007.

It is considered that the retention and revegetation of a biodiversity corridor area within the site will assist the recovery of the ecological community.

CONCLUSION

As the proposed action will result in a reduction in the extent of the CPSW-SGTF CEEC within the subject site, a referral of this project to the Department of Sustainability, Environment, Water. Population and Communities is required.

ATTACHMENT A2.1
PROTECTED MATTERS SEARCH REPORT

Australian Government
Department of Sustainability, Environment, Water, Population and Communities

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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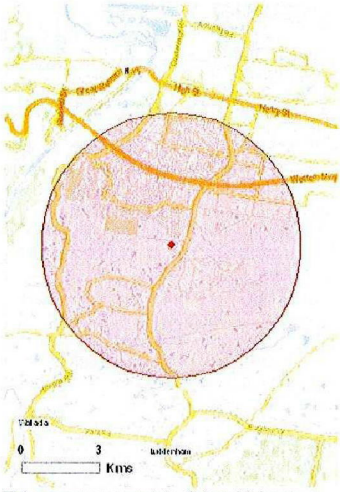

Coordinates
Buffer: 5.0Km

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	24
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate.

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	7
Commonwealth Heritage Places:	1
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	7
State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	18
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically Endangered	Community likely to occur within area
Shale/Sandstone Transition Forest	Endangered	Community likely to occur within area
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Vulnerable	Species or species habitat likely to occur within area
Fish		
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Frogs		

Name	Status	Type of Presence
Heleioporus australiacus		
Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area
Litoria aurea		
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within area
Litoria littlejohni		
Littlejohn's Tree Frog, Heath Frog [64733]	Vulnerable	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Petrogale penicillata		
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus		
Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pseudomys novaehollandiae		
New Holland Mouse [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Plants		
Allocasuarina glareicola		
[21932]	Endangered	Species or species habitat likely to occur within area
Cynanchum elegans		
White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
Pelargonium sp. Striatellum (G.W.Carr 10345)		
Omeo Stork's-bill [84065]	Endangered	Species or species habitat may occur within area
Pimelea spicata		
[20834]	Endangered	Species or species habitat known to occur within area
Pomaderris brunnea		
Rufous Pomaderris [16845]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis saxicola		
Sydney Plains Greenhood [64537]	Endangered	Species or species habitat may occur within area
Streblus pendulinus		
Siah's Backbone, Sia's Backbone, Isaac Wood [21618]	Endangered	Species or species habitat may occur within area
Reptiles		
Hoplocephalus bungaroides		
Broad-headed Snake [1182]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat likely to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus		
White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis		
Black-faced Monarch [609]		Species or species habitat known to occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Ardea ibis		
Cattle Egret [59542]		Species or species habitat likely to occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Vulnerable*	Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Defence Housing Authority
Commonwealth Land - Defence Service Homes Corporation
Commonwealth Land - Director of War Service Homes
Defence - 1CAD ORCHARD HILLS KINGSWOOD
Defence - RANMME (DEOH)

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Natural		
Orchard Hills Cumberland Plain Woodland	NSW	Listed place

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Vulnerable*	Species or species habitat likely to occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Mulgoa Natural Area	NSW	Registered
Orchard Hills Cumberland Plain Woodland	NSW	Registered
Historic		
Fernhill Setting	NSW	Registered
Glenmore	NSW	Registered
Mulgoa Group and Landscape	NSW	Registered

Name	State	Status
St Thomas Anglican Church & Cemetery	NSW	Registered
The Cottage	NSW	Registered

State and Territory Reserves [Resource Information]

Name	State
Mulgoa	NSW

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Frogs		
Bufo marinus Cane Toad [1772]		Species or species habitat likely to occur within area
Mammals		
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

Coordinates

-33.80659 150.69085

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Department of Environment, Climate Change and Water, New South Wales
-Department of Sustainability and Environment, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment and Natural Resources, South Australia
-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts
-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Geoscience Australia
-CSIRO
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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APPENDIX 3

HOLLOW BEARING TREE ASSESSMENT

HOLLOW BEARING TREE ASSESSMENT

A3.1 SURVEY METHODOLOGY

A hollow bearing tree survey was undertaken within the subject site during March 2013. Systematic searches were conducted throughout the proposed development area on foot to assess and detect the presence of hollow bearing trees. Inspection of trees was undertaken by encircling trees from ground level from vantage points which allowed inspection from each cardinal point. A pair of binoculars was utilised to assist with the detection of tree hollows. Observation of fauna use was also recorded and included searches for scratches on the truck of trees and evidence of nesting material, signs of chewing, rubbing, scratching or droppings on hollow entrances, presence of fauna inside hollows and fauna entering or exiting hollows.

Each hollow bearing tree observed was numbered and tagged and its location was recorded on an aerial photograph of the site.

The following Information was recorded for each hollow bearing observed:
Tree tag number;
Tree species name;
DBH (diameter of trunk at 1.4 metres above ground);
Canopy spread;
Tree health as a percentage of healthy growth compared to dead limbs;
Hollow aperture in increments (<10cm/10-30cm/>30cm);
Position of the hollow in the tree (broken trunk, trunk, basal and branch);
Presence and size of any split wood, cracked bark or hollow arboreal termite nests; and
Species of any fauna observed utilising the hollows observed.

Visual inspection from ground level has inherent limitations and can result in observer bias where actual tree hollows are not visible to the observer or false hollows are recorded. Hollows can be obscured due to the location within the tree and the angle of observation by the surveyor and not all tree hollows present may have been identified. False hollows can also be recorded due to variables such as dark stains, wounds or marks on trees, poor visibility, solid branch ends or the presence of shallow cavities. In instances where the observer was uncertain as to the presence of a tree hollow the precautionary principle was applied and a hollow was assumed to be present.

A3.2 ASSESSMENT RESULTS

Four hollow bearing trees were observed within the subject site. Hollow bearing trees observed will be retained within the southern section of the subject site. The tree hollows observed were mostly small and medium sized branch and trunk hollows some with split wood and bark. Hollow bearing tree locations are shown in Figure 2.1 and the characteristics of hollow bearing trees observed are provide in Table A3.1.

TABLE A3.1 HOLLOW BEARING TREE DETAILS				
Tag No	HT0001	HT0002	HT0003	HT0004
Scientific Name	*Eucalyptus moluccana*	*Eucalyptus crebra*	*Eucalyptus crebra*	*Eucalyptus sp*
Common Name	Grey Box	Narrow-leaved Ironbark	Narrow-leaved Ironbark	-
Remove/Retain	Retained	Retained	Retained	Removed
DBH (cm)	40	15/15/40	80	75
Spread (m)	4	4	25	12
Height (m)	15	12	22	15
Health %	30	<5	50	<5
Comment				
Broken Trunk <10cm				
Broken Trunk 10-30cm				
Broken Trunk >30cm				
Trunk <10cm				1
Trunk 10-30cm	1		1	1
Trunk >30cm				
Branch <10cm			2	
Branch 10-30cm				
Branch >30cm				
Splits <10cm				
Splits 10-30cm	1			
Splits >30cm				
Bark <10cm				
Bark 10-30cm		1	1	1
Bark >30cm				