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FLORA AND FAUNA ASSESSMENT REPORT

103 - 109 LAYCOCK STREET
CRANEBROOK NSW 2749

Prepared For: Rocco Alvaro

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Executive Summary

Envirotech Pty. Ltd. has been commissioned to prepare a Flora and Fauna Assessment Report for a proposed seniors housing development application submitted to Penrith City Council. This report describes the biological environment of 103 – 109 Laycock Street, Cranebrook NSW and assesses the potential effects on threatened and migratory species, endangered populations and ecological communities of the proposal.

A desktop search for threatened species within a 10 km radius of the Site was generated and a flora and fauna assessment was undertaken to ascertain if any threatened species were on Site or might use the Site.

The Site was largely cleared of native vegetation with only scattered Eucalypts, herbaceous weeds and some native groundcovers observed on the Site. Fauna habitat within the study area lacks structural complexity and is likely to be utilised by urban-tolerant species only. The overall vegetative composition is no longer representative of the native vegetation community that was once present in the study area.

No threatened species, endangered populations or endangered ecological communities listed on the schedules of the *Threatened Species Conservation Act* 1995, or the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 were recorded in the study area.

Following the application of the test of significance (also known as seven-part test) of NSW *Threatened Species Conservation Act 1995,* in accordance with relevant assessment guidelines, it is concluded that the proposal is unlikely to have a significant effect on threatened species, endangered populations, ecological communities, or their habitats. A Species Impact Statement is not required for the proposal.

Following consideration of the administrative guidelines for determining significance under the Commonwealth *Environment Protection & Biodiversity Conservation Act* 1999, it is concluded that the proposal is unlikely to have a significant impact on matters of National Environmental Significance or Commonwealth land, and a referral to the Commonwealth Environment Minister is not necessary.

Several impact mitigation and amelioration strategies have been recommended for the proposal. These strategies mitigate the effects of the proposal on native species and threatened species, endangered populations, ecological communities, or their habitats and minimise the impacts of the proposal on the flora and fauna values of the study area in general.

Certification

The results presented in this report are a true and accurate record. Survey work has been carried out in accordance with the *Threatened Species and Regional Biodiversity Survey and Assessment Guidelines* (DECC 2007). Flora and fauna investigations have been prepared in consideration of the schedules and requirements of the NSW *Threatened Species Conservation Act* 1995 and the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999. The results of this survey report are available to the public for future use and have been supplied to the NSW Department of Planning, Industry and Environment for inclusion in the *Atlas of NSW Wildlife Database.*

Survey and assessment of threatened biodiversity has been undertaken by an experienced and qualified staff.

Definitions

Activity	A project, development, undertaking, activity or series of activities, or an alteration of any of these things.
AHD	Australian Height Datum
TSC Act	*Threatened Species Conservation Act* 1995
BoM	Bureau of Meteorology
cm	Centimetre
DCP	Development Control Plan
DoE	Department of Environment
EP&A Act	*Environmental Planning and Assessment Act* 1979
EPBC Act	*Environment Protection and Biodiversity Conservation Act* 1999
GDA	Geocentric Datum of Australia
Habitat	An area occupied, whether periodically or constantly by a species, population or ecological community.
ha	Hectare
km	Kilometre
LEP	Local Environmental Plan
LGA	Local Government Area
m	Metre
MGA	Map Grid of Australia

mm	Millimetre
NSW DPIE	NSW Department of Planning, Industry and Environment
SEPP	State Environmental Planning Policy
Site	The area of the property on which the proposed development would occur.
Study Area	The property known as 103 - 109 Laycock Street, Cranebrook NSW 2749 and adjacent properties, including areas which would reasonably impact or be impacted by the proposed development.
Threatened Biodiversity	Species, populations, ecological communities or their habitats listed and protected under a legislative instrument, such as the TSC Act and the EPBC Act.
Vegetation Community	An assemblage of native flora species known to occur in association as a result of topography, soil landscape and rainfall.

1 Introduction

Envirotech Pty. Ltd. has been commissioned to prepare a Flora and Fauna Assessment Report for a development application at 103 - 109 Laycock Street, Cranebrook NSW 2749. The Site is located at -33.723186 S, 150.702876 E and is located within the Penrith City Council Local Government Area (Figure 1).

Figure 1: Location of the Site (image source: Nearmaps 2019)

1.1 Site Description

Table 1 provides description of the site and its context.

Table 1: Site Description

Site Address	103 - 109 Laycock Street, Cranebrook NSW 2749
Lot / DP	Lot 23 in DP 700376
Size of Property	8152 m^2 (0.81 ha)
Current Land use	Residential
Local Government Area	Penrith City Council

1.2 Proposed Development

The site will be development into a Seniors Housing.

Table 2: Description of proposed development

Proposed Development	Proposed Seniors Housing & Housing for People with a Disability.
Development footprint area (ha)	0.81 ha (the entire site)

1.3 Aims and Objectives

The aim of this report is to address the legislative requirements of an assessment of significance under the *Environmental Planning and Assessment Act* 1979 and the *Threatened Species Conservation Act 1995* . The objectives of the flora and fauna survey and assessments of significance are to determine the potential impacts of the proposed activity on threatened species, populations and ecological communities and their habitats, as listed under State and Commonwealth legalisation.

1.3.1 Constraints

This report is constrained by the following factors:

- **Timing of surveys** - This timeframe has not enabled the development and implementation of rigorous survey as recommended by scientific guidelines. Surveys undertaken during the project period have been developed to take advantage of study opportunities and do not reflect optimum best practice.

- **Seasonality** - It is acknowledged that a number of species may visit the Site sporadically or in response to seasonal triggers, such as flowering or fruiting times. Habitat utilisation may also depend on the life stage of the species and the resources available in the study area. Given the timeframe of this project it has not been possible to conduct surveys at times more appropriate to life cycle or foraging behaviour.
- **Survey Effort** - The Site is considered to be highly disturbed and does not accommodate the employment of transect and quadrat survey techniques. Surveys have been opportunistic and have generally followed random meanders.

2 Legislative Framework

Table 3 identifies legislative requirements relevant to the proposed development and includes environmental planning instruments, legislative provisions, approvals, consents and licences.

Table 3: Legislative requirements.

Government Level	Relevant Legislation / Instrument	Relevance to the Proposed Development
Commonwealth Government	*Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)	Threatened species, populations or ecological communities or their habitats are known to occur in the region.
NSW State Government	*Environment Planning and Assessment Act 1979* (EP&A Act)	The proposed development requires approval under the Act.
NSW State Government	*Threatened Species Conservation Act* 1995 (TSC Act)	The Site is located within the State of New South Wales where the act applies. Impacts to threatened biodiversity (i.e. threatened ecological communities (TECs), threatened species, populations and habitat of threatened species) require assessment as per the act and associated legislation.
NSW State Government	*Biosecurity Act* 2015	Under the Act, landowners/occupiers have a legal responsibility to control declared noxious weeds under the Act.

3 Methods

4.1 Desktop Review

4.1.1 Database Review

Desktop review for existing information was undertaken as shown in Table 4.

Table 4: Database Review

Database / Website	Objective
Penrith Council Website	Identification of site context information, such as zoning
Atlas of NSW Wildlife Database (BioNet)	Search for threatened biodiversity listed under the TSC Act. The search of threatened biodiversity was undertaken for a 10km locality surrounding the site. The BioNet Atlas was questioned on 13 August 2019.
Protected Matters Search Tool (PMST)	Search for Matters of National Environmental Significance (MNES) listed under the EPBC Act, including threatened biodiversity. The search of threatened biodiversity was undertaken for a 10km locality surrounding the site.
BioNet Vegetation Information System	The Vegetation Information System (VIS), part of the Atlas of NSW was questioned regarding existing vegetation mapping for the site.
SEED Portal	View of maps with regards to vegetation mapping and BioNet records.

4.2 Likelihood of Occurrence and Risk Assessment

In order to complement identification of threatened species likely to occur within the site, the NSW BioNet and the PMST were undertaken. A likelihood of occurrence and risk assessments were undertaken for threatened species identified in the NSW BioNet Atlas and PMST**.**

4.2.1 Likelihood of Occurrence

Species identified in the NSW BioNet atlas and the PMST were collated into a table where an assessment of the likelihood of occurrence of that threatened biodiversity was undertaken. In making this determination, the following factors were considered:

- habitat quality within and adjacent to the Development Site as determined through review of regional vegetation mapping and the results of the September survey;
- breeding habitat/resources present – assists with identification of the importance of habitat to the species;
- dispersal ability - based on known ecology - whether the species have an ability to disperse to new areas of habitat following disturbance; and
- local records in similar habitat/distance/connectivity to the Development Site.

This allows for assessment of cryptic or seasonal species that are unlikely to be readily identified during brief site inspections and/or due to seasonal constraints. The likelihood of each species occurring was categorised as known, potential or unlikely to occur based on the definitions provided in Table 5.

Table 5: Definitions of Likelihood of Occurrence

Category	Description
Known	• the ecological community/species/matter has been recorded in the Subject Land during field surveys; or • database records demonstrate that the ecological community/species has been known to occur in the Subject Land within the last 10-year period.
Potential	• the ecological community/species' known distribution includes the Subject Land, and suitable habitat is present within it, or, • database records demonstrate that the ecological community/species has been known to occur in the Subject Land, however, has not been recorded within the last 10 years, or • the species is a wide-ranging flying species which may 'fly-over' the Subject Land, regardless of the habitat types present and has been recorded within the 10 km locality surrounding the Subject Land.
Unlikely	• the ecological community/species has not been recorded within 10 km locality of the Subject Land and suitable habitat does not occur within the Subject Land, or • the Subject Land is not within the TEC/species' known distribution, or • sufficient field surveys have been conducted to conclude that the species is likely to be absent.

The following considerations were made in assessing habitat suitability and distribution:

- *Habitat quality within and adjacent to the Subject Land.*
- *Breeding habitat/resources present – assists with identification of the importance of habitat to the species.*
- *The species' ability to disperse to new areas of habitat following disturbance.*
- *Local records in similar habitat/distance/connectivity to the Subject Land.*

4.2.2 Risk Assessment

A risk assessment was undertaken using the definitions of Species Sensitivity and Consequence to assign a relative risk ranking for each listed ecological value (Low, Medium, High or Very High, as shown in Table 6). Impacts to ecological values with potential to occur that were assessed as having a Low risk was not further assessed. Impacts to ecological values with potential to occur that were assessed as having a Medium, High or Very High risk were further assessed in accordance with the requirements of the EPBC Act and TSC Act, including the preparation of detailed Assessments of Significance.

Species sensitivity rankings are based on the species conservation status under the EPBC Act and TSC Act. Where the conservation status differs between listings, the conservation status with higher sensitivity is used.

Table 6: Risk Assessment Matrix

		Consequence			
		Negligible	**Minor**	**Moderate**	**Major**
Sensitivity	Ecological value not listed as threatened	Low	Low	Medium	High
	Ecological value listed as Vulnerable or Migratory	Low	Medium	Medium	High
	Ecological value listed as Endangered	Low	Medium	High	Very High
	Ecological value listed as Critically Endangered	Medium	High	Very High	Very High

Consequence Definitions

Negligible: No impacts or removal of ecological community. Effect on species is within the likely normal range of variation. No removal of specific breeding habitat features.

Minor: Indirect impacts to listed ecological community which may affect a small proportion of the ecological community. Effects a small proportion of a population and Project-related mortality of a small number of individuals may occur but does not substantially affect other species dependent on it, or the populations of the species itself. No removal of specific breeding habitat features.

Moderate: Direct removal of a portion of a listed ecological community. Effects an enough proportion of a species population that it may bring about a substantial change in abundance and/or reduction in distribution over one or more generations but does not threaten the long-term viability of that population or any population dependent on it.

Major: Direct removal of a listed ecological community. Effects an entire population or species at sufficient scale to cause a substantial decline in abundance and/or change in distribution beyond with natural recruitment (reproduction, immigration from unaffected areas) may not return that population or species, or any population or species dependent upon it, to its former level within several generations, or when there is no possibility of recovery.

Species sensitivity definitions

Species sensitivities refer to listed under either the EPBC Act or TSC Act. Where listings differ, the higher sensitivity is used.

4.3 Vegetation Surveys

Vegetation surveys were conducted during daylight hours of 24 September 2019 and included the identification of native and exotic species in the study area and observation of vegetation on adjoining properties. The surveys were conducted as a random meander across the entirety of the study area. Vegetation surveys targeted the identification of native and threatened biodiversity.

4.4 Fauna Surveys

Targeted fauna surveys were not undertaken due to time constraints associated with the project. The likelihood of species being present or utilising the Site has been determined through interrogation of published observations, research and assessment of habitat features during field survey.

4.5 Habitat Assessment

Habitat assessment was conducted in conjunction with random meanders. Preliminary assessment of threatened biodiversity likely to occur in the study area provided details of required habitat. Habitat identification and assessment targeted:

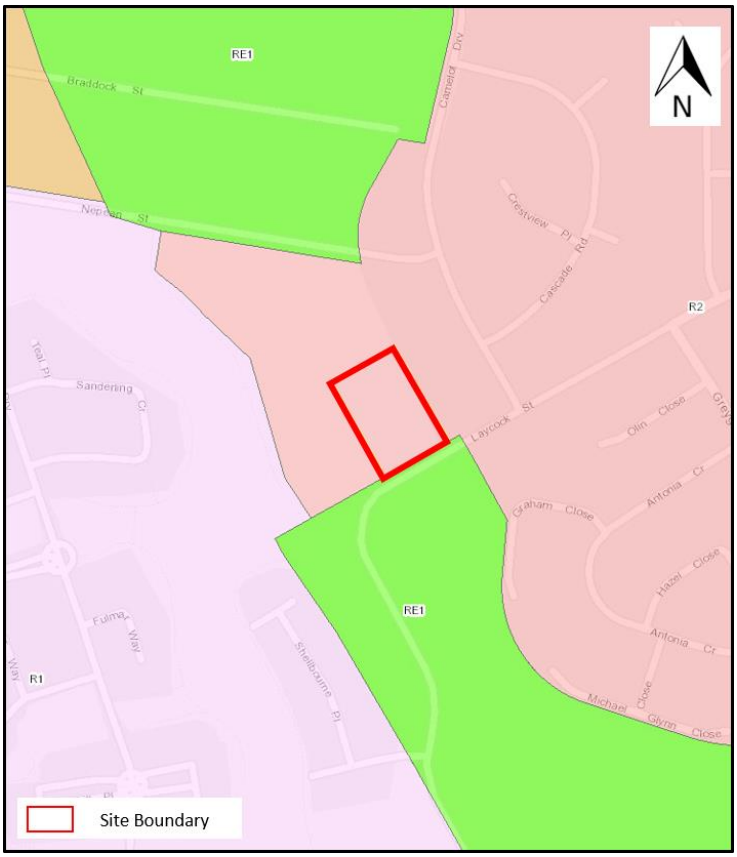
- Tree hollows
- Loose bark;
- Roosting trees;
- Nesting Sites;
- Fruiting and flowering plants;
- Bare branches;
- Dead trees and logs;
- Termite mounds;
- Rocks;
- Exposed bedrock;
- Scats;
- Tree scratching;
- Scrapes or diggings;
- Hair;
- Burrows;
- Waterbodies;
- Aquatic vegetation; and
- Long grass and leaf litter

4 Results

4.1 Site Context

Table 7 provides a summary of the site context.

Table 7: Site Context

Feature	Description
Site Location	The study Site is located within the Penrith City Council Local Government Area east of the Sydney International Regatta Centre. The Site is accessed by Laycock Street accessed via either Greygums Road or Andrews Road. Much of the property has been cleared as a result of current and historical land use. The site is situated among residential properties east of the Sydney International Regatta Centre. A vacant block of land is located to the south of the property.
Zoning	The property is zoned R2 - Low Density Residential under the Penrith Local Environmental Plan 2010.  **Figure 2:** R2 Land zoning of the Site; Site denoted by red outline (NSW Planning Portal - ePlanning Spatial Viewer 2019).

Geology	The Site is underlain by the Luddenham soils group and Wianamatta Group Ashfield Shale/Bringelly Shale formations. Soils are characteristically moderately deep yellow podzolic soils and prairie soils within lower slopes and drainage line areas. Soils are erosional and minor gully erosion or sheet erosion may be evident along unpaved roads or in disturbed areas.
Landform and soils	The landform of the Site is characteristic of the area. Low rolling to steep low hills are observed surrounding the Site. For the most part the Site landform has been shaped by its location on the Nepean River floodplain. Soils are limited by low to moderate fertility and moderate erodibility. The property is located within a flat to undulating area capable of supporting grazing and is situated approximately 31.2 m above sea level (ASL).
Hydrology	The area is located within the Hawkesbury/Nepean River catchment area. Drainage from the Site flows into the Nepean River approximately 2 km south west of the Site.
Rainfall	Mean annual rainfall has been determined from observations from Penrith Lakes AWS weather station (BOM station 067113). Penrith Lakes AWS weather station has recorded a mean annual rainfall of 717.0 mm across 22 years of observations. The weather station is located approximately 2 km east and within 10 m elevation of the Site.
Disturbance History	The land has been historically cleared for agricultural and grazing uses. Mid-stratum vegetation is largely absent from the Site; a native and invasive groundcover was observed to be in a managed state. Scattered Eucalypt species were observed along the entrance way and aligning the north eastern and northern boundary of the lot. Bare patches of soil were observed in some sections of the lot resulting from vehicular travel across the area and associated soil compaction.
Weather Conditions	Temperature at the time of the survey was 20°C at 1200 hrs as recorded by BOM station 067113 on the survey date. No rainfall occurred during surveys. A light breeze was observed during the inspection.

4.2 Threatened Biodiversity

A list of threatened biodiversity listed under the TSC Act and the EPBC Act and likely to occur within the site were obtained from the BioNet (see Appendix B) and the PMST (see Appendix C). An assessment of likelihood of occurrence and risk assessment for threatened biodiversity was undertaken shown in Table 11 presented in Appendix C.

A total of 5 species were identified as likely to occur and having a moderate to very high risk of impact due to the proposed development. The species are:

- Regent Honeyeater (*Anthochaera hrygia*)
- Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)
- Glossy Black-Cockatoo (*Calyptorhynchus lathami*)

- Little Lorikeet (*Glossopsitta pusilla*)
- Swift Parrot (*Lathamus discolour*)

A test of significance was undertaken for the species listed under the TSC Act (see Appendix E) and an assessment of significance was undertaken for those species listed under the EPBC Act (see Appendix F). Based on those assessments, it has been concluded that:

- The proposal will not result in significant impacts on TSC Act listed threatened species assessed.
- The proposal will not result in significant impacts on EPBC Act listed TECs, threatened species and their habitats.

4.3 Vegetation Communities

4.3.1 Existing Vegetation Mapping

Vegetation in the locality has been mapped as part of the Cumberland Plain Vegetation Mapping Project. A review of Map 11 – Penrith LGA North Section indicates that native vegetation has not been mapped at the site (see Figure X).

Vegetation on the Site was observed to be in a highly disturbed state and lacked the complexity of an intact vegetation community. Vegetation on the Site comprised of a scattered native and invasive lower stratum over a managed groundcover and exposed soils. Little to no shrub stratum was present across the Site. Endangered Ecological Communities mapped to be located near to the Site are depicted in Figure 3 for reference. The vegetation on the Site did not conform to any descriptions of the below listed Endangered Ecological Communities.

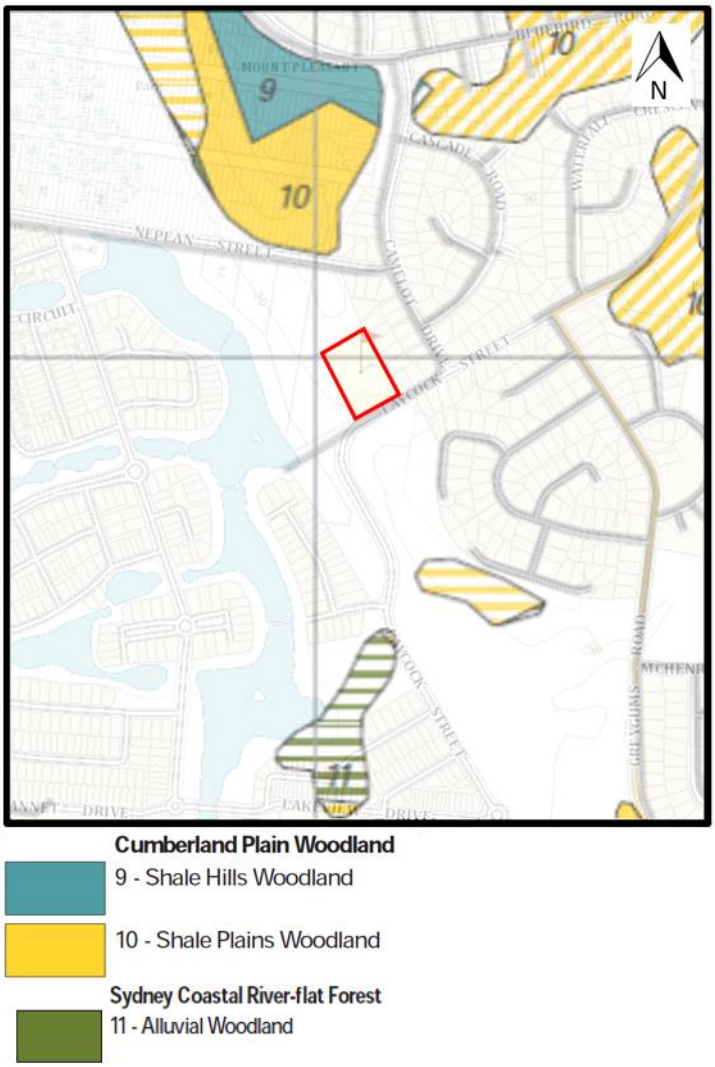


Figure 3: Vegetation mapping – *Cumberland Plain Vegetation Mapping Project* (Map 11 – Penrith LGA Northern Section)

4.3.2 Ground-truthed Vegetation

The site is currently occupied by a residential property with lawns and planted vegetation. No native vegetation in a natural (i.e. undisturbed) condition occurs at the site. Vegetation at the site is shown in Figure 4 and includes:

- Lawns: maintained lawns with numerous ground cover exotics;
- Lawns with planted shrubs and trees: a portion of the site, includes planted shrubs and trees. These shrubs and trees are present in a garden condition with lawns. Planted shurbs and trees include native and exotic species. Native trees include: Black She-oak (Allocasuarina littoralis), Fig tree (*Ficus* sp.), gum trees (*Eucalyptus* sp., *Eucalyptus sideroxylon*, *Angophora* sp.) trees and Tea Trees (*Leptospermum* sp. and *Melaleuca* spp.), Silk Grevillea (*Grevillea robusta*) and Crimson Bottlebrush (*Callistemon citrinus*). Exotic species include pines (*Pinus* sp.) and *Cupressus lusitanica*. Two Narrow-leaved Ironbarks (*Eucalyptus crebra*) appear to be remnant trees.

- Planted Melaleucas: Tea Trees (*Melaleuca* spp.) have been planted along the eastern boundary and parts of the northern boundary of the site.

Photograph 1: View of lawns at the site

Photograph 2: View of planted shrubs and trees at the site

Photograph 3: View of Malelucas planted along the eastern boundary of the site

Figure 4: Ground-truthed vegetation at the Site

4.3.2.1 Threatened Ecological Communities

Threatened Ecological Communities are absent at the site.

4.4 Flora Species

4.4.1 General Flora Species

A total of 36 flora species were recorded at the site, including 15 native species (42%), 20 exotics (56 %) and one cultivar of a native species (3%). Table 8 presents the full list of flora species recorded at the site.

4.4.2 Threatened Flora Species

No threatened flora species were recorded at the site.

4.4.3 Weed Species

A total of 20 exotic species were recorded, including Fireweed (*Senecio madagascariensis*). Fireweed is a listed weed as:

- Primary Weed within the Greater Sydney Area, including the Penrith LGA.
- Weed of National Significance under the national weed strategy.

It is noted that in accordance with the Biosecurity Act 2015, the general biosecurity duty applies for all landowners to manage weeds.

Table 8: Flora Species List

Family	Scientific Name	Common Name	Flora Type	Lawns	Lawns with planted shurbs and trees	Remnant natives
Amaryllidaceae	*Sternbergia lutea subsp. Lutea*	Autumn Crocus	E	X		
Apiaceae	*Daucus carota*	Wild Carrot	E	X		
Asparagaceae	*Phoenix sp.*	a Palm	E		X	
Asteraceae	*Senecio madagascariensis*	Fireweed	PW, WoNS	X		
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	E	X		
Asteraceae	*Taraxacum officinale*	Dandelion	E	X		
Cassuarinaceae	*Allocasuarina littoralis*	Black She-oak	N		X	
Convolvulacea	*Dichondra repens*	Kidney Weed	N	X		
Cupressaceae	*Cupressus lusitanica*	Arizona Cypress	E		X	
Fabaceae (Faboideae)	*Medicago arabica*	Spotted Medic	E	X		
Fabaceae (Faboideae)	*Trifolium dubium*	Yellow Suckling Clover	E	X		
Iridaceae	*Romulea minutifolia*	Small-flowered Onion Grass	E	X		
Lamiaceae	*Stachys arvensis*	Stagger Weed	E	X		
Malvaceae	*Modiola carolineana*	Red-flowered Mallow	E	X		
Meliaceae	*Melia azedarach*	White Cedar, Chinaberry Tree	N		X	
Moreaceae	*Ficus sp.*	a Fig Tree	N		X	
Myrtaceae	*Angophora sp.*	an Apple	N		X	
Myrtaceae	*Callistemon citrinus*	Crimson Bottlebrush	N		X	
Myrtaceae	*Eucalyptus crebra*	Narrow-leaved Ironbark	N		X	X
Myrtaceae	*Eucalyptus sideroxylon*	Mugga Ironbark	N		X	
Myrtaceae	*Eucalyptus sp.*	a gum tree	N		X	
Myrtaceae	*Leptospermum sp.*	a Tea Tree	N		X	

Family	Scientific Name	Common Name	Flora Type	Lawns	Lawns with planted shurbs and trees	Remnant natives
Myrtaceae	*Melaleuca lanceolata*	Black Tea Tree	N		X	
Myrtaceae	*Melaleuca stypheloides*	Prickly-leaved Tea Tree	N		X	
Oxalidaceae	*Oxalis pes-caprae*	-	E	X		
Phormicaceae	*Dianella sp.*	a Flax Lily	N	X		
Pinaceae	*Pinus sp.*	a Pine	E		X	
Plantaginaceae	*Veronica arvensis*	Wall Speedwell	E	X		
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	E	X		
Poaceae	*Bromus catharticus*	Prairie Grass	E	X	X	
Poaceae	*Cynodon dactylon*	Couch, Bermuda Grass	N	X	X	
Poaceae	*Ehrharta erecta*	Panic Veldtgrass	E	X	X	
Poaceae	*Hordeum sp.*	-	E	X		
Poaceae	*Lolium rigidum*	Annual Ryegrass	E	X	X	
Proteaceae	*Grevillea robusta*	Silky Oak	N		X	
Proteaceae	*Grevillea* 'Peaches and Cream'	a cultivar Grevillea	C		X	

Flora Type: N = Native; E = Exotic; PW = Primary Weed in the Greater Sydney Area (including Penrith LGA), WoNS = Weeds of National Significance

4.5 Fauna Species and Fauna Habitat

4.5.1 Fauna Species

A total of four bird species were observed or heard at the site and during surveys (see Table 9). The birds observed are native species commonly found in disturbed landscapes.

4.5.2 Fauna Habitat

The following habitat components were observed on the Site during surveys:

- Leaf and bark litter: limited amount of leaf and bark litter was present in some trees. The litter is managed as part of garden maintenance.
- Tree hollows: a total of three hollows were observed on a Narrow-leaved Ironbark located at the entrance of the property (see Figure 5). The hollows were occupied by a pair of Rainbow Lorikeet and a pair of Galah.
- Fruiting and flowering plants: native and exotic shrubs and trees, mostly planted, are present at the site. Some of the shrubs and trees were observed in flower at the time of the site inspection. This represent limited seasonal feeding resources for native fauna.
- Roosting habitat: Shrubs and trees are present at the site.

The presence of these components indicates that the Site supports limited foraging and roosting habitat for fauna. No listed species as per Table 9 were found, hence, it is unlikely that the Site would be utilised for habitat and resources.

The Site is highly disturbed. The Site is considered to lack structural complexity, being comprised of managed native and invasive lower stratum vegetation over exposed soils with little to no shrub stratum present.

Overall, it is considered that no habitat critical to the foraging, breeding, roosting or dispersal needs of any species are present within the Site. The proposed development would not threaten the local or regional presence of any native fauna.

Figure 5: Hollow-bearing Tree at the Site

4.5.2 Threatened Fauna Species

No threatened fauna species were observed at the site. Limited habitat, mainly foraging habitat, for native species, including some native birds and flying mammals are available at the site.

Table 9: Fauna Species List

Family	Scientific Name	Common Name	N, E	Observation Type	Notes
Psittaculidae	*Trichoglossus moluccanus*	Rainbow Lorikeet	N	O	A pair observed at and leaving a tree hollow
Cacatuidae	*Eolophus roseicapilla*	Galah	N	O	A pair observed at and leaving a tree hollow
Threskiomithidae	*Threskiornis molucca*	Australian White Ibis	N	O	Flying over the site
Meliphagidae	*Manorina melanocephala*	Noisy Miner	N	O	Flying among trees
Columbidae	*Ocyphaps sp.*	a Pigeon	N	H	Heard

4.7 Habitat Connectivity

The site itself is located in a highly disturbed and developed area, it is adjacent to residential dwellings to the east, cleared open space to the west, north and south. The site is also adjacent to Laycock Street. In terms of connectivity, the site has very little value, as the only vegetation present is planted vegetation along the eastern boundary and scattered trees on the southern portion of the site.

At a larger spatial scale, the site is located on a generally cleared landscape with connectivity values restricted to treed areas adjacent to water bodies (e.g. Penrith Lakes and Nepean River).

Based on the above, it is considered that the site has very little connectivity value. Removal or disturbance of planted vegetation on the Site would not further fragment or isolate patches of native vegetation, nor will it result in significant additional barriers for fauna movement.

4.8 Matters of National Environmental Significance

Based on the PMST report (Appendix C), the likelihood of occurrence and risk assessment (Appendix D) and the assessment of significance (Appendix F), it is concluded that the proposed development will not result in significant effects on threatened biodiversity listed as Matters of National Environmental Significance (MNES) under the EPBC Act.

4.9 Limitations of the Report

The methodological design employed for the purposes of this report was habitat based, in accordance with Section 5A of the *Environment Planning and Assessment Act* 1979.

In respect to the timing of the survey and the survey effort employed, a considerable continuum of fauna and flora species and assessments of the ecological processes that are likely to be imposed on the study Site, have been derived through desktop searches, and background and literature searches. Therefore, a full inventory of flora and fauna and the ecological processes likely to occur on the study Site and surroundings cannot be fully provided in this report.

It is also acknowledged that the presence and detection of threatened and migratory species can alter in respect to time, which includes seasonal weather and climatic cycles. These limitations have been mitigated by identifying any potential habitat for flora and fauna species and by assessing the likelihood of occurrence of these species, with respect to previous records, the habitat present, the land use on the study Site and the landscape context of the wider area.

The report has collected data from publicly available data sources and is bound by the limitations of the collection, processing and management of those databases used (Table 4).

Nevertheless, the techniques used in this investigation are considered adequate to gather the data necessary to assess the impacts of the proposal on the flora and fauna and habitats in the study area.

5 Impact Evaluation

No threatened species or ecological communities have been recorded within the site and the proposed Seniors Housing and Housing for People with a Disability will not result in any impacts to the identified biodiversity values of the site.

5.1 Vegetation Clearing

No native vegetation communities are present at the site. The site has previously been cleared and native and exotic flora species planted. Planted trees include native gum trees and native shrubs. Two potential remnant trees, Narrow-leaved Ironbark, were observed at the site.

Planted flora do not represent significant habitat features for any of the threatened species assessed however any clearing of native vegetation within this site would be considered to contribute to cumulative loss of potential habitat across the wider locality.

5.2 Fauna Habitat Removal

One hollow-bearing tree with three hollows was recorded at the site. The hollows were occupied by native bird species. Although removal of the hollows and hollow-bearing tree will not result in loss of habitat for threatened species, it will result in loss of habitat for native species. The loss of one tree with hollows is not considered to be significant for the long-term survival of native species. However, loss of hollow-bearing trees will contribute to the cumulative loss of suitable habitat for hollow dependent native species in the region.

5.3 Fragmentation and Loss of Connectivity

Vegetation removal, particularly in undisturbed landscapes results in fragmentation of habitat into smaller isolated patches. Where habitat loss occurs, connectivity of remnant patches of habitat also occurs and its extent depends on the distances among patches and the nature or composition of areas between patches.

The site is located in a highly cleared landscape and the site do not constitutes a remnant patch of native vegetation. Removal of non-native vegetation from the site will not result in increasing the level of fragmentation in the locality, nor will it further increase loss of connectivity.

5.4 Edge Effects

Edge effects are changes in habitat conditions (such as degree of humidity and exposure to light or wind) and occur at the ecotone between different types of vegetation (e.g. forest vs grassland). Edge effects are inherent or natural in nature but can have negative impacts if they alter ecological processes.

Edge effects are intensified at the interface between native vegetation and cleared or build up areas as habitat modification (e.g. isolation and fragmentation) and habitat loss (e.g. vegetation clearing) events occur rapidly and prevent organisms (flora and fauna) to assimilate changes.

Removal of vegetation induces edge effects as it causes new environmental conditions to develop along the edges of cleared environments. The removal of vegetation generally promotes invasion of exotic species and/or disturbance tolerant native plants. The clearing of vegetation may in turn promote the influx of pest species such as foxes and feral cats that use edges to stalk and ambush prey. Native animals such as raptorial birds (e.g. owls) and mammals (e.g. chiropteran bats) also use edge environments for hunting.

Non-native vegetation at the site has already been exposed to edge effects due to historical clearing and its location in a mostly cleared landscape. Therefore, potential additional edge effects associated with any future retirement residential development are expected to be minimal. The following edge effects should be considered during future development design:

- minor changes in microclimate;
- invasion by exotic plant and animals species; and
- increase in sedimentation.

Appropriate management and mitigation measures including weed control and erosion and sediment control are outlined in Chapter 6.

5.5 Impacts on Threatened Biodiversity – TSC Act

The site has very limited foraging values and removal of vegetation therein will not result in impacts on TSC Act listed threatened ecological communities, populations, species or their habitats.

5.6 Impacts on Threatened Biodiversity – EPBC Act

The site has very limited foraging values and removal of vegetation therein will not result in impacts on threatened ecological communities, populations, species or their habitats listed as Matters of National Environmental Significance under the EPBC Act. Referral to the Commonwealth is not required.

6 Mitigation Measures and Recommendations

6.1 Foraging habitat for native fauna

Where retention of native shrubs and trees is not possible, it is recommended that native species, nectar and fruiting producing, to be planted in open spaces of the proposed development. Planting of native species contributes to ameliorate the loss of foraging resources for native fauna species.

6.2 Roosting habitat for native fauna

Only one hollow-bearing tree occurs at the site. If removal of the sole hollow-bearing tree occurs as part of the development footprint requirements, it is recommended that short and long-term measures are undertaken to prevent net loss of fauna habitat. The recommendations are:

- Short-term mitigation measure: Replacement of tree hollows with nest boxes/artificial hollows at a rate of 1:1 (i.e. one nest box/artificial hollow per tree hollow removed. Three tree hollows are currently present at the site. Use of nest boxes and/or artificial tree hollows is a short term as these artificial habitats do not last for several decades nor they are always occupied by native fauna.
- Long-term mitigation measure: Replacement of trees at a rate of 2:1 (i.e. two trees will be planted to replace each hollow bearing tree removed). Hollow formation is dependent on a tree's history, its species and location. Generally, small hollows with narrow entrances suitable for small animals such as small arboreal mammals and small birds, take about 100 years to form. Hollows of a medium size and suitable for animals such as parrots will take around 200 years to form, and the larger and deeper hollows occupied by glossy black cockatoos (*Calyptorhynchus lathami*) and other larger animals such as masked owls (*Tyto novaehollandiae*) can take a lot longer (NPWS 1999). Therefore, replacement of trees that form hollows is important for the long-term availability of these habitat resources for native fauna.

6.3 Loss of Native Fauna during removal of hollow-bearing trees

Monitoring of the hollows prior to removal to avoid impacting any breeding females or juveniles. A suitable qualified fauna catcher or ecologist should be engaged to supervise tree pre-clearing and clearing to prevent injury and/or death of native fauna.

6.4 Recommendations

- Ensure that urban and stormwater runoff are implemented in accordance with Penrith City Council requirements and the Managing Urban Stormwater series of documents and the NSW State Rivers and Estuaries Policy.

- Notice of the development application is to be advertised where appropriate.
- Coordinated work practices aimed at minimising land disturbance.
- Ensure that earthworks are avoided during wet weather, or when the soil is saturated.
- Regular monitoring of erosion and stormwater control devices and identification, rehabilitation and revegetation of eroded or potential erosion areas.

7 Conclusion

The proposed development is not likely to have a significant impact on a Matters of National Environmental Significance listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999, nor is it likely to have a significant impact on threatened species, populations or endangered communities (and their habitats) listed under the NSW *Threatened Species Conservation Act 1995* . No Species Impact Statements are required and referral to the Minister is not necessary.

8 References

NSW National Parks and Wildlife Service (2002) *Native Vegetation of the Cumberland Plain* map

NSW Department of Planning, Industry and Environment (2019) *eSpade – NSW soil and land information,* http://www.environment.nsw.gov.au/eSpadeWebapp/

NSW Department of Planning, Industry and Environment (2019) *NSW BioNet – the webSite for the Atlas of NSW Wildlife,* http://www.bionet.nsw.gov.au/

NSW Department of Planning, Industry and Environment (2019) *Six Maps,* http://maps.six.nsw.gov.au/

NSW Department of Planning, Industry and Environment (2019) *Threatened species profiles* http://www.environment.nsw.gov.au/ threatenedSpeciesApp/

NSW Water Resources Council (1993) NSW State Rivers and Estuaries Policy

NPWS (1999) Natural Tree Hollows – Essential for Wildlife. NSW National Parks and Wildlife Service's Conservation Management Note 5 – 1999, Hurtsville.

Department of the Environment (2013) *Matters of National Environmental Significance: Significant Impact Guidelines*

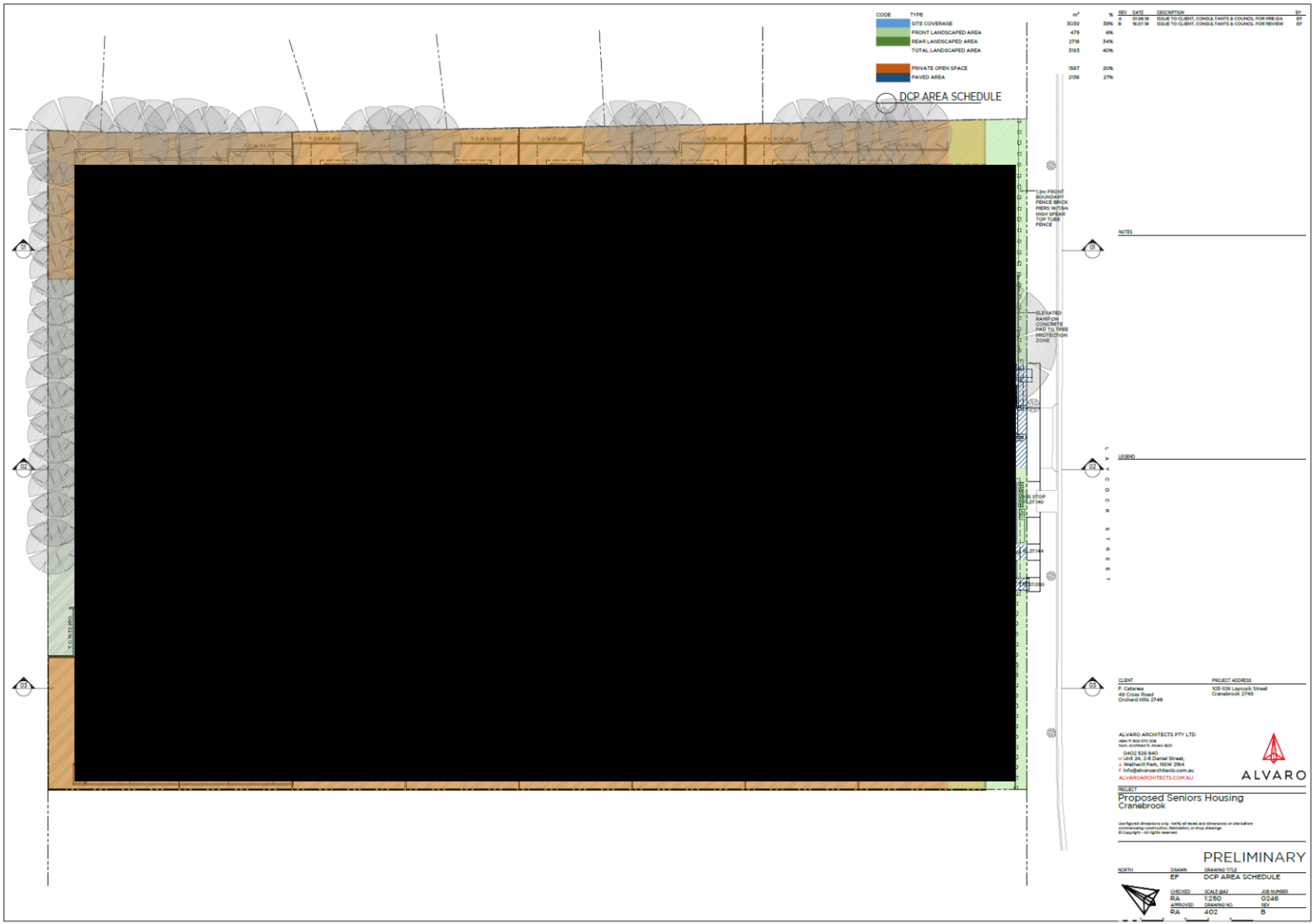
Department of Environment and Climate Change (2007) *Threatened Species and Regional Biodiversity Survey and Assessment Guidelines*

Department of the Environment and Energy (2019) *Protected Matters Search Tool,* www.environment.gov.au/epbc/protected-matters-search-tool

Department of the Environment and Energy (2019) *Species profile and threats database*, http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Appendix A – Detailed Site Plans

Site plans as provided by the client.



Appendix B – BioNet Atlas Records

Table 10: BioNet Atlas records within the 10km locality surrounding the Site

Family	Scientific Name	Common Name	TSC Act	EPBC Act	Records
Fauna					
Amphibia					
Myobatrachidae	*Heleioporus australiacus*	Giant Burrowing Frog	V	V	1
Reptilia					
Elapidae	*Hoplocephalus bungaroides*	Broad-headed Snake	E	V	1
Aves					
Acanthizidae	*Chthonicola sagittata*	Speckled Warbler	V		7
Accipitridae	*Circus assimilis*	Spotted Harrier	V		1
Accipitridae	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	V	Mi	1
Accipitridae	*Hieraaetus morphnoides*	Little Eagle	V		2
Accipitridae	*Lophoictinia isura*	Square-tailed Kite	V		3
Anatidae	*Stictonetta naevosa*	Freckled Duck	V		2
Ardeidae	*Ardea ibis*	Cattle Egret		Mi	9
Artamidae	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V		5
Cacatuidae	*Calyptorhynchus lathami*	Glossy Black-Cockatoo	V		3
Estrildidae	*Stagonopleura guttata*	Diamond Firetail	V		1
Meliphagidae	*Anthochaera phrygia*	Regent Honeyeater	X	CE	1
Meliphagidae	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V		1
Meropidae	*Merops ornatus*	Rainbow Bee-eater	P	Mi	1
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	V		13
Petroicidae	*Petroica boodang*	Scarlet Robin	V		4
Psittacidae	*Glossopsitta pusilla*	Little Lorikeet	V		6
Psittacidae	*Lathamus discolor*	Swift Parrot	E	CE	10

Family	Scientific Name	Common Name	TSC Act	EPBC Act	Records
Psittacidae	*Neophema pulchella*	Turquoise Parrot	V		1
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper		Mi	1
Scolopacidae	*Tringa glareola*	Wood Sandpiper		Mi	2
Strigidae	*Ninox strenua*	Powerful Owl	V		4
Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis		Mi	1
Tytonidae	*Tyto tenebricosa*	Sooty Owl	V		1
Mammalia					
Dasyuridae	*Dasyurus maculatus*	Spotted-tailed Quoll	V	E	1
Miniopteridae	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V		26
Molossidae	*Micronomus norfolkensis*	Eastern Coastal Free-tailed Bat	V		15
Petauridae	*Petaurus norfolcensis*	Squirrel Glider	V		2
Phascolarctidae	*Phascolarctos cinereus*	Koala	V	V	2
Pteropodidae	*Pteropus poliocephalus*	Grey-headed Flying-fox	V	V	234
Vespertilionidae	*Chalinolobus dwyeri*	Large-eared Pied Bat	V	V	6
Vespertilionidae	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V		6
Vespertilionidae	*Myotis macropus*	Southern Myotis	V		20
Vespertilionidae	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V		19
Gastropoda					
Camaenidae	*Meridolum corneovirens*	Cumberland Plain Land Snail	E		36
Flora					
Apocynaceae	*Marsdenia viridiflora subsp. viridiflora*	Marsdenia viridiflora R. Br. subsp. viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas	CE		188
Casuarinaceae	*Allocasuarina glareicola*		E	E	5
Fabaceae (Faboideae)	*Dillwynia tenuifolia*		V		225
Fabaceae (Faboideae)	*Pultenaea parviflora*		E	V	433
Fabaceae (Mimosoideae)	*Acacia bynoeana*	Bynoe's Wattle	E	V	27

Family	Scientific Name	Common Name	TSC Act	EPBC Act	Records
Myrtaceae	*Micromyrtus minutiflora*		E	V	107
Myrtaceae	*Syzygium paniculatum*	Magenta Lilly Pilly	E	V	1
Proteaceae	Grevillea juniperina subsp. juniperina	Juniper-leaved Grevillea	V		195
Proteaceae	Persoonia nutans	Nodding Geebung	E	E	199
Thymelaeaceae	Pimelea spicata	Spiked Rice-flower	E	E	4

CE = Critically Endangered; E = Endangered; Mi = Migratory; Ma = Marine; X = presumed extinct; V = Vulnerable

Appendix C – Protected Matters Search Tool Report

Australian Government
Department of the Environment and Energy

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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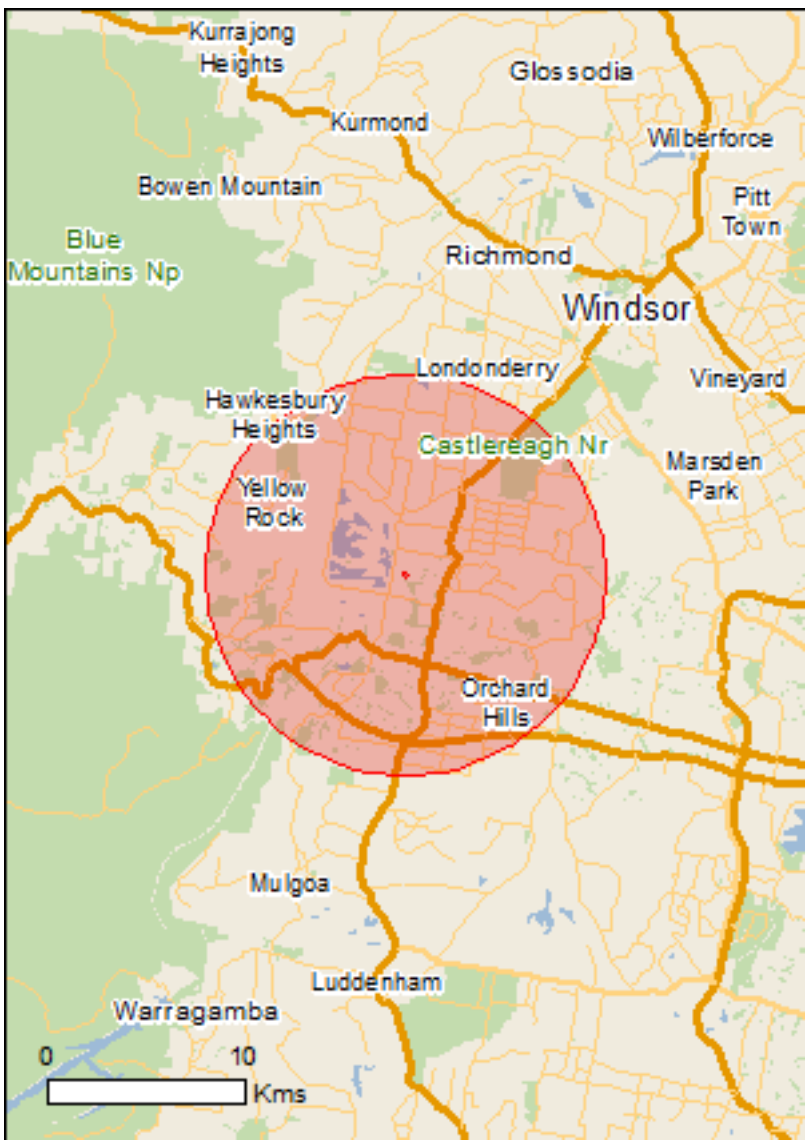

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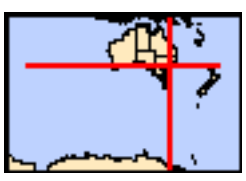

Summary

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:	1
National Heritage Places:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	9
Listed Threatened Species:	50
Listed Migratory Species:	16

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. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

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:	17
Commonwealth Heritage Places:	2
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	7
Regional Forest Agreements:	None
Invasive Species:	50
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

World Heritage Properties		[Resource Information]
Name	State	Status
The Greater Blue Mountains Area	NSW	Declared property

National Heritage Properties		[Resource Information]
Name	State	Status
Natural		
The Greater Blue Mountains Area	NSW	Listed place

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
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	Endangered	Community likely to occur within area
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically Endangered	Community likely to occur within area
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Temperate Highland Peat Swamps on Sandstone	Endangered	Community known to occur within area
Turpentine-Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	Endangered	Community may occur within area
Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	Community likely to occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
[Rostratula australis](#) Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Fish		
[Macquaria australasica](#) Macquarie Perch [66632]	Endangered	Species or species habitat known to occur within area
[Prototroctes maraena](#) Australian Grayling [26179]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
[Heleioporus australiacus](#) Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat known to occur within area
[Litoria aurea](#) Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
[Litoria littlejohni](#) Littlejohn's Tree Frog, Heath Frog [64733]	Vulnerable	Species or species habitat may occur within area
[Mixophyes balbus](#) Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area
Insects		
[Synemon plana](#) Golden Sun Moth [25234]	Critically Endangered	Species or species habitat known to occur within area
Mammals		
[Chalinolobus dwyeri](#) Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to 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 known to occur within area
[Petauroides volans](#) Greater Glider [254]	Vulnerable	Species or species habitat known to 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
[Pseudomys novaehollandiae](#) New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
[Pteropus poliocephalus](#) Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Other		
[Pommerhelix duralensis](#) Dural Land Snail [85268]	Endangered	Species or species habitat known to occur within area
Plants		
[Acacia bynoeana](#) Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat known to occur within area
[Acacia pubescens](#) Downy Wattle, Hairy Stemmed Wattle [18800]	Vulnerable	Species or species habitat likely to occur within area
[Allocasuarina glareicola](#) [21932]	Endangered	Migration route known to occur within area
[Cryptostylis hunteriana](#) Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
[Cynanchum elegans](#) White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
[Eucalyptus aggregata](#) Black Gum [20890]	Vulnerable	Species or species habitat may occur within area
[Genoplesium baueri](#) Yellow Gnat-orchid [7528]	Endangered	Species or species habitat may occur within area
[Haloragis exalata subsp. exalata](#) Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat may occur within area
[Haloragodendron lucasii](#) Hal [6480]	Endangered	Species or species habitat likely to occur within area
[Melaleuca deanei](#) Deane's Melaleuca [5818]	Vulnerable	Species or species habitat likely to occur within area
[Micromyrtus minutiflora](#) [11485]	Vulnerable	Species or species habitat likely to occur within area
[Persicaria elatior](#) Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area
[Persoonia hirsuta](#) Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat known to occur within area
[Persoonia nutans](#) Nodding Geebung [18119]	Endangered	Species or species habitat known to occur within area
[Pimelea curviflora var. curviflora](#) [4182]	Vulnerable	Species or species habitat may occur within area
[Pimelea spicata](#) Spiked Rice-flower [20834]	Endangered	Species or species habitat known to occur within area

Name	Status	Type of Presence
Pomaderris brunnea Rufous Pomaderris [16845]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat may occur within area
Pterostylis saxicola Sydney Plains Greenhood [64537]	Endangered	Species or species habitat likely to occur within area
Pultenaea glabra Smooth Bush-pea, Swamp Bush-pea [11887]	Vulnerable	Species or species habitat likely to occur within area
Pultenaea parviflora [19380]	Vulnerable	Species or species habitat known to occur within area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat may occur within area
Thelymitra kangaloonica Kangaloon Sun Orchid [81861]	Critically Endangered	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Hoplocephalus bungaroides Broad-headed Snake [1182]	Vulnerable	Species or species habitat may 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
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
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		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat likely to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		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
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat known to occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		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 - Airservices Australia
Commonwealth Land - Australian Postal Commission
Commonwealth Land - Australian Postal Corporation
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Defence Housing Authority
Commonwealth Land - Defence Service Homes Corporation
Commonwealth Land - Director of War Service Homes
Commonwealth Land - Telstra Corporation Limited
Defence - 1CAD ORCHARD HILLS KINGSWOOD
Defence - AIR HEADQUARTERS AUSTRALIA - GLENBROOK
Defence - AIRTC ST MARYS
Defence - LONDONDERRY PARACHUTE DROP ZONE
Defence - LONDONDERRY RTS (Communication Station)
Defence - PENRITH DEPOT (Army Stores)
Defence - RANMME (DEOH)
Defence - SIGNAL STRS DEPOT-KINGSWOOD

Commonwealth Heritage Places [Resource Information]

Name	State	Status

Name	State	Status
Natural		
Orchard Hills Cumberland Plain Woodland	NSW	Listed place
Shale Woodland Llandilo	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		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		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]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	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
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		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]	Endangered*	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Agnes Banks	NSW
Blue Mountains	NSW
Castlereagh	NSW
Mulgoa	NSW
Wianamatta	NSW
Wianamatta	NSW
Yellomundee	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
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Carduelis chloris European Greenfinch [404]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		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
Asparagus plumosus Climbing Asparagus-fern [48993]		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
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to 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
Opuntia spp. Prickly Pears [82753]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
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
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		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
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

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 and National Heritage properties, Wetlands of International and National 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.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

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.

Coordinates

-33.722397 150.701252,-33.722112 150.702583,-33.723575 150.703484,-33.724146 150.702368,-33.724146 150.702368,-33.722397 150.701252

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-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian 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, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-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 D – Likelihood of Occurrence and Risk Assessment Table

Table 11: Likelihood of Occurrence and Risk Assessment

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Threatened Ecological Communities (TEC)								
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion Source: PMST	The Castlereagh Scribbly Gum and Agnes Banks Woodlands ecological community is typically a low woodland, with canopy species reaching an average 15 m in height, but with some trees growing to around 20 m. The ecological community's understorey has a prominent and diverse mid-layer of sclerophyll shrubs. It typically has a patchy ground cover of sedges and grasses. However, in areas of poorly drained soil there may be less species diversity in the mid layer and the ground layer may contain a high diversity of sedges and grasses. The isolation of the alluvial deposits in the Hawkesbury-Nepean river valley and differences in the soil characteristics have led to the development of differences in species composition and abundance across the range of the ecological community. For example, this is expressed in differing abundance of Melaleuca and Banksia species in the mid stratum. In addition, the Agnes Banks vegetation occurs on aeolian sand and can contain a number of species reminiscent of communities closer to the coast, such as *Dillwynia glaberrima*, *Ricinocarpos pinifolius* (wedding bush) and *Banksia aemula* (wallum).	-	EEC	Unlikely	Negligible	Low	No	The TEC is not present within the Site.
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community Source: PMST	Coastal Swamp Oak Forest is often found in association with other vegetation types such as coastal saltmarsh, mangroves, freshwater wetlands, littoral rainforests or swamp sclerophyll forests in a 'mosaic' of coastal floodplain communities. The structure of Coastal Swamp Oak Forest can vary from forest to woodland depending on its location in the landscape and disturbance history. The local expression of the ecological community is influenced by soils, history of inundation by tidal flows/estuarine system dynamics, groundwater salinity, Site history, disturbance regimes and current land management. Many remaining patches of the ecological community contain regrowth from past clearance or other disturbances, and/or due to naturally occurring river and coastal dynamics. Some patches, for example where drainage is more impeded, may be expressed primarily as sedgeland or rushland, with a very sparse canopy (down to 10 per cent crown cover) of predominantly swamp oak. Other patches may just occur as canopy trees, over dense needle litter with sparse native groundcover. Where groundwater is more saline, for example on estuarine and/or coastal lake fringes, the ecological community is typically expressed as a low woodland or forest. In these areas, the composition of the understory is more likely to include saline tolerant (typically saltmarsh) species. In more freshwater areas, the ecological community is more likely to demonstrate greater structural diversity – often being expressed as a taller open or rarely closed forest with a diverse understory, typically including a greater abundance of grasses and herbs.	-	EEC	Unlikely	Negligible	Low	No	The TEC is not present within the Site.
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion Source: PMST	Ranges from open forest to low woodland, with a canopy dominated by Broad-leaved Ironbark (*Eucalyptus fibrosa*) and Paperbark (*Melaleuca decora*). The canopy may also include other eucalypts such as Woolybutt (*E. longifolia*). The dense shrubby understorey consists of Prickly-leaved Paperbark (*Melaleuca nodosa*) and Peach Heath (*Lissanthe strigosa*), with a range of 'pea' flower shrubs, such as *Dillwynia tenuifolia*, Hairy Bush-pea (*Pultenaea villosa*) and Gorse Bitter Pea (*Daviesia ulicifolia*) (can be locally abundant). The sparse ground layer contains a range of grasses and herbs. Contains many more species and other references should be consulted to identify these. Has a very restricted natural distribution and mainly occurs on clay soils derived from the deposits of ancient river systems (alluvium), or on shale soils of the Wianamatta Shales. Can intergrade into Shale-Gravel Transition Forest (where the alluvium is shallow), Castlereagh Swamp Woodland (in moist depressions) and Castlereagh Scribbly Gum Woodland (on sandier soils). Most species in the community are able to regenerate from lignotubers and buds beneath the bark as well as seeds stored in the soil.	EEC	CEEC	Unlikely	Negligible	Low	No	The TEC is not present within the Site.
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest Source: PMST	The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest lies in a coastal valley rain shadow that occupies the driest part of the Cumberland Plain. It typically occurs on flat to undulating or hilly terrain, at elevations up to about 350 m above sea level, and on clay soils (derived from Wianamatta Group shales), with some occurrences on other soils. Annual rainfall in the region typically lies within the range of 700–900 mm. This ecological community has several vegetation layers in its natural state. The tree canopy is typically dominated by *Eucalyptus moluccana* (grey	CEEC	CEEC	Unlikely	Negligible	Low	No	The TEC is not present within the Site.

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
	box), *E. tereticornis* (forest red gum), and/or *E. fibrosa* (red ironbark). Other canopy species may occur in association with the typical dominants and may be locally dominant at some Sites, depending on local variation in the landscape. Smaller trees and shrubs grow underneath the tree canopy. The vegetation on the ground is a mix of grasses and herbs.							
Shale Sandstone Transition Forest of the Sydney Basin Bioregion Source: PMST	Occurs at the edges of the Cumberland Plain, where clay soils from the shale rock intergrade with earthy and sandy soils from sandstone, or where shale caps overlay sandstone. The boundaries are indistinct, and the species composition varies depending on the soil influences. The main tree species include Forest Red Gum (*Eucalyptus tereticornis*), Grey Gum (*E. punctata*), stringybarks (*E. globoidea, E. eugenioides*) and ironbarks (*E. fibrosa* and *E. crebra*). Areas of low sandstone influence (more clay-loam soil texture) have an understorey that is closer to Cumberland Plain Woodland. Shale Sandstone Transition Forest in the Sydney Basin Bioregion contains many more species than described for the canopy (above) and other references should be consulted to identify these.	CEEC	CEEC	Unlikely	Negligible	Low	No	The TEC is not present within the Site.
Temperate Highland Peat Swamps on Sandstone Source: PMST	The structure of the vegetation varies from open shrubland to closed heath or open heath (dominated by shrub species but with a sedge and graminoid understorey and occasionally with scattered low trees) to sedgeland and closed sedgeland. Topographic location, hydrology and soils significantly influence the dominant species composition.	-	EEC	Unlikely	Negligible	Low	No	The TEC is not present within the Site.
Turpentine-Ironbark Forest of the Sydney Basin Bioregion Source: PMST	Open forest, with dominant canopy trees including Turpentine *Syncarpia glomulifera*, Grey Gum *Eucalyptus punctata*, Grey Ironbark *E. paniculata* and Thin-leaved Stringybark *E. eugenoides*. In areas of high rainfall (over 1050 mm per annum) Sydney Blue Gum *E. saligna* is more dominant. The shrub stratum is usually sparse and may contain mesic species such as Sweet Pittosporum *Pittosporum undulatum* and Elderberry Panax *Polyscias sambucifolia*. Contains many more species and other references should be consulted to identify these. Occurs close to the shale/sandstone boundary on the more fertile shale influenced soils, in higher rainfall areas on the higher altitude margins of the Cumberland Plain, and on the shale ridge caps of sandstone plateaus. A transitional community, between Cumberland Plain Woodland in drier areas and Blue Gum High Forest on adjacent higher rainfall ridges.	CEEC	CEEC	Unlikely	Negligible	Low	No	The TEC is not present within the Site.
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion Source: PMST	Generally tall open eucalypt forests found on igneous rock in, or adjacent to, the Sydney Basin Bioregion. Occurs in areas of high rainfall, generally ranging from 950 to 1600 mm/year and typically occurs at elevations between 650 and 1050 m above sea level. In the Blue Mountains, the ecological community occurs as small, disjunct patches scattered across the upper mountains on caps of post-Triassic basalt, or on basalt-like volcanics. The ecological community typically occurs as an open to tall open forest with a sparse to dense layer of shrubs and vines, and a diverse understorey of native grasses, forbs, twiners and ferns. However, the structure of the ecological community may vary from tall open forest with trees up to and above 30 m tall with a projected foliage cover of 30–70% to woodland with trees 10–30 m tall, with a projected foliage cover of 10–30% depending on aspect, slope, soil conditions, soil depth, and previous clearing and disturbance. Rainforest elements are also present in less coastal remnants with sheltered aspects and topography, and along watercourses.	-	EEC	Unlikely	Negligible	Low	No	The TEC is not present within the Site.

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Western Sydney Dry Rainforest and Moist Woodland on Shale Source: PMST	A dry vine scrub community of the Cumberland Plain, western Sydney. Canopy trees include Prickly Paperbark (*Melaleuca styphelioides*), Hickory Wattle (*Acacia implexa*) and Native Quince (*Alectryon subcinereus*). There are many rainforest species in the shrub layer, such as Mock Olive (*Notolaea longifolia*), Hairy Clerodendrum (*Clerodendrum tomentosum*) and Yellow Pittosporum (*Pittosporum revolutum*). The shrub layer combines with vines, such as Gum Vine (*Aphanopetalum resinosum*), Wonga Vine (*Pandorea pandorana*) and Slender Grape (*Cayratia clematidea*) to form dense thickets in sheltered locations. Restricted to hilly country where it occurs on the sheltered lower slopes and in gullies. Generally found at higher elevation, in areas receiving higher rainfall than much of the Cumberland Plain Woodland. Occurs on clay soils derived from Wianamatta shale. Rainforest plants within this vegetation are fire sensitive and dependent on the sheltered aspect and density of vegetation for protection. Vine thickets in Western Sydney Dry Rainforest provide good habitat for birds and mammals. Several species of plants (including *Spartothamnella juncea* and rare and threatened such as *Marsdenia viridiflora*) have their southern distribution limit within areas of Western Sydney Dry Rainforest.	EEC	CEEC	Unlikely	Negligible	Low	No	The TEC is not present within the Site.
Amphibians								
Heleioporus australiacus Giant Burrowing Frog Source: PMST/BioNet	Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. Spends more than 95% of its time in non-breeding habitat in areas up to 300 m from breeding Sites. Burrows below the soil surface or in the leaf litter. Breeds in soaks or pools within first or second order streams.	V	V	Potential	Negligible	Low	No	Aquatic habitat is not present within the Site. There is 1 record of the species occurring within a 10 km radius of the Site – 5.1 km north west of the Site (22/03/15).
Litoria aurea Green and Golden Bell Frog Source: PMST	Inhabits marshes, dams and stream-sides, particularly those containing *Typha* spp. or *Eleocharis* spp. Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as *Gambusia holbrooki,* have a grassy area nearby and diurnal sheltering Sites available. Some Sites, particularly in the Greater Sydney region occur in highly disturbed areas.	E	V	Potential	Negligible	Low	No	Aquatic habitat is not present within the Site. No known records of the species exist within the 10km locality.
Litoria littlejohni Littlejohn's Tree Frog Source: PMST	Found in perched swamps, upper reaches of permanent streams, dams, ditches, isolated pools, flooded hollows, creeks, streams and lagoons. Breeds in the upper reaches of permanent streams and in perched swamps. Non-breeding habitat is heath-based forests and woodlands where it shelters under leaf litter and low vegetation.	V	V	Unlikely	Negligible	Low	No	Aquatic habitat is not present within the Site. No known records of the species exist within the 10km locality.
Mixophyes balbus Stuttering Frog Source: PMST	Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Outside the breeding season adults live in deep leaf litter and thick understorey vegetation on the forest floor. Breeding occurs in streams during summer after heavy rain. Eggs are laid on rock shelves or shallow riffles in small, flowing streams.	E	V	Unlikely	Negligible	Low	No	Aquatic habitat is not present within the Site. No known records of the species exist within the 10km locality.
Aves								
Anthochaera phrygia Regent Honeyeater Source: PMST, BioNet	Inhabits dry open forests and woodlands that have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. Generalist forager, though it feeds mainly on the nectar from a small number of Eucalypts that produce high volumes. Usually makes open, cup shaped nests in horizontal branches or forks in mature Eucalypts, sheoaks and mistletoe *haustoria*.	E	CE	Potential	Negligible	Medium	Yes	Limited suitable habitat for the species occurs within the Site. There is 1 record of the species occurring within a 10 km radius – 5.2 km NW of the Site (01/10/2001).

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Artamus cyanopterus cyanopterus Dusky Woodswallow Source: BioNet	Found in woodlands and dry open sclerophyll forests, usually dominated by Eucalypts including mallee associations. Also recorded in shrublands and heathlands and various modified habitats including regenerating forests; very occasionally in moist forests or rainforests. Prefers understorey typically open with sparse Eucalypt saplings, *Acacia* and other shrubs, including heath. Ground cover may consist of grasses, sedges or open ground, often with coarse woody debris. Often observed in farmland, usually at the edges of forest or woodland or in roadside remnants or wind breaks with dead timber.	V	-	Potential	Minor	Medium	Yes	Limited suitable foraging habitat for the species occurs within the Site. The Site is not suitable as a roosting habitat. There are 5 records of the species occurring within a 10 km radius – the closest being 0.4 km NW of the Site (28/03/2014).
Botaurus poiciloptilus Australasian Bittern Source: PMST	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes and spikerushes. Hides during the day and feeds, mainly at night. Feeding platforms may be constructed over deeper water from reeds and are often littered with prey remains. Breeding occurs in summer from October to January and the nest is a platform of reeds.	E	E	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Calyptorhynchus lathami Glossy Black-Cockatoo Source: BioNet	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. *Allocasuarina littoralis* and *A. torulosa* are important foods. Inland populations feed on a wide range of sheoaks, including *Allocasuaraina diminuta* and *A. gymnathera*. *belah* is also utilised and may be a critical food source for some populations. Dependent on large hollow-bearing eucalypts for nest Sites.	V	-	Potential	Minor	Medium	Yes	Limited suitable habitat for the species occurs within the Site. There are 3 records of the species occurring within a 10 km radius – the closest being 3.6 km NE of the Site (10/09/02).
Chthonicola sagittata Speckled Warbler Source: BioNet	Lives in a wide range of *Eucalyptus* dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Large, relatively undisturbed remnants are required for the species to persist in an area. Pairs are sedentary and occupy a territory of about 10 ha, slightly larger when not breeding. The rounded, domed, roughly built nest is located in a slight hollow in the ground or the base of a low dense plant, between August and January.	V	-	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 7 records of the species occurring within a 10 km radius – the closest being 2.9 km NE of the Site (01/04/15).
Circus assimilis Spotted Harrier Source: BioNet	Occurs in grassy open woodland including *Acacia* and mallee remnants, inland riparian woodland, grassland and shrub steppe. Found most commonly in native grassland but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Builds a stick nest in a tree and lays eggs in spring.	V	-	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There is 1 record of the species occurring within a 10 km radius – being 4.5 km NW of the Site (25/03/03).
Daphoenositta chrysoptera Varied Sittella Source: BioNet	Inhabits Eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods. Builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.	V	-	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 13 records of the species occurring within a 10 km radius – the closest being 2.8 km NE of the Site (16/05/96).
Dasyornis brachypterus Eastern Bristlebird Source: PMST	Habitat for central and southern populations is characterised by dense, low vegetation including heath and open woodland with a heathy understorey. Shy and cryptic and rarely flies, although can be seen scampering over the ground; when approached, may move to a lookout perch 1 m or more above the ground, then retreat into dense vegetation. Nests are elliptical domes constructed on or near the ground amongst dense vegetation.	E	E	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Glossopsitta pusilla Little Lorikeet Source: BioNet	Forages primarily in the canopy of open Eucalyptus forest and woodland but also finds food in *Angophora*, *Melaleuca* and other tree species, riparian habitats particularly are used. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain populations. Feeds mostly on nectar and pollen, also on native fruits and only rarely in orchards. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts.	V	-	Potential	Minor	Medium	Yes	Limited suitable habitat for the species occurs within the Site. There are 6 records of the species occurring within a 10 km radius – the closest being 2.3 km NE of the Site (27/06/18).
Grantiella picta Painted Honeyeater Source: PMST	Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping Eucalypts, she-oak, paperbark or mistletoe branches.	V	V	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Haliaeetus leucogaster White-bellied Sea-Eagle Source: BioNet	Occurs at Sites near the sea or sea-shore and in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Habitats are characterised by large areas of open water including larger rivers, swamps, lakes, and the sea. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeds in mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nests in large emergent Eucalypts, often having emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass.	V	-	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There is 1 record of the species occurring within a 10 km radius – being 3.7 km NE of the Site (21/12/11).
Hieraaetus morphnoides Little Eagle Source: BioNet	Occupies open eucalypt forest, woodland or open woodland, Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	V	-	Potential	Negligible	Low	No	Limited suitable habitat for the species occurs within the Site. There are 2 records of the species occurring within a 10 km radius – the closest being 0.35 km NW of the Site (28/03/14).
Lathamus discolor Swift Parrot Source: PMST, BioNet	Migrates to the Australian south-east mainland between March and October, where they occur in areas where Eucalypts are flowering profusely or where there are abundant lerp infestations. They return to Tasmania where they breed from September to January, nesting in old trees with hollows and feeding in forests dominated by *Eucalyptus globulus*.	E	CE	Potential	Negligible	Low / Medium	Yes (EPBC Act)	Limited and substandard foraging habitat for the species occurs within the Site. There are 10 records of the species occurring within a 10 km radius – the closest being 3.4 km SW of the Site (30/04/12).
Lophoictinia isura Square-tailed Kite Source: BioNet	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland. Breeding is from July to February, with nest Sites generally located along or near watercourses, in a fork or on large horizontal limbs.	V	-	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 3 records of the species occurring within a 10 km radius – the closest being 1.6 km SE of the Site (19/02/17).
Melithreptus gularis gularis Black-chinned	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially *Eucalyptus sideroxylon, E. albens, E. microcarpa, E. melliodora, E. blakelyi* and *E. tereticornis*. Also inhabits open forests	V	-	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site.

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Honeyeater (eastern subspecies) Source: BioNet	of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees. The compact, suspended, cup-shaped nest is placed high in the crown of a tree, in the uppermost lateral branches, hidden by foliage.							There is 1 record of the species occurring within a 10 km radius – being 5 km NE of the Site (22/04/95).
Neophema pulchella Turquoise Parrot Source: BioNet	Occurs at the edge of eucalypt woodland, which adjoins clearings, creeks and timbered ridges in farmland. Nesting occurs in tree hollows, logs or posts.	V	-	Potential	Negligible	Low	No	Limited suitable habitat for the species occurs within the Site. There is 1 record of the species occurring within a 10 km radius – being 6.7 km NE of the Site (20/03/15).
Ninox strenua Powerful Owl Source: BioNet	Inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. Breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. Roosts by day in dense vegetation comprising species such as *Syncarpia glomulifera, Allocasuarina littoralis, Acacia melanoxylon, Angophora floribunda, Exocarpus cupressiformis* and a number of Eucalypt species. Nests in large tree hollows (at least 0.5 m deep), in large Eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old.	V	-	Potential	Negligible	Low	No	The Site is highly disturbed land with some native trees planted that do not represent suitable foraging grounds for the species. No suitable breeding habitat occurs within the Site. There are 4 records of the species occurring within a 10 km radius – the closest being 1 km E of the Site (12/01/11).
Petroica boodang Scarlet Robin Source: BioNet	Found in forests and woodlands. Habitat usually contains abundant logs and fallen timber. In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees. Nest is an open cup made of plant fibres and cobwebs and is built in the fork of tree usually more than 2 metres above the ground; nests are often found in a dead branch in a live tree, or in a dead tree or shrub.	V	-	Potential	Negligible	Low	No	Limited suitable habitat for the species occurs within the Site. There are 4 records of the species occurring within a 10 km radius – the closest being 3 km SW of the Site (25/03/15).
Rostratula australis Australian Painted-snipe Source: PMST	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. The nest consists of a scrape in the ground, lined with grasses and leaves. Forages nocturnally on mud-flats and in shallow water. Feeds on worms, molluscs, insects and some plant-matter.	E	E	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Stagonopleura guttata Diamond Firetail Source: BioNet	Found in grassy Eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas and sometimes in lightly wooded farmland. Usually encountered in flocks of between 5 to 40 birds, occasionally more. Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. Birds roost in dense shrubs or in smaller nests built especially for roosting.	V	-	Potential	Negligible	Low	No	The Site do not have suitable habitat for the species. There is 1 record of the species occurring within a 10 km radius – being 0.3 km NW of the Site (28/03/14).

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Stictonetta naevosa Freckled Duck Source: BioNet	Prefers permanent freshwater swamps and creeks with heavy growth of *Cumbungi*, *Lignum* or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds. Generally rests in dense cover during the day, usually in deep water. Feeds at dawn and dusk and at night on algae, seeds and vegetative parts of aquatic grasses and sedges and small invertebrates. Nests are usually located in dense vegetation at or near water level.	V	-	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 2 records of the species occurring within a 10 km radius – the closest being 2.4 km SW of the Site (22/01/83).
Tyto tenebricosa Sooty Owl Source: BioNet	Occurs in a variety of rainforest, including dry, subtropical and warm temperate variants, and moist eucalypt forest. Roosts during the day in tall forest tree hollows or in heavy vegetation. Large tree hollows are used for nesting.	V	-	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There is 1 record of the species occurring within a 10 km radius – being 4 km E of the Site (14/08/07).
Migratory Marine Birds								
Apus pacificus Fork-tailed Swift Source: PMST	Almost exclusively aerial, flying from less than 1 m to at least 300 m above ground. Occurs over inland plains but sometimes above foothills or in coastal areas. Forages aerially, up to hundreds of metres above ground, but also less than 1 m above open areas or over water.	-	Mi, Ma	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Tringa glareola Wood Sandpiper Source: BioNet	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They also frequent inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding, and irrigated crops. The Wood Sandpiper forages on moist or dry mud at the edges of wetlands, either along shores, among open scattered aquatic vegetation, or in clear shallow water. The species has been recorded roosting on low, grassy hillocks in a flooded meadow. It has also been recorded perched low in trees and on fences. The Wood Sandpiper does not breed in Australia.	-	Mi, Ma	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 2 records of the species occurring within a 10 km radius – being 2.3 km SW of the Site (25/02/88).
Ardea ibis Cattle Egret Source: BioNet	The Cattle Egret is widespread across most of Australia. The species inhabits tropical and temperate grasslands, wooded lands and terrestrial wetlands. It often forages away from water on low lying grasslands, improved pastures and croplands. It is often found in cattle fields, farm areas with livestock and foraging in rubbish bins. It roosts in trees, or amongst ground vegetation in or near lakes and swamps. A breeding population is located from Newcastle (NSW) to Bundaberg (Qld). It also breeds in major inland wetlands in northern NSW.	-	Mi, Ma	Potential	Negligible	Low	No	Limited suitable habitat for the species occurs within the Site. There are 9 records of the species occurring within a 10 km radius – the closest being 2.3 km NW of the Site (31/05/04).
Plegadis falcinellus Glossy Ibis Source: BioNet	The Glossy Ibis is a migratory marine bird. Within Australia, the Glossy Ibis is generally located east of the Kimberley in Western Australia and Eyre Peninsula in South Australia. The species is also known to be patchily distributed in the rest of Western Australia. The species is rare or a vagrant in Tasmania. The Glossy Ibis' preferred habitat for foraging and breeding are freshwater marshes at the edges of lakes and rivers, lagoons, floodplains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons.	-	Mi, Ma	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There is 1 record of the species occurring within a 10 km radius – being 2.4 km SW of the Site (14/02/81).

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Merops ornatus Rainbow Bee-eater Source: BioNet	The Rainbow Bee-eater is distributed across much of mainland Australia and occurs on several near-shore islands. The Rainbow Bee-eater mainly feeds on insects and will occasionally take other animal items including earthworms. The nest of the species is located in an enlarged chamber at the end of long burrow or tunnel that is excavated in flat or sloping ground, in the banks of rivers, creeks or dams. The nests are typically concentrated together in loose colonies.	-	Mi, Ma	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There is 1 record of the species occurring within a 10 km radius – being 2.4 km SW of the Site (14/02/81).
Motacilla flava Yellow Wagtail Source: PMST	The species occupies a broad range of habitats during its breeding in temperate Asia and foothold in North America (Alaska). Populations migrate to south Asia and Australia. The species feeds aerially, foraging for insects and other small invertebrates. They have been observed to occupy disturbed areas including airfields.	-	Mi, Ma	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Migratory Terrestrial Birds								
Cuculus optatus Oriental Cuckoo Source: PMST	Winters in coastal parts of northern and eastern Australia. Found in forest canopy, open wooded areas and orchards.	-	Mi	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Hirundapus caudacutus White-throated Needletail Source: PMST	Almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. Recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows.	-	V, Mi	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Monarcha melanopsis Black-faced Monarch Source: PMST	Mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex *notophyll* vine-forest, tropical rainforest, subtropical rainforest, mesophyll thicket/shrubland, warm temperate rainforest, dry rainforest and occasionally in cool temperate rainforest. Also sometimes found in nearby open eucalypt forests (mainly wet sclerophyll forests), especially in gullies with a dense, shrubby understorey as well as in dry sclerophyll forests and woodlands, often with a patchy understorey.	-	Mi	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Monarcha trivirgatus Spectacled Monarch Source: PMST	Prefers thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves.	-	Mi	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Myiagra cyanoleuca Satin Flycatcher Source: PMST	Inhabits heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests. Mainly recorded in eucalypt forests, especially wet sclerophyll forest, often dominated by eucalypts such as *Eucalypt fastigata, E. dalrympleana or occasionally Mountain Ash, E. regnans*. Sometimes also occurs in dry sclerophyll forests and woodlands, usually dominated by eucalypts such as *E. blakelyi, E. sideroxylon, E. albens, E. macrorhyncha* and Broad-leaved Stringybark, usually with open understorey.	-	Mi	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Rhipidura rufifrons Rufous Fantail Source: PMST	Mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as *Eucalyptus microcorys, E. cypellocarpa, E. delegatensis, E. pilularis or E. resinifera*; usually with a dense shrubby understorey often including ferns. When on passage, they are sometimes recorded in drier sclerophyll forests and woodlands, including *Eucalyptus maculata, E. melliodora*, ironbarks or stringybarks, often with a shrubby or heath understorey.	-	Mi	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Migratory Wetland Birds								
Actitis hypoleucos Common Sandpiper Source: PMST/BioNet	Utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. Forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. Roost Sites are typically on rocks or in roots or branches of vegetation, especially mangroves. Known to perch on posts, jetties, moored boats and other artificial structures, and to sometimes rest on mud or 'loaf' on rocks.	-	Mi	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There is 1 record of the species occurring within a 10 km radius – located 2.7 km SW of the Site.
Calidris acuminata Sharp-tailed Sandpiper Source: PMST	Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. Forages at the edge of the water of wetlands or intertidal mudflats, either on bare wet mud or sand, or in shallow water, also among inundated vegetation of saltmarsh, grass or sedges. After rain, they may forage in paddocks of short grass, well away from water. Roosts at the edges of wetlands, on wet open mud or sand, in shallow water, or in short sparse vegetation, such as grass or saltmarsh.	-	Mi	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Calidris ferruginea Curlew Sandpiper Source: PMST	Generally found in intertidal mudflats or sheltered coasts. Can also occur in non-tidal lakes, lagoons and swamps, sometimes at inland locations. Forages in shallow water, and sometimes on exposed algae mats or water weed. Roosts on beaches and wetlands, and sometimes on rocky shores and salt marshes.	E	CE, Mi	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Calidris melanotos Pectoral Sandpiper Source: PMST	Prefers shallow fresh to saline wetlands with open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. Found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	-	Mi	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Gallinago hardwickii Latham's Snipe Source: PMST	Occurs in permanent and ephemeral wetlands up to 2000 m above sea-level, usually inhabiting open, freshwater wetlands with low, dense vegetation. Forages in areas of mud (either exposed or beneath a very shallow covering of water) and some form of cover (e.g. low, dense vegetation). Roosts on the ground near (or sometimes in) their foraging areas, usually in Sites that provide some degree of shelter, e.g. beside or under clumps of vegetation, among dense tea-tree, in forests, in drainage ditches or plough marks, among boulders, or in shallow water if cover is unavailable.	-	Mi	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Numenius madagascariensis Eastern Curlew Source: PMST	Generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts. Forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed. Roosts on sandy spits and islets, especially on dry beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves. May also roost on wooden oyster leases or other similar structures.	-	CE, Mi	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Pandion haliaetus Osprey Source: PMST	Requires extensive areas of open fresh, brackish or saline water for foraging. Frequents a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes. May occur over atypical habitats such as heath, woodland or forest when travelling to and from foraging Sites.	-	Mi	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Tringa nebularia Common Greenshank Source: PMST	Found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves, thickets of rushes, and dead or live trees.	-	Mi	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Fish								
Macquaria australasica Macquarie Perch Source: PMST	The natural geographical range of the Macquarie Perch is the Murray-Darling Basin. Macquarie Perch have declined considerably from their historical distribution within NSW and they are now considered isolated to the upper reaches of the Lachlan and Murrumbidgee Rivers in southern NSW. It is also found in low numbers in the Mongarlowe River, where the population is considered likely to be the result of a translocation from the Murray-Darling Basin. Other populations exist in Cataract Dam in the Nepean River catchment, as well as a 2008 record from Georges River near Campbelltown. It persists in the Burrinjuck, Cotter (Murrumbidgee) and Wyangala impoundments. A breeding population in the Queanbeyan River upstream of the Googong Reservoir exists solely due to a translocation of individuals from the reservoir past a natural barrier. The Googong reservoir population is believed to be effectively extinct. Macquarie perch may occasionally become displaced downstream from the Queanbeyan River into Googong, but they do not form a population in the reservoir.	E	E	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Prototroctes maraena Australian Grayling Source: PMST	The Australian Grayling occurs in streams and rivers on the eastern and southern flanks of the Great Dividing Range, from Sydney, southwards to the Otway Ranges of Victoria and in Tasmania.	E	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Invertebrates								

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Meridolum corneovirens Cumberland Plain Land Snail Source: BioNet	Primarily inhabits the critically endangered ecological community Cumberland Plain Woodland and grassy open woodland with occasional dense patches of shrubs. Also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest. Lives under litter, bark, leaves and logs, or shelters in loose soil around grass clumps. Occasionally shelters under rubbish. Generally active at night.	E	-	Potential	Negligible	Low	No	The Site is highly disturbed land, with lawns and planted trees. Although some leaf litter is present at the base of some trees, this leaf litter is managed in the garden and do not have suitable habitat conditions for the species. There are 36 records of the species occurring within a 10 km radius – the closest being 2.1 km NE of the Site (23/06/14).
Pommerhelix duralensis Dural Land Snail Source: PMST	Has a strong affinity for communities in the interface region between shale and sandstone-derived soils, with forested habitats that have good native cover and woody debris. Favours sheltering under rocks or inside curled-up bark. Also observed resting in exposed areas such as on exposed rock or leaf litter, however it will also shelter beneath leaves, rocks and light woody debris.	E	E	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Synemon plana Golden Sun Moth Source: PMST	Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which the ground layer is dominated by wallaby grasses. Occurs in landscapes which are typically low and open with the bare ground between tussocks thought to be an important microhabitat feature. Adults are short-lived (one to four days) and do not feed, the larvae are thought to feed exclusively on the roots of wallaby grasses. Breeding in the ACT is Nov to Dec but may differ in other areas.	E	CE	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Mammals								
Microbats								
Chalinolobus dwyeri Large-eared Pied Bat Source: PMST/BioNet	Roosts in cave entrances, crevices in cliffs, old mine workings and the disused, bottle-shaped mud nests of the Fairy Martin. Frequents low to mid-elevation dry open forest and woodland close to these features. Females raise young in maternity roosts from November to January in roof domes in sandstone caves and overhangs. They remain loyal to the same cave over many years.	V	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 6 records of the species occurring within a 10 km radius – the closest being 4.5 km NW of the Site (17/01/18).
Falsistrellus tasmaniensis Eastern False Pipistrelle Source: BioNet	Prefers moist habitats, with trees taller than 20 m. Generally roosts in Eucalypt hollows but has also been found under loose bark on trees or in buildings. Breeding occurs in late spring to early summer. Hibernates in winter.	V	-	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 6 records of the species occurring within a 10 km radius – the closest being 1.9 km N of the Site (21/10/16).
Micronomus norfolkensis Eastern Coastal Free-tailed Bat Source: BioNet	Occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roosts mainly in tree hollows but will also roost under bark or in man-made structures. Usually solitary but also recorded roosting communally, probably insectivorous.	V	-	Potential	Negligible	Low	No	Limited suitable habitat for the species occurs within the Site. There are 15 records of the species occurring within a 10 km radius – the closest being 1.9 km N of the Site (21/10/16).

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Miniopterus orianae oceanensis Large Bent-winged Bat Source: BioNet	Caves are the primary roosting habitat. Also uses derelict mines, storm-water tunnels, buildings and other man-made structures. Forms discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. At other times of the year, populations disperse within about 300 km range of maternity caves. Hunts in forested areas, catching moths and other flying insects above the tree tops.	V	-	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 26 records of the species occurring within a 10 km radius – the closest being 1.9 km N of the Site (21/10/16).
Myotis macropus Southern Myotis Source: BioNet	Generally roosts in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forages over streams and pools catching insects and small fish by raking their feet across the water surface.	V	-	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 20 records of the species occurring within a 10 km radius – the closest being 1.9 km N of the Site (21/10/16).
Scoteanax rueppellii Greater Broad-nosed Bat Source: BioNet	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m.	V	-	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 19 records of the species occurring within a 10 km radius – the closest being 1.9 km N of the Site (21/10/16).
Other Mammals								
Dasyurus maculatus maculatus Spotted-tailed Quoll Source: PMST/BioNet	Found in a variety of areas including open forest, rainforest, woodland, coastal heath and inland riparian forest. Uses tree hollows, logs, rock outcrops, small caves and rocky cliff faces as dens. Uses flat rocks amongst boulder Sites, rocky stream beds or banks and rocky cliff faces as latrine Sites.	V	E	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There is 1 record of the species occurring within a 10 km radius – being 2.9 km SE of the Site (30/06/06).
Petauroides volans Greater Glider Source: PMST	Feeds exclusively on Eucalypt leaves, buds, flowers and mistletoe. Shelters during the day in tree hollows and will use up to 18 hollows in their home range.	-	V	Potential	Negligible	Low	No	Limited suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Petaurus norfolcensis Squirrel Glider Source: BioNet	Occurs on the coast in a range of habitats including low scrubby eucalypt woodlands and banksia thickets to tall, wet eucalypt forests bordering on rainforest. Important food sources are likely to be the winter flowering *Banksia integrifolia* and *Corymbia maculata* and the summer flowering *B. serrata* and *Eucalyptus paniculata*. Tree hollows are an important habitat feature providing den Sites for raising young. Hollows can be found in trees of the genera *Eucalyptus*, *Corymbia* and *Angophora*.	V	-	Potential	Negligible	Low	No	Limited suitable habitat for the species occurs within the Site. There are 2 records of the species occurring within a 10 km radius – the closest being 3.5 km NE of the Site (06/08/09).
Petrogale penicillata Brush-tailed Rock-wallaby Source: PMST	Occupies rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Browses on vegetation in and adjacent to rocky areas, eating grasses and forbs as well as the foliage and fruits of shrubs and trees. Shelters or basks during the day in rock crevices, caves and overhangs. Mostly active at night.	E	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Phascolarctos cinereus Koala Source: PMST/BioNet	Inhabits Eucalypt woodlands and forests. Feeds on the foliage of more than 70 Eucalypt species and 30 non-Eucalypt species, but in any one area will select preferred browse species.	V	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 2 records of the species occurring within a 10 km radius – the closest being 4 km NE of the Site (01/01/86).
Pseudomys novaehollandiae New Holland Mouse Source: PMST	Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. Social animal, living predominantly in burrows shared with other individuals.	-	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Pteropus poliocephalus Grey-headed Flying-fox Source: PMST/BioNet	Occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies close to water in vegetation with a dense canopy. Feeds on the nectar and pollen of native trees, in particular *Eucalyptus*, *Melaleuca* and *Banksia*, and fruits of rainforest trees and vines. Also forages in cultivated gardens and fruit crops.	V	V	Potential	Negligible	Low	No	Limited foraging habitat for the species occurs in canopy of trees within the Site. The Site is not a camp for the species, the neared known camp is located at approximately 29.5km south-east. There are 234 records of the species occurring within a 10 km radius – the closest being 0.25 km SE of the Site (08/04/15).
Reptiles								
Hoplocephalus bungaroides Broad-headed Snake Source: PMST/BioNet	Shelters in rock crevices and under flat sandstone rocks on exposed cliff edges during autumn, winter and spring. Moves from sandstone rocks to shelters in crevices or hollows in large trees within 500 m of escarpments in summer.	E	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There is 1 record of the species occurring within a 10 km radius – being 2 km SE of the Site (01/01/16).
Threatened Flora								
Acacia bynoeana Bynoe's Wattle Source: PMST/BioNet	Occurs on sandy soils, in heath or dry sclerophyll forest. Appears to have preference for open Sites, sometimes disturbed, such as recently burnt areas, and roadside spoil mounds and trail margins. Grows with overstorey species including Scribbly Gum, Red Bloodwood, Narrow-leaved Apple, Saw Banksia and Parramatta Red Gum.	E	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 27 records of the species occurring within a 10 km radius – the closest being 2.8 km NE of the Site (16/08/04).
Acacia pubescens Downy Wattle Source: PMST	Occurs on alluviums, shales and at the intergrade between shales and sandstones. The soils are characteristically gravely soils, often with ironstone. Found in open woodland and forest, in a variety of plant communities, including Cooks River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland. Flowers from August to October. The pods mature in October to December.	V	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Allocasuarina glareicola	Grows in Castlereagh woodland on lateritic soil. Found in open woodland with *Eucalyptus parramattensis, Eucalyptus fibrosa, Angophora bakeri, Eucalyptus sclerophylla* and *Melaleuca decora*. Common associated understorey species	E	E	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site.

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Source: PMST/BioNet	include *Melaleuca nodosa, Hakea dactyloides, Hakea sericea, Dillwynia tenuifolia, Micromyrtus minutiflora, Acacia elongata, Acacia brownei, Themeda australis* and *Xanthorrhoea minor*.							There are 5 records of the species occurring within a 10 km radius – the closest being 3.6 km N of the Site (04/12/00).
Cryptostylis hunteriana Leafless Tongue-orchid Source: PMST	Found in a range of habitats including woodland, sedgelands, forest, wetlands and swamp heath. Large populations occur in woodland dominated by *Eucalyptus sclerophylla, E. sieberi, Corymbia gummifera* and *Allocasuarina littoralis*. Occurs on moist and sandy, dry and peaty soils.	V	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Cynanchum elegans White-flowered Wax Plant Source: PMST	Occurs at the edge of dry rainforest vegetation. May also be associated with littoral rainforest, *Leptospermum laevigatum – Banksia integrifolia* subsp. *integrifolia* coastal scrub; *Corymbia maculata* aligned open forest and woodland; *Melaleuca armillaris* scrub to open scrub; and *Eucalyptus tereticornis* aligned open forest and woodland.	E	E	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Dillwynia tenuifolia Source: BioNet	Found in scrubby/dry heath habitat. In western Sydney may be locally abundant particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. May also be common in transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland. Flowering occurs sporadically through the year with a peak from August to March depending on environmental conditions.	V	-	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 225 records of the species occurring within a 10 km radius – the closest being 1.8 km NE of the Site (17/05/01).
Eucalyptus aggregata Black Gum Source: PMST	Grows in the lowest parts of the landscape. Grows on alluvial soils, on cold, poorly-drained flats and hollows adjacent to creeks and small rivers. Often grows with other cold-adapted eucalypts, such as *Eucalyptus pauciflora, E. viminalis, E. rubida, E. stellulata and E. ovata*. Black Gum usually occurs in an open woodland formation with a grassy groundlayer dominated either by *Poa labillardierei* or *Themeda australis*, but with few shrubs. Also occurs as isolated paddock trees in modified native or exotic pastures.	V	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Genoplesium baueri Yellow Gnat-orchid Source: PMST	Found in open, shrubby and heathy forest, heathland to shrubby woodland. Also, grows in moss gardens on sandstone. Associated soils are sands or sandy loams.	E	E	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Grevillea juniperina subsp. *juniperina* Juniper-leaved Grevillea Source: BioNet	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. Associated canopy species within Cumberland Plain Woodland and Shale/Gravel Transition Forest include *Eucalyptus tereticornis, E. moluccana, E. crebra, E. fibrosa* and *E. eugenioides*. Understorey species include *Bursaria spinosa, Dillwynia sieberi, Ozothamnus diosmifolius, Daviesia ulicifolia, Acacia falcata, Acacia parramattensis, Themeda australis, Aristida ramosa, Cymbopogon refractus, Eragrostis brownii, Cheilanthes sieberi, Dianella revoluta* and *Goodenia hederacea*. In Castlereagh Woodland on more sandy soils the dominant canopy species are *Eucalyptus fibrosa, E. sclerophylla, Angophora bakeri* and *Melaleuca decora*. Understorey species include *Melaleuca nodosa, Hakea sericea, Cryptandra spinescens, Acacia elongata, Gonocarpus teucrioides, Lomandra longifolia* and the threatened species *Dillwynia tenuifolia, Pultenaea parviflora, Micromyrtus minutiflora* and *Allocasuarina glareicola*. Flowering may occur sporadically throughout the year, but particularly between July and October.	V	-	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 195 records of the species occurring within a 10 km radius – the closest being 2.1 km E of the Site (12/10/07).
Haloragis exalata subsp. *Exalata* Wingless Raspwort	Appears to require protected and shaded damp situations in riparian habitats. Flowering specimens in NSW are recorded from November to January.	V	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site.

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Source: PMST								No known records of the species exist within the 10km locality.
Haloragodendron lucasii Hal Source: PMST	Associated with dry sclerophyll forest. Reported to grow in moist sandy loam soils in sheltered aspects, and on gentle slopes below cliff-lines near creeks in low open woodland. Associated with high soil moisture and relatively high soil-phosphorus levels. Flowering occurs from August to November with fruits appearing from October to December.	E	E	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Marsdenia viridiflora subsp. viridiflora Marsdenia viridiflora R. Br. subsp. viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas Source: BioNet	Grows in vine thickets and open shale woodland. Recent records are from Prospect, Bankstown, Smithfield, Cabramatta Creek and St Marys. The species has been previously known to exist north from Razorback Range. The species has a milky latex when cut and large underground tubers. Fruit are large and pear-shaped, up to 80 mm long. The midvein of the leaf is prominent. Bell-shaped flowers occur in groups of 3 - 10 and are 3 - 4 mm in diameter, greenish or yellow.	E	-	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 188 records of the species occurring within a 10 km radius – the closest being 2.5 km NE of the Site (01/12/15).
Melaleuca deanei Deane's Paperbark Source: PMST	Occurs in sandy soils, woodlands and wet heath on sandstone. Found in mostly ridgetop woodland, with fewer Sites in heath on sandstone.	V	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Micromyrtus minutiflora Source: PMST/BioNet	Grows in Castlereagh Scribbly Gum Woodland, Ironbark Forest, Shale/Gravel Transition Forest, open forest on tertiary alluvium and consolidated river sediments. Sporadic flowering, June to March.	E	V	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 107 records of the species occurring within a 10 km radius – the closest being 2.2 km NE of the Site (17/05/01).
Persicaria elatior Knotweed Source: PMST	Normally grows in damp places, including coastal with swampy areas, along watercourses, streams and lakes, swamp forest and disturbed areas.	V	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Persoonia hirsuta Hairy Geebung Source: PMST	Found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone. Usually present as isolated individuals or very small populations.	E	E	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Persoonia nutans Nodding Geebung	Found on aeolian and alluvial sediments in northern populations, in a range of sclerophyll forest and woodland habitats, including Agnes Banks Woodland, Castlereagh Scribbly Gum and Cooks River /Castlereagh Ironbark Forest.	E	E	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site.

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Source: PMST/BioNet	Also, grows on tertiary alluvium in southern populations, which may also extent into shale sandstone transitional communities.							There are 199 records of the species occurring within a 10 km radius – the closest being 2.4 km NE of the Site (17/05/07).
Pimelea curviflora var. curviflora Source: PMST	Occurs on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes amongst woodlands. Also recorded in Illawarra Lowland Grassy Woodland habitat at Albion Park on the Illawarra coastal plain. Flowers October to May. Has an inconspicuous cryptic habit as it is fine and scraggly and often grows amongst dense grasses and sedges. It may not always be visible at a Site as it appears to survive for some time without any foliage after fire or grazing, relying on energy reserves in its tuberous roots.	V	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Pimelea spicata Spiked Rice-flower Source: PMST, BioNet	Found on well-structured clay soils. On the Cumberland Plain Sites it is associated with Grey Box communities (particularly Cumberland Plain Woodland variants and Moist Shale Woodland) and in areas of ironbark. The co-occurring species in the Cumberland Plain Sites are *Eucalyptus moluccana, E. tereticornis* and *E. crebra. Bursaria spinosa* is often present at Sites and *Themeda australis* is usually present in the groundcover. In the coastal Illawarra it occurs commonly in Coast Banksia open woodland with a better developed shrub and grass understorey. Coastal headlands and hilltops are the favoured Sites. The IIllawarra populations usually occur in one of two communities - a woodland or a coastal grassland. Woodland Sites are dominated by *E. tereticornis E. eugenioides,* with a groundcover dominated by *Themeda australis* and *Lomandra longifolia*. The grassland Sites are dominated by *Themeda australis* and *Lomandra longifolia*, with *Imperata cylindrica*. A shrubby layer, where present, is dominated by *Acacia sophorae* and *Westringia fruticosa* with *Banksia integrifolia*.	E	E	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 4 records of the species occurring within a 10 km radius – the closest being 0.2 km NE of the Site (02/08/07).
Pomaderris brunnea Rufous Pomaderris Source: PMST	Grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines. Flowers appear in September and October. The species has been found in association with *Eucalyptus amplifolia, Angophora floribunda, Acacia parramattensis, Bursaria spinosa* and *Kunzea ambigua.*	E	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Pterostylis gibbosa Illawarra Greenhood Source: PMST	All known populations grow in open forest or woodland, on flat or gently sloping land with poor drainage. A deciduous orchid that is only visible above the ground between late summer and spring, and only when soil moisture levels can sustain its growth.	E	E	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Pterostylis saxicola Sydney Plains Greenhood Source: PMST	Occurs in shallow soil depressions above cliff lines on sandstone rock shelves. Associated with sclerophyll forest or woodland and in heathy forest, supported by shale or shale/sandstone transitional soils (including sandy soils). Also found in sandstone boulder crevices, often near streams. Grows at altitudes between 10 and 60 m, in small groups, loose colonies or as scattered individuals.	E	E	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Pultenaea glabra Smooth Bush-pea Source: PMST	Grows in swamp margins, hillslopes, gullies and creekbanks and occurs within dry sclerophyll forest and tall damp heath on sandstone. Flowers September to November, fruit matures October to December.	V	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.

Scientific Name Common Name	Habitat	BC Act	EPBC Act	Likelihood of Occurrence	Potential Impact Consequence	Risk Rating	Included for Assessment	Justification for Inclusion / Exclusion
Pultenaea parviflora Source: PMST/BioNet	Common in scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays, as well as transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland. *Eucalyptus fibrosa* is usually the dominant canopy species. Flowering peaks in September.	E	V	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There are 433 records of the species occurring within a 10 km radius – the closest being 1.5 km NE of the Site (28/07/98).
Rhizanthella slateri Eastern Underground Orchid Source: PMST	Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest. Highly cryptic given that it grows almost completely below the soil surface, with flowers being the only part of the plant that can occur above ground. Flowers September to November.	V	E	Potential	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Syzygium paniculatum Magenta Lilly Pilly Source: PMST/BioNet	Found in Littoral Rainforest on grey soils over sandstone in the south coast. Also found in Riverside Galley Rainforest and Littoral Rainforest communities on gravels, sands, silts and clays in the central coast.	E	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. There is 1 record of the species occurring within a 10 km radius – being 4 km SE of the Site (01/02/18; Appears to be an ornamental planting).
Thelymitra kangaloonica Kangaloon Sun Orchid Source: PMST	Grows in seasonally swampy sedgeland on grey silty clay loam. Found at 600-700 m above sea level.	CE	CE	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.
Thesium australe Austral Toadflax Source: PMST	Found in grassland on coastal headlands and grassy woodland, shrubland or grassland at inland locations. Commonly found with *Themeda australis*. Occurs on soils derived from sedimentary, igneous and metamorphic geology, including peaty loams and black clay loams to yellow podzolics. Commonly present at damp Sites.	V	V	Unlikely	Negligible	Low	No	No suitable habitat for the species occurs within the Site. No known records of the species exist within the 10km locality.

CE = Critically Endangered; E = Endangered; V = Vulnerable; X = presumable extinct; CEEC = Critically Endangered Ecological Community; EEC = Endangered Ecological Community

Appendix E – TSC Act – Assessment of Significance

To comply with State legislative requirements, an Assessment of Significance under 5A of the *Environmental Planning and Assessment Act* 1979 and the *Threatened Species Conservation Act* 1995 has been undertaken for the following species:

7-part Test: Forest Birds

Introduction

The present 7-part test was undertaken for the following species:

- The Regent Honeyeater (*Anthochaera phrygia*) is listed as Endangered under the *TSC Act*.
- The Dusky Woodswallow (*Artamus cyanopterus cyanopterus*) is listed as Vulnerable under the *TSC Act*.
- The Glossy Black-Cockatoo (*Calyptorhynchus lathami*) is listed as Vulnerable under the *TSC Act*.
- The Little Lorikeet (*Glossopsitta pusilla*) is listed as Vulnerable under the *TSC Act*.

Habitat and Ecology

Regent Honeyeater (*Anthochaera phrygia*): Inhabits dry open forests and woodlands that have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. The species is a generalist forager, though it feeds mainly on the nectar from a small number of Eucalypts that produce in high volumes. The Regent Honeyeater usually makes open, cup shaped nests in horizontal branches or forks in mature Eucalypts, sheoaks and mistletoe *haustoria*.

Dusky Woodswallow (*Artamus cyanopterus cyanopterus*): Found in woodlands and dry open sclerophyll forests, usually dominated by Eucalypts including mallee associations. Also recorded in shrublands and heathlands and various modified habitats including regenerating forests; very occasionally in moist forests or rainforests. Prefers an understorey that is typically open with sparse Eucalypt saplings, *Acacia* and other shrubs, including heath. Ground cover may consist of grasses, sedges or open ground, often with coarse woody debris. Often observed in farmland, usually at the edges of forest or woodland or in roadside remnants or wind breaks with dead timber.

Glossy Black-Cockatoo (*Calyptorhynchus lathami*): Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. *Allocasuarina littoralis* and *A. torulosa* are important foods. Inland populations feed on a wide range of sheoaks, including *Allocasuaraina diminuta* and *A. gymnathera*. *belah* is also utilised and may be a critical food source for some populations. The species is dependent on large hollow-bearing eucalypts for nest sites.

Little Lorikeet (*Glossopsitta pusilla*): Forages primarily in the canopy of open Eucalyptus forest and woodland but also finds food in *Angophora*, *Melaleuca* and other tree species; riparian habitats particularly are used. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain populations. The species feeds mostly on nectar and

pollen, also on native fruits and only rarely in orchards. The species nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts.

Habitat Availability at the Site

Regent Honeyeater (*Anthochaera phrygia*): Limited suitable habitat for the species occurs within the site. Canopy cover across the site is sparse with limited canopy connectivity of mature Eucalypts. Higher canopy cover and connectivity occurs in an isolated stand of *Allocasuarina* and *Eucalypt* (ironbark) species in the south western portion of the site. Mistletoe was observed on the site.

Dusky Woodswallow (*Artamus cyanopterus cyanopterus*): Limited suitable habitat for the species occurs within the site. The vegetation on the site has been highly modified and has been maintained as a residential garden; the vegetation does not conform to "woodland and/or dry open sclerophyll forest". The species may utilise the mature Eucalypt or *Allocasuarina* dispersed within the cleared, open grounds of the site. The site lacks the structural complexity often required by the species in the lower and middle vegetative/habitat stratum. Coarse woody debris and dead timber is absent from the site.

Glossy Black-Cockatoo (*Calyptorhynchus lathami*): Limited suitable habitat for the species occurs within the site. The vegetation on the site does not conform to open forest and/or woodland, however an isolated stand of *Allocasuarina* and *Eucalypt* (ironbark) species in the south western portion of the site is representative of habitat commonly utilised by this species. The mature Eucalypt (ironbark) with hollows located directly adjacent to the southern property boundary may be used by the species for nest sites.

Little Lorikeet (*Glossopsitta pusilla*): Limited suitable habitat for the species occurs within the site. Riparian habitats are not located on the site. The spaced *Melaleuca* and Eucalypt trees located within the site may be utilised by urban populations. Hollows detected on the site may be utilised for nesting by the species, as they display a preference to nest in proximity to feeding areas.

Seven-part Test

Part 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.

Regent Honeyeater (*Anthochaera phrygia*): This species favours habitats that have significantly large numbers of mature trees, high canopy cover and an abundance of mistletoes. The site has been cleared of a substantial amount of tertiary, lower and mid stratum vegetation historically. Canopy cover, especially that consisting of mature Eucalypts, is limited across the site. Higher canopy cover and connectivity occurs in an isolated stand of *Allocasuarina* and *Eucalypt* (ironbark) species in the south western portion of the site. The species may feed on the nectar from a small number of Eucalypts that produce high volumes, including the large ironbark located on the site. A small number of Mistletoe was observed on the site and may be used as a feeding resource by the species during flowering times. The species is nomadic and partly migratory with movements observed to align with key flowering times of Box-Ironbark forests of Victoria and New South Wales. The species utilises a very large home range. The proposal will remove the potential foraging habitat from the study area, however, will not substantially affect the foraging resources available to this species in the wider area. Under these circumstances, the action

	proposed is unlikely to affect the life cycle of this species such that a viable local population of this species is likely to be placed at risk of extinction. **Dusky Woodswallow (*Artamus cyanopterus cyanopterus*):** This species favours woodlands and dry open sclerophyll forests, usually dominated by Eucalypts including mallee associations. The species has been observed to occupy cleared areas and roadside remnants. The lack of mallee associations and structural habitat complexity in the lower and middle stratum, including the absence of native shrubs and woody debris, suggest that the presence of a local population of the species would be unlikely. The species is widespread across Australia and exploits a range of habitats favouring those which are more structurally complex than the subject site. The proposal will remove the potential foraging habitat from the study area, however, will not substantially affect the foraging resources available to this species in the wider area. Under these circumstances, the action proposed is unlikely to affect the life cycle of this species such that a viable local population of this species is likely to be placed at risk of extinction. **Glossy Black-Cockatoo (*Calyptorhynchus lathami*):** The vegetation on the site does not conform to open forest and/or woodland, however, an isolated stand of *Allocasuarina* and Eucalypt (ironbark) species in the south western portion of the site is representative of habitat that may be potentially utilised by this species. The species is uncommon although widespread throughout forests and woodlands of NSW. The proposal will remove the potential foraging and feeding habitat from the study area, however, will not substantially affect the foraging and feeding resources available to this species in the wider area. Under these circumstances, the action proposed is unlikely to affect the life cycle of this species such that a viable local population of this species is likely to be placed at risk of extinction. **Little Lorikeet (*Glossopsitta pusilla*):** The managed vegetation on the site may provide limited foraging and feeding habitat for the species. The species is distributed widely across the coastal regions of eastern Australia and is found particularly in riparian habitats. No riparian habitat will be removed by the proposal. The proposal will remove the potential foraging and feeding habitat (isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees) from the study area, however, that action will not substantially affect the foraging and feeding resources available to this species in the wider area. Under these circumstances, the action proposed is unlikely to affect the life cycle of this species such that a viable local population of this species is likely to be placed at risk of extinction.
Part b):	**In the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised**
	This Assessment of Significance is for threated fauna species. No endangered populations of threatened fauna species were identified on the Site, hence, the life cycle of any species that constitutes an endangered population will not be disrupted such that the viability of that population is likely to be significantly compromised.
Part c):	**In the case of an endangered ecological community, whether the action proposed:** **(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or;**
	Not applicable.

	(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.
	Not applicable.
Part d):	**In relation to the habitat of a threatened species, population or ecological community:** **(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and**
	Threatened Forest Birds: The action proposed is to clear all vegetation (native, invasive and/or ornamental) on the site to accommodate the building envelope and associated structures. The total area of the site is approximately 0.81 ha (based on estimates in six maps). The potential habitat proposed to be removed for the abovementioned Forest Bird species is not considered to be important for the long-term survival of these species, with none of the above-mentioned species being recorded during field surveys. The habitat on the site is highly modified with a mixture of native, invasive and ornamental vegetation scattered among a managed groundcover/lawn.
	(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 proposed action is for the complete removal of the managed vegetation on the site and will not fragment or isolate any vegetation or areas of habitat for the highly mobile and wide-ranging Forest Bird species examined. The proposal will not substantially restrict access to any resources or areas of habitat for the examined species as the site is bound by residential development to the east, residential property to the west (habitat corridor in place), cleared lands to the south and a residential property to the north.
	(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.
	The proposed action is unlikely to affect the long-term survival of any of the abovementioned species, as the potential habitat located on the site is highly modified, lacks key structural habitat components required by the abovementioned species and is located in an area not foreseen to support populations of these species.
Part e):	**Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).**
	Under the *TSC Act*, the Director General maintains a register of critical habitats within NSW. The action proposed will not adversely affect critical habitat.
Part f):	**Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.**

Regent Honeyeater (*Anthochaera Phrygia):* A National Recovery Plan (DoE 2016) has been prepared for this species and lists 6 objectives and strategies:

- Reverse the long-term population trend of decline and increase the numbers of regent honeyeaters to a level where there is a viable, wild breeding population, even in poor breeding years; and to
- Enhance the condition of habitat across the regent honeyeater range to maximise survival and reproductive success and provide refugia during periods of extreme environmental fluctuation.

- The strategies to achieve the plans' objectives are:
    - Improve the extent and quality of regent honeyeater habitat.
    - Bolster the wild population with captive-bred birds until the wild population becomes self-sustaining.
    - Increase understanding of the size, structure, trajectory and viability of the wild population.
    - Maintain and increase community awareness, understanding and involvement in the recovery program.

The above management actions have been reviewed and it is considered that the action proposed is generally consistent with the objectives and associated management of the species.

Dusky Woodswallow (*Artamus cyanopterus cyanopterus*):

The NSW Government has developed a recovery strategy for this species under the Saving Our Species program. The dusky Woodswallow has been assigned to the Landscape managed species management stream. This management stream ensures that the species is secure in the wild in NSW and that its NSW geographic range is extended or maintained. Currently, one priority management site has been identified for this species which covers the majority of NSW. These management actions and Action Statements have been reviewed and it is considered that the action proposed is consistent with the objectives and associated management actions for the species. Management focuses on the rehabilitation and revegetation of areas of high value habitat for the species. The habitat on the site is not of high value to the examined species.

Glossy Black-Cockatoo (*Calyptorhynchus lathami*):

The NSW Government has developed a recovery strategy for this species under the Saving Our Species program. The Glossy Black-Cockatoo has been assigned to the Landscape managed species management stream. This management stream ensures that the species is secure in the wild in NSW and that its NSW geographic range is extended or maintained. There are currently two active management sites that have been identified for this threatened species across NSW. These sites are in the Southern Highlands and within the Goulburn Mulwaree, Shoalhaven, Upper Lachlan Shire, Wingecarribee and Wollondilly Local Government Areas as part of the Great Western Wildlife Corridor. No management sites for the species are located within the Penrith City Council LGA or near to the subject site. These management actions and Action Statements have been reviewed and it is considered that the action proposed is generally consistent with the objectives and associated management actions for the species. Management of the species focuses on protecting areas of native forest and woodland containing she-oak trees and ensuring that prescribed burning activities will not impact the survivability of mature stands of she-oaks.

Little Lorikeet (*Glossopsitta pusilla*): The NSW Government has developed a recovery strategy for this species under the Saving Our Species program. The Little Lorikeet has been assigned to the Landscape managed species management stream. This management stream aims to ensure

	that the species is secure in the wild in NSW and that its NSW geographic range is extended or maintained. There are currently two active management sites that have been identified for this threatened species across NSW. One of these sites is located in Western Sydney, as part of the Cumberland Plain Restoration Program - Greater Sydney Landcare Network Inc. The development site is not located in a designated area for this management site (no management sites for this species are located on private land). The second management site is located state-wide as a Nectar-Lovers FNPW in the form of engaging and encouraging communities to plant flora species that may be utilised by the Little Lorikeet. This site does not occur on any private land. These management actions, threats and action statements have been reviewed and it is considered that the action proposed is generally consistent with the objectives and associated management actions for the species.
Part g):	**Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**
	The proposal may marginally constitute or promote the action of several Key Threatening Processes under the NSW *Threatened Species Conservation Act* 1995. The Key Threatening Processes listed below are already, or have already, been in operation within the subject site and were observed during the site inspection; - Clearing of native vegetation; - Invasion of native vegetation by exotic perennial grasses; - Competition from feral honeybees *Apis mellifera*; - Loss of tree hollows. The proposal involves the removal of all vegetation on the site, including a hollow-bearing tree. Mitigation measures have been proposed to minimise the net effects of removal of native trees and a hollow-bearing tree. The vegetation on the site has been highly modified historically and is regularly managed (lawns and garden beds). The proposal will not substantially contribute to the above mentioned Key Threatening Processes.
Conclusion	
	The proposed action is unlikely to have a significant impact on forest birds; namely the Regent Honeyeater (*Anthochaera phrygia*), Dusky Woodswallow (*Artamus cyanopterus cyanopterus*), Glossy Black-Cockatoo (*Calyptorhynchus lathami*) and Little Lorikeet (*Glossopsitta pusilla*) due to the low value of the habitat proposed for removal. A Species Impact Statement is not required.

7-part Test: Swift Parrot (*Lathamus discolour*)

Introduction	
	This 7-part test applies to the Swift Parrot (*Lathamus discolour*), listed as Endangered under the TSC Act. **Habitat and Ecology** The Swift Parrot migrates to the Australian south-east mainland between March and October, where they occur in areas where Eucalypts are flowering profusely or where there are abundant lerp infestations. In NSW the species occurs mostly on the coast and south west slopes. They return to Tasmania where they breed from September to January, nesting in old trees with hollows and feeding in forests dominated by *Eucalyptus globulus*. The species favours feed trees including the Swamp Mahogany (*Eucalyptus robusta*), Spotted Gum (*Corymbia maculata),* Red Bloodwood (*C. gummifera*), Forest Red Gum (*E. tereticornis*), Mugga Ironbark (*E. sideroxylon*) and White Box (*E. albens*). The species may commonly use lerp infested trees including the Inland Grey Box (*E. macrocarpa*), Grey Box (*E. moluccana*), Blackbutt (*E. pilularis*) and Yellow Box (*E. melliodora*). The species may feed on other flowering Eucalypts if the abovementioned species are not present or in abundance. The species may return to foraging sites on a cyclic basis depending on food availability. **Habitat Availability at the Site** Limited suitable habitat for the species occurs within the site. The vegetation on the site has been highly modified and has been maintained as a residential garden. Several Eucalypt species are present on the site.
Seven-part Test	
Part a):	**In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.**
	The Swift Parrot forages and breeds in the forested environments of Tasmania from September to January nesting in old trees with hollows dominated by *Eucalyptus globulus*. The species is found in NSW between March and October, where they occur in areas where Eucalypts are flowering profusely or where there are abundant lerp infestations. Canopy cover, especially that consisting of mature Eucalypts, is limited across the site. Higher canopy cover and connectivity occurs in an isolated stand of *Allocasuarina* and Eucalypt (ironbark) species in the south western portion of the site, however, these species are not listed as preferred feed trees for the species. In the samples of leaves taken during the site inspection, there was negligible evidence of lerp infestation of the Eucalypt species sampled. The species utilises a very large home range. The potential habitat located on the site is not breeding habitat. The proposal will remove the potential foraging habitat from the study area, however, will not substantially affect the foraging and feeding resources available to this species in the wider area. Under these circumstances, the

	action proposed is unlikely to affect the life cycle of this species such that a viable local population of this species is likely to be placed at risk of extinction.
Part b):	**In the case of an endangered population, whether the life cycle of the species that constitutes the endangered population is likely to be disrupted such that the viability of the population is likely to be significantly compromised**
	This test of significance is for threated fauna species. No endangered populations of threatened fauna species were identified on the Site, hence, the life cycle of any species that constitutes an endangered population will not be disrupted such that the viability of that population is likely to be significantly compromised.
Part c):	**In the case of an endangered ecological community, whether the action proposed:** **(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or;**
	Not applicable.
	(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.
	Not applicable
Part d):	**In relation to the habitat of a threatened species, population or ecological community:** **(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and**
	The action proposed is to clear all vegetation (native, invasive and/or ornamental) on the site to accommodate the building envelope and associated structures. The total area of the site is 8152 m^2 (0.81 ha). The potential habitat proposed to be removed for the Swift Parrot is not considered to be important for the long-term survival of the species. The Swift Parrot was not recorded during field surveys. The Swift Parrot does not use the vegetation on the site as breeding habitat. The habitat on the site is highly modified with a mixture of native, invasive and ornamental vegetation scattered among a managed groundcover/lawn.
	(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 proposed action is for the complete removal of the managed vegetation on the site and will not fragment or isolate any vegetation or areas of habitat for the mobile and wide-ranging Swift Parrot. The proposal will not substantially restrict access to any resources or areas of habitat for the examined species as the site is bound by residential development to the east, residential property to the west (vegetation corridor in place), cleared lands to the south and a residential property to the north.

	(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.
	The proposed action is unlikely to affect the long-term survival of the Swift Parrot, as the potential habitat located on the site is highly modified, lacks key Eucalypt species that are favoured by the Swift Parrot and is located in an area not foreseen to support populations of these species. The habitat located on the site is not breeding habitat for the species.
Part e):	**Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).**
	Under the TSC Act, the Director General maintains a register of critical habitats within NSW. The action proposed will not adversely affect critical habitats.
Part f):	**Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.**
	A National Recovery Plan (DoE 2011) has been prepared for this species and lists 2 main objectives: - *To prevent further decline of the Swift Parrot population.* - *To achieve a demonstrable sustained improvement in the quality and quantity of Swift Parrot habitat to increase carrying capacity.* The associated recovery actions and performance criteria are as follows; Recovery Actions: - *Identify the extent and quality of habitat.* - *Manage and protect Swift Parrot habitat at the landscape scale.* - *Monitor and manage the impact of collisions, competition and disease.* - *Monitor population and habitat.* Supporting Actions: - *Increase community involvement in, and awareness of, the recovery program.* - *Coordinate, review and report on recovery process.* The above management actions have been reviewed and it is considered that the action proposed is generally consistent with the objectives and associated management of the species. The Swift Parrot does not use the vegetation on the site as breeding habitat. The habitat on the site is highly modified with a mixture of native, invasive and ornamental vegetation scattered among a managed groundcover/lawn.
Part g):	**Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.**
	The proposal may marginally constitute or promote the action of several Key Threatening Processes under the NSW *Threatened Species Conservation Act* 1995. The Key Threatening Processes listed below are already, or have already, been in operation within the subject site and were observed during the site inspection;

- Clearing of native vegetation;
- Invasion of native vegetation by exotic perennial grasses;
- Competition from feral honeybees *Apis mellifera*;
- Loss of tree hollows.

The proposal involves the removal of all vegetation on the site. The vegetation on the site has been highly modified historically and is regularly managed (lawns and garden beds). The proposal will not substantially contribute to the above-mentioned Key Threatening Processes.

Conclusion

The proposed action is unlikely to have a significant impact on the Swift Parrot (*Lathamus discolour*) due to the low value of the habitat proposed for removal and the understanding that the species is highly mobile and migrates to breed in Tasmania, thus, not using the vegetation on the site for breeding habitat. A Species Impact Statement is not required.

Appendix F – EPBC Act – Assessment of Significance

Vulnerable Species

It is considered that the proposed development will not disrupt the lifecycle of any Vulnerable species such that any potentially viable local population would be placed at increased risk of extinction (see Table 11 - Likelihood of Occurrence and Risk Assessment in Appendix D).

Assessment of Significance: Endangered and Critically Endangered Species

Introduction	
The *Significant Impact Guidelines 1.1* provide guidelines on determining whether a proposed action is likely to have a significant impact on a Matter of National Environmental Significance. The following assessment has been undertaken considering the impacts of the proposed development on the following species, listed on Section 178 of the *Environment Protection and Biodiversity Conservation Act* 1999; • Regent Honeyeater (*Anthochaera phrygia)* – Critically Endangered as listed in the *EPBC Act* 1999. • Swift Parrot (*Lathamus discolour*) - Critically Endangered as listed in the *EPBC Act* 1999.	
Significant Impact Assessment ***An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:***	
1.	***… lead to a long-term decrease in the size of a population;***
The proposed action is not likely to have a significant impact on the critically endangered species Regent Honeyeater (*Anthochaera phrygia)* and Swift Parrot (*Lathamus discolour*) that would lead to a long-term decrease in the size of a population of the species. No populations of the examined critically endangered species have been observed or recorded within or immediately adjacent to the Site.	
2.	***… reduce the area of occupancy of the species;***
The proposed action is not likely to have a significant impact on the critically endangered species Regent Honeyeater (*Anthochaera phrygia)* and Swift Parrot (*Lathamus discolour*) that would lead to a reduction in area of occupation of the species. The subject species have not been observed or recorded within or immediately adjacent to the Site.	
3.	***… fragment an existing population into two or more populations;***
The proposed action is not likely to have a significant impact on the critically endangered species Regent Honeyeater (*Anthochaera phrygia*) and Swift Parrot (*Lathamus discolour*) as the proposal will not fragment an existing population into two or more populations. Vegetation and habitat adjacent to the Site would not be impacted by the proposed activity. No populations of the Regent Honeyeater (*Anthochaera phrygia)* and Swift Parrot (*Lathamus discolour*) have been observed or recorded within or immediately adjacent to the Site.	

4.	***… adversely affect habitat critical to the survival of a species;***
No habitat critical to the survival of the Regent Honeyeater (*Anthochaera phrygia)* and Swift Parrot (*Lathamus discolour*) would be adversely affected by the proposed activity.	
5.	***… disrupt the breeding cycle of a population;***
The Site does not constitute significant breeding habitat. The proposed action is unlikely to significantly disrupt the breeding cycle of the Regent Honeyeater (*Anthochaera phrygia)* and Swift Parrot (*Lathamus discolour*).	
6.	***… modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;***
The removal of habitat resulting from the proposed action is unlikely to result in a decline of the Regent Honeyeater (*Anthochaera phrygia)* and Swift Parrot (*Lathamus discolour*). Vegetation and habitat adjacent to the Site would not be impacted by the proposed activity.	
7.	***… result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat;***
The proposed action is not likely to have a significant impact on the Regent Honeyeater (*Anthochaera phrygia)* and Swift Parrot (*Lathamus discolour*) as it is not likely to result in invasive species that are harmful to the Regent Honeyeater and Swift Parrot becoming established in the potential habitat utilised by the species on the site. The Regent Honeyeater (*Anthochaera phrygia)* and Swift Parrot (*Lathamus discolour*) were not observed or recorded on or immediately adjacent to the Site.	
8.	***… introduce disease that may cause the species to decline, or;***
The proposed action would be conducted in such a way as to minimise the introduction or spread of disease that may cause the decline of the examined species.	
9.	***… interfere with the recovery of the species.***
The proposed action would be limited to the Site and would not interfere with the recovery of the Regent Honeyeater (*Anthochaera phrygia)* and Swift Parrot (*Lathamus discolour*).	
Conclusion	
The proposed action at the site is not foreseen to promote or exacerbate the abovementioned aspects of this Significant Impact Assessment. The Regent Honeyeater (*Anthochaera phrygia)* and Swift Parrot (*Lathamus discolour*) favour specific foraging and breeding habitats including forest and woodlands. These habitats are not represented on the site as the site has been highly disturbed historically and now remains in a managed state.	

Migratory Species

The proposed development will not significantly decrease the habitat available for Migratory species or disrupt the lifecycle of these species such that viable populations are likely to be placed at risk of extinction (see Table 11 - Likelihood of Occurrence and Risk Assessment in Appendix D). The proposed development is therefore not likely to have a significant impact on Migratory species and is not likely to result in any exacerbation of the Significant Impact Criteria for migratory species provisions within the EPBC Act.