Western Sydney University Milperra Campus Redevelopment Preliminary Ecological Assessment

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Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Methodology
BC Act	*Biodiversity Conservation Act 2016*
BCF	Biodiversity Conservation Fund
BCT	Biodiversity Conservation Trust
BC Regulation	Biodiversity Conservation Regulation 2017
BDAR	Biodiversity Development Assessment Report
BOPC	Biodiversity Offsets Payment Calculator
BOS	Biodiversity Offset Scheme
ELA	Eco Logical Australia
EP&A Act	*Environmental Protection and Assessment Act 1979*
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
FM Act	*Fisheries Management Act 1994*
HBT	Hollow bearing Tree
GIS	Geographic Information System
GPS	Global Positioning System
Koala Habitat Protection SEPP	*State Environmental Planning Policy 44 – Koala Habitat Protection*
MNES	Matters of National Environmental Significance
PCT	Plant Community Type
SAII	Serious and Irreversible Impact
TEC	Threatened Ecological Community
TFD	Trust Fund Deposit
WM Act 2000	*Water Management Act 2000*

1. Introduction

Eco Logical Australia (ELA) was contracted by Mirvac to provide a preliminary ecological assessment to inform a Planning Proposal seeking to rezone the Western Sydney University (WSU) Milperra campus for residential land use. The study area comprises the greater part of the Western Sydney University campus at 2 Bullecourt Avenue, Milperra (Lot 103 DP 874035). The study area includes both the proposed development area and Offset area (Figure 1).

This constraints assessment is based on an initial desktop and literature review, field survey and review of the application of the Biodiversity Offsets Scheme (BOS) to this proposal. Additional field survey would be required at a later stage to verify the presence of threatened species and / or their habitat for the preparation of a Biodiversity Development Assessment Report (BDAR).

1.1 Description of the proposal

The WSU Milperra Campus is currently used as one of eleven WSU Campuses. The Campus has an area of 23.31 ha and is bounded by Bullecourt Avenue to the north, Horsley Road to the east, M5 Motorway to the south, and Ashford Avenue to the west. Two non-campus uses are located within this bounded area, including the council owned and operated hockey field to the north-west corner of the site, and Mt. St. Joseph's Catholic School, occupying a third of the street frontage to Horsley Road to the east. Remnant Cumberland Plain Woodland (classified as a critically endangered ecological community) is positioned in the north east corner of the Campus.

The campus is currently used for tertiary education, student accommodation, administrative functions, and student parking. It is proposed that the site be repurposed for residential development.

A Master Plan has been prepared for the WSU Milperra campus and is accompanied by a Planning Proposal that seeks to amend the land use, height of buildings, Floor Space Ratio, biodiversity, minimum lot size and special provisions controls under the Bankstown Local Environmental Plan 2015.

The proposal will impact on native flora and fauna, and therefore, this ecological assessment is required to determine any impacts to species, populations, or ecological communities listed under the *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This report discusses the extent of direct and indirect impacts from the proposed rezoning and will inform the planning proposal to Bankstown Canterbury Council.

Remnant Cumberland Plain Woodland (CPW) in the North west corner of the campus is proposed to be retained and potentially managed as an Offset area. This report also considers the feasibility of management of this area as such.

1.2 Key Terms

The following terminology has been used in this report:

- *Subject site*: the area to be directly affected by the proposal

- *Study area*: the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly
- *Locality*: The locality is defined by a 5 km radius around the study area for the purposes of conducting database searches
- *Developable area*: the area to be cleared for development
- *Offset area*: the area to be potentially established as a Stewardship Site.

Figure 1: Study area indicating development area, offset area and vegetation communities

2. Legislative Context

Table 1: Legislation and context

Name	Relevance to the project
	Commonwealth
Environmental Protection and Biodiversity Conservation Act 1999	The Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999) aims to protect Matters of National Environmental Significance (MNES), including vegetation communities and species listed under the EPBC Act. If a development is likely to have a significant impact on MNES, it is likely to be considered a 'Controlled Action' by the Commonwealth and requires assessment and approval by the Commonwealth in order to proceed. The NSW and Commonwealth Governments signed a Bi-lateral Agreement to streamline assessment processes, however the Bi-lateral Agreement has not been updated to cover the new NSW BC Act 2016. Until that occurs, two separate assessments and approvals (one by the state, the other by the Commonwealth) are required of development that has a significant impact on MNES. Commonwealth approvals may require biodiversity offsets that are different to those required by the state. As discussed in Section 4.1, one threatened ecological community listed under the EPBC Act 1999, Cumberland Plain Woodland, has been mapped within the study area. Field survey has identified that the patch of native vegetation within the proposed offset area meets the Commonwealth definition. If such a vegetation patch is proposed for removal, depending on the amount, it may be considered a significant impact on MNES and therefore be considered a Controlled Action by the Commonwealth.
	State
Environmental Planning and Assessment Act 1979	Any future proposed development is assumed to be assessed as local development and will therefore be assessed under Part 4 of the *Environmental Protection and Assessment Act 1979* (EP&A Act 1979), with the City of Canterbury-Bankstown as the consent authority.
Biodiversity Conservation Act 2016	The BC Act 2016, under section 7.3, outlines the assessment requirements to determine whether proposed development (Part 4 of the EP&A Act 1979) is likely to significantly affect threatened species or ecological communities, or their habitats, and whether the Biodiversity Offsets Scheme (BOS) will be triggered. As discussed in Section 5.1, impacts to native vegetation of 0.5 ha or more are likely to trigger the BOS and therefore, the preparation of a Biodiversity Development Assessment Report (BDAR) may be required. Along the western boundary of the study area, as shown in Figure 2, the native vegetation is mapped as having high biodiversity value. If impacts to these areas are proposed, the BOS will be triggered and a BDAR will be required. **Under the current planning proposal, the BOS will be triggered.**
Fisheries Management Act 1994 (FM Act)	The development does not involve harm to mangroves or other protected marine vegetation, dredging, reclamation or blocking of fish passage and therefore a permit under the FM Act is not required.
Water Management Act 2000 (WM Act 2000)	The project does not involve work on waterfront land and therefore a Controlled Activity Approval under s91 of the WM Act is not required.
	Planning Instruments
State Environmental Planning Policy No 44 – Koala Habitat	The study area is not located within a Local Government Area to which the Koala Habitat Protection SEPP applies.

Name	Relevance to the project
Protection (Koala Habitat Protection SEPP)	
Bankstown Local Environment Plan 2015	The subject site is zoned SP2 'Educational Establishment' under the Bankstown LEP. The study area is not located on land shown on the Terrestrial Biodiversity Maps of the Bankstown LEP 2015.
Bankstown Development Control Plan 2015	Part B11 - Tree Preservation Order Section 2.3 (c) states that all trees, regardless of size, listed as Vulnerable or Endangered or a component of an Endangered Ecological Community listed under the *Threatened Species Conservation Act 1995*; and all trees, regardless of size, listed under the *Environmental Protection and Biodiversity Conservation Act 1999* cannot be ringbarked, cut down, top, lop, prune, remove, injure or wilfully destroyed or carry out excavation and earthworks within the tree protection zone except with the approval of Council and in accordance with any conditions imposed with this approval. This report outlines the ecological features present within the study area and will discuss the implications of associated vegetation clearance.

3. Methodology

3.1 Literature Review and Database Search

A review of readily available databases pertaining to the ecology and environmental features of the study area and surrounding area, and existing vegetation mapping was conducted to identify records of threatened species, populations and communities and their potential habitat. Databases and vegetation mapping that were reviewed included:

- BioNet (Atlas of NSW Wildlife) database search (5 km) threatened species, populations and ecological communities listed under the BC Act 2016 (November 2019)
- EPBC Act 1999 Protected Matters Search Tool (5 km) for threatened and migratory species, populations and ecological communities listed under the Commonwealth EPBC Act 1999 (November 2019)
- NSW Threatened Species Profiles (DPIE 2019)
- Local Planning Reports
    - Bankstown Local Environmental Plan 2015
    - Bankstown Biodiversity Strategy 2015-2025
- Vegetation Mapping
    - The Native Vegetation of the Sydney Metropolitan Area (OEH 2016)
- Previous reports
    - Western Sydney University Milperra Campus Redevelopment - Ecological Assessment. (ELA 2018).

Species from both the Wildlife Atlas and Protected Matters online searches were combined to produce a list of threatened species, populations and communities that may occur within the study area.

3.2 Field Survey

The field survey was conducted on 30 October and 25 November 2019 by ecologists Toni Frecker (BAM Accredited Assessor) and Stacey Wilson. The site inspection was conducted to:

- Validate existing vegetation mapping (as per ELA 2018) and determine the condition of vegetation communities present, presence of any threatened ecological communities, and other native vegetation within the study area;
- Identify vegetation zones for application of the Biodiversity Assessment Method (BAM)

The collection of vegetation data using the BAM was undertaken and their cover-abundance were recorded. A total of seven full-floristic vegetation plots was surveyed to verify Plant Community Types (PCTs) and their condition within the study area (Table 2).

When habitat features were present, they were marked spatially using a handheld GPS unit. The habitat features present (i.e. hollow bearing tree), tree species, type of feature and abundance of habitat features were noted. Opportunistic sightings of all fauna present within the study area were recorded.

Table 2: Full floristic PCT and zone identification plots

Vegetation Zone	Vegetation Community	PCT ID	PCT Name	Condition	Number of plots surveyed
1	Cumberland Plain Woodland	849 - EPBC / BC listed	Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Good	1
2	Cumberland Plain Woodland	849 – BC listed	Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Low	2
3	Cumberland Plain Woodland	849 – (Landscaped)	Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Degraded	2
4	Cumberland Plain Woodland	849 – (Planted)	Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Degraded	2

3.3 Survey Limitations

This assessment was not intended to provide an inventory of all species present across the study area but instead an overall assessment of the ecological values of the study area with particular emphasis on threatened species, endangered ecological communities and key fauna habitat features

4. Results

4.1 Vegetation Mapping and Plant Community Types

Field survey confirmed the previous mapping by ELA in 2017 and validated the presence of one threatened ecological community Cumberland Plain Woodland (CPW).

Field survey identified a total of four vegetation zones (Figure 1), which have been assigned to appropriate Plant Community Type (PCT). Table 3below shows the assigned vegetation zones and their listing under both the BC Act and EPBC Act.

The condition of CPW vegetation within the study area was highly variable.

Table 3: Summary of vegetation condition and conservation status

Vegetation	Condition	Description	TSC Act	EPBC Act
CPW (EPBC / BC listed)	Good	• Remnant/ regrowth vegetation, native shrubs and ground layer present • Vegetation patch is >0.5 ha in size • Native canopy > 10% • Perennial ground cover > 50%	Yes	Yes
CPW (BC listed)	Low	• Vegetation fragmented and contains high density of exotic ground cover species • Mature native canopy > 10% • Perennial ground cover did not achieve > 30% and/or patch size did not achieve > 0.5 ha • Several isolated patches within study area	Yes	No
CPW (Landscaped)	Degraded	• Planted species of native tree • Landscaped garden • Perennial ground cover did not achieve > 30% and/or patch size did not achieve > 0.5 ha	No	No
CPW (Planted)	Degraded	• Planted species of diagnostic CPW tree species • Consist of single isolated trees with a mown exotic understorey and/or carpark	No	No

4.2 Threatened Flora and Fauna

A search for threatened species using the Protected Matters Search Tool and Atlas of NSW Wildlife (within a 5 km buffer around the study area) and the review of literature identified a number of threatened flora species, threatened fauna and migratory species.

An assessment of the likelihood of occurrence of threatened species within the study area is in **Appendix A** and was used to guide the site inspection methodology. Note, the likelihood of occurrence provided in **Appendix A** represents the assessment following the site inspection results.

It should also be noted that the results of the Protected Matters Search Tool, which have been included in **Appendix A**, includes species based on habitat modelling and species records.

4.2.1 Threatened Flora

One threatened flora species *Acacia pubescens* (Downy Wattle) was recorded in the conservation area in the north east corner of the study area. This species is listed as vulnerable under the BC and EPBC Acts. A total of 12 stems from three clumps were recorded during the field survey. This is a decline in numbers since 2010 where 38 stems were recorded (AMBS 2010). This population of *A. pubescens* is currently under threat from the spread of exotic species with the health of some individuals in poor condition and evidence of dead individuals. Continued dry climatic conditions may also be impacting this population.

Five *Eucalyptus scoparia* (Wallangarra White Gum) trees were recorded on site located near the library (ELA 2018). *E. scoparia* is listed as endangered under the TSC Act and vulnerable under the EPBC Act. This tree is known from the New England Tablelands and are therefore planted specimens.

Eucalyptus nicholii (Narrow-leaved Black Peppermint) has previously been recorded on the site (ELA 2018). However, this would have been a planted specimen as this species is not known from the local area.

4.2.2 Fauna species and their habitat

Vegetation within the study area provides suitable habitat for a number of common peri-urban species and potential habitat for threatened fauna species. The habitat features within the study area relevant to each fauna group are identified in Table 4below.

Table 4: Habitat features and associated fauna groups (guilds) recorded in the study area

Habitat Features	Guild	Presence of habitat features in study area
Native vegetation	Birds, microchiropteran bats (microbats), megachiropteran bats (fruit bats) and arboreal mammals	Remnant patch of CPW and large amount of mature native trees
Winter flowering species	Winter migratory birds, arboreal mammals and megachiropteran bats (fruit bats)	*Eucalyptus tereticornis*, *Corymbia maculata*, *Eucalyptus sideroxylon* and *Corymbia citriodora* were present and distributed across the study area
Hollow-bearing trees	Birds, arboreal mammals and microbats	Hollow-bearing trees were identified in the study area including in the remnant patch of CPW and in some of the mature native trees
Leaf litter	Reptiles, amphibians, invertebrates	Present within the remnant patch of CPW
Coarse woody debris	Terrestrial mammals, reptiles, invertebrates	Present within the remnant patch of CPW

4.2.3 Species Credit Species

In accordance with the BAM, Table 5 outlines the species credit species predicted to occur at the Developable area (i.e. candidate species). These species will require targeted survey to confirm presence during the preparation of the BDAR.

Table 5: Species credit species that may require survey

Scientific Name	Common Name	Survey Months
Flora		
Acacia pubescens	Downy Wattle	January - December
Fauna		
Burhinus grallarius	Bush Stone-curlew	January – December
Meridolum corneovirens	Cumberland Plain Land Snail	January – December

5. Constraints Assessment

5.1 Triggering the Biodiversity Offsets Scheme – Biodiversity Conservation Act 2016

For a local development under Part 4 of the EP&A Act 1979, the Biodiversity Offsets Scheme (BOS) and Biodiversity Assessment Method (BAM) may be triggered by the following means:

- Area clearing threshold- exceeding the area clearing threshold associated with the minimum lot size for the property will trigger entry into the BOS (Table 6)
- Whether the impacts occur on an area mapped on the Biodiversity Value Map

If the proposed development does not exceed the two thresholds listed above, the proponent is required to undertake 'tests of significance' for threatened ecological communities and threatened species. If a 'test of significance' determines a significant impact, the BOS will be triggered and the preparation of a BDAR will be required.

5.1.1 Biodiversity Offsets Scheme – Area Clearing Threshold

The area clearing threshold is triggered when an area of native vegetation* to be cleared reaches the thresholds for the relevant lot size (Table 6).

In accordance with the Bankstown LEP 2015, the minimum lot size for the study area is currently the actual lot size (23 ha). Thus, if the proposed development clears more than 0.5 ha of native vegetation, a BDAR will be required. However, it is noted that if a future planning proposal amends the Bankstown LEP 2015, and the minimum lot size is reduced to less than 1 ha, the BOS will be triggered if the proposed development clears more than 0.25 ha of native vegetation.

Table 6: Area clearing threshold

Minimum lot size associated with the property	Threshold for clearing native vegetation, above which the BAM and offsets scheme apply
Less than 1 ha	0.25 ha or more
1 ha to less than 40 ha	0.5 ha or more
40ha to less than 1000 ha	1 ha or more
1000 ha or more	2 ha or more

* Note: native vegetation is defined in Section 1.6 of the BC Act 2016 (and has the same meaning as in Part 5A of the *Local Land Services Act 2013*); essentially encompasses any species native to NSW and does not necessarily conform to a Plant Community Type.

5.1.2 Offset Scheme Thresholds – Biodiversity Values Land Map

The Biodiversity Values map identifies land considered to have high biodiversity values as defined by the *Biodiversity Conservation Regulation 2017*. The study area does contain areas of high biodiversity value as mapped below (Figure 2) (accessed 1 December 2019). This area of high biodiversity value falls within the proposed development area. Clearing of this land triggers entry into the BOS scheme and therefore the development will require preparation of a BDAR.

Figure 2: Biodiversity values map identifying vegetation in the west of the study area (mapped in purple)

5.2 Serious and Irreversible Impacts (SAII)

The BC Act 2016 requires a consent authority to consider whether a development will have a Serious and Irreversible Impact (SAII) on biodiversity values. If a local development has SAII it must be refused by the consent authority. Cumberland Plain Woodland is a candidate ecological community for SAII, however thresholds for what is considered SAII have not yet been set. To our knowledge a DA has not yet been refused on the basis of a SAII. Therefore, the likelihood of a SAII cannot be confirmed until either thresholds are published, or a refusal is set as a precedent. Avoiding or minimising impacts to these communities would reduce the risk of an SAII.

6. Mitigation Measures

6.1 Offsetting Requirements and Options

As discussed above, as the Biodiversity Offset Scheme will be triggered, the proponent will be required to offset the associated impacts of the proposed development on biodiversity.

The number of credits required to be purchased is determined by collection of field survey data so that the project can be assessed using the Biodiversity Assessment Method and a BDAR prepared that outlines the number of credits required to offset the loss of biodiversity. If the development is approved, a condition of consent would require the purchase and retirement of credits prior to construction. This would need to be assessed for each DA unless a strategic approach (i.e. Biodiversity Certification) is taken.

There are three ways in which credit requirements can be satisfied as described below. Caution is required when advising on credit prices for two reasons. Firstly, because it is a transition period between old credits under the Biobanking Scheme and 'new' credits under the BC Act 2016. The conversion from one to the other has resulted in significant uncertainty in how to price credits as all sales of credits were under the Biobanking scheme. Secondly because credits are a market commodity and therefore may rise and fall in value with supply and demand.

6.1.1 Purchasing Credits from the Market

Credits can be purchased from vendors in the credit market. A price is agreed between purchaser and vendor. Once purchased, credits are transferred into the purchaser's ownership and then retired via DPIE. In some cases, a purchaser may agree to purchase credits that have not yet been generated - for example when a landholder has lodged a Stewardship Agreement but has not yet had the Agreement approved. An options agreement can be used to say that the purchaser will buy the credits at a certain price if/when the credits are created. This latter approach obviously has a higher risk to the purchaser.

If the proponent chooses to purchase credits from the market to meet the offset obligations from the development, it is important to understand the like-for-like rule. This rule ensures biodiversity impacts are offset with biodiversity that is very similar to the biodiversity being impacted. The like-for-like rule requires that:

- Impacts on native vegetation must be offset with vegetation that is in the same local area as the impact (based on near or adjacent Interim Biogeographic Regionalisation for Australia (IBRA) subregions) and:
    - If a TEC was impacted, the offset must be for the same TEC, or
    - If native vegetation that is not a TEC was impacted, the offset must be vegetation that is the same vegetation class and in the same or higher offset trading group.

6.1.2 Payment to the Biodiversity Conservation Trust

Under the new BC Act 2016, the proponent also has the option to pay into the Biodiversity Conservation Fund (BCF). Once the Biodiversity Conservation Trust (BCT) receives payment for the offset obligation, the proponents offset obligations are discharged.

DPIE has produced a Biodiversity Offsets Payment Calculator (BOPC) to provide a price guide for credits. Credit prices will however change with supply and demand, and it is possible that these prices could change **significantly** between now and when the credits are required. An indicative estimate of the credits required for the proposed development is provided in Table 7 below.

If a project is required to offset impacts to EPBC listed communities, the BCT may not be an option as the Commonwealth Department of Energy and the Environment has not signed a bi-lateral agreement with NSW and therefore simply paying money into the BCT does not provide the Commonwealth with the certainty that it will be used to protect and manage EPBC listed communities. For this preliminary assessment, it has been assumed that no EPBC listed CPW (i.e. Cumberland Plain Woodland (BC and EPBC listed) as shown in Figure 1), will be impacted.

Table 7: Costs for PCT identified within the development area (6/12/19)

PCT	Cost of 1 Credit (ex GST)	Credits Required (indicative)	Total Costs (indicative)
849	$39,992.41	5	$200,000

6.1.3 Generating Credits within the Conservation Area

The proponent can potentially generate credits from within the site by establishing a Biodiversity Stewardship Agreement under the BC Act 2016 over the conservation lands. A Stewardship site would generate biodiversity credits which could be used by the proponent on this or other projects - or sold on the market.

A Stewardship site is permanently secured for conservation purposes and money is set aside for the in-perpetuity management of the land. The financial contribution is placed into a Trust Fund at the start of the project and money is provided back to the landholder on an annual basis to cover the annual costs of management. If the biodiversity credits are sold for more than the Trust Fund Deposit (TFD) the landowner keeps difference between the sale price and the TFD. Establishing such sites and selling them is a taxable event. ELA are not tax experts and therefore we recommend consultation with a tax expert if this option is pursued.

The Stewardship option may also be attractive if the proponent wishes to dedicate the land to a public authority as it means the public authority has a reliable source of funds to cover the cost of management in-perpetuity and therefore avoids taking on a liability with no funds to cover it. The TFD needs to be large enough to pay for the in-perpetuity management of the Stewardship Site. Part of the TFD is then returned to the landowner each year to pay for the management actions.

Figure 3: Additional revegetation site in conservation area (outlined in purple)

7. Conclusion

The subject site contains Cumberland Plain Woodland, which is listed as critically endangered Ecological Community under the both the BC Act 2019 and EPBC Act 1999.

The BOS will be triggered by any development that involves the clearing of 0.5 ha or more of native vegetation on the site or if the areas mapped on the BV Map are cleared. Further field survey, primarily for threatened species searches, is required to finalise the number of credits that would need to be purchased and retired, or offset, if the proposal was approved.

Indicative biodiversity credits have been calculated for both those required for clearing in the developable area and those generated by the establishment of a Stewardship site in the offset area; with the potential for credits to be generated within the study area.

8. References

Australian Museum Business Services 2010. *Opportunities and Constraints Assessment, UWS Bankstown Campus*. Prepared for the University of Western Sydney.

Bangalay Botanical Surveys 2010. *Remnant Bushland and Biodiversity Management Plan for the University of Western Sydney (Bankstown Campus).* Prepared for the University of Western Sydney.

Department of the Environment and Energy 2017a. *Protected matters search tool website*. [online]. Australian Government. Available: http://www.deh.gov.au/erin/ert/epbc/index.html

Department of the Environment and Energy 2017b. *Species Profile and Threats Database*. [Online] Available from: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Department of the Environment 2015. *National Flying-fox Monitoring Viewer*. Available: http://www.environment.gov.au/webgis-framework/apps/ffc-wide/ffc-wide.jsf

Eco Logical Australia (ELA) 2017. *Western Sydney University Milperra Campus Redevelopment - Ecological Assessment*. Prepared for APP c/- Western Sydney University.

Greening Australia (date unknown). *UWS Vegetation Management Plan*. Prepared for the University of Western Sydney.

Office of Environment and Heritage (OEH) 2016. *The Native Vegetation of the Sydney Metropolitan Area. Volume 2: Vegetation Community Profiles. Version 3.0*. NSW Office of Environment and Heritage, Sydney.

NSW Department of Planning, Industry and Environment (DPIE). 2017a. *Threatened Species Database* (5 km radius search). OEH Sydney, NSW.

NSW Department of Planning, Industry and Environment (DPIE) 2019. Threatened Species Profiles. Available: https://www.environment.nsw.gov.au/threatenedSpeciesApp/

Appendix A Likelihood of Occurrence Table

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the site inspection and professional judgement. Some Migratory or Marine species identified from the Commonwealth database search have been excluded from the assessment, due to lack of habitat. The terms for likelihood of occurrence are defined below:

- "yes" - the species was or has been observed on the site
- "likely" = a medium to high probability that a species uses the site
- "potential" = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- "unlikely" = a very low to low probability that a species uses the site
- "no" = habitat on site and in the vicinity is unsuitable for the species.

The records column refers to the number of records occurring within 5 km of the study area, as provided by the NSW Wildlife Atlas (BioNet) database search.

Information provided in the habitat associations' column has primarily been extracted (and modified) from the Commonwealth Species Profile and Threats Database and the NSW Threatened Species Profiles.

Scientific Name	BC Act Status	EPBC Act Status	Description	Likelihood of Occurrence	Impact Assessment Required
THREATENED ECOLOGICAL COMMUNITIES					
Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion (BC Act) Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion (EPBC Act)	V / CE	E	Sydney Basin Bioregion, mostly in the Cumberland IBRA sub-region, with small occurrences in the Sydney Cataract, Wollemi and Burragorang sub-regions. It occurs primarily in the Castlereagh area in the north-west of the Cumberland Plain with other known occurrences near Holsworthy, Kemps Creek and Longneck Lagoon. Occurs primarily on Tertiary sands and gravels of the Hawkesbury-Nepean river system. At Agnes Banks it primarily occurs on aeolian (wind-blown) sands overlying Tertiary alluvium. Found on flat or gently undulating terrain in rain shadow areas typically receiving 700–900 mm annual rainfall. The ecological community occurs primarily at low elevations up to 80 m above sea level (ASL), including old ridges, dunes and terraces.	No - this TEC does not occur within the subject site.	No
Coastal Swamp Oak (*Casuarina glauca)* Forest of New South Wales and South East Queensland ecological community	E	E	The structure of the community may vary from open forests to low woodlands, scrubs or reedlands with scattered trees. It has a dense to sparse tree layer in which *Casuarina glauca* (Swamp Oak) is the dominant species northwards from Bermagui. Other trees including *Acmena smithii* (Lilly Pilly), *Glochidion* spp. (Cheese Trees) and *Melaleuca* spp. (Paperbarks) may be present as subordinate species, and are found most frequently in stands of the community northwards from Gosford. *Melaleuca ericifolia* is the only abundant tree in this community south of Bermagui. The understorey is characterised by frequent occurrences of vines, *Parsonsia straminea, Geitonoplesium cymosum* and *Stephania japonica* var. discolor, a sparse cover of shrubs, and a continuous groundcover of forbs, sedges, grasses and leaf litter. The composition of the ground stratum varies depending on levels of salinity in the groundwater.	No - this TEC does not occur within the subject site.	No
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	E	CE	Occurs in western Sydney, with the most extensive stands occurring in the Castlereagh and Holsworthy areas. Smaller remnants occur in the Kemps Creek area and in the eastern section of the Cumberland Plain. Mainly occurs on clay soils derived from the deposits of ancient river systems (alluvium), or on shale soils of the Wianamatta Shales.	No - this TEC does not occur within the subject site.	No

Scientific Name	BC Act Status	EPBC Act Status	Description	Likelihood of Occurrence	Impact Assessment Required
Cumberland Plain Woodland in the Sydney Basin Bioregion (BC Act) Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest (EPBC Act)	CE	CE	Remnants scattered widely across the Cumberland Plain in western Sydney. Typically occurs on heavy clay soils derived from Wianamatta Shale. Flat to undulating or hilly terrain, at elevations up to approximately 350 metres above sea level. Predominantly associated with clay soils, that are derived from Wianamatta Shale geology. Minor occurrences may be present on other soil groups, notably Holocene Alluvium and soils derived from the Mittagong Formation	Yes – this TEC was identified within the study area.	Yes
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	CE	CE	Occurs at the edges of the Cumberland Plain in western Sydney, most now occurs in the Hawkesbury, Baulkham Hills, Liverpool, Parramatta, Penrith, Campbelltown and Wollondilly local government areas. Intergrade between clay soils from the shale rock and earthy and sandy soils from sandstone, or where shale caps overlay sandstone.	No - this TEC does not occur within the subject site.	No
Turpentine-Ironbark Forest of the Sydney Basin Bioregion	CE	CE	Open forest, with dominant canopy trees including *Syncarpia glomulifera* (Turpentine), *Eucalyptus punctata* (Grey Gum), *Eucalyptus paniculate* (Grey Ironbark) and *Eucalyptus* eugenoides (Thin-leaved Stringybark). In areas of high rainfall (over 1050 mm per annum) *Eucalyptus saligna* (Sydney Blue Gum) is more dominant. The shrub stratum is usually sparse and may contain mesic species such as *Pittosporum undulatum* (Sweet Pittosporum) and *Polyscias sambucifolia* (Elderberry Panax). 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.	No - this TEC does not occur within the subject site.	No
Robertson Basalt Tall Open-forest in the Sydney Basin and South Eastern Highlands Bioregions (BC Act)	CE	E	The structure of the ecological community varies from tall open forest to woodland depending on aspect, slope, soil conditions, soil depth, and previous disturbance. Typically, the ecological community has a sparse to dense layer of shrubs and vines, and a diverse understorey of native grasses, forbs, twiners and ferns.	No - this TEC does not occur within the subject site.	No

Scientific Name	BC Act Status	EPBC Act Status	Description	Likelihood of Occurrence	Impact Assessment Required
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion (EPBC Act)					
Western Sydney Dry Rainforest and Moist Woodland on Shale	E	CE	Cumberland Plain Sub-region of the Sydney Basin Bioregion. It generally occurs in rugged terrain and other patches may occur on undulating terrain, with dry rainforest patches typically occupying steep lower slopes and gullies, and moist woodland patches typically occupying upper sections of the slope occurs almost exclusively on clay soils derived from Wiannamatta Group shales.	No - this TEC does not occur within the subject site.	No
Key: V = Vulnerable, E = Endangered, CE = Critically Endangered.					

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
FAUNA							
Birds							
Actitis hypoleucos	Common Sandpiper	-	Ma, Mi	Found along all coastlines of Australia and in many areas inland. The species 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.	2	Unlikely - lack of suitable habitat for this species in the subject site.	No
Anthochaera phrygia	Regent Honeyeater	E4A	CE	Inland slopes of south-east Australia, and less frequently in coastal areas. In NSW, most records are from the North-West Plains, North-West and South-West Slopes, Northern Tablelands, Central Tablelands and Southern Tablelands regions; also recorded in the Central Coast and Hunter Valley regions. Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of *Casuarina cunninghamiana* (River Oak).	19	Unlikely - lack of suitable habitat for this species in the subject site.	No
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	Dusky woodswallows are widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland	30	Unlikely - lack of suitable habitat for this species in the subject site.	No
Botaurus poiciloptilus	Australasian Bittern	E1	E	Found over most of NSW except for the far north-west. Found in permanent freshwater wetlands with tall, dense vegetation, particularly *Typha* spp. (bullrushes) and *Eleocharis* spp. (spikerushes).	1	Unlikely - lack of suitable habitat for this species in the subject site.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Burhinus grallarius	Bush-stone Curlew	E1	-	In NSW, found sporadically in coastal areas, and west of the divide throughout the sheep-wheat belt. In NSW, it occurs in lowland grassy woodland and open forest.	3	Unlikely - lack of suitable habitat for this species in the subject site.	No
Circus assimilis	Spotted Harrier	V	-	Found throughout the Australian mainland, except in densely forested or wooded habitats, and rarely in Tasmania. Grassy open woodland, inland riparian woodland, grassland, shrub steppe, agricultural land and edges of inland wetlands.	5	Unlikely - lack of suitable habitat for this species in the subject site.	No
Daphoenositta chrysoptera	Varied Sittella	V	-	Distribution in NSW is nearly continuous from the coast to the far west. Inhabits eucalypt forests and woodlands, mallee and Acacia woodland.	25	Unlikely - lack of suitable habitat for this species in the subject site.	No
Dasyornis brachypterus	Eastern Bristlebird	E1	E	There are three main populations: Northern - southern Qld/northern NSW, Central - Barren Ground NR, Budderoo NR, Woronora Plateau, Jervis Bay NP, Booderee NP and Beecroft Peninsula and Southern - Nadgee NR and Croajingalong NP in the vicinity of the NSW/Victorian border. Central and southern populations inhabit heath and open woodland with a heathy understorey. In northern NSW, habitat comprises open forest with dense tussocky grass understorey.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Glossopsitta pusilla	Little Lorikeet	V	-	In NSW, found from the coast westward as far as Dubbo and Albury. Dry, open eucalypt forests and woodlands, including remnant woodland patches and roadside vegetation.	36	Potential – *Eucalyptus* sp., *Melaleuca* sp. And *Angophora* sp., which form foraging and roosting habitat for this species, were identified within the study area.	Yes (foraging)

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Grantiella picta	Painted Honeyeater	V	V	Widely distributed in NSW, predominantly on the inland side of the Great Dividing Range but avoiding arid areas. Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	-	Distributed along the coastline of mainland Australia and Tasmania, extending inland along some of the larger waterways, especially in eastern Australia. Freshwater swamps, rivers, lakes, reservoirs, billabongs, saltmarsh and sewage ponds and coastal waters. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest and urban areas.	24	Unlikely - lack of suitable habitat for this species in the subject site.	No
Hieraaetus morphnoides	Little Eagle	V	-	Throughout the Australian mainland, with the exception of the most densely-forested parts of the Dividing Range escarpment. Open eucalypt forest, woodland or open woodland, including sheoak or Acacia woodlands and riparian woodlands of interior NSW.	14	Unlikely - lack of suitable habitat for this species in the subject site.	No
Hirundapus caudacutus	White-throated Needletail	-	M	All coastal regions of NSW, inland to the western slopes and inland plains of the Great Divide. Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	9	Unlikely - lack of suitable habitat for this species in the subject site.	No
Ixobrychus flavicollis	Black Bittern	V	—	Occurs in both terrestrial and estuarine wetlands generally in areas of permanent water and dense vegetation. In areas with permanent water it may occur in flooded grassland, forest, woodland, rainforest and mangroves.	8	Unlikely - lack of suitable habitat for this species in the subject site.	No
Lathamus discolor	Swift Parrot	E1	CE	Migrates from Tasmania to mainland in Autumn-Winter. In NSW, the species mostly occurs on the coast and south west slopes. Box-ironbark forests and woodlands.	46	Unlikely - lack of suitable habitat for this species in the subject site.	No
Lophoictinia isura	Square-tailed Kite	V	-	In NSW, it is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast. Timbered habitats	2	Unlikely - lack of suitable habitat for	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
				including dry woodlands and open forests, particularly timbered watercourses.		this species in the subject site.	
Melithreptus gularis gularis	Black-chinned Honeyeater	V	-	Widespread in NSW from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. Also Richmond and Clarence River areas and a few scattered sites in the Hunter, Central Coast and Illawarra regions. Occurs in open forests or woodlands dominated by box and ironbark eucalypts, or by smooth-barked gums, stringybarks, river sheoaks and tea-trees.	8	Unlikely - lack of suitable habitat for this species in the subject site.	No
Merops ornatus	Rainbow Bee-eater		Ma	Distributed across much of mainland Australia, including NSW. Open forests and woodlands, shrublands, farmland, areas of human habitation, inland and coastal sand dune systems, heathland, sedgeland, vine forest and vine thicket.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Monarcha melanopsis	Black-faced Monarch	-	M	In NSW, occurs around the eastern slopes and tablelands of the Great Divide, inland to Coutts Crossing, Armidale, Widden Valley, Wollemi National Park and Wombeyan Caves. It is rarely recorded farther inland. Rainforest, open eucalypt forests, dry sclerophyll forests and woodlands, gullies in mountain areas or coastal foothills, Brigalow scrub, coastal scrub, mangroves, parks and gardens.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Motacilla flava	Yellow Wagtail	-	M	Regular summer migrant to mostly coastal Australia. In NSW recorded Sydney to Newcastle, the Hawkesbury and inland in the Bogan LGA. Swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land, lawns.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Myiagra cyanoleuca	Satin Flycatcher	-	M	In NSW, widespread on and east of the Great Divide and sparsely scattered on the western slopes, with very occasional records on the western plains. Eucalypt-dominated forests, especially near wetlands, watercourses, and heavily-vegetated gullies.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Neophema chrysogaster	Orange-bellied Parrot	E4	CE	Breeds in Tasmania and migrates in autumn to spend the winter on the mainland coast of south-eastern SA and southern Victoria. Occasional reports from NSW, most recently Shellharbour and Maroubra in May	0	Unlikely - lack of suitable habitat for	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
				2003. Winter habitat is mostly within 3 km of the coast in sheltered bays, lagoons, estuaries, coastal dunes and saltmarshes. Also small islands and peninsulas, saltworks, golf courses, low samphire herbland and taller coastal shrubland.		this species in the subject site.	
Neophema pulchella	Turquoise Parrot	V	-	Occurs along the length of NSW from the coastal plains to the western slopes of the Great Dividing Range. Eucalypt and cypress pine open forests and woodlands, ecotones between woodland and grassland, or coastal forest and heath.	1	Unlikely - lack of suitable habitat for this species in the subject site.	No
Ninox strenua	Powerful Owl	V	-	Powerful Owls are associated with a wide range of wet and dry forest types with a high density of prey, such as arboreal mammals, large birds and flying foxes. Large trees with hollows at least 0.5m deep are required for shelter and breeding.	24	Unlikely - lack of suitable habitat for this species in the subject site.	No
Numenius madagascariensis	Eastern Curlew	-	CE, M	Summer migrant to Australia. Primarily coastal distribution in NSW, with some scattered inland records. Estuaries, bays, harbours, inlets and coastal lagoons, intertidal mudflats or sandflats, ocean beaches, coral reefs, rock platforms, saltmarsh, mangroves, freshwater/brackish lakes, saltworks and sewage farms.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Petroica boodang	Scarlet Robin	V	-	In NSW, it occurs from the coast to the inland slopes. Dry eucalypt forests and woodlands, and occasionally in mallee, wet forest, wetlands and tea-tree swamps.	2	Unlikely - lack of suitable habitat for this species in the subject site.	No
Petroica phoenicea	Flame Robin	V	-	In NSW, breeds in upland areas, and in winter many birds move to the inland slopes and plains, or occasionally to coastal areas. Likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in upland tall moist eucalypt forests and woodlands. In winter uses dry forests, open woodlands, heathlands, pastures and native grasslands. Occasionally occurs in temperate rainforest, herbfields, heathlands, shrublands and sedgelands at high altitudes.	3	Unlikely - lack of suitable habitat for this species in the subject site.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Petroica rodinogaster	Pink Robin	V	-	North to near Bombala in south-eastern NSW. Disperses north and west in winter, sometimes as far north as the central coast of NSW. Rainforest and tall, open eucalypt forest, particularly in densely vegetated gullies.	1	Unlikely - lack of suitable habitat for this species in the subject site.	No
Rhipidura rufifrons	Rufous Fantail	-	M	Coastal and near coastal districts of northern and eastern Australia, including on and east of the Great Divide in NSW. Wet sclerophyll forests, subtropical and temperate rainforests. Sometimes drier sclerophyll forests and woodlands.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Rostratula australis	Australian Painted Snipe	E1	E	In NSW most records are from the Murray-Darling Basin. Other recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. Swamps, dams and nearby marshy areas.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Tyto novaehollandiae	Masked Owl	V	-	Associated with forest with sparse, open, understorey, typically dry sclerophyll forest and woodland and especially the ecotone between wet and dry forest, and non-forest habitat. Known to utilise forest margins and isolated stands of trees within agricultural land and heavily disturbed forest where its prey of small and medium sized mammals can be readily obtained.	1	Unlikely - lack of suitable habitat for this species in the subject site.	No
Mammals							
Cercartetus nanus	Eastern Pygmy-possum	V	-	The Eastern Pygmy Possum occurs in wet and dry eucalypt forest, subalpine woodland, coastal banksia woodland and wet heath. Pygmy-Possums feed mostly on the pollen and nectar from banksias, eucalypts and understorey plants and will also eat insects, seeds and fruit. The presence of Banksia sp. and Leptospermum sp. are an important habitat feature. Small tree hollows are favoured as day nesting sites, but nests have also been found under bark, in old birds nests and in the branch forks of tea-trees.	4	Unlikely - lack of suitable habitat for this species in the subject site.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Recorded from Rockhampton in Qld south to Ulladulla in NSW. Largest concentrations of populations occur in the sandstone escarpments of the Sydney basin and the NSW north-west slopes. Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.	3	Unlikely - lack of suitable habitat for this species in the subject site.	No
Dasyurus maculatus	Spotted-tailed Quoll	V	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Qld. Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	South-east coast and ranges of Australia, from southern Qld to Victoria and Tasmania. In NSW, records extend to the western slopes of the Great Dividing Range. Tall (greater than 20m) moist habitats.	10	Likely – hollow bearing trees, which represent roosting habitat for this species, were identified within the subject site.	Yes
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	-	Found along the east coast from south Qld to southern NSW. Dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.	4	Likely – hollow bearing trees, which represent roosting habitat for this species, were identified within the subject site.	Yes
Miniopterus australis	Little Bent-winged Bat	V	-	East coast and ranges south to Wollongong in NSW. Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub.	5	Likely – hollow bearing trees, which represent roosting habitat for this species, were	Yes

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
						identified within the subject site.	
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	In NSW it occurs on both sides of the Great Dividing Range, from the coast inland to Moree, Dubbo and Wagga Wagga. Rainforest, wet and dry sclerophyll forest, monsoon forest, open woodland, paperbark forests and open grassland.	409	Unlikely - lack of suitable habitat for this species in the subject site	No
Myotis macropus	Southern Myotis	V	-	In NSW, found in the coastal band. It is rarely found more than 100 km inland, except along major rivers. Foraging habitat is waterbodies (including streams, or lakes or reservoirs) and fringing areas of vegetation up to 20m.	63	Unlikely – Lack of suitable foraging habitat near subject site	No
Petauroides volans	Greater Glider	-	V	Greater Glider is found in Eastern Australia, from the Windsor Tableland in north Queensland through to central Victoria (Wombat State Forest). Eucalypt forests and woodlands. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Petrogale penicillata	Brush-tailed Rock-wallaby	E1	V	In NSW they occur from the Qld border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Phascolarctos cinereus	Koala	V	V	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. There are sparse and possibly disjunct populations in the Bega District, and at several sites on the southern tablelands. Eucalypt woodlands and forests.	83	Unlikely - lack of suitable habitat for this species in the subject site.	No
Pseudomys novaehollandiae	New Holland Mouse	-	V	Fragmented distribution across eastern NSW. Open heathlands, woodlands and forests with a heathland understorey, vegetated sand dunes.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria. Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	447	Likely – hollow bearing trees, which represent roosting habitat for this species, were identified within the subject site.	Yes
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	There are scattered records of this species across the New England Tablelands and North West Slopes. Rare visitor in late summer and autumn to south-western NSW. Almost all habitats, including wet and dry sclerophyll forest, open woodland, open country, mallee, rainforests, heathland and waterbodies.	6	Unlikely - lack of suitable habitat for this species in the subject site.	No
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	Both sides of the great divide, from the Atherton Tableland in Qld to north-eastern Victoria, mainly along river systems and gullies. In NSW it is widespread on the New England Tablelands. Woodland, moist and dry eucalypt forest and rainforest.	6	Likely – hollow bearing trees, which represent roosting habitat for this species, were identified within the subject site.	Yes
Amphibians							
Heleioporus australiacus	Giant Burrowing Frog	V	V	South eastern NSW and Victoria, in two distinct populations: a northern population in the sandstone geology of the Sydney Basin as far south as Ulladulla, and a southern population occurring from north of Narooma through to Walhalla, Victoria. Heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Litoria aurea	Green and Golden Bell Frog	E1	V	Since 1990, recorded from ~50 scattered sites within its former range in NSW, from the north coast near Brunswick Heads, south along the coast to Victoria. Records exist west to Bathurst, Tumut and the ACT	19	Unlikely - lack of suitable habitat for	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
				region. Marshes, dams and stream-sides, particularly those containing Typha spp. (bullrushes) or Eleocharis spp. (spikerushes). Some populations occur in highly disturbed areas.		this species in the subject site.	
Litoria littlejohni	Littlejohn's Tree Frog	V	V	Plateaus and eastern slopes of the Great Dividing Range from Watagan State Forest south to Buchan in Victoria. The species has not been recorded in southern NSW within the last decade. "Breeding habitat is the upper reaches of permanent streams and perched swamps. Non-breeding habitat is heath-based forests and woodlands	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Litoria raniformis	Southern Bell Frog	E1	V	In NSW, only known to exist in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. A few recent unconfirmed records have also been made in the Murray Irrigation Area. Permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. Also found in irrigated rice crops.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No
Pseudophryne australis	Red-crowned Toadlet	V	-	It has a restricted distribution. It is confined to the Sydney Basin, from Pokolbin in the north, the Nowra area to the south, and west to Mt Victoria in the Blue Mountains. The species occurs in open forests, mostly on Hawkesbury and Narrabeen Sandstones. Breeding congregations occur in dense vegetation and debris beside ephemeral creeks and gutters. Red-crowned Toadlets have not been recorded breeding in waters that are even mildly polluted or with a pH outside the range 5.5 to 6.5.	4	Unlikely - lack of suitable habitat for this species in the subject site.	No
Reptiles							
Hoplocephalus bungaroides	Broad-headed Snake	E1	V	Largely confined to Triassic and Permian sandstones within the coast and ranges in an area within approximately 250 km of Sydney. Dry and wet sclerophyll forests, riverine forests, coastal heath swamps, rocky outcrops, heaths, grassy woodlands.	0	Unlikely - lack of suitable habitat for this species in the subject site.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Gastropods							
Meridolum corneovirens	Cumberland Plain Land Snail	E1	-	Areas of the Cumberland Plain west of Sydney, from Richmond and Windsor south to Picton and from Liverpool, west to the Hawkesbury and Nepean Rivers at the base of the Blue Mountains. Primarily inhabits Cumberland Plain Woodland. Also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest.	39	Potential – Cumberland Plain Woodland, which represents roosting habitat for this species, was identified within the study area.	Yes
FLORA							
Acacia bynoeana	Bynoe's Wattle	E1	V	Found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains. Heath or dry sclerophyll forest on sandy soils.	0	No - suitable habitat not recorded within the subject site.	No
Acacia prominens	Gosford Wattle	E2	-	Occurs at a few sites along the railway line at Penshurst, at Carss Bush Park, Carss Park and there is an unconfirmed siting at Oatley Park, Oatley. Open situations on clayey or sandy soils.	1	No - suitable habitat not recorded within the subject site.	No
Acacia pubescens	Downy Wattle	V	V	Restricted to the Sydney region around the Bankstown-Fairfield-Rookwood and Pitt Town area, with outliers occurring at Barden Ridge, Oakdale and Mountain Lagoon. Open woodland and forest, including Cooks River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland. Occurs on alluviums, shales and at the intergrade between shales and sandstones.	2517	Yes – 16 individuals (all juveniles) were identified in the remnant CPW in the north east corner of the study area.	No – the development proposal includes retaining the area of vegetation where this species was identified.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Allocasuarina diminuta subsp. mimica	Allocasuarina diminuta subsp. mimica L.A.S.Johnson population in the Sutherland and Liverpool local government areas	E2	-	The endangered population occurs along sandstone ridges and upper hillsides in the region northwest from Heathcote, towards Menai and Holsworthy, in heathy and low open woodland communities. It is restricted to the Local Government Areas listed in this instance (Sutherland and Liverpool). Other occurrences in the Blue Mountains and Southern Highlands (Blackheath to Bundanoon and Taralga), and also in the coastal communities from Kingsford to Little Bay) are not included in the Endangered population listing. "Heathy woodland, heathlands and low open woodlands.	1	No - suitable habitat not recorded within the subject site.	No
Allocasuarina glareicola		E1	E	Primarily restricted to the Richmond (NW Cumberland Plain) district, but with an outlier population found at Voyager Point, Liverpool. Castlereagh woodland on lateritic soil. Found in open woodland with *Eucalyptus parramattensis*, *Eucalyptus fibrosa*, *Angophora bakeri*, *Eucalyptus sclerophylla* and *Melaleuca decora*.	1	Unlikely - suitable habitat not recorded within the subject site.	No
Caesia parviflora var. minor	Small Pale Grass-lily	E1	-	In NSW, found in Barcoongere State Forest, between Grafton and Coffs Harbour. Damp places in open forest on sandstone.	1	Unlikely - suitable habitat not recorded within the subject site.	No
Caladenia tessellata	Thick-lipped Spider-orchid	—	V	*Caladenia tessellata* occurs in grassy sclerophyll woodland, often growing in well-structured clay loams or sandy soils south from Swansea, usually in sheltered moist places and in areas of increased sunlight. It flowers from September to November.	0	Unlikely - suitable habitat not recorded within the subject site.	No
Callistemon linearifolius	Nettled Bottle Brush	V	—	*Callistemon linearifolius* has been recorded from the Georges River to Hawkesbury River in the Sydney area, and north to the Nelson Bay area of NSW, growing in dry sclerophyll forest. For the Sydney area, recent records are limited to the Hornsby Plateau area near the Hawkesbury River.	31	No - suitable habitat not recorded within the subject site.	No
Cryptostylis hunteriana	Leafless Tongue Orchid	V	V	*Cryptostylis hunteriana* is known from a range of vegetation communities including swamp-heath and woodland. The larger	0	Unlikely - suitable habitat not	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
				populations typically occur in woodland dominated by Scribbly Gum (*Eucalyptus sclerophylla*), Silvertop Ash (*E. sieberi*), Red Bloodwood (*Corymbia gummifera*) and Black Sheoak (*Allocasuarina littoralis*); where it appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (*C. subulata*) and the Tartan Tongue Orchid (*C. erecta*). Occurs in Coastal Plains Scribbly Gum Woodland and Coastal Plains Smoothed-barked Apple Woodland. Flowers between November and February.		recorded within the subject site.	
Cynanchum elegans	White-flowered Wax Plant	E1	E	Restricted to eastern NSW, from Brunswick Heads on the north coast to Gerroa in the Illawarra region, and as far west as Merriwa in the upper Hunter River valley. Dry rainforest; littoral rainforest; Leptospermum laevigatum-Banksia integrifolia subsp. integrifolia (Coastal Tea-tree–Coastal Banksia) coastal scrub; Eucalyptus tereticornis (Forest Red Gum) or Corymbia maculata (Spotted Gum) open forest and woodland; and Melaleuca armillaris (Bracelet Honeymyrtle) scrub.	0	Unlikely - suitable habitat not recorded within the subject site.	No
Deyeuxia appressa	Deyeuxia appressa	—	E	Almost nothing is known of the habitat and ecology of this highly restricted NSW endemic known only from two records in the Sydney area; first collected in 1930 at Herne Bay, Saltpan Creek, off the Georges River, south of Bankstown; then collected in 1941 from Killara, near Hornsby.	2	Unlikely - suitable habitat not recorded within the subject site.	No
Epacris purpurascens var. purpurascens		V	—	*Epacris purpurascens* var. *purpurascens* has been recorded between Gosford in the north to Avon Dam in the south, in a range of habitats, but most have a strong shale soil influence.	45	Unlikely - suitable habitat not recorded within the subject site.	No
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V	V	The Narrow-leaved Peppermint occurs in grassy or sclerophyll woodland, in association with other eucalypts that grow in the region, including New England Blackbutt (*E. andrewsii*) and many of the stringybarks, such as Broad-leaved Stringybark (*E. caliginosa*).The	1	Likely - previously identified within the subject site by Angophora Consulting 2014. Not identified by	May require assessment – planted specimen

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
				species is found on shallow, relatively infertile soils on shale and slate geology.		ELA during field survey.	
Eucalyptus scoparia	Wallangarra White Gum	E1	V	In NSW it is known from only three locations near Tenterfield. Open eucalypt forest, woodland and heaths on well-drained granite/rhyolite hilltops, slopes and rocky outcrops, typically at high altitudes.	5	Yes – five trees were identified near the library within the subject site.	May require assessment – planted specimens
Genoplesium baueri	Bauer's Midge Orchid	E1	E	Has been recorded from locations between Nowra and Pittwater and may occur as far north as Port Stephens. Dry sclerophyll forest and moss gardens over sandstone.	0	Unlikely - suitable habitat not recorded within the subject site.	No
Grevillea parviflora subsp. parviflora	Small-flower Grevillea	V	V	Sporadically distributed throughout the Sydney Basin and in the Hunter in the Cessnock - Kurri Kurri area. Also known from Putty to Wyong and Lake Macquarie on the Central Coast. Heath and shrubby woodland to open forest on sandy or light clay soils usually over thin shales.	151	Unlikely - suitable habitat not recorded within the subject site.	No
Hibbertia fumana		E4A	-	Although originally collected by R. Brown, Caley and Sieber from sites as diverse as 'near South Head' and 'western Sydney', the only known extant population is in the Moorebank area (which could be the 'in occidental Sydney' or 'near Sydney' of either author). Currently only known from a single population at Moorebank but potentially elsewhere in greater Sydney. Generally found in areas of woodland with a more open understorey, in a long intergrade between Castlereagh Scribbly Gum Woodland and Castlereagh Ironbark Forest at the Moorebank Site. Has the potential to occur in similar intergrade alluvial habitats rich in sands and laterite in other parts of western Sydney.	396	Unlikely - suitable habitat not recorded within the subject site.	No
Hibbertia puberula		E1		Wollemi National Park south to Morton National Park and the south coast near Nowra. Low heath, dry sclerophyll woodland, upland swamps, on sandy soils or clay.	10	Unlikely - suitable habitat not	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
						recorded within the subject site.	
Hibbertia puberula subsp. glabrescens		E4A	CE	Known to occur in only one population, at Bankstown Airport in Sydney's southern suburbs. Heavily modified low grass/shrub association on sandy alluvium with a high silt content.	0	Unlikely - suitable habitat not recorded within the subject site.	No
Hibbertia sp. Bankstown		E4	CE	Known to occur in only one population, at Bankstown Airport in Sydney's southern suburbs. "Heavily modified low grass/shrub association (ex Cooks River/Castlereagh Ironbark Forest) on sandy alluvium with a high silt content.	314	Unlikely - suitable habitat not recorded within the subject site.	No
Hibbertia stricta subsp. furcatula		E1	-	Two known populations: one in the southern outskirts of Sydney around the Woronora River gorge, near Loftus and in Royal National Park; the other is near Nowra on the mid-South Coast. Dry eucalypt forest and woodland	6	Unlikely - suitable habitat not recorded within the subject site.	No
Leucopogon exolasius	Woronora Beard-heath	V	V	Upper Georges River area and in Heathcote National Park. Woodland on sandstone.	2	Unlikely - suitable habitat not recorded within the subject site.	No
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	E2	-	Razorback Range, also recorded at Prospect, Bankstown, Smithfield, Cabramatta Creek and St Marys. Vine thickets and open shale woodland.	12	Unlikely - suitable habitat not recorded within the subject site.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Melaleuca biconvexa	Biconvex Paperbark	V	V	The Biconvex Paperbark occurs in damp areas, often near watercourses, on alluvium soils over shale (Terrigal formation). The species may form a dense stand in a narrow strip adjacent to a watercourse.	0	Unlikely - suitable habitat not recorded within the subject site.	No
Melaleuca deanei	Deane's Paperbark	V	V	Found in heath on sandstone, and also associated with woodland on broad ridge tops and slopes on sandy loam and lateritic soils.	6	Unlikely - suitable habitat not recorded within the subject site.	No
Persoonia hirsuta	Hairy Geebung	E1	E	*Persoonia hirsuta* occurs from Singleton in the north, south to Bargo and the Blue Mountains to the west. It grows in dry sclerophyll eucalypt woodland and forest on sandstone.	2	Unlikely - suitable habitat not recorded within the subject site.	No
Persoonia nutans	Nodding Geebung	E1	E	Restricted to the Cumberland Plain in western Sydney, between Richmond in the north and Macquarie Fields in the south. Northern populations: sclerophyll forest and woodland (Agnes Banks Woodland, Castlereagh Scribbly Gum Woodland and Cooks River / Castlereagh Ironbark Forest) on aeolian and alluvial sediments. Southern populations: tertiary alluvium, shale sandstone transition communities and Cooks River / Castlereagh Ironbark Forest.	42	Unlikely - suitable habitat not recorded within the subject site.	No
Pimelea curviflora var. curviflora		V	V	Confined to the coastal area of the Sydney and Illawarra regions between northern Sydney and Maroota in the north-west and Croom Reserve near Albion Park in the south. Woodland, mostly on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes.	0	Unlikely - suitable habitat not recorded within the subject site.	No
Pimelea spicata	Spiked Rice-flower	E1	E	Two disjunct areas; the Cumberland Plain (Marayong and Prospect Reservoir south to Narellan and Douglas Park) and the Illawarra (Landsdowne to Shellharbour to northern Kiama). Well-structured clay soils. Eucalyptus moluccana (Grey Box) communities and in areas of	515	Unlikely	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
				ironbark on the Cumberland Plain. Coast Banksia open woodland or coastal grassland in the Illawarra.			
Pomaderris prunifolia	P. prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	E2	-	Population is known from only three sites: at Rydalmere, within Rookwood Cemetery and at The Crest of Bankstown. Foound in Rocky ridges and areas of outcrop.	3	Unlikely - suitable habitat not recorded within the subject site.	No
Prostanthera saxicola	Prostanthera saxicola population in Sutherland and Liverpool local government areas	E2	-	Primarily in Eucalypt forest, heath and low shrubland, often in damp or moist sites. This population is restricted to the named local government areas (Liverpool and Sutherland) in the southern to south-western parts of Sydney. Recorded occurrences are mainly between Holsworthy station and Sutherland station, north from Lucas Heights and south of the Georges River. However, the population may extend beyond this into the adjacent parts of the relevant LGAs within the region (including the military reserve lands and the Royal and Heathcote National Parks).	1	Unlikely - suitable habitat not recorded within the subject site.	No
Pterostylis gibbosa	Illawarra Greenhood	E1	E	Known from a small number of populations in the Hunter region (Milbrodale), the Illawarra region (Albion Park and Yallah) and the Shoalhaven region (near Nowra). Open forest or woodland, on flat or gently sloping land with poor drainage.	0	Unlikely - suitable habitat not recorded within the subject site.	No
Pterostylis saxicola	Sydney Plains Greenhood	E1	E	Restricted to western Sydney between Freemans Reach in the north and Picton in the south. Small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines, adjacent to sclerophyll forest or woodland on shale/sandstone transition soils or shale soils.	17	Unlikely - suitable habitat not recorded within the subject site.	No
Pultenaea parviflora		E1	V	Endemic to the Cumberland Plain. Mainly from Windsor to Penrith and east to Dean Park, with outlier populations at Kemps Creek and Wilberforce. Dry sclerophyll forest, especially Castlereagh Ironbark Forest, Shale Gravel Transition Forest and transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland.	2	Unlikely - suitable habitat not recorded within the subject site.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
Rhodamnia rubescens	Scrub Turpentine	E4A	-	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	2	Unlikely - suitable habitat not recorded within the subject site.	No
Syzygium paniculatum	Magenta Lilly Pilly	V	V	This species occupies a narrow coastal area between Bulahdelah and Conjola State Forests in NSW. On the Central Coast, it occurs on Quaternary gravels, sands, silts and clays, in riparian gallery rainforests and remnant littoral rainforest communities *S. paniculatum* is summer flowering (November-February), with the fruits maturing in May.	1	Unlikely - suitable habitat not recorded within the subject site.	No
Thesium australe	Austral Toadflax	V	V	In eastern NSW it is found in very small populations scattered along the coast, and from the Northern to Southern Tablelands. Grassland on coastal headlands or grassland and grassy woodland away from the coast.	0	Unlikely - suitable habitat not recorded within the subject site.	No
Wahlenbergia multicaulis	Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield	E2	-	13 known sites, two of which are in northern Sydney (Thornleigh and Mt Ku-Ring-Gai) with the remainder in western Sydney (Rookwood, Chullora, Bass Hill, Bankstown, Georges Hall, Campsie, South Granville and Greenacre). "In Hornsby LGA it occurs in or adjacent to sandstone gully forest. In Western Sydney it is found in remnants of Cooks River/ Castlereagh Ironbark Forest. Typically occurs in damp, disturbed sites.	7	Unlikely - suitable habitat not recorded within the subject site.	No
Wilsonia backhousei	Narrow-leafed Wilsonia	V	-	In NSW, found on the coast between Mimosa Rocks National Park and Wamberal north of Sydney (Nelson's Lake, Potato Point, Sussex Inlet, Wowly Gully, Parramatta River at Ermington, Clovelly, Voyager Point, Wollongong and Royal National Park). Margins of salt marshes and lakes.	554	No - suitable habitat not recorded within the subject site.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	BioNet records within 5 km	Likelihood of Occurrence	Impact Assessment Required
BC Act Key: V = vulnerable, E1 = endangered, E2 = endangered population, E4A = critically endangered							
EPBC Act Key: V = vulnerable, E = endangered, CE = critically endangered, M = migratory under CAMBA, JAMBA, RoKAMBA or Bonn Agreement, Mar = Marine.							

Appendix B Species List

Scientific Name	Common Name	Native / Exotic
Acacia decurrens	Black Wattle	N
Acacia falcata		N
Acacia parramattensis	Parramatta Wattle	N
Acacia pubescens#	Downy Wattle	N, V
Acmena smithii	Lilly Pilly (horticultural variety)	N/P
Angophora costata	Sydney Red Gum	N/P
Angophora floribunda	Rough-barked Apple	N
Aristida vagans	Threeawn Speargrass	N
Asparagus aethiopicus	Asparagus Fern	State level priority weeds, WoNS
Asparagus asparagoides	Bridal creeper	State level priority weeds, WoNS
Asplenium australasicum	Bird's Nest Fern	N/P
Astroloma humifusum	Native Cranberry	N
Avena sp.		E
Banksia integrifolia	Coast Banksia	N
Bidens pilosa	Cobblers Pegs	E
Brachychiton acerifolius	Illawarra Flame Tree	N/P
Brunoniella australis	Blue Trumpet	N
Bursaria spinosa	Native Blackthorn	N
Castanospermum australe	Black Bean	N/E
Cenchrus clandestinus	Kikuyu	E
Centella asiatica	Indian Pennywort	N
Chamaesyce sp.		E
Chloris gayana	Rhodes Grass	E
Cinnamomum camphora	Camphor Laurel	Regional priority weed
Clematis aristata	Old Man's Beard	N
Clivea sp.		E
Convolvulus erubescens	Pink Bindweed	N
Corymbia gummifera	Red Bloodwood	N/P
Corymbia maculata	Spotted Gum	N
Crassula sp.	Stonecrop	N
Cynodon dactylon	Couch	N
Cyperus gracilis	Slender Flat-sedge	N
Cyperus sesquiflorus		E
Dendrobium speciosum var.	Rock Orchid	N/P

Scientific Name	Common Name	Native / Exotic
Desmodium varians	Slender Tick-trefoil	N
Dianella caerulea var. caerulea		N
Dianella longifolia		N
Dichondra repens	Kidney Weed	N
Doryanthes excelsa	Gymea Lily	N/P
Einadia hastata	Berry Saltbush	N
Einadia polygonoides	Knotweed Goosefoot	N
Eleusine tristachya	Goose Grass	E
Entolasia marginata	Bordered Panic	N
Entolasia stricta	Wiry Panic	N
Eragrostis brownii	Brown's Lovegrass	N
Eragrostis curvula	African Lovegrass	E
Eucalyptus citriodora	Lemon-scented Gum	N/P
Eucalyptus crebra	Narrow-leaved Ironbark	N
Eucalyptus eugenioides	Thin-leaved Stringybark	N
Eucalyptus fibrosa	Red Ironbark	N
Eucalyptus microcorys	Tallowwood	N/P
Eucalyptus moluccana	Grey Box	N
Eucalyptus robusta	Swamp Mahogany	N/P
Eucalyptus saligna	Blue Gum	N/P
Eucalyptus scoparia#	Wallangarra White Gum	N/P
Eucalyptus sideroxylon	Mugga Ironbark	N/P
Eucalyptus tereticornis	Forest Red Gum	N
Exocarpus cupressiformis	Cherry Ballart	N
Facelis retusa		E
Ficus sp.	Fig	E
Gamochaeta spp.		E
Glycine clandestina	Twining glycine	N
Glycine tabacina	Variable Glycine	N
Hardenbergia violacea	False Sarsaparilla	N
Hymenosporum flavum	Native Frangipani	
Indigofera australis	Australian Indigo	N
Jacaranda mimosifolia	Jacaranda	E
Lepidosperma laterale	Variable Sword-sedge	N
Liriope sp.		E
Lomandra filiformis subsp. filiformis		N

Scientific Name	Common Name	Native / Exotic
Lomandra longifolia	Spiny-headed Mat-rush	N
Lophostemon confertus	Brush Box	N/P
Macrozamia sp.		N/P
Melaleuca decora	White-feather Honeymyrtle	N
Melia azedarach	White cedar	N/P
Microlaena stipoides var. stipoides	Weeping Grass	N
Modiola caroliniana	Red-flowered Mallow	E
Nandina domestica	Japanese Sacred Bamboo	E
Ochna serrulata	Mickey Mouse Plant	E
Olearia viscidula	Wallaby Weed	N
Oplismenus aemulus	Basket Grass	N
Oxalis perennans		N
Ozothamnus diosmifolius	White Dogwood	N
Panicum simile	Two-colour Panic	N
Philodendron sp. 'Xanadu'		E
Phoenix canariensis	Canary Island Date Palm	E
Pratia purpurascens	Whiteroot	N
Plantago lanceolata	Lamb's Tongue	E
Rytidosperma tenuius	Wallaby Grass	N
Senecio madagascariensis	Fireweed	State level priority weed, WoNS
Setaria sp.		E
Sida rhombifolia	Paddys Lucerne	E
Solanum prinophyllum	Forest Nightshade	N
Soliva sessilis	Bindii	E
Synoum glandulosum subsp.	Scentless Rosewood	N/P
Taraxacum officinale	Dandelion	E
Themeda triandra	Kangaroo Grass	N
Tricoryne elatior	Yellow Autumn-lily	N
Trifolium repens	White Clover	E
Verbena bonariensis	Purpletop	E
Vittadinia cuneata var. cuneata	Fuzzweed	N

Key: N = Native; E = Exotic; P = Planted; WoNS = Weed of National Significance;, # = Threatened species

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