FLORA AND FAUNA ASSESSMENT
FOR A PROPOSED DEVELOPMENT AT
103-109 LAYCOCK STREET, CRANEBROOK (LOT 23 DP 700376)
PENRITH CITY COUNCIL
LOCAL GOVERNMENT AREA

Job number: 2407

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ECA ECOLOGICAL CONSULTANTS ASSOCIATION of NSW Inc

2021 PRACTISING MEMBER

Executive Summary

Introduction

This Flora and Fauna Assessment (FFA) has been drafted to inform a proposed development at 103-109 Laycock Street, Cranebrook in the Penrith City Council Local Government Area (LGA), referred to in this report as the Subject Land. The Proposal would redevelop the Subject Land to support a new seniors housing estate (the Proposal).

Methodology

This FFA was conducted in two phases, a desktop assessment and field surveys. The desktop assessment identified the potential presence of several listed threatened species, populations and Threatened Ecological Communities (TECs), known or considered likely to occur in the locality, under the NSW *Biodiversity Conservation Act 2016* (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The desktop assessment also identified several native Plant Community Types (PCTs) which could be present within the Subject Land. The findings of the desktop assessment were used to inform the scope of the field surveys.

Field surveys were conducted in May 2021 by one ecologist from Anderson Environmental. These surveys comprised a complete walk-through survey of the entire Subject Land and the survey of one Biodiversity Assessment Method (BAM) vegetation plot. Dedicated fauna surveys for birds, reptiles and gastropods were undertaken and fauna species were documented whenever incidentally encountered.

Results

The field surveys concluded that the Subject Land contained remnant and planted native vegetation most strongly conforming to the PCT of Cumberland Shale Plains Woodland (PCT ID 849). This PCT consisted of a single mature remnant *Eucalyptus crebra* (Narrow-leaved Ironbark), two mature remnant *Angophora subvelutina* (Broad-leaved Apple) and a small stand of planted *E. crebra* and *Allocasuarina littoralis* (Black Sheoak). This patch was largely characterised by these canopy species with virtually no shrub layer and a ground stratum consisting of a mixture of native and exotic forbs and grasses. PCT ID 849 was considered to be commensurate with the TEC of Cumberland Plain Woodland in the Sydney Basin Bioregion, listed as critically endangered under the BC Act and EPBC Act. Remaining vegetation within the Subject Land was characterised by a mixture of planted non-endemic native and exotic trees and shrubs and largely exotic grasslands.

Two threatened flora species were identified on the Subject Land:

- *Eucalyptus scoparia* (Wallangarra White Gum) – listed as endangered under the BC Act and vulnerable under the EPBC Act; and
- *Syzygium paniculatum* (Magenta Lilly Pill) – listed as endangered under the BC Act and vulnerable under the EPBC Act.

Both of these species were present as planted individuals resulting from past landscaping. Both occur outside of their natural ranges and/or habitats and are not considered to comprise an indigenous, viable local population.

One listed threatened fauna species was detected during surveys, the Little Lorikeet (*Glossopsitta pusilla*) – listed as vulnerable under the BC Act. Numerous other threatened woodland and hollow-roosting birds, microbats and Flying Foxes were considered to have a moderate or greater likelihood of occurrence and the impacts of the Proposal on these species were consequently assessed through 5-part Assessments of Significance (AoS), as per Part 7.3 of the BC Act. Both of the above flora species as well as several fauna species are also listed under the EPBC Act, and the impact on these entities was consequently assessed through Tests of Significance (ToS) under the EPBC Act.

Impact Assessment

The Proposal would remove the majority of the current extent of CPW as well as the populations of the two threatened flora species on the Subject Land. However, the mature hollow-bearing tree would be retained. Fringing planted native *Melaleuca bracteata* along the eastern and northern boundaries of the Subject Land would also be retained. The CPW to be removed consists of planted immature and non-habitat bearing mature trees, native grasses and forbs. The remaining vegetation to be removed consists of mixed non-endemic natives and exotics and largely exotic grasslands of limited native fauna value.

AoS (BC Act) carried out for the above TEC and threatened species concluded that the Proposal was not likely to have a significant impact on any listed entity. The level of impact would be small, removing a largely planted, immature and low condition patch of this TEC and would retain the highest value fauna habitat item (hollow-bearing tree).

Indirect impacts of the development on surrounding lands are considered to be minimal. The Subject Land is small and surrounded on all sides by suburban or highly managed residential lands and lacks good direct connectivity with nearby areas of better condition native vegetation. Wetlands located approximately 100 m to the west of the Subject Land are separated by managed residential lands and with this existing buffer no significant impact on these lands are considered likely as a result of the Proposal.

The Proposal was also assessed for entry into the BAM, as per Part 6 of the BC Act. This assessment concluded that the Proposal did not meet any of the three entry requirements for the BAM (for Part 4 developments under the *Environmental Planning and Assessment Act 1979* (EPA Act). Therefore, assessment through the BAM in the form of a Biodiversity Development Assessment Report (BDAR) is not necessary.

Recommendations

Numerous mitigation measures could be implemented during and following construction including sediment and weed control measures, limiting noise generating works and avoiding night works (to limit additional light pollution on adjacent areas of fauna habitat). The long-term impacts of the Proposal on habitat utility of the local area are considered negligible. The Proposal would be located within a highly urbanised landscape alongside existing roadways and suburban lands. Native vegetation on adjacent lands is already disturbed by past land use practices and exotic weed incursion.

The Proposal will avoid and mitigate impacts on native vegetation through the retention of the mature hollow-bearing eucalypt and fringing planted native vegetation which will continue to provide habitat connectivity through the east of the Subject Land for native fauna.

Compensation for the small level of impact on low condition CPW could include future landscaping utilising native species indicative of CPW. Species selection should include representatives from all strata (canopy, shrub, ground story).

Matters of National Environmental Significance

Assessment of MNES determined that the CPW present on the Subject Land did meet the minimum condition thresholds for protection under the EPBC Act. Two federally listed threatened flora species and three threatened fauna species were known or were considered to have potential to occur on the Subject Land (*Eucalyptus scoparia*, *Syzygium paniculatum*, Grey-headed Flying Fox (*Pteropus poliocephalus*), Regent Honeyeater (*Anthochaera phrygia*) and Swift Parrot (*Lathamus discolor*). Tests of significance conducted for these and species concluded that the Proposal would not have a significant impact on these entities and no referral to the federal Minister of the Environment was considered necessary.

Conclusion

Assessment of the Proposal concluded that the Proposal will result in the clearing of a small area of largely planted and immature low condition CPW as well as the removal of both populations of threatened flora. However, the highest value fauna habitat would be retained (hollow-bearing tree) as well as vegetation providing fauna movement through the Subject Land. The two threatened flora species are planted individuals and are not considered indicative of viable local populations of these species. Assessments under the BC Act and EPBC Act for TECs and species present or considered likely to occur concluded that the Proposal is unlikely to have a significant impact on these species.

Glossary of Acronyms

BAM – Biodiversity Assessment Method

BC Act – *Biodiversity Conservation Act 2016*

BDAR – Biodiversity Development Assessment Report

CEEC – Critically Endangered Ecological Community

DoE – Department of the Environment

EEC – Endangered Ecological Community

EPA Act – *Environmental Planning and Assessment Act 1979*

EPBC Act – *Environment Protection and Biodiversity Conservation Act 1999*

FM Act – *Fisheries Management Act 1994*

LGA – Local Government Area

NSW – New South Wales

NSW NPWS – New South Wales National Parks and Wildlife Service

NPW Act – *National Parks and Wildlife Act 1974*

OEH – Office of Environment and Heritage

TEC – Threatened Ecological Community

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1. INTRODUCTION

1.1 BACKGROUND

This Flora and Fauna Assessment (FFA) has been drafted for a proposed development at 103-109 Laycock Street, Cranebrook (the Subject Land). The proposed development would subdivide the existing lot into a new senior housing estate (referred to as the Proposal). See **Appendix 8** for the Proposal layout.

To inform the Proposal, Anderson Environmental Pty Ltd (Anderson Environmental) was engaged to prepare a FFA. The FFA assesses the impact the Proposal will have on threatened flora, fauna and Threatened Ecological Communities (TECs) listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This FFA also considers the Proposal against the entry requirements for assessment through the Biodiversity Assessment Method (BAM) and whether the Proposal is required to be assessed through a Biodiversity Development Assessment Report (BDAR), as per Part 6 of the BC Act.

1.2 SITE DESCRIPTION

1.2.1 Location

The Subject Land occurs at 103-109 Laycock Street Cranebrook. **Figure 1.1** below provides the location of the Subject Land with the wider locality. **Table 1.1** below provides the site particulars.

Table 1.1: Site particulars

Attribute	Site particular
Locality	The Subject Land is located on the edge of suburban lands to the east and by large lot residential lands to the north, south and west
LGA	Penrith City Council
Address	103-109 Laycock Street, Cranebrook
Lot and DP	Lot 23 DP 700376
Subject Land Area (ha)	0.8
Current Land Use	Large lot residential
Topography	Low rolling to steep low hills. Local relief 50–120 m, slopes 5–20%. Convex narrow (20–300 m) ridges and hillcrests grade into moderately inclined sideslopes with narrow concave drainage lines. Moderately inclined slopes of 10–15% are the dominant landform elements (NSW Government, 2021)
Geology	This soil landscape is underlain by Wianamatta Group Ashfield Shale and Bringelly Shale formations. The Ashfield Shale consists of laminite and dark grey shale. Bringelly Shale consists of shale, calcareous claystone, and laminite. Between these two shale members is the Minchinbury Sandstone consisting of fine to medium-grained lithic quartz sandstone (NSW Government, 2021)

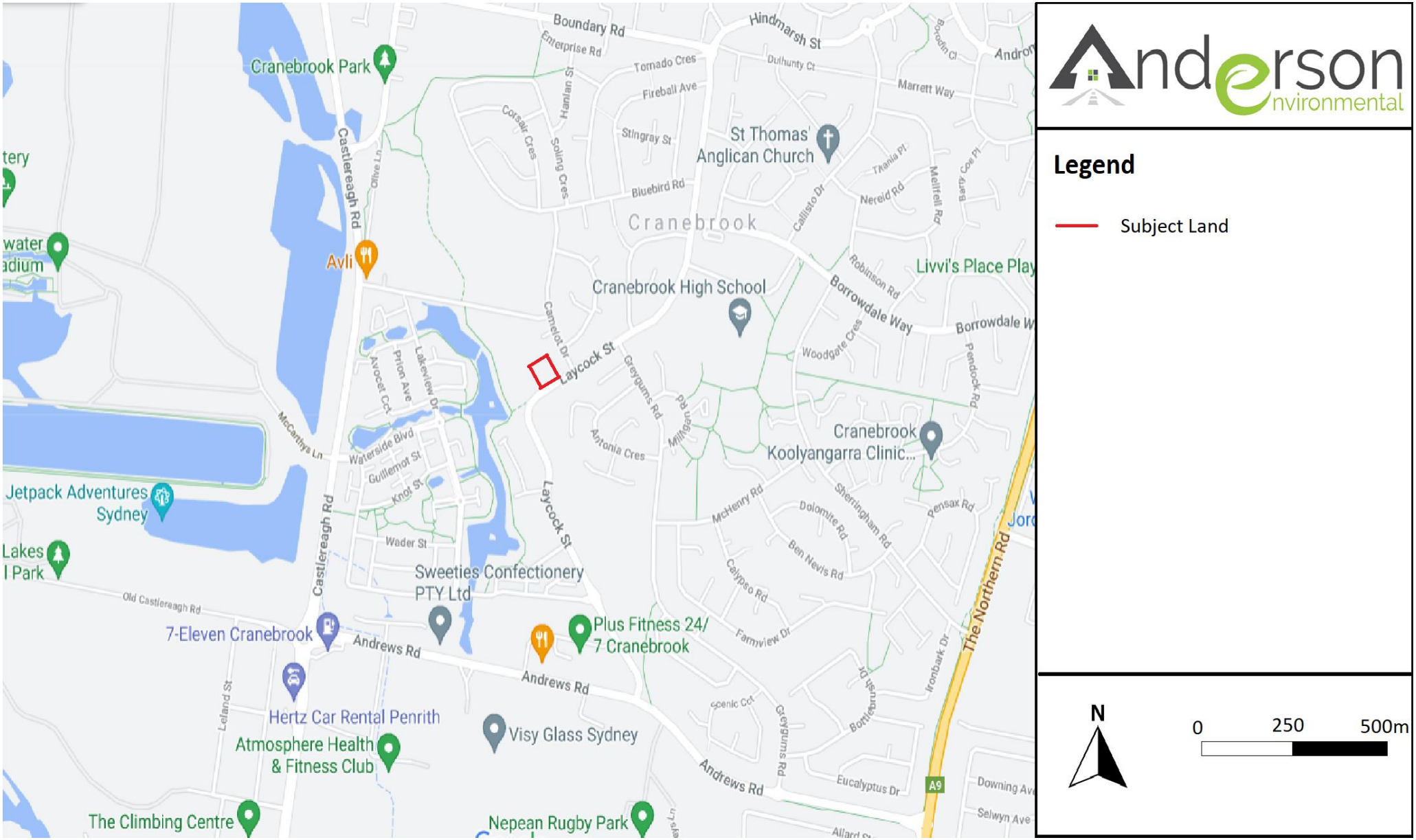

Figure 1.1: Subject Land location

1.3 LEGISLATIVE REQUIREMENTS

This study and report were undertaken with reference to the requirements of the NSW *Environmental Planning and Assessment Act 1979* (EPA Act), the NSW BC Act and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Final determinations of the NSW Scientific Committee (NSW NPWS) and the Commonwealth Scientific Committee are current to the time of writing.

Reference was also made to the *National Parks and Wildlife Act 1974* (NPW Act). The Subject Land was also assessed in relation to the 'improve or maintain principals' adopted by most local councils.

1.4 LIMITATIONS

No survey can detect all species at any one point in time however allowances were made for species which may occur based on known current research and habitat preferences. The survey recorded species as they were encountered and the survey aimed to detect threatened species or Threatened Ecological Communities (TECs) as listed under state and federal legislation. The survey focussed on the identification of the vegetation communities and any threatened flora or potential habitat for threatened flora. No attempt was made to record every single species on the site and not all specimens are visible in all seasons. Surveys for fauna entailed detailed habitat searches.

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2. METHODOLOGY

2.1 DETERMINATION OF ASSESSMENT AREAS

Prior to the conduction of this assessment, the geographic scope of all necessary components was determined. The areas assessed consisted of three overlaid areas of increasing size. A description of each area, the justification for the boundaries of this area and the purpose of this area in this assessment is as follows:

- Subject Land. This is land which would be directly impacted upon by the Proposal (through disturbance to the ground, recontouring, vegetation removal etc.). The Subject Land area is used to determine the total area of direct impact on all mapped Plant Community Types (PCTs), TECs and threatened species and for the determination of the necessary credits required to offset the unavoidable impacts (residual impact). In this assessment the Subject Land is equivalent to the entire lot;
- Study Area. This is the land that was physically surveyed as part of this assessment. In the case of the Proposal, this was equivalent to the Subject Land; and
- Locality. This is the area to considered for wider habitat connectivity and the presence of threatened fauna in state and federal database searches. It is equivalent to a 10 km buffer from the Subject Land.

2.2 DESKTOP STUDY

A desktop review was undertaken to identify current records of threatened flora, fauna and ecological communities, migratory species and Key Threatening Processes (KTPs) within 10 km of the Study Area. Databases and resources consulted during this phase of works comprised:

- The NSW Department of Planning, Industry and Environment (DoPIE) (formally the Office of Environment and Heritage (OEH)) BioNet Atlas database, which contains records of threatened species, populations and ecological communities, critical habitat and Key Threatening Processes (KTPs) listed under the BC Act;
- Biodiversity Values Map and Threshold Tool (NSW Deparment of Planning, Industry and Environment, 2021);
- Local vegetation mapping – Remnant Vegetation Mapping of the Cumberland Plain (crown cover greater than 10%). VIS_ID 2221 (NSW Department of Planning, Industry and Environment , 2010);
- The Threatened Biodiversity Data Collection (TBDC). An online resource for registered users providing credit class information and habitat information for species listed under the BC Act (NSW Department of Planning, Industry and Environment, 2021a); and
- Habitat profiles for all threatened, populations and ecological communities, and migratory species that are known to or have potential to occur within the locality.

2.3 FIELD SURVEY

The assessment of the site was carried out between 12:00 and 15:00 on 11/05/2021. The assessment was carried out by Bo Davidson (M. Environment). Weather conditions were fine and sunny on the date of survey, see **Table 2-2** below.

Table 2-2: Weather conditions on date of survey

Date	Minimum temperature (*C)	Maximum temperature (*C)	Rainfall (mm)
11/05/2021	12.9	23.1	0.0

Source: Australian Bureau of Meteorology, Penrith Lakes station (Weatherzone, 2021)

2.3.1 Flora

The survey involved two assessment techniques; a random meander survey and the survey of one vegetation plot. A total of two person hours were devoted to flora survey (one hour of random meander survey time and one hour conducting plot surveys).

The random meander encompassed the entire Study Area with a greater emphasis on key microhabitat features (waterbodies, rock outcroppings etc.). This survey included targeted searches for endangered species, populations and communities known to occur within 10 km, as identified in the desktop assessment. Landscape features were also recorded for greater ecological context. Weed species were also recorded to inform control requirements for future works.

One 20 m x 50 m BAM plot within the Study Area were surveyed to assess the accuracy of the vegetation mapping consulted during the desktop assessment and collect data to determine the most likely PCT present. The BAM plot was surveyed using the methodology detailed in Section 4.2.1 of the BAM. Refer to **Figure 2-1** below for the location of the vegetation plot. A photo and GPS co-ordinates were taken from base of the centre line of the plot.

2.3.1.1 Taxonomy and References

Taxonomy is from Harden (1990 – 1993, 2000 and 2002) and from any recent updates from the Royal Botanic Gardens (RBG), Sydney. The main references utilised for this report include; NSW National Parks and Wildlife Service (NPWS) (1997), Robinson, L (1997), Fairley, A and Moore, P (1995), Threatened Species Profiles compiled by NSW NPWS and from field and research experience.

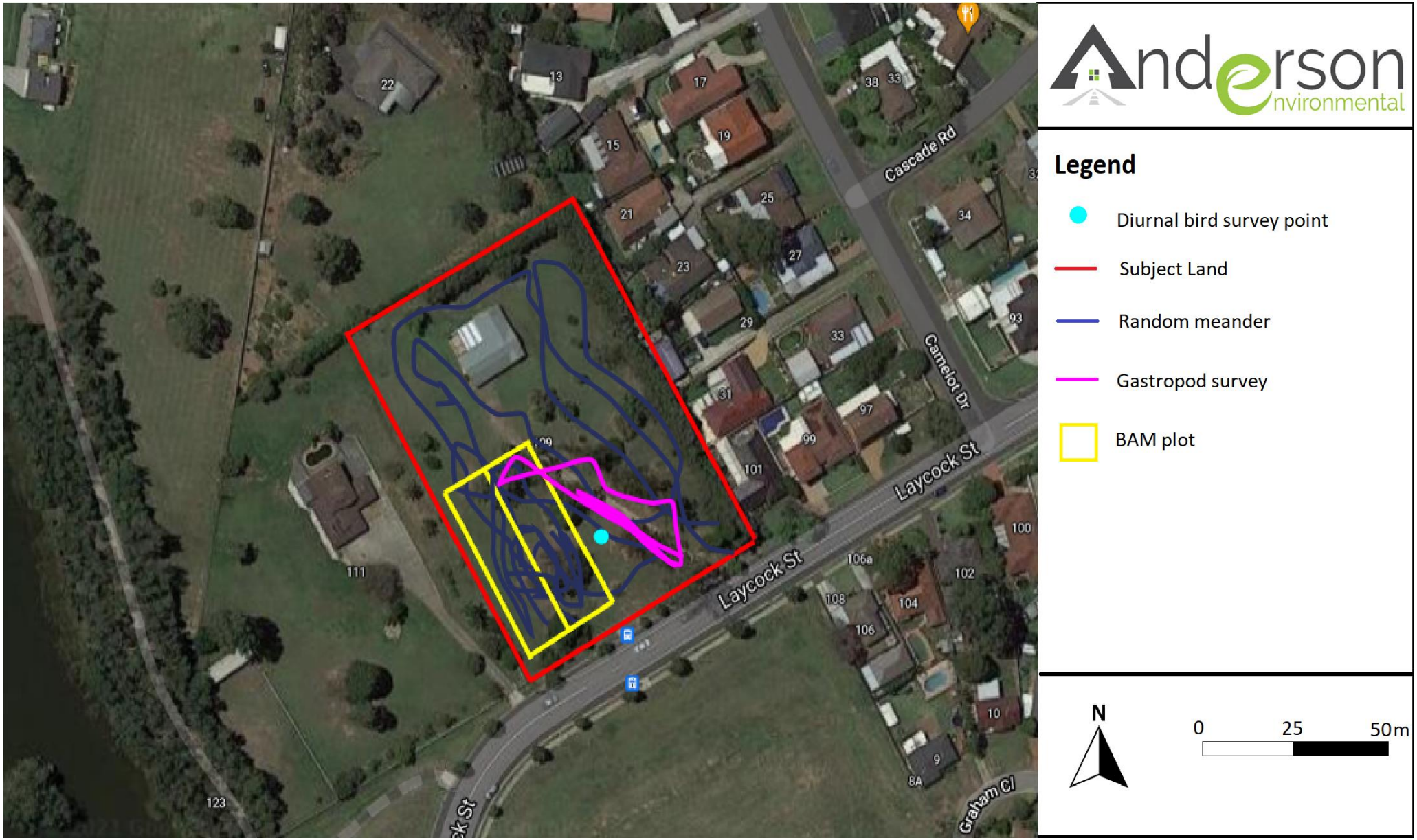

Figure 2.1: Survey effort

2.3.2 Fauna

Fauna surveys and habitat assessment was undertaken throughout the entire Study Area, with a specific focus on areas of remnant native vegetation, structures and other habitat features. These included targeted surveys for birds and gastropods, as shown in **Table 2-3** below.

Table 2-3: Fauna survey effort

Fauna species or group	Survey method employed	Person hours
Diurnal birds	20 minute visual and aural survey from a fixed survey point in the centre of the Subject Land	0.3 hours
Gastropods	30-minute active survey of areas of likely habitat (around trees, areas of dense leaf litter, tussock grasses etc.)	0.5 hours

Fauna were also surveyed opportunistically during all field work activities using the techniques below:

- Opportunistic observations – Opportunistic observations of fauna species through visual sighting or auditory confirmation, while searching for potential habitat was conducted throughout the Subject Land;
- Habitat analysis – Assessments of potential habitat for threatened species was undertaken. This included an assessment of the condition of the habitat once found; and
- Searches for indirect evidence of fauna species – This included searching for glider chews, scratches on eucalypts, diggings, borrows, scats, tracks, owl pellets and whitewash and identification of any specific habitat components for threatened fauna. Logs were turned over in search of reptiles then replaced in their original positions. Similarly, thick understory and dense thickets were also investigated for ground dwelling fauna and small bush birds.

Areas or items of significant fauna habitat value (rock outcrops, caves and crevices, waterbodies and creeklines, habitat-bearing trees etc.) were noted, locations recorded using a GPS device and representative photos taken where relevant. For habitat-bearing trees the following additional data was collected:

- Tree species;
- Height in meters;
- Diameter at Breast Height (DBH) in millimetres;
- Number of hollows present;
- Size class of hollows (S=5-15cm, M=15-25cm and L=25+cm); and
- Other notable observations (presence of fauna or signs of inhabitation etc.).

2.3.2.1 Taxonomy and References

Taxonomy is from the following sources; Mammals (Churchill, 2009 and Strahan, 1995), Reptiles and Amphibians (Cogger, 1994), and Birds (Simpson and Day 1993). The main references utilised for this report include; Strahan, R (1995), Cogger, H (1994), Simpson and

Day (1993), State Forests of NSW (1995), Robinson M (1995), Threatened Species Profiles compiled by NSW NPWS and from field and research experience of the authors.

3. RESULTS

3.1 DESKTOP STUDY

The sections below detail threatened species, populations and TECs identified from the relevant government databases and mapping resources consulted during the desktop study.

3.1.1 NSW BioNet Atlas

The NSW BioNet Atlas identified a total of 46 listed flora and fauna entities from within 10 km of the Study Area (two amphibian, 20 bird, two gastropod, 11 mammal, 10 threatened flora species and one threatened flora populations). The details of these entities and their legislative status are provided in **Table A6.1** and **Table A6.2** of **Appendix 6**.

In addition, this database identified a total of 24 TECs as known to occur or possibly occurring within 10 km of the Study Area. These TECs and their legislative status are provided in **Table A6.1** of **Appendix A**.

3.1.2 Commonwealth PMST

The Commonwealth PMST identified a total of 63 listed flora and fauna entities which may, are likely to or are known to occur from within 10 km of the Study Area (three amphibian, nine threatened bird, two fish, one gastropod, seven mammal, 16 migratory bird and 24 flora species). These species, their legislative status and type of presence are provided in **Table A6.1** and **Table A6.2** of **Appendix 6**.

In addition, this database identified a total of 10 TECs which may, are likely to or are known to occur within 10 km of the Study Area. These TECs, their legislative presence and type of presence are provided in **Table A6.1** of **Appendix 6**.

3.1.3 Vegetation Mapping

Aerial imagery indicated that the Study Area consisted of native remnant woodlands, exotic planted trees and shrubs and grasslands.

OEH vegetation mapping reviewed during the desktop study did not identify the presence of any mapped native vegetation Plant Community Type (PCT). However, the presence of native vegetation was apparent. This assessment was used to inform the ground survey.

3.2 FIELD SURVEY

The Study Area was observed to contain a mixture of remnant and planted native vegetation, non-endemic native and exotic ornamental trees and large areas of exotic grasslands. The Study Area supported a single detached dwelling, attached garage and an unsealed driveway access.

3.2.1 Vegetation Communities

Field assessment of the vegetation communities present aligned with the mapping consulted in the desktop study. A single native vegetation community was assessed as present, with the remainder of the Study Area dominated by non-endemic native and exotic ornamental trees and shrubs, structures, sealed surfaces and exotic dominated grasslands. **Table 3-1** classifies the native vegetation communities observed within the Study Area.

Table 3.1: Estimated area occupied by native PCTs within the Subject Land

Vegetation description	Formation (Keith 2004)	Class (Keith 2004)	Plant Community Type	Plant Community Type ID	TEC	BC Act Status*	EPBC Act Status*	Approximate area (ha)
Cumberland Plain Woodland	KF_CH3 Grassy Woodlands	Coastal Valley Grassy Woodlands	Cumberland shale plains woodland	849	Cumberland Plain Woodland in the Sydney Basin Bioregion	CE	CE	0.05

**CE = Critically Endangered, E = Endangered, V = Vulnerable*

Figure 3-1 below shows the distribution of this community within the Study Area as well as the extent of planted native woody vegetation. The remainder of the Study Area was composed of exotic woody vegetation and grasslands.

Figure 3-1: Native Plant Community Types, Threatened Ecological Communities and threatened flora species within the Subject Land

A description of the condition of the vegetation communities present within the Study Area is provided below.

3.2.1.1 Woody Native Vegetation

3.2.1.1.1 Cumberland Shale Plains Woodland (PCTID 849)

This PCT forms the single vegetation zone within the Subject Land and is located entirely within the south-west corner of the Subject Land.

Zone 1 is dominated by the canopy species *Eucalyptus crebra* (Narrow-leaved Ironbark), with a single mature remnant tree present and a small stand of planted immature trees. The understory was largely absent but a stand of immature *Allocasuarina littoralis* (Black Sheoak) was present. In the north of this patch two mature *Angophora subvelutina* (Broad-leaved Apple) were present, indicative of the nearby riparian habitat to the west of the Subject Land. The ground stratum was dominated by a mixture of native and exotic grasses and forbs; primarily the natives *Cynodon dactylon* (Couch Grass), *Cyperus gracilis* and *Microleana stipoides* var *stipoides* (Weeping Meadow Grass) and the exotics *Eragrostis curvula* (African Love Grass) and *Paspalum dilatatum* (Common Paspalum). **Photograph 3-1** below shows this PCT on the Subject Land.

Photograph 3-1: Cumberland Shale Plains Woodland on the Subject Land

Cumberland Shale Plains Woodland (PCTID 849) conforms to one potential TEC under the BC Act known to occur in the Cumberland Plain IBRA sub-region, Cumberland Plain Woodland in the Sydney Basin Bioregion (CPW). This TEC is listed as critically endangered under the BC Act.

With reference to the species listed under the Scientific Committee Determination for this TEC, this patch contains one indicative canopy species, *E. crebra*. The following listed understory species were also present *Dianella longifolia* (Blueberry Lily), *Dichondra repens* (Kidney Weed) and *M. stipoides* var *stipoides*. Based on this assessment, this TEC is considered to be present; however, in a significantly degraded state.

3.2.1.1.2 Planted Native and Exotic Vegetation

The Subject Land supported scattered ornamental native (predominantly non-endemic) and exotic trees and shrubs. These were dominated by screen of *Melaleuca bracteata* (Black Tea-tree) mature planted *Eucalyptus scoparia* (Wallangarra White Gum) as well as the exotic species *Murraya paniculata* (Orange Jessamine), *Pinus radiata* (Radiata Pine) and *Schinus molle* (Peppercorn Tree). **Photograph 3-2** below provides an example of the woody non-endemic native and exotic woody vegetation of the Subject Land.

Photograph 3-2: Non-endemic native and Exotic woody vegetation of the Subject Land

3.2.1.2 Exotic Grasslands

The remainder of the Subject Land was dominated by predominantly exotic grasslands, comprising the species *Ehrharta erecta* (Panic Veldt Grass) *Paspalum dilatatum* and *Pennisetum clandestinum* (Kikuyu Grass).

3.2.2 Flora

As described above, the floral composition of the Study Area comprised a disturbed assemblage characteristic of urban environments with a strong presence of exotic and weedy species. A small patch of remnant and planted endemic native species were considered to conform to a listed PCT and TEC.

Two threatened flora species were identified during survey:

- *Eucalyptus scoparia* (Wallangarra White Gum) – listed as endangered under the BC Act and vulnerable under the EPBC Act; and
- *Syzygium paniculatum* (Magenta Lilly Pill) – listed as endangered under the BC Act and vulnerable under the EPBC Act.

These two species were present as planted ornamentals and are not indicative of an endemic population of either species. A total of eight *E. scoparia* were present along the driveway access, see **Photograph 3.2** above. This species is only known to occur naturally within a small

area near Tenterfield in northern NSW. A single *S. paniculatum* was present, see **Photograph 3.3** below. This species naturally occurs within temperate rainforest and wet sclerophyll forests closer to the coastline.

Photograph 3.3: *Syzygium paniculatum* on the Subject Land

No other threatened flora species or populations identified from the desktop study were found during surveys and none are considered likely to be present due to the highly modified conditions present throughout the Subject Land.

3.2.3 Priority Weeds

Priority weeds are classified under specific Biosecurity Duties under the NSW *Biosecurity Act 2015* (Bio Act) for the respective Local Land Services (LLS) area. All plants have a general biosecurity duty under the act.

Priority weeds for the LLS area of the Greater Sydney Region (which includes the Penrith LGA) documented on the Subject Land and their required biosecurity duties are described in **Table 3.2** below.

Table 3.2: Priority weeds documented in the Study Area and required biosecurity duties under the Bio Act

Scientific name	Common name	Biosecurity duty	Duty description
Anredera cordifolia	Madeira Vine	Prohibition on dealings	Must not be imported into the State or sold
Asparagus asparagoides	Bridal Creeper	Prohibition on dealings	Must not be imported into the State or sold
Asparagus aethiopicus	Sprenger's Asparagus	Prohibition on dealings	Must not be imported into the State or sold

3.2.4 Fauna

A diverse range of fauna were observed throughout the Study Area, predominantly birds. Suitable habitat for a variety of species was present including native and exotic foraging trees,

and a single large hollow-bearing tree. The location of high value fauna habitat features identified within the Study Area is shown in **Figure 3-1** above.

Details of species encountered and threatened species habitat is detailed in the following sections. A complete fauna species list is provided in **Appendix 3**.

3.2.4.1 Amphibians

No amphibian species were observed or heard calling during surveys. However, dry conditions preceding the date of survey were not considered suitable for high amphibian activity. The Subject Land contained limited suitable amphibian habitat; however, wetlands were located within 200 m of the Subject Land would provide habitat for a range of native amphibian species.

Two threatened amphibian species are known from occurrence records from within 10 km of the Study Area (OEH BioNet); in addition, the federal PMST database search identified an additional species considered to have potential to occur in the locality:

- Giant Burrowing Frog (*Heleioporus australiacus*) – listed as vulnerable under the BC Act and EPBC Act;
- Green and Golden Bell Frog (*Litoria aurea*) – listed as endangered under the BC Act and vulnerable under the EPBC Act; and
- Stuttering Frog (*Mixophyes balbus*) – listed as endangered under the BC Act and vulnerable under the EPBC Act.

No suitable habitat for these species is considered to be present within the Study Area. The Giant Burrowing Frog is known to not occur on vegetation assemblages on clay-derived soils. The Study Area lacks preferred microhabitats for the other two species in the form of calm waterbodies with dense reed beds and rainforest escarpment habitat, respectively.

No threatened amphibian species was considered likely to occur in the Study Area.

3.2.4.2 Birds

Numerous common woodland and aquatic bird species were observed within the Study Area and the nearby locality. Frequently encountered species included the Australian Magpie (*Cracticus tibicen*), Australian White Ibis (*Threskiornis moluccus*), Dusky Moorhen (*Gallinula tenebrosa*), Galah (*Eolophus roseicapilla*) and Magpie Lark (*Grallina cyanoleuca*).

Numerous threatened and listed bird species are known to occur from within 10 km of the Study Area. One listed species, the Little Lorikeet (*Glossopsitta pusilla*) – listed as vulnerable under the BC Act was observed flying over lands to the immediate south of the Subject Land.

One hollow-bearing trees were identified within the Study Area, a mature *Eucalyptus crebra*. Hollows in this tree were observed to be supporting a pair of Galahs during surveys and would provide potential nesting resources for the Little Lorikeet as well as other hollow-nesting threatened birds known from the locality, including the Glossy Black Cockatoo (*Calyptorhynchus lathami*) – listed as vulnerable under the BC Act.

Other vulnerable woodland species considered to have potential to occur comprised:

- Dusky Woodswallow (*Artamus cyanopterus cyanopterus*) – listed as vulnerable under the BC Act;
- Regent Honeyeater (*Anthochaera phrygia*) – listed as critically endangered under the BC Act; and
- Swift Parrot (*Lathamus discolor*) – listed as critically endangered under the BC Act.

3.2.4.3 Gastropods

As detailed in **Section 2.4.2** above, dedicated surveys for the Cumberland Plain Land Snail (*Meridolum corneovirens*) – listed as endangered under the BC Act were conducted during surveys of the Study Area. No living snails or empty shells were found; however, a shell of the common exotic Garden Snail (*Cornu aspersum*) was found during this search.

The habitat of the Subject Land is considered broadly suitable for the Cumberland Plain Land Snail with some remnant CPW vegetation present and areas of dense leaf litter around numerous mature trees.

3.2.4.4 Mammals

No native mammal species were observed during surveys; however, nocturnal surveys were not conducted. Common native species such as the Common Brushtail Possum (*Trichosurus vulpecula*) and Common Ringtail Possum (*Pseudocheirus peregrinus*) are considered likely to use the Study Area for foraging and denning in the large hollow-bearing tree present.

Several threatened mammal species were considered likely to occur within the Study Area, predominantly microchiropteran bats:

- Eastern Coastal Free-tailed Bat (*Mormopterus norfolkensis*) – listed as vulnerable under the BC Act;
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) – listed as vulnerable under the BC Act;
- Greater Broad-nosed Bat (*Scoteanax rueppellii*) – listed as vulnerable under the BC Act;
- Grey-headed Flying Fox (*Pteropus poliocephalus*) – listed as vulnerable under the BC Act;
- Southern Myotis (*Myotis macropus*) – listed as vulnerable under the BC Act; and
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) – listed as vulnerable under the BC Act.

A camp of the Grey-headed Flying Fox is known to be present approximately 3 km to the south-west of the Subject Land in the suburb of Emu Plains (Commonwealth of Australia, 2021). The microchiropteran bat species are all known from recent occurrence records in the locality and the hollow-bearing tree present would provide suitable roosting resources for these species.

3.2.4.5 Reptiles

No reptile species were observed in the Study Area during surveys; however, common species such as the Eastern Water Skink (*Eulamprus quoyii*) and Sun Skinks (*Lampropholis sp*.) are considered likely to be present.

No threatened reptile species were identified in the state or federal databases from within 10 km of the Study Area. The Study Area lacked complex habitat required by many of these species such as rocky escarpments, dense woody debris and large areas of exposed rock for sunning etc. No threatened reptile species was considered likely to occur in the Study Area.

4. IMPACT ASSESSMENT

4.1 INTRODUCTION

All developments have an impact on the biodiversity values of a site. These consist of:

- Direct impacts such as the clearing of vegetation, waterbodies and other habitat features; and
- Indirect impacts through mechanisms such as increased surface and sediment runoff, introduction of exotic species and diseases, increased disturbances through greater pedestrian and traffic utilisation, increased noise and light pollution and introduction of exotic domestic herbivores (sheep, cattle etc.) and predators (cats and dogs).

These impacts are associated with all phases of a development, from initial land clearing through to occupancy by new landowners/tenants, operation of facilities etc. A biodiversity sensitive approach can lead to a substantial decrease the in impacts of any development. In addition, a variety of techniques and technologies are available to reduce the potential impacts of a development throughout all stages.

4.1.1 Direct Impacts

As shown in **Appendix 8**, the Proposal would require the clearing of the majority of native vegetation and fauna habitat from the Subject Land. This would include most of the identified patch of CPW in the south-west corner of the Subject Land. However, the single mature hollow-bearing eucalypt would be retained as well as the fringing *Melaleuca bracteata* along the northern and eastern boundaries of the Subject Land.

See **Figure 4.1** for the tree retention plan from the Arboricultural Impact Assessment by Redgum Horticultural for the Subject Land, which identifies the trees proposed to be removed and retained (Redgum Horticultural, 2021).

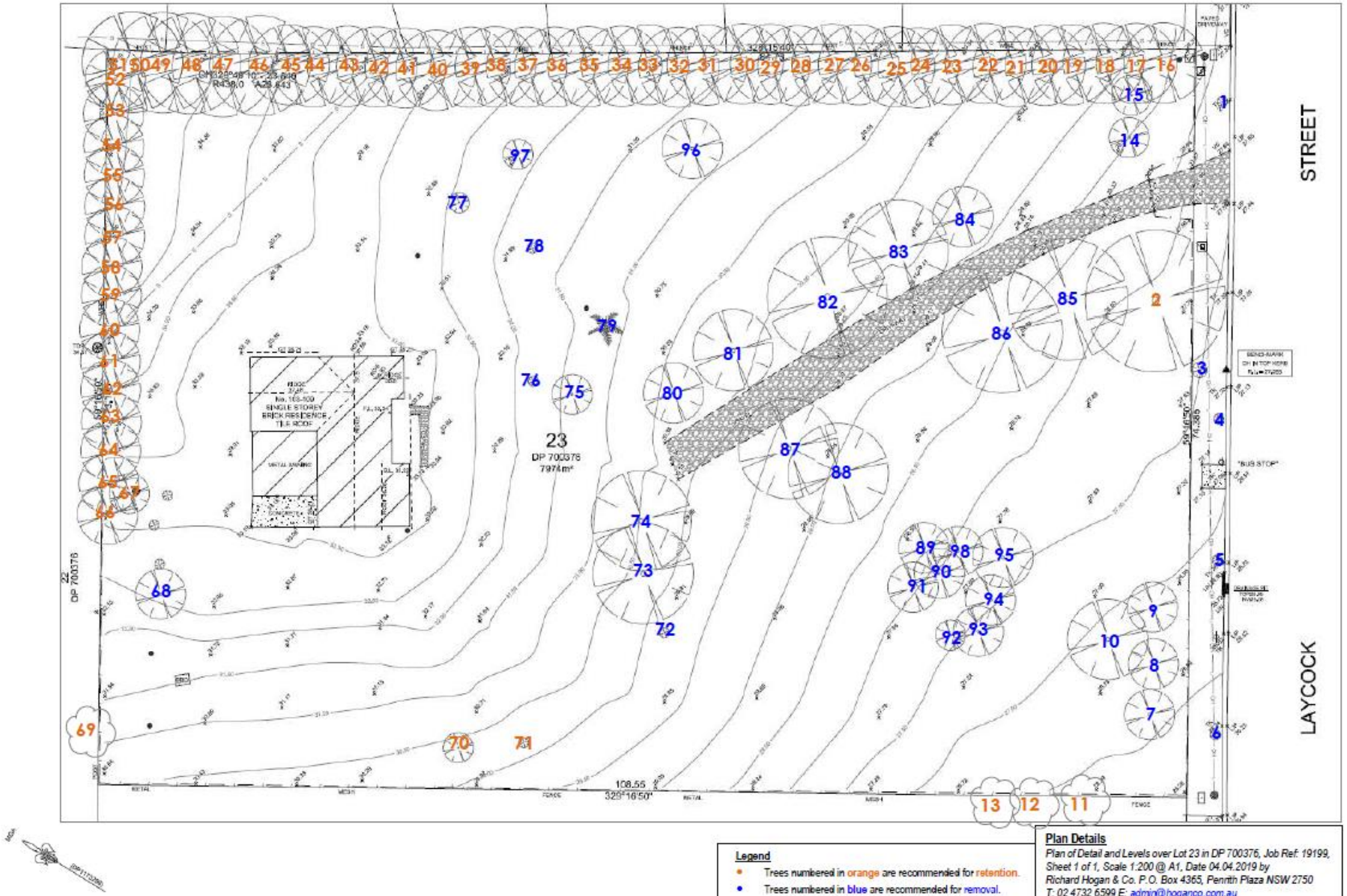

Figure 4.1: Tree retention plan for the Subject Land by Redgum Horticultural

4.1.1.1 Direct Impacts on Threatened Flora, TECs and their Habitats

As shown in **Section 3.2.1** above, two threatened flora species and one TEC were documented from within the Study Area. The two flora species are not locally endemic and are remnants of previous landscape plantings on the Subject Land. These individuals are not considered to represent a viable local population of these species. All individuals of both species would be removed by the Proposal.

The Proposal would remove the majority of the TEC CPW present; however, the mature hollow-bearing remnant *Eucalyptus crebra* would be retained and would continue to provide habitat for local native fauna.

An assessment of the likely impacts on all threatened flora species, populations and TECs known or considered to have potential to occur within 10 km of the Study Area is provided in **Appendix 6**. Assessments of Significance (AoS) under the BC Act are provided in **Appendix 7** for the two species and the TEC identified on the Subject Land.

These assessments concluded that the Proposal would not have a significant impact on these entities. Further assessment through a BDAR is not considered necessary.

4.1.1.2 Direct Impacts on Threatened Fauna and their Habitats

As described in **Section 3.2.4** above the Study Area contains suitable habitat for several threatened fauna species in the form of remnant and planted endemic native trees and a single large remnant hollow-bearing *E. crebra*. The Proposal would remove the majority of the remnant native vegetation as well as non-endemic native and exotic fruiting and flowering trees. However, the most important fauna habitat item the large remnant *E. crebra* would be retained and would continue to provide habitat resources for local native fauna including potentially the threatened fauna identified in **Section 3.2.4** above.

An assessment of the likely impacts on all threatened fauna species known or considered to have potential to occur within 10 km of the Study Area is provided in **Appendix 6**. Assessments of Significance (AoS) under the BC Act are provided in **Appendix 7** for the species identified in **Section 3.2.4** above.

These assessments concluded that the Proposal would not have a significant impact on these entities. Further assessment through a BDAR is not considered necessary.

4.1.2 Key Threatening Processes

Table 4.1 below details the KTPs which could arise from development in the Study Area, as well as an assessment of the extent to which these KTPs would be exacerbated.

Table 4.1: Key Threatening Processes assessment

KTP (BC Act)	KTP (EPBC Act)	Extent of KTP exacerbation
Anthropogenic Climate Change	Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	The Project will contribute to greenhouse gas emissions through construction activities and removal of vegetation. Due to the small size of the Subject Land, the proposed works are not

KTP (BC Act)	KTP (EPBC Act)	Extent of KTP exacerbation
		considered likely to significantly exacerbate this KTP
Clearing of native vegetation	Land clearance	The Project will result in the removal of a small portion of native vegetation. This impact is not considered a significant exacerbation of this KTP on the locality scale
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	Infection of amphibians with chytrid fungus resulting in chytridiomycosis	There is a low risk that this pathogen could be introduced in unclean fill and untreated water running offsite. This is not considered a significant risk provided appropriate mitigation measures are enacted
Infection of native plants by *Phytophthora cinnamomi*	Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*)	This pathogen may be introduced in unclean fill used on site and untreated water running offsite. This is not considered a significant risk provided appropriate mitigation measures are enacted
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	-	This pathogen may be introduced in unclean fill used on site and untreated water running offsite. This is not considered a significant risk provided appropriate mitigation measures are enacted
Invasion and establishment of exotic vines and scramblers	-	Exotic weed vine and scrambler species may be introduced as seed in unclean fill. Representatives of such species were observed to already be present in the Study Area, but in low numbers. This is not considered a significant risk provided appropriate mitigation measures are enacted
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)	-	This species may be introduced as seed in unclean fill. This is not considered a significant risk provided appropriate mitigation measures are enacted
Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata* (Wall. ex G. Don) Cif	-	This species may be introduced as seed in unclean fill. This is not considered a significant risk provided appropriate mitigation measures are enacted

KTP (BC Act)	KTP (EPBC Act)	Extent of KTP exacerbation
Invasion of native plant communities by *Chrysanthemoides monilifera*	-	This species may be introduced as seed in unclean fill. This is not considered a significant risk provided appropriate mitigation measures are enacted
Invasion of native plant communities by exotic perennial grasses	-	Exotic perennial grass species may be introduced as seed in unclean fill. Representatives of such species were observed to already be present in significant numbers throughout much of the Study Area. Future development is not considered likely to significantly exacerbate this KTP in the locality. This is not considered a significant risk provided appropriate mitigation measures are enacted
Invasion, establishment and spread of Lantana (*Lantana camara* L. sens. Lat)	-	This species may be introduced as seed in unclean fill. This is not considered a significant risk provided appropriate mitigation measures are enacted

4.1.3 Indirect Impacts

In addition to direct impacts associated with the development of lands through removal of native vegetation, fauna habitat, changes to surface drainage patterns etc., developments also have a variety of secondary impacts on the wider locality. Indirect impacts likely to arise as a result of the Project comprise:

- Sediment migration from areas of unconsolidated, exposed soil during development works into downslope areas of native vegetation;
- Introduction of new weed species and pathogens into downslope and downstream areas due to runoff from unconsolidated, exposed soil during development as well as in stormwater following development;
- Increased contaminant and nutrient loads introduced from stormwater into native vegetation downslope and downstream of the Subject Site following development;
- Increased noise and light pollution on nearby areas of retained native vegetation, reducing fauna utility of this habitat; and
- Increased dust generation during development works, reducing fauna utility of areas of nearby retained habitat.

Section 5 below details measures which may be implemented throughout all stages of future development to mitigate the effects of the above indirect impacts.

4.1.3.1 Indirect Impacts on Threatened Flora, TECs and Their Habitats

Indirect impacts on threatened flora values within the Study Area are considered to be limited. The Subject Land is small and the impact of the Proposal would be largely contained within the Subject

Land. Indirect impacts on sensitive environmental receivers on lands to the west are buffered by adjacent lands. Secondary impacts would be largely limited to the development stage and can be mitigated as detailed in **Section 5** below.

Impacts of future stormwater discharge into the adjacent wetlands is not considered to be a significant alteration to this waterway. This wetland is located in an urban environment with significant stormwater and surface drainage inflows from already developed lands. The increased stormwater discharge from the development of the Subject Land is not considered likely to significantly increase the risk of new pathogen or weed species into the riparian vegetation environment.

4.1.3.2 Indirect Impacts on Threatened Fauna and Their Habitats

Indirect impacts on threatened fauna known to occur in the locality would consist of the following:

- Increased noise and light pollution during and following development;
- Increased dust generation during works discouraging use of adjacent vegetation; and
- Increased risk of vehicle collision with fauna following development.

The Project is not considered likely significantly exacerbate the existing state of these impacts in the locality. The nearby riparian vegetation and wetland environment exist in an urbanised landscape with the above indirect impacts already present. Fauna (including potential threatened species) are adapted to this urban landscape and the Project is not considered likely to significantly alter the habitat utility of habitat adjacent to the Study Area for any known local threatened fauna.

4.2 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

This section details the assessment of potential Matters of National Environmental Significance (MNES) which may be impacted as a result of the Proposal. These MNES are as listed under the Commonwealth EPBC Act and encompass:

- World heritage properties;
- National heritage properties;
- Wetlands of national importance;
- The Great Barrier Reef Marine Park;
- Commonwealth Marine Area;
- Listed Threatened Ecological Communities;
- Listed threatened species; and
- Listed migratory species.

Assessment for the presence of these entities was conducted through the Protected Matters Search Tool (PMST) with a 5 km buffer around the Subject Land (Commonwealth of Australia, 2021).

4.2.1 World Heritage Properties

Based on the desktop search, one World Heritage Property listed under the EPBC Act occurs within the search area, the greater Blue Mountains Area. This is located outside of the Study Area and no impact on this Word Heritage Property is anticipated to occur as a result of the Proposal.

4.2.2 National Heritage Properties

Based on the desktop search, one National Heritage Place listed under the EPBC Act occur within the

search area, the greater Blue Mountains Area. This is located outside of the Study Area and no impact on this Word Heritage Property is anticipated to occur as a result of the Proposal.

4.2.3 Wetlands of International Importance

Based on the desktop search, no wetlands of international importance listed under the EPBC Act occur within the search area.

4.2.4 The Great Barrier Reef Marine Park

The Subject Land is not part of or near the Great Barrier Reef Marine Park. Therefore, the Proposal will not impact on the Great Barrier Reef Marine Park.

4.2.5 Commonwealth Marine Area

The Subject Land is not part of or near the Commonwealth Marine Area. Therefore, the Proposal will not impact on the Commonwealth Marine Area.

4.2.6 Listed Threatened Ecological Communities

The BC Act TEC of Cumberland Plain Woodland in the Sydney Basin Bioregion also aligns with the EPBC Act TEC of Cumberland Plain Shale Woodlands and Shale-gravel Transition Forest, listed as critically endangered under the EPBC Act.

However, to meet the federal listing, a patch of candidate CPW is required to meet minimum condition thresholds to qualify for protection under the EPBC Act. An assessment flowchart is provided on Page 11 of the Cumberland Plain Shale Woodlands and Shale-gravel Transition Forest A guide to identifying and protecting the nationally threatened ecological community *Environment Protection and Biodiversity Conservation Act 1999*: Policy Statement 3.31 (Commonwealth of Australia, 2010). **Figure 4.2** below provides this assessment flowchart.

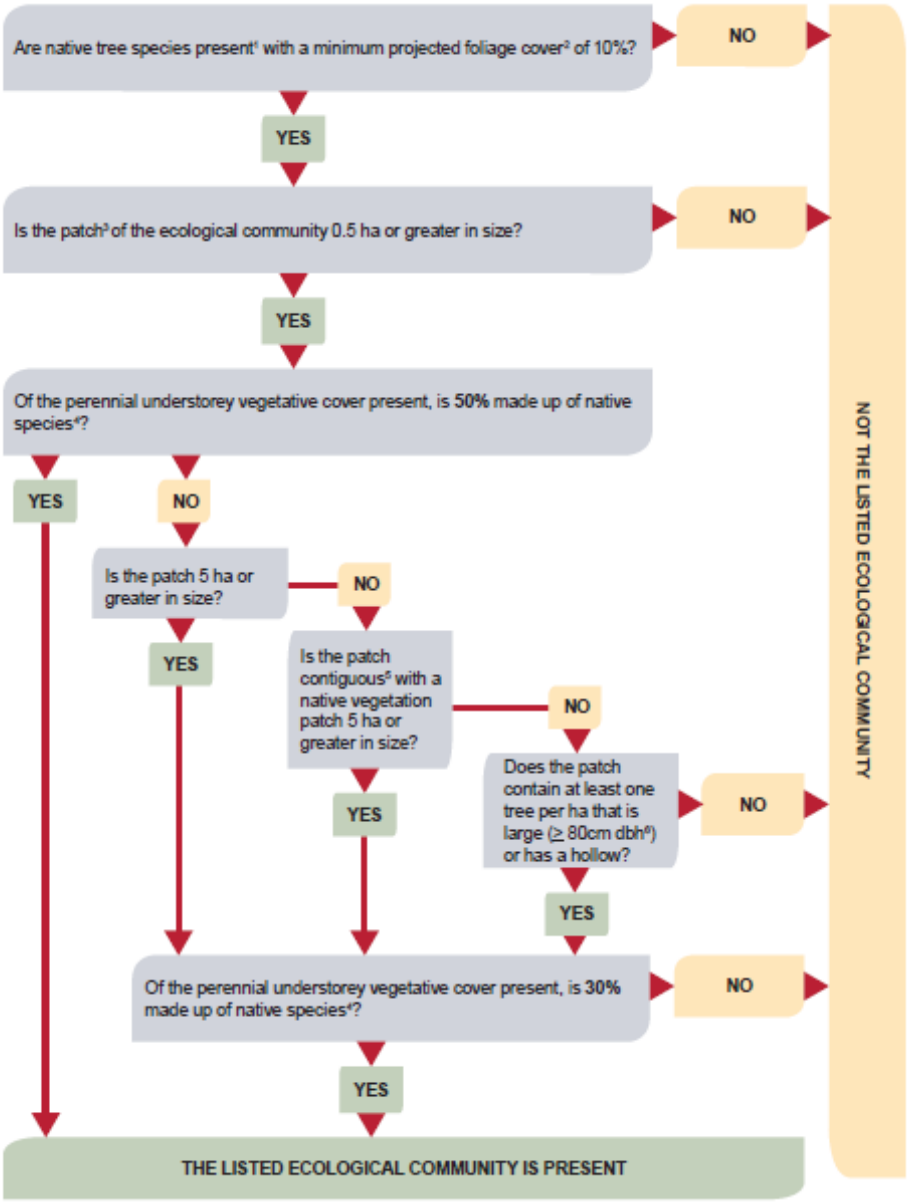

Figure 4.2: Flowchart of key diagnostic features and condition thresholds to identify the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest ecological community

Table 4.2 below provides and assessment of the candidate vegetation on the Subject Land against these minimum condition thresholds.

Table 4.2: Assessment of candidate TEC vegetation on the Subject Land against the minimum condition thresholds for protection under the EPBC Act

Threshold	Assessment
Are native tree species present with a minimum projected foliage cover of 10%?	With reference to the plot data in **Appendix 5**, this threshold is met. Meets this threshold. **Proceed**
Is the patch of the ecological community 0.5 ha or greater in size?	No, the total contiguous patch this TEC vegetation within 103-109 Laycock Street is less than 0.5 ha.

Threshold	Assessment
	Does not meet this threshold. **Not the listed ecological community**
Of the perennial understorey vegetative cover present, is 50% made up of native species?	N/a
Is the patch 5 ha or greater in size?	N/A
Is the patch contiguous with a native vegetation patch 5 ha or greater in size?	N/A
Of the perennial understorey vegetative cover present, is 30% made up of native species?	N/a

Based on the assessment in **Table 4.2** above, the candidate TEC on the Subject Land does not meet the minimum condition thresholds for protection under the EPBC Act. Therefore, an assessment of significance for this TEC as a Matter of National Environmental Significance (MNES) is not required. This TEC is not considered further in this assessment.

No other potential TECs under the EPBC Act were identified on the Subject Land, see **Appendix 6**.

4.2.7 Listed Threatened Species

Appendix 6 assesses the likelihood of occurrence of all EPBC Act listed threatened species identified in the PMST report. This analysis identified the following species as present or having a moderate or greater likelihood of occurrence on the Subject Land:

- Flora:
  - *Eucalyptus scoparia* (Wallangarra White Gum) – listed as vulnerable under the EPBC Act; and
  - *Syzygium paniculatum* (Magenta Lilly Pilly) – listed as vulnerable under the EPBC Act.
- Fauna:
  - Grey-headed Flying Fox (*Pteropus poliocephalus*) – listed as vulnerable under the EPBC Act;
  - Regent Honeyeater (*Anthochaera phrygia*) – listed as critically endangered under the EPBC Act; and
  - Swift Parrot (*Lathamus discolor*) – listed as critically endangered under the EPBC Act.

The impact of the Proposal on these species is assessed through tests of significance under the EPBC Act. These assessments are provided in **Appendix 7**.

These tests concluded that the Proposal is unlikely to have a significant impact on these species. The Proposal would remove a small portion of suitable habitat for these species which would not lead to greater isolation or fragmentation of the patch. The local area is already highly urbanised and the Project is not considered likely to significantly degrade the utility of the habitat for these species in the local area.

4.2.8 Listed Migratory Species

Appendix 6 assesses the likelihood of occurrence of all EPBC Act listed migratory species identified in the PMST report. No listed migratory species is considered to have a moderate or greater likelihood of occurrence on the Subject Land.

5. RECOMMENDATIONS

5.1 INTRODUCTION

When assessing the biodiversity impacts of a proposed development there are three key considerations. These three approaches are listed in a descending order of best biodiversity outcomes:

- Avoid: modify the proposed development so no significant impact on resident biodiversity values would occur. This is typically impractical but can help guide mitigation measures;
- Mitigate: modify the proposed development to reduce the significant impacts on biodiversity values to the maximum extent possible. This is typically achieved through measures such as modification of proposed dwelling envelopes to avoid removing vegetation etc.; and
- Compensate: include measures in the proposed development to compensate for the biodiversity values lost. This can be achieved through an on-site offset which reserves a portion of the subject site in perpetuity for conservation and rehabilitation purposes. It can also be achieved through an off-site offset under the NSW Biodiversity Offsets Scheme (BOS). This allows for the proponent of a proposed development to purchase biodiversity credits of an equal value to the credit value of the biodiversity assets present on a subject site. These credits will then be used to preserve an area of equivalent biodiversity value off-site.

This section makes recommendations to reduce or to provide suitable compensation for the impacts on flora and fauna values detailed in **Section 4** above.

5.2 AVOIDING IMPACTS

As detailed in **Section 4.1.1** above, the Project would avoid removal of the large remnant hollow-bearing eucalypt, considered to represent the highest value fauna habitat on the Subject Land. The Proposal would also retain fringing *Melaleuca bracteata* along the eastern and northern boundaries of the Subject Land. This vegetation would continue to provide a wildlife corridor along these boundaries for fauna moving through the Subject Land. Finally, the Proposal would not isolate or fragment any area of native vegetation. The current level of connectivity around the Subject Land would be retained through the abovementioned fringing *M. bracteata* as well as through scattered native trees on lands to the west and north.

No high value fauna habitat items would be removed by the Proposal.

5.3 MITIGATING IMPACTS

As discussed above, the Proposal would retain the large mature eucalypt containing hollow-bearing resources. This will mitigate the impact of the Proposal on the habitat value of present native vegetation. The native vegetation to be removed, including remnant CPW TEC is largely composed of planted immature individuals resulting from past landscaping. The two threatened flora species present are not endemic to the locality and are representative of past landscaping plantings. They are not considered to represent a viable local population of either species.

The remaining potential impacts on biodiversity associated with the Proposal are considered to be indirect. As detailed in **Section 4.1.3** above, a variety of indirect impacts may arise without adequate

safeguards as a result of the Project. Appropriate mitigation measures for these impacts are described in **Table 5.1** below.

Table 5.1: Appropriate mitigation measures for likely indirect impacts of the Proposal

Impact	Action	Outcome	Timing	Responsibility
Sediment migration from areas of unconsolidated, exposed soil during development works into downslope areas of native vegetation	Sediment fencing is to be installed below all areas of exposed soil during works	Prevention of migration of unconsolidated soil into areas of adjacent native vegetation	Prior to any soil disturbance works. Maintained and repaired as required. Retained until soil is stabilised by another mechanism (laying of turf, sowing of grass etc.)	Contractor(s) responsible for works
Introduction of new weed species and pathogens, turbidity and suspended sediment into downslope and downstream areas due to runoff from unconsolidated, exposed soil during development as well as in stormwater following development	Appropriate runoff controls such as sediment fencing can be installed prior to any soil disturbance works. Any exogenous soil and water used on site (e.g. for dust suppression) is to be appropriately treated to minimize the rise of the introduction of new pests and diseases. Any proposed stormwater infrastructure design, should also consider water sensitive urban design elements to minimise harmful discharge into the wetland to the west	Mitigation of the risk of introduction of new pests and diseases into downslope areas of native vegetation and the nearby wetland	Prior to any soil disturbance works and during development	Contractor(s) responsible for works/Proponent/development planner
Increased contaminant and nutrient loads introduced from stormwater into native vegetation downslope and downstream of the Subject Site following development	The impact of this process on the downslope wetland would be mitigated through appropriate water sensitive urban design elements to minimise harmful discharge into the wetland to the west. Muscle Creek is already exposed to inflows of contaminants from the surrounding urban environment. The Project is not considered likely to significantly exacerbate this process	Minimisation of contaminated stormwater entering the nearby wetland	During development	Proponent/development planner

Impact	Action	Outcome	Timing	Responsibility
Increased noise and light pollution on nearby areas of retained native vegetation, reducing fauna utility of this habitat	Restricting works to daylight hours and minimising the use of loud machinery whenever possible or containing such machinery within noise barriers. The Study Area is located within an urbanised landscape. Local fauna utilising the available habitat are adapted to the conditions of locality. Works are considered unlikely to significantly affect habitat utility for resident native fauna	Minimal disturbance to sensitive fauna using habitat within the subject site and adjacent lands	During all development works	Contractor(s) responsible for works
Entrapment of fauna in trenching works. This can result in fauna death or injury through drowning, burial and compaction or through interaction with excavation plant	Carry out excavation and backfilling works within a single day. If sections of trench are required to be left overnight cover with metal plates or heavy wooden boards to prevent fauna access. Inspect open trenches each morning for potentially trapped fauna prior to commencing works. If fauna is observed within trench, contact a suitably training and qualified wildlife handler to carry out rescue and relocation. Injured or juvenile fauna are to be taken to a local veterinarian for assessment and treatment. Works within the trench are not to resume until any fauna present have been rescued	Minimal risk of fauna injury or death during trenching works	During all trenching works or other earthworks resulting in potential fauna entrapment areas	Contractor(s) responsible for works

Impact	Action	Outcome	Timing	Responsibility
Increased dust generation during development works, reducing fauna utility of areas of nearby retained habitat	Dust minimisation through water suppression, avoiding works on high wind days and limiting dust generating activities to the extent possible	Minimal disturbance to sensitive fauna using habitat within the Study Area and adjacent lands	During all development works	Contractor(s) responsible for works

5.4 COMPENSATION

Future landscaping and revegetation of areas disturbed by the Project are recommended to be carried out using locally endemic appropriate species, primarily CPW representative species to emulate the historic native vegetation the Study Area. Plantings should be designed to incorporate canopy, shrub and groundcover components wherever possible.

5.5 ADDITIONAL ASSESSMENT REQUIREMENTS (BIODIVERSITY CONSERVATION ACT 2016)

Under the BAM, there are three entry pathways for a Part 4 development (under the NSW EPA Act):

1. Exceeding the minimum native vegetation clearing thresholds as detailed in Section 7.2 of the Biodiversity Conservation Regulation 2017; and/or
2. Clearing of vegetation mapped on the Biodiversity Values Map (BVM) assessed through a Biodiversity Offset Scheme Entry Threshold (BOSET) report; and/or
3. An assessment of one or more threatened entity (species, population or TEC) that determined that the development would have a "significant impact" on the entity. Assessed via a five-part test under Section 7.3 of the BC Act.

With regards to the Subject Land, the Proposal does not meet condition one or two. As shown in the BOSET report provided in **Appendix 2**, the Subject Land does not fall within any lands mapped on the BVM. Also as shown in the BOSET report, the minimum native vegetation clearing threshold for BAM entry for the Subject Land is 0.25 ha. As discussed in **Section 3** above, the Proposal was assessed as not resulting in this level of clearing of native vegetation. Finally, as discussed in **Section 4** of this report, the Proposal was not considered likely to have a significant impact on any TEC, species or population listed under the BC Act.

Based on this assessment, the Proposal is not required to be assessed through a BDAR in accordance with the BAM.

6. CONCLUSIONS

This FFA has been drafted to inform the Proposal at 103-109 Laycock Street, Cranebrook in the Penrith City Council LGA. The Proposal would redevelop the Subject Land to support a new seniors housing estate.

This FFA was conducted in two phases, a desktop assessment and field surveys. The desktop assessment identified the potential presence of several listed threatened species, populations and TECs, known or considered likely to occur in the locality. The desktop assessment also identified several native PCTs which could be present within the Subject Land. The findings of the desktop assessment were used to inform the scope of the field surveys.

Field surveys were conducted in May 2021 by one ecologist from Anderson Environmental. These surveys comprised a complete walk-through survey of the entire Subject Land and the survey of one Biodiversity Assessment Method (BAM) vegetation plot. Dedicated fauna surveys for birds, reptiles and gastropods were undertaken and fauna species were documented whenever incidentally encountered.

The field surveys concluded that the Subject Land contained remnant and planted native vegetation most strongly conforming to the PCT of Cumberland Shale Plains Woodland (PCT ID 849). This PCT consisted of a single mature remnant *Eucalyptus crebra* (Narrow-leaved Ironbark), two mature remnant *Angophora subvelutina* and a small stand of planted *E. crebra* and *Allocasuarina littoralis* (Black Sheoak). This patch was largely characterised by these canopy species with virtually no shrub layer and a ground stratum consisting of a mixture of native and exotic forbs and grasses. PCT ID 849 was considered to be commensurate with the TEC of Cumberland Plain Woodland in the Sydney Basin Bioregion, listed as critically endangered under the BC Act. Remaining vegetation within the Subject Land was characterised by a mixture of planted non-endemic native and exotic trees and shrubs and largely exotic grasslands.

Two threatened flora species were identified on the Subject Land:

- *Eucalyptus scoparia* (Wallangarra White Gum) – listed as endangered under the BC Act and vulnerable under the EPBC Act; and
- *Syzygium paniculatum* (Magenta Lilly Pill) – listed as endangered under the BC Act and vulnerable under the EPBC Act.

Both of these species were present as planted individuals resulting from past landscaping. Both occur outside of their natural ranges and/or habitats and are not considered to comprise an indigenous, viable local population.

One listed threatened fauna species was detected during surveys, the Little Lorikeet (*Glossopsitta pusilla*) – listed as vulnerable under the BC Act. Numerous other threatened woodland and hollow-roosting birds, microbats and Flying Foxes were considered to have a moderate or greater likelihood of occurrence and the impacts of the Proposal on these species were consequently assessed through 5-part tests, as per Part 7.3 of the BC Act.

The Proposal would remove the majority of the current extent of CPW on the Subject Land.

However, the mature hollow-bearing tree would be retained. Fringing planted native *Melaleuca bracteata* along the eastern and northern boundaries of the Subject Land would also be retained. The CPW to be removed consists of planted immature and non-habitat bearing mature trees, native grasses and forbs. The remaining vegetation to be removed consists of mixed non-endemic natives and exotics and largely exotic grasslands of limited native fauna value.

Numerous mitigation measures could be implemented during and following construction including sediment and weed control measures, limiting noise generating works and avoiding night works (to limit additional light pollution on adjacent areas of fauna habitat). The long-term impacts of the Proposal on habitat utility of the local area are considered negligible. The Proposal would be located within a highly urbanised landscape alongside existing roadways and suburban lands. Native vegetation on adjacent lands is already disturbed by past land use practices and exotic weed incursion.

Assessment of MNES determined that the CPW present on the Subject Land did meet the minimum condition thresholds for protection under the EPBC Act. Two federally listed threatened flora species and three threatened fauna species were known or were considered to have potential to occur on the Subject Land (*Eucalyptus scoparia*, *Syzygium paniculatum*, Grey-headed Flying Fox, Regent Honeyeater and Swift Parrot). Tests of significance conducted for this TEC and species concluded that the Proposal would not have a significant impact on these entities and no referral to the federal Minister of the Environment was considered necessary.

Assessment of the Proposal concluded that the Proposal will result in the clearing of a small area of largely planted and immature low condition CPW as well as the removal of both populations of threatened flora. However, the highest value fauna habitat would be retained (hollow-bearing tree) as well as vegetation providing fauna movement through the Subject Land. The two threatened flora species are planted individuals and are not considered indicative of viable local populations of these species. Assessments under the BC Act and EPBC Act for TECs and species present or considered likely to occur concluded that the Proposal is unlikely to have a significant impact on these species. Further assessment through a BDAR (BC Act) and/or a referral to the federal Minister of the Environment (EPBC Act) are not considered necessary.

7. REFERENCES

Commonwealth of Australia. (2010). *Cumberland Plain Shale Woodlands and Shale-gravel Transition Forest: A guide to identifying and protecting the nationally threatened ecological community Environment Protection and Biodiversity Conservation Act 1999: Policy Statement 3.31.* Canberra: Commonwealth of Australia.

Commonwealth of Australia. (2014). *EPBC Act referral guidelines for the vulnerable Koala.* Canberra: Commonwealth of Australia.

Commonwealth of Australia. (2017). *Draft Recovery Plan for the Grey-headed Flying-fox Pteropus poliocephalus.* Canberra: Commonwealth of Australia.

Commonwealth of Australia. (2021, May 25). *National Flying-fox Monitoring Viewer*. Retrieved from Australian Government Department of Agriculture, Water and the Environment: http://www.environment.gov.au/webgis-framework/apps/ffc-wide/ffc-wide.jsf

Commonwealth of Australia. (2021, March 3). *Protected Matters Search Tool*. Retrieved from Protected Matters Search Tool: http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf

Duncan, M. (2010). *National Recovery Plan for the Thick-lip Spider-orchid Caladenia tessellata.* Melbourne: Department of Sustainability and Environment.

NSW Deparment of Planning, Industry and Environment. (2021, February 18). *Biodiversity Values Map and Threshold Tool*. Retrieved from Biodiversity Values Map and Threshold Tool: https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap

NSW Department of Environment and Conservation. (2004). *DEC Draft Assessment Guidelines.* Sydney: NSW Department of Environment and Conservation.

NSW Department of Environment, Energy and Science. (2020). *Biodiversity Assessment Method.* NSW.

NSW Department of Planning, Industry and Environment . (2010, July 23). *Remnant Vegetation Mapping of the Cumberland Plain (crown cover greater than 10%). VIS_ID 2221* . Retrieved from NSW Government SEED database: https://datasets.seed.nsw.gov.au/dataset/remnant-vegetation-mapping-of-the-cumberland-plain-crown-cover-greater-than-10-vis_id-2221e0dca

NSW Department of Planning, Industry and Environment. (2009). *NSW Guide to Surveying Threatened Plants.* Sydney: NSW Department of Planning, Industry and Environment.

NSW Department of Planning, Industry and Environment. (2009). *Threatened Species Survey and Assessment Guidelines: Field Survey Methods for Fauna, Amphibians.* Sydney: NSW Department of Planning, Industry and Environment.

NSW Department of Planning, Industry and Environment. (2017a). *Biodiversity Conservation Regulation.* Sydney: NSW Department of Planning, Industry and Environment.

NSW Department of Planning, Industry and Environment. (2018). *'Species Credit' Threatened Bats and Their Habitats, NSW Survey Guide for the Biodiversity Assessment Method* . Sydney: NSW Department of Planning, Industry and Environment.

NSW Department of Planning, Industry and Environment. (2019). *Guidance to Assist a Decision-maker to Determine a Serious and Irreversible Impact.* Sydney: NSW Department of Planning, Industry and Environment.

NSW Department of Planning, Industry and Environment. (2021a, February 18). *Threatened Biodiversity Data Collection*. Retrieved from Threatened Biodiversity Data Collection: https://www.environment.nsw.gov.au/asmslightprofileapp/account/login?ReturnUrl=%2fAtlasApp%2fDefault.aspx

NSW Government. (2020). *State Environmental Planning Policy (Koala Habitat Protection) 2020.* Sydney: NSW Government.

NSW Government. (2021, May 21). *Espade V2.1*. Retrieved from Espade: https://www.environment.nsw.gov.au/espade2webapp

Redgum Horticultural. (2021). *Report Arboricultural Impact Assessment and Tree Management Plan 103-109 Laycock Street Cranebrook.* Rouse Hill: Redgum Horticultural Arboriculture and Horticulture Consultants.

Weatherzone. (2021, May 21). *Penrith Daily Summaries*. Retrieved from Weatherzone: https://www.weatherzone.com.au/station.jsp?lt=site&lc=67113&list=ds

8. APPENDIX 1: DISCLAIMER AND LIMITATION OF LIABILITY

The use of this report is for the client only and is based on an assessment of the site at the point in time of assessment. The material in this report reflects the judgement of Anderson Environmental Pty Ltd in light of background information and site conditions at the time of assessment and we take no responsibility for any database inaccuracies or other inaccuracies in background and or other information. The report is not to be reproduced or released to any other party, in whole or in part, without the express written consent of Anderson Environmental Pty Ltd. This report is Copyright protected and is not to be reproduced in part or whole or used by a third party without the express written permission of Anderson Environmental Pty Ltd. If you are not the client who commissioned this report or a local government authority for which approval is being sought as part of the formal DA process and are in possession of this report you are in breach of the law and we reserve the right to recover damages from any individuals, companies or other parties as a result of such breaches. Any use, which a third party makes of this report, or any reliance or discussions based on it, is the responsibility of such Third Parties and as outlined above is in breach of the law. Anderson Environmental and its staff accepts no responsibility for damages, if any, suffered by any third party because of decisions made or actions taken based on this report and reserves the right to recover damages from the third party from breaches as outlined above.

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9. APPENDIX 2: BOSET REPORT

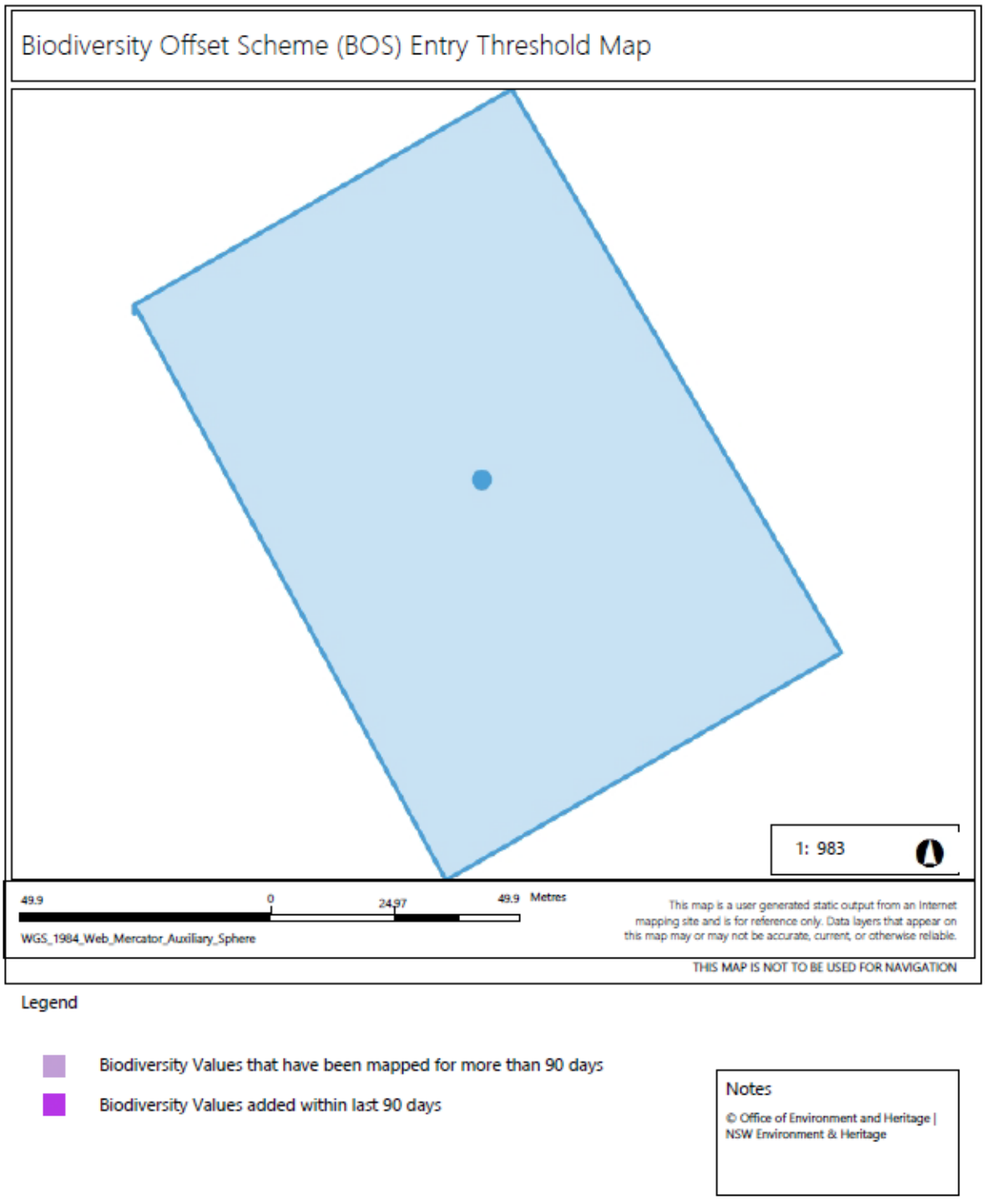

Figure A2.1: BOSET report for the Subject Land

NSW GOVERNMENT

Biodiversity Values Map and Threshold Report

Results Summary

Date of Calculation	09/05/2021 3:28 PM	**BDAR Required***
Total Digitised Area	0.8 ha	
Minimum Lot Size Method	LEP	
Minimum Lot Size	0.06 ha	
Area Clearing Threshold	0.25 ha	
Area clearing trigger Area of native vegetation cleared	Unknown #	Unknown #
Biodiversity values map trigger Impact on biodiversity values map(not including values added within the last 90 days)?	no	no
Date of the 90 day Expiry	N/A	

*If BDAR required has:

- at least one 'Yes': you have exceeded the BOS threshold. You are now required to submit a Biodiversity Development Assessment Report with your development application. Go to https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor to access a list of assessors who are accredited to apply the Biodiversity Assessment Method and write a Biodiversity Development Assessment Report
- 'No': you have not exceeded the BOS threshold. You may still require a permit from local council. Review the development control plan and consult with council. You may still be required to assess whether the development is "likely to significantly affect threatened species' as determined under the test in s. 7.3 of the Biodiversity Conservation Act 2016. You may still be required to review the area where no vegetation mapping is available.

Where the area of impact occurs on land with no vegetation mapping available, the tool cannot determine the area of native vegetation cleared and if this exceeds the Area Threshold. You will need to work out the area of native vegetation cleared - refer to the BOSET user guide for how to do this.

On and after the 90 day expiry date a BDAR will be required.

Disclaimer

This results summary and map can be used as guidance material only. This results summary and map is not guaranteed to be free from error or omission. The State of NSW and Office of Environment and Heritage and its employees disclaim liability for any act done on the information in the results summary or map and any consequences of such acts or omissions. It remains the responsibility of the proponent to ensure that their development application complies will all aspects of the *Biodiversity Conservation Act 2016*.

The mapping provided in this tool has been done with the best available mapping and knowledge of species habitat requirements. This map is valid for a period of 30 days from the date of calculation (above).

Acknowledgement

I as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature_____ Date: 09/05/2021 03:28 PM

10. APPENDIX 3: FAUNA SPECIES LIST

Table A3-1: Fauna species list

Class	Common name	Scientific name	BC Act	EPBC Act	Exotic	Bird survey point 1	Incidental	Mode of detection	Notes
Aves	Australian Magpie	*Cracticus tibicen*				*		Heard	
	Australian Raven	*Corvus coronoides*				*		Heard	
	Australian White Ibis	*Threskiornis moluccus*				*		Heard	
	Common Myna	*Acridotheres tristis*			*	*		Heard	
	Crested Pigeon	*Ocyphaps lophotes*				*		Seen	
	Dusky Moorhen	*Gallinula tenebrosa*				*		Heard	
	Galah	*Eolophus roseicapilla*					*	Seen	
	Little Lorikeet	*Glossopsitta pusilla*	V			*		Seen/heard	Seen flying over lands to the south of Subject Land
	Magpie Lark	*Grallina cyanoleuca*				*		Seen	
	Noisy Miner Bird	*Manorina melanocephala*				*		Heard	
	Rainbow Lorikeet	*Trichoglossus moluccanus*				*		Heard	
	Red Wattlebird	*Anthochaera carunculata*				*		Heard	
	Red-rumped Parrot	*Psephotus haematonotus*				*		Heard	
	Superb Fairywren	*Malurus cyaneus*					*	Heard	
	Sulphur-crested Cockatoo	*Cacatua galerita*				*		Heard	
Gastropoda	Garden Snail	*Cornu aspersum*			*		*	Shell	

Class	Common name	Scientific name	BC Act	EPBC Act	Exotic	Bird survey point 1	Incidental	Mode of detection	Notes
Mammalia	Dog	*Canis lupus familiaris*			*		*	Seen	

11. APPENDIX 4: VEGETATION PLOT DATA AND INCIDENTAL FLORA

Table A4.1: Plot Location Data

Plot	Date	Zone	Datum	Easting	Northing
P1	11/05/2021	56	H	287172	6266109

Table A4.2: Plot Descriptive Data

Plot	Vegetation zone	Dimensions	Midline bearing (dec degrees)	Photo #	IBRA Region/ subregion	Vegetation Class	PCT	Confidence	TEC (yes/no)	Confidence	Surveyors
P1	Z1	20x50m	317	P1	Sydney/ Cumberland	Coastal Valley Grassy Woodlands	849	Moderate	Yes	Moderate	Bo Davidson

Table A4.3: Plot Floristic Data

Growth form	Scientific Name	Common Name	Native/ Exotic/ High Threat Exotic	Plot 1		Incidental
				Cover	Abundance	
Tree	*Allocasuarina littoralis*	Black Sheoak	N	5	4	
	Angophora subvelutina	Broad-leaved Apple	N			X
	Brachychiton acerifolius	Illawarra Flame Tree	N			X
	Eucalyptus crebra	Narrow-leaved Ironbark	N	5	4	
	Eucalyptus scoparia	Wallangarra White Gum	N			X
	Ficus macrophylla	Moreton Bay Fig	N			X
	Grevillea robusta	Silky Oak	N			X
	Melia azedarach	Chinaberry	N			X
Shrub	*Callistemon citrinus*	Lemon-scented Bottlebrush	N			X
	Grevillea sp.	Grevillea red hooks	N			X
	Melaleuca bracteata	Black Tea-tree	N			X
	Melaleuca styphelioides	Prickly-leaved Paperbark	N			X
	Syzygium paniculatum	Magenta Lilly Pilly	N			X
Grass and Grass-like	*Bothriochloa decipiens*		N	0.1	10	
	Cynodon dactylon	Couch Grass	N	25	1000	
	Cyperus gracilis	-	N	0.1	6	
	Microleana stipoides var stipoides	Weeping Meadow Grass	N	5	100	
Forb	*Cymbonotus lawsonianus*	Bear's Ear	N	0.1	5	
	Dichondra repens	Kidney Weed	N	0.5	50	
	Dianella caerulea	Blueberry Lilly	N	0.1	1	
	Dianella longifolia	Long-leaved Blueberry Lily	N	0.1	1	
	Wahlenbergia gracilis	Australian Bluebell	N			X
Ferns	*Cheilanthes sieberi var sieberi*	Poison Rock Fern	N	0.1	6	
Other	*Glycine clandestina*	Twining Glycine	N	0.1	6	
	Glycine tabacina	Variable Glycine	N	0.1	6	
	Desmodium varians	Slender Tick-trefoil	N	1	50	
Exotic	*Abelia chinensis*	Chinese Honeysuckle	E			X
	Agapanthus sp.	Lily of the Nile	E			X
	Anagallis arvensis	Scarlet Pimpernel	E			X
	Anredera cordifolia	Madeira Vine	HTE			X
	Araucaria heterophylla	Norfolk Pine	E			X
	Asparagus aethiopicus	Sprenger's Asparagus	HTE			X
	Asparagus asparagoides	Bridal Creeper	HTE			X
	Axonopus compressus	Broad-leaved Carpet Grass	E	10	100	
	Bauhinia galpinii	African Plume	E			X
	Bidens pilosa	Cobbler's Pegs	HTE	0.1	1	

Growth form	Scientific Name	Common Name	Native/ Exotic/ High Threat Exotic	Plot 1		Incidental
				Cover	Abundance	
	Chloris gayana	Rhodes Grass	HTE			X
	Conyza sp.	Fleabane	E	0.1	1	
	Cupressus sp.	A Cypress	E			X
	Ehrharta erecta	Panic Veldt Grass	HTE	2	50	
	Eleusine indica	Indian Goosegrass	E	0.1	10	
	Eragrostis curvula	African Love Grass	HTE	0.1	3	
	Hypochaeris radicata	Flatweed	E	0.1	6	
	Jacaranda mimosifolia	Blue Jacaranda	E			X
	Malva sp.	Mallow	E	0.5	20	
	Medicago lupulina	Black Medick	E			X
	Morus alba	White Mulberry	E			X
	Murraya paniculata	Orange Jessamine	E			X
	Nerium oleander	Oleander	E			X
	Oxalis corniculata	Creeping Woodsorrel	E	0.1	20	
	Paspalum dilatatum	Paspalum	HTE	25	1000	
	Pennisetum clandestinum	Kikuyu Grass	E			X
	Phoenix canariensis	Phoenix Palm	E			X
	Picea abies	Norway Spruce	E			X
	Pinus radiata	Radiata Pine	E	5	1	
	Plantago lanceolata	Lamb's Tongues	E	1	20	
	Plumbago auriculata	Cape Plumbago	E			X
	Portulaca oleracea	Common Purslane	E			X
	Richardia brasiliensis	Brazilian Clover	E	2	50	
	Rumex obtusifolius	Broad-leaved Dock	E			X
	Schinus molle	Peppercorn Tree	N			X
	Sida rhombifolia	Paddy's Lucerne	E	0.1	10	
	Soliva sp.	Bindies	E	10	500	
	Sonchus sp.	Milk Thistle	E	0.1	20	
	Taraxacum officinale	Dandelion	E	0.1	5	
	Ulmus parvifolia	Chinese Elm	E			X
High Threat Weed cover				27.2		
Stems < 5cm				Y		
Stems 5-9 cm (no with hollows)				N (0)		
Stems 10-19 cm (no with hollows)				Yes (0)		
Stems 20-29 cm (no with hollows)				Yes (0)		
Stems 30-49 cm (no with hollows)				Yes (0)		
Stems 50-79 cm (no with hollows)				1 (0)		

Growth form	Scientific Name	Common Name	Native/ Exotic/ High Threat Exotic	Plot 1		Incidental
				Cover	Abundance	
Stems 80+ cm (no with hollows)				0 (0)		
Leaf litter cover (%)				21		
Total length of fallen logs				1		

Photograph A4.1: Plot 1

12. APPENDIX 5: HABITAT TREE DATA

Table A5.1: Habitat tree data

Tree No.	Scientific Name	Common Name	Height (m)	DBH (mm)	No. of Hollows	Size Class*	Notes
1	*Eucalyptus crebra*	Narrow-leaved Ironbark	20	900	5	1L, 3M, 1S	Galah seen in hollow

**S=5-15cm, M=15-25cm, L=25+cm*

13. APPENDIX 6: LIKELIHOOD OF OCCURRENCE TABLES

Threatened flora and fauna, and migratory species (listed under the BC Act and EPBC Act) that have been gazetted and are known, or have potential, to occur within a 10 km radius of the Subject Land have been considered in this section. TECs known from the broader area have also been considered. The likelihood of occurrence within the Subject Land of each species and TEC was assessed using the criteria described in Table A6-1 and the findings presented in Table A6-2 (flora species and TECs) and Table A6-3 (fauna species).

Table A6-1: Likelihood of occurrence criteria

Likelihood Rating	Criteria
Known	The species was recorded within the Subject Land during the field surveys
High	It is likely that a species would inhabit or utilise habitat within the Subject Land. Criteria for this category may include: • Species recently and/or regularly recorded in contiguous or nearby habitat; • High quality habitat or resources present within the Subject Land; • Species is known or likely to maintain a resident population surrounding the Subject Land; and • Species is known or likely to visit during migration or in response to seasonal availability of resources present on site.
Moderate	Potential habitat for a species occurs within the Subject Land. Criteria for this category may include: • Species previously recorded in contiguous habitat albeit not recently (>10 years); • Habitat present, but poor quality, depauperate or modified types and/or resources; • Species has potential to utilise habitat during migration or seasonal availability of resources; and • Cryptic flora species with potential habitat within the Subject Land that have not been targeted by surveys (for example, surveys were not undertaken within the flowering season.
Low	It is unlikely that the species inhabits the area, if it did, it would likely be a transient visitor. Criteria for this category may include: • The Subject Land does not support the specific habitat types or resources required by the species; • The Subject Land is beyond the current distribution of the species or is isolated from known populations; and • Non cryptic flora species not observed during targeted surveys.
None/ absent	The habitat within the Subject Land is unsuitable for the species

Table A6.2: TECs and flora species

Species	Expected habitat from OEH	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Agnes Banks Woodland in the Sydney Basin Bioregion (BC Act) Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion (EPBC Act)	The Castlereagh Scribbly Gum and Agnes Banks Woodlands range from woodland to low open-woodland with the canopy species typically 10-15 m tall (Benson, 1981; Keith, 2004). The ecological community's understorey has a prominent and diverse 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	E4B	E	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Blue Gum High Forest in the Sydney Basin Bioregion (BC Act) Blue Gum High Forest of the Sydney Basin Bioregion (EPBC Act)	A moist, tall open forest community, with dominant canopy trees of Sydney Blue Gum (Eucalyptus saligna) and Blackbutt (*E. pilularis*). Forest Oak (*Allocasuarina torulosa*) and Sydney Red Gum (*Angophora costata*) also occur. Species adapted to moist habitat such as Lilly Pilly (*Acmena smithii*), Sandpaper Fig (*Ficus coronata*), Rainbow Fern (*Calochleana dubia*) and Common Maidenhair (*Adiantum aethiopicum*) may also occur.	E4B	CE	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Blue Mountains Basalt Forest in the Sydney Basin Bioregion (BC Act) Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion (EPBC Act)	A moist, tall open forest community, with dominant canopy trees of Sydney Blue Gum (*Eucalyptus saligna*) and Blackbutt (*E. pilularis*). Forest Oak (Allocasuarina torulosa) and Sydney Red Gum (*Angophora costata*) also occur. Species adapted to moist habitat such as Lilly Pilly (*Acmena smithii*), Sandpaper Fig (*Ficus coronata*), Rainbow Fern (*Calochleana dubia*) and Common Maidenhair (*Adiantum aethiopicum*) may also occur.	E	E	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion (BC Act) Turpentine-Ironbark Forest of the Sydney Basin Bioregion (EPBC Act)	Characteristic tree species of this ecological community are Mountain Blue Gum (*Eucalyptus deanei*), Monkey Gum (*E. cypellocarpa*) and Turpentine (*Syncarpia glomulifera*). Other tree species include Sydney Red Gum (*Angophora costata*), Rough-barked Apple (*A. floribunda*), Mountain Mahogany (*E. notabilis*), Sydney Peppermint (*E. piperita*) and Grey Gum (*E. punctata*). Tree species composition varies between sites depending on geographical location and local conditions (e.g. topography, rainfall exposure).	E	CE	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal

Species	Expected habitat from OEH	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Blue Mountains Swamps in the Sydney Basin Bioregion (BC Act) Temperate Highland Peat Swamps on Sandstone (EPBC Act)	The Blue Mountains Swamps community is characterised by a dense mixture of shrubs and sedges, most of which have sclerophyllous foliage. The shrub stratum typically varies from 0.5 m to over 2.0 m tall and is highly variable in cover. The ground stratum may be up to about 1 m tall and is dominated by a dense sward of sclerophyllous sedges and grasses except in patches where these are displaced by a dense cover of taller shrubs. Ferns, forbs and small shrubs are scattered amongst the sedges and grasses.	V	E	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
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)	Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion is dominated by *Eucalyptus parramattensis* subsp. *parramattensis*, *Angophora bakeri* and *E. sclerophylla*. A small tree stratum of *Melaleuca decora* is sometimes present, generally in areas with poorer drainage	V	E	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Castlereagh Swamp Woodland Community (BC Act)	A low woodland, often having dense stands of Paperbark trees Melaleuca decora along with other canopy trees, such as Parramatta Red Gum (*Eucalyptus parramattensis* subsp. *parramattensis*). The shrub layer is not well developed and is mostly made up of young paperbark trees. The ground layer has a diversity of plants that tolerate waterlogged conditions, such as Swamp Pennywort (*Centella asiatica*), Common Rush (Juncus usitatus) and Branched Goodenia (*Goodenia paniculata*)	E	-	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion (BC Act) Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion (EPBC Act)	The Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion is a dry 5sclerophyll open-forest to low woodland which occurs predominantly in the Cumberland 6Subregionbetween Castlereagh and Holsworthy, as well as around the headwaters of the Cooks River	E	CE	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal

Species	Expected habitat from OEH	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Cumberland Plain Woodland in the Sydney Basin Bioregion (BC Act) Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (EPBC Act)	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 box*), E. tereticornis* (forest red gum), and/or *E. fibrosa* (red ironbark)	E4B	CE	None/ absent	Indicative species for this TEC was present on the Subject Land; however, highly disturbed and degraded. Does not meet minimum condition thresholds for consideration under the EPBC Act. Assessed in **Section 5** above and **Appendix 7** below
Elderslie Banksia Scrub Forest (BC Act) Elderslie Banksia Scrub Forest in the Sydney Basin Bioregion (EPBC Act)	A scrub community dominated by Coastal Banksia *Banksia integrifolia* subsp. *integrifolia*. Other canopy species include Broad-leaved Apple *Angophora subvelutina*. The shrubby understorey is diverse and includes species that usually occur in sandstone areas, such as Wedding Bush *Ricinocarpus pinifolius*, Riceflower *Pimelea linifolia* subsp. *linifolia* and Daphne Heath *Brachyloma daphnoides*	E4B	-	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (BC Act)	Associated with coastal areas subject to periodic flooding and in which standing fresh water persists for at least part of the year in most years. Typically occurs on silts, muds or humic loams in low-lying parts of floodplains, alluvial flats, depressions, drainage lines, backswamps, lagoons and lakes but may also occur in backbarrier landforms where floodplains adjoin coastal sandplains	E	-	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion (BC Act) Central Hunter Valley eucalypt forest and woodland ecological community (EPBC Act)	Hunter Valley Footslopes Slaty Gum Woodland is a woodland, or occasionally an open forest, with a sparse to moderately dense tree layer with occasional small trees and a moderately dense to dense shrub layer. The tree canopy is typically dominated by *Eucalyptus dawsonii* (Slaty Gum) and/or *Eucalyptus moluccana* (Grey Box). *Acacia salicina* (Cooba) and *Allocasuarina luehmannii* (Bulloak) may form a small tree layer or be part of the upper-most canopy	V	CE	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal

Species	Expected habitat from OEH	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Moist Shale Woodland in the Sydney Basin Bioregion (BC Act) Western Sydney Dry Rainforest and Moist Woodland on Shale (EPBC Act)	Similar to Cumberland Plain Woodland. It differs in having a shrub understorey that contains plants from moist habitats. Dominant canopy trees include Forest Red Gum Eucalyptus tereticornis, Grey Box *E. moluccana*, Narrow-leaved Ironbark *E. crebra* and Spotted Gum Corymbia maculata. Small trees, such as Hickory Wattle *Acacia implexa* and Sydney Green Wattle *A. parramattensis* subsp. *parramattensis* are also common. The shrub layer includes *Breynia oblongifolia*, Hairy Clerodendrum *Clerodendrum tomentosum* and Indian Weed *Siegesbeckia orientalis* subsp. *orientalis*	E	CE	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps bioregions (BC Act) Temperate Highland Peat Swamps on Sandstone (EPBC Act)	Montane Peatlands and Swamps comprises a dense, open or sparse layer of shrubs with soft-leaved sedges, grasses and forbs. It is the only type of wetland that may contain more than trace amounts of Sphagnum spp., the hummock peat-forming mosses. Small trees may be present as scattered emergents or absent	E	E	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Newnes Plateau Shrub Swamp in the Sydney Basin Bioregion (BC Act) Temperate Highland Peat Swamps on Sandstone (EPBC Act)	An ecological community dominated by shrubs and sedges that occurs on sites with impeded drainage in low slope headwater valleys on the Newnes Plateau in the upper Blue Mountains. The community is characteristically dominated by shrubs, with a variable cover of sedges. Shrubs have a dense to open cover, and include *Baeckea linifolia*, *Grevillea acanthifolia* subsp. *acanthifolia*, *Epacris paludosa* and *Leptospermum* species. The cover of sedges varies inversely with shrub cover	E	E	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (BC Act) River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria (EPBC Act)	It has a tall open tree layer of eucalypts, which may exceed 40 m in height, but can be considerably shorter in regrowth stands or under conditions of lower site quality. While the composition of the tree stratum varies considerably, the most widespread and abundant dominant trees include *Eucalyptus tereticornis* (forest red gum), *E. amplifolia* (cabbage gum), *Angophora floribunda* (rough-barked apple) and *A. subvelutina* (broad-leaved apple)	E	CE	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal

Species	Expected habitat from OEH	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Shale Gravel Transition Forest in the Sydney Basin Bioregion (BC Act) Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (EPBC Act)	Has an open forest structure with a canopy dominated by Broad-leaved Ironbark *Eucalyptus fibrosa*, with Grey Box *E. moluccana* and Forest Red Gum *E. tereticornis* occurring less frequently. Paperbark *Melaleuca decora* is common in the small tree layer. A sparse shrub layer is usually present which includes Blackthorn *Bursaria spinosa*, *Daviesia ulicifolia* and Peach Heath *Lissanthe strigosa*.	E	CE	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Shale Sandstone Transition Forest in the Sydney Basin Bioregion (BC Act) Shale Sandstone Transition Forest of the Sydney Basin Bioregion (EPBC Act)	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	E4B	CE	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion (BC Act)	Southern Sydney sheltered forest on transitional sandstone soils is an open forest dominated by eucalypts with scattered subcanopy trees, a diverse shrub layer and a well-developed groundcover of ferns, forbs, grasses and graminoids. The dominant trees include *Angophora costata*, *Eucalyptus piperita* and occasionally *Eucalyptus pilularis*, particularly around Helensburgh. *Corymbia gummifera* occurs frequently within the community, although generally at lower abundance than the other eucalypts. Features that distinguish Southern Sydney sheltered forest on transitional sandstone soils from vegetation more typical of sandstone gullies in the eastern Sydney basin include the occurrences of Eucalyptus pilularis, Acacia binervata, *Elaeocarpus reticulatus*, *Pittosporum undulatum* and its relatively dense groundcover of ferns, grasses, rushes, lilies and forbs	E	-	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Sun Valley Cabbage Gum Forest in the Sydney Basin Bioregion (BC Act)	Sun Valley Cabbage Gum Forest is dominated by *Eucalyptus amplifolia* (Cabbage Gum) with *E. eugenioides* (Thin-leaved Stringybark) as an associated tree. Native understorey species include *Acacia parramattensis*, *Imperata cylindrica*, *Lomandra longifolia* and *Pteridium esculentum*.	E4B	-	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal

Species	Expected habitat from OEH	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (BC Act) Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community (EPBC Act)	This community is found on the coastal floodplains of NSW. 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. Tree diversity decreases with latitude, and *Melaleuca ericifolia* is the only abundant tree in this community south of Bermagui	E	E	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (BC Act)	This swamp community has an open to dense tree layer of eucalypts and paperbarks although some remnants now only have scattered trees as a result of partial clearing. The trees may exceed 25 m in height, but can be considerably shorter in regrowth stands or under conditions of lower site quality where the tree stratum is low and dense. For example, stands dominated by *Melaleuca ericifolia* typically do not exceed 8 m in height. The community also includes some areas of fernland and tall reedland or sedgeland, where trees are very sparse or absent	E	-	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
Western Sydney Dry Rainforest in the Sydney Basin Bioregion (BC Act) Western Sydney Dry Rainforest and Moist Woodland on Shale (EPBC Act)	The dry rainforest form is a low, closed forest dominated by non-eucalypts—notably prickly-leaved paperbark (*Melaleuca styphelioides*), hickory wattle (*Acacia implexa*) and native quince (*Alectryon subcinereus*), while white euodia (*Melicope micrococca*) may also be common. The moist woodland form has a more open canopy dominated by eucalypts, notably forest red gum (*Eucalyptus tereticornis*) and coastal grey box (*E. moluccana*)	E	CE	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions (BC Act) White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act)	It is an open woodland community (sometimes occurring as a forest formation), in which the most obvious species are one or more of the following: White Box *Eucalyptus albens*, Yellow Box *E. melliodora* and Blakely's Red Gum *E. blakelyi*. Intact sites contain a high diversity of plant species, including the main tree species, additional tree species, some shrub species, several climbing plant species, many grasses and a very high diversity of herbs	E4B	CE	None/ absent	Vegetation mapping and survey of the Subject Land confirmed this TEC is not present on the Subject Land. No significant impact on this TEC is anticipated as a result of the Proposal

Species	Expected habitat from OEH	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Bynoe's Wattle (*Acacia bynoeana*)	Occurs in heath or dry sclerophyll forest on sandy soils. Seems to prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple	E1	V	None/ absent	Adequate survey during an appropriate season for detection of species. Species not cryptic. Species not detected No significant impact on this species is anticipated as a result of the Proposal
Downy Wattle (*Acacia pubescens*)	Concentrated around the Bankstown-Fairfield-Rookwood area and the Pitt Town area, with outliers occurring at Barden Ridge, Oakdale and Mountain Lagoon. Occurs on alluviums, shales and at the intergrade between shales and sandstones. The soils are characteristically gravely soils, often with ironstone	V	V	None/ absent	Adequate survey during an appropriate season for detection of species. Species not cryptic. Species not detected No significant impact on this species is anticipated as a result of the Proposal
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 include *Melaleuca nodosa*, *Hakea dactyloides*, *Hakea sericea*, *Dillwynia tenuifolia*, *Micromyrtus minutiflora*, *Acacia elongata*, *Acacia brownei*, *Themeda australis* and *Xanthorrhoea minor*	E1	E	None/ absent	Subject Land did not support suitable soils and PCTs for this species. No significant impact on this species is anticipated as a result of the Proposal
Leafless Tongue-orchid (*Cryptostylis hunteriana*)	Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. The larger populations typically occur in woodland dominated by Scribbly Gum (*Eucalyptus sclerophylla*), Silvertop Ash (*E. sieberi*), Red Bloodwood (Corymbia gummifera) and Black Sheoak (*Allocasuarina littoralis*); 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*)	V	V	Low	Survey not conducted during a season suitable for detection. However, habitat is highly modified and regularly mown. Species is considered unlikely to occur. No significant impact on this species is anticipated as a result of the Proposal
White-flowered Wax Plant (*Cynanchum elegans*)	The White-flowered Wax Plant usually occurs on the edge of dry rainforest vegetation. Other associated vegetation types include littoral rainforest; Coastal Tea-tree *Leptospermum laevigatum* – Coastal Banksia *Banksia integrifolia* subsp. *integrifolia* coastal scrub; Forest Red Gum *Eucalyptus tereticornis* aligned open forest and woodland; Spotted Gum *Corymbia maculata* aligned open forest and woodland; and Bracelet Honeymyrtle *Melaleuca armillaris* scrub to open scrub	E	E	None/ absent	Subject Land did not support suitable soils and PCTs for this species. No significant impact on this species is anticipated as a result of the Proposal

Species	Expected habitat from OEH	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Dillwynia tenuifolia	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. At Yengo, is reported to occur in disturbed escarpment woodland on Narrabeen sandstone	V	-	None/ absent	Adequate survey during an appropriate season for detection of species. Species not cryptic. Species not detected No significant impact on this species is anticipated as a result of the Proposal
Black Gum (*Eucalyptus aggregata*)	Black Gum is found in the NSW Central and Southern Tablelands, with small isolated populations in Victoria and the ACT. In NSW it occurs in the South Eastern Highlands Bioregion and on the western fringe of the Sydney Basin Bioregion. Grows on alluvial soils, on cold, poorly-drained flats and hollows adjacent to creeks and small rivers.	V	V	None/ absent	Adequate survey during an appropriate season for detection of species. Species not cryptic. Species not detected No significant impact on this species is anticipated as a result of the Proposal
Wallangarra White Gum (*Eucalyptus scoparia*)	In NSW it is known from only three locations near Tenterfield, including Bald Rock National Park. In Queensland it is equally rare, occurring at three sites on the Stanthorp Plateau including one population in Girrawween National Park. Only one Queensland population has more than a dozen trees. Found in open eucalypt forest, woodland and heaths on well-drained granite/rhyolite hilltops, slopes and rocky outcrops, typically at high altitudes	E	V	Known	Eight planted individuals present on the Subject Land. All would be removed by the Proposal
Bauer's Midge Orchid (*Genoplesium baueri*)	The species has been recorded from locations between Ulladulla and Port Stephens. About half the records were made before 1960 with most of the older records being from Sydney suburbs including Asquith, Cowan, Gladesville, Longueville and Wahroonga. Grows in dry sclerophyll forest and moss gardens over sandstone.	E	E	None/ absent	Subject Land did not support suitable PCTs and sandstone microhabitats for this species. No significant impact on this species is anticipated as a result of the Proposal
Juniper-leaved Grevillea (*Grevillea juniperina subsp. juniperina*)	Endemic to Western Sydney, centred on an area bounded by Blacktown, Erskine Park, Londonderry and Windsor with outlier populations at Kemps Creek and Pitt Town. Grows on reddish clay to sandy soils derived from Wianamatta Shale and Tertiary alluvium (often with shale influence), typically containing lateritic gravels.	V	-	None/ absent	Adequate survey during an appropriate season for detection of species. Species not cryptic. Species not detected No significant impact on this species is anticipated as a result of the Proposal
Square Raspwort (*Haloragis exalata subsp. exalata*)	Square Raspwort appears to require protected and shaded damp situations in riparian habitats	V	V	None/ absent	Subject Land did not support suitable PCTs and riparian microhabitats for this species. No significant impact on this species is anticipated as a result of the Proposal
Haloragodendron lucasii	The known locations of this species are confined to a very narrow distribution on the north shore of Sydney. 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	E	E	None/ absent	Subject Land did not support suitable PCTs and microhabitats for this species. Subject Land is well outside known species' range No significant impact on this species is anticipated as a result of the Proposal

Species	Expected habitat from OEH	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Marsdenia viridiflora R. Br. subsp. *viridiflora* population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas	Recent records are from Prospect, Bankstown, Smithfield, Cabramatta Creek and St Marys. Previously known north from Razorback Range. Grows in vine thickets and open shale woodland	EP	-	Low	Adequate survey during an appropriate season for detection of species. Species not cryptic. Species not detected No significant impact on this species is anticipated as a result of the Proposal
Deane's Paperbark (*Melaleuca deanei*)	Deane's Paperbark occurs in two distinct areas, in the Ku-ring-gai/Berowra and Holsworthy/Wedderburn areas respectively. There are also more isolated occurrences at Springwood (in the Blue Mountains), Wollemi National Park, Yalwal (west of Nowra) and Central Coast (Hawkesbury River) areas. The species grows in heath on sandstone.	V	V	None/ absent	Adequate survey during an appropriate season for detection of species. Species not cryptic. Species not detected No significant impact on this species is anticipated as a result of the Proposal
Micromyrtus minutiflora	Restricted to the general area between Richmond and Penrith, western Sydney. Grows in Castlereagh Scribbly Gum Woodland, Ironbark Forest, Shale/Gravel Transition Forest, open forest on tertiary alluvium and consolidated river sediments	E1	V	Low	Adequate survey during an appropriate season for detection of species. Species not cryptic. Species not detected No significant impact on this species is anticipated as a result of the Proposal
Tall Knotweed (*Persicaria elatior*)	This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	V	V	None/ absent	Subject Land did not support suitable PCTs and riparian microhabitats for this species. No significant impact on this species is anticipated as a result of the Proposal
Hairy Geebung (*Persoonia hirsuta*)	The Hairy Geebung is found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	E	E	None/ absent	Adequate survey during an appropriate season for detection of species. Species not cryptic. Species not detected No significant impact on this species is anticipated as a result of the Proposal
Nodding Geebung (*Persoonia nutans*)	Northern populations are confined to aeolian and alluvial sediments and occur in a range of sclerophyll forest and woodland vegetation communities, with the majority of individuals occurring within Agnes Banks Woodland or Castlereagh Scribbly Gum Woodland and some in Cooks River / Castlereagh Ironbark Forests. Southern populations also occupy tertiary alluvium, but extend onto shale sandstone transition communities and into Cooks River / Castlereagh Ironbark Forest	E	E	None/ absent	Adequate survey during an appropriate season for detection of species. Species not cryptic. Species not detected No significant impact on this species is anticipated as a result of the Proposal
Pimelea curviflora var. *curviflora*	Occurs on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes amongst woodlands. Also recorded in Illawarra Lowalnd Grassy Woodland habitat at Albion Park on the Illawaraa coastal plain	V	V	Low	Subject Land did not support suitable soils and microhabitats for this species. No significant impact on this species is anticipated as a result of the Proposal

Species	Expected habitat from OEH	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Spiked Rice-flower (*Pimelea spicata*)	In both the Cumberland Plain and Illawarra environments this species is found on well-structured clay soils	E	E	Low	Adequate survey was conducted during an appropriate season on the Subject Land for this species, no population was detected. No significant impact on this species is anticipated as a result of the Proposal
Brown Pomaderris (*Pomaderris brunnea*)	Brown Pomaderris grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines	E	V	None/ absent	Adequate survey was conducted during an appropriate season on the Subject Land for this species, no population was detected. No population of any members of this genus were encountered during surveys of the Subject Land. No significant impact on this species is anticipated as a result of the Proposal
Sydney Plains Greenhood (*Pterostylis saxicola*)	Most commonly found growing in small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines. The vegetation communities above the shelves where *Pterostylis saxicola* occurs are sclerophyll forest or woodland on shale/sandstone transition soils or shale soils	E	E	None/ absent	Subject Land did not support suitable microhabitats for this species. No significant impact on this species is anticipated as a result of the Proposal
Pultenaea parviflora	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.	E	V	None/ absent	Adequate survey was conducted during an appropriate season on the Subject Land for this species, no population was detected. No significant impact on this species is anticipated as a result of the Proposal
Eastern Australian Underground Orchid (*Rhizanthella slateri*)	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	V	E	Low	Adequate survey during an appropriate season could not be conducted for this species. Habitat present was highly modified (regularly mown). Species considered unlikely to be present No significant impact on this species is anticipated as a result of the Proposal
Scrub Turpentine (*Rhodamnia rubescens*)	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.	E4B	CE	None/ absent	Adequate survey was conducted during an appropriate season on the Subject Land for this species, no population was detected. No significant impact on this species is anticipated as a result of the Proposal
Magenta Lilly Pilly (*Syzygium paniculatum*)	On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities	E	V	Known	Planted individual present within the Subject Land. Would be removed by the Proposal

Species	Expected habitat from OEH	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Kangaloon Sun Orchid (*Thelymitra kangaloonica*)	*Thelymitra kangaloonica* (*Thelymitra* sp. Kangaloon) is only known to occur on the southern tablelands of NSW in the Moss Vale / Kangaloon / Fitzroy Falls area at 550-700 m above sea level. It is found in swamps in sedgelands over grey silty grey loam soils	E4B	CE	None/ absent	Subject Land did not support suitable soils and PCTs for this species. Subject Land well outside known distribution of the species. No significant impact on this species is anticipated as a result of the Proposal
Austral Toadflax (*Thesium australe*)	Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (*Themeda australis*)	V	V	Low	Subject Land did not support suitable microhabitats for this species. No significant impact on this species is anticipated as a result of the Proposal

**BC Act Status: V=Vulnerable, E=Endangered, E4A=Critically Endangered, EP=Endangered Population*
***EPBC Act Status: V=Vulnerable, E=Endangered, CE=Critically Endangered, X=Extinct*

Table A6.3: Fauna species

Species	Expected habitat from OEH.	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Common Sandpiper (*Actitis hypoleucos*)	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. The Common Sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties	-	B,C,J,R	None/ absent	Subject site lacks wetland habitat needed by this species. No significant impact on this species is anticipated as a result of the Proposal
Regent Honeyeater *(Anthochaera phrygia)*	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes.	E4B	E	Moderate	Known from recent occurrence records in the locality. Subject Land contains marginal foraging habitat for this species in the form of mature eucalypts. Proposal would remove portion of this habitat
Fork-tailed Swift (*Apus pacificus*)	he Fork-tailed Swift is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher. In Australia, they mostly occur over inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities.	-	C,J,R	Low	Species is known from the local area. However, this species forages high over the ground and habitat utility is not strongly influenced by ground habitat. No significant impact on this species is anticipated as a result of the Proposal
Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)	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.	V	-	Moderate	Known from recent occurrence records in the locality. Subject Land contains marginal foraging habitat for this species in the form of mature eucalypts. Proposal would remove a portion of this habitat
Australasian Bittern *(Botaurus poiciloptilus)*	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.) Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails.	E	E	None/ absent	Subject Land lacks suitable freshwater wetland or riparian habitats. These habitats are present on nearby lands to the west; however, the Subject Land lacks connectivity with this habitat. No significant impact on this species is anticipated as a result of the Proposal
Sharp-tailed Sandpiper (*Calidris acuminata*)	In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms	-	B,C,J,R	None/absent	Subject Land lacks suitable freshwater wetland or riparian habitats. These habitats are present on nearby lands to the west; however, the Subject Land lacks connectivity with this habitat. No significant impact on this species is anticipated as a result of the Proposal

Species	Expected habitat from OEH.	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Curlew Sandpiper *(Calidris ferruginea)*	Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland.	-	CE,C,J,K	None/ absent	Subject Land lacks suitable wetland or riparian habitats. These habitats are present on nearby lands to the west; however, the Subject Land lacks connectivity with this habitat. No significant impact on this species is anticipated as a result of the Proposal
Pectoral Sandpiper (*Calidris melanotos*)	In Australasia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	-	B,J,R	None/ absent	Subject Land lacks suitable wetland or riparian habitats. These habitats are present on nearby lands to the west; however, the Subject Land lacks connectivity with this habitat. No significant impact on this species is anticipated as a result of the Proposal
Glossy Black-Cockatoo (*Calyptorhynchus lathami*)	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) are important foods	V	-	Moderate	Known from recent records from the locality. Subject Land supports key feed trees for this species. Proposal would remove a portion of this vegetation
Large-eared Pied Bat *(Chalinolobus dwyeri)*	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Petrochelidon ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features	V	V	Low	Species known from recent occurrence records in the locality. However, Subject Land and locality lacks suitable roosting/ breeding habitat for this species (caves, tunnels, cliffs etc.). No significant impact on this species is anticipated as a result of the Proposal
Speckled Warbler (*Chthonicola sagittata*)	The Speckled Warbler lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	V	-	Low	Known from recent records from the locality. However, Subject Land is highly modified, lacking preferred understory distribution. No significant impact on this species is anticipated as a result of the Proposal
Spotted Harrier (*Circus assimilis*)	Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands	V	-	Low	Not known from recent occurrence records in the locality. Species' habitat preferences are broad and the Subject Land forms a small part of the local foraging habitat for this species. No significant impact on this species is anticipated as a result of the Proposal

Species	Expected habitat from OEH.	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Oriental Cuckoo (*Cuculus optatus*)	This species mainly inhabits forests, occurring in coniferous, deciduous and mixed forest. It feeds mainly on insects and their larvae, foraging for them in trees and bushes as well as on the ground. It is usually secretive and hard to see	-	C,J,R	Low	Not known from recent occurrence records in the locality. Subject Land lacks complex forest habitat preferred by this species. No significant impact on this species is anticipated as a result of the Proposal
Varied Sittella (*Daphoenositta chrysoptera*)	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland.	V	-	Low	Known from recent records from the locality. However, Subject Land is highly modified, lacking preferred understory distribution. No significant impact on this species is anticipated as a result of the Proposal
Spotted-tailed Quoll *(Dasyurus maculatus)*	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites.	V	E	Low	Species is not known from recent occurrence records in the locality. Subject Land is located in a highly urbanised environment with no direct connectivity with large areas of native vegetation in the locality. No significant impact on this species is anticipated as a result of the Proposal
Grey Falcon (*Falco hypoleucos*)	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	E	V	Low	Species not known from recent occurrence records in the locality. Species is a vagrant to the coast and is highly unlikely to regularly use habitat in the locality. No significant impact on this species is anticipated as a result of the Proposal
Eastern False Pipistrelle (*Falsistrellus tasmaniensis*)	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania. 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.	V	-	Moderate	Species is known from recent occurrence records from the locality. The Subject Land contains suitable foraging habitat and hollow-bearing roost trees. The Proposal would remove a portion of the available foraging habitat
Little Lorikeet (*Glossopsitta pusilla*)	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species.	V	-	Known	Species seen flying over lands to the south of the Subject Land during surveys. Subject Land contains foraging and nesting resources for this species. The Proposal would remove a portion of the available foraging habitat

Species	Expected habitat from OEH.	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Latham's Snipe (*Gallinago hardwickii*)	In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity	-	B,J,R	None/ absent	Subject Land lacks suitable wetland habitat for this species. No significant impact on this species is anticipated as a result of the Proposal
Painted Honeyeater *(Grantiella picta)*	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*. Insects and nectar from mistletoe or eucalypts are occasionally eaten.	V	V	Low	Species not known from recent occurrence records in the locality. Subject Land lacks mistletoe stands needed by this species. No significant impact on this species is anticipated as a result of the Proposal
White-bellied Sea-Eagle (*Haliaeetus leucogaster*)	Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh	V	-	Low	Known from recent occurrence records from the locality. Suitable riparian habitat is present on lands to the west as well as the nearby Nepean River. The habitat of the Subject Land forms a small part of a wider foraging range and does not contain riparian, open water habitat. The nearby habitat would not be directly impacted by the Proposal. The single large tree present does not support an established raptor stick nest. No significant impact on this species is anticipated as a result of the Proposal
Giant Burrowing Frog *(Heleioporus australiacus)*	Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based.	V	V	None/ absent	Subject Land occurs over primarily shale-derived clay soils unsuitable for this species. No significant impact on this species is anticipated as a result of the Proposal
White-throated Needletail (*Hirundapus caudacutus*)	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	-	V,C,J,K	Low	Species not known from recent occurrence records from the locality. Subject Land lacks large areas of native vegetation preferred for aerial foraging by this species. No significant impact on this species is anticipated as a result of the Proposal

Species	Expected habitat from OEH.	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Little Eagle (*Hieraaetus morphnoides*)	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used.	V	-	Low	Known from recent occurrence records from the locality. The habitat of the Subject Land forms a small part of a wider foraging range and does not have good connectivity with nearby areas of good condition habitat. The single large tree present does not support an established raptor stick nest. No significant impact on this species is anticipated as a result of the Proposal
Broad-headed Snake (*Hoplocephalus bungaroides*)	The Broad-headed Snake is largely confined to Triassic and Permian sandstones, including the Hawkesbury, Narrabeen and Shoalhaven groups, within the coast and ranges in an area within approximately 250 km of Sydney	E	V	None/ absent	Not known from recent occurrence records from the locality. The Subject Land and locality do not contain sandstone-based soils and escarpment habitat for this species. Considered unlikely to be present. No significant impact on this species is anticipated as a result of the Proposal
Swift Parrot *(Lathamus discolor)*	On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations.	E	E	Moderate	Known from recent occurrence records in the locality. The Subject Land supports mature eucalypts providing potential flowering resources for this species during Winter migrations. The Proposal would remove a portion of the available foraging habitat
Green and Golden Bell Frog *(Litoria aurea)*	Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (*Typha* spp.) or spikerushes (*Eleocharis* spp.). Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*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	Low	This species is not known from recent occurrence records in the locality. The Subject Land does not support suitable aquatic and riparian habitat preferred by this species. Nearby habitat on lands to the west would not be directly impacted by the Proposal. No significant impact on this species is anticipated as a result of the Proposal

Species	Expected habitat from OEH.	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Square-tailed Kite (*Lophoictinia isura*)	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	V	-	Low	Known from recent occurrence records from the locality. The habitat of the Subject Land forms a small part of a wider foraging range and does not have good connectivity with nearby areas of good condition habitat. The single large tree present does not support an established raptor stick nest. No significant impact on this species is anticipated as a result of the Proposal
Macquarie Perch (*Macquaria australasica*)	Requires free-flowing waterways to complete life cycle. The species is heavily dependent on the availability of flowing mesohabitats (runs and/or riffles) and small complex rock piles (aggregations of 0.5–1 m diameter boulders) to provide cover	-	E	None/ absent	Subject Land lacks suitable waterway habitat for this species. Nearby habitat on lands to the west would not be directly impacted by the Proposal. No significant impact on this species is anticipated as a result of the Proposal
Black-chinned Honeyeater (eastern subspecies) (*Melithreptus gularis gularis*)	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*E. albens*), Inland Grey Box (*E. microcarpa*), Yellow Box (*E. melliodora*), Blakely's Red Gum (*E. blakelyi*) and Forest Red Gum (*E. tereticornis*). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees.	V	-	Low	Not known from recent occurrence records from the locality. Subject Land does not contain preferred vegetation type for this species. No significant impact on this species is anticipated as a result of the Proposal
Cumberland Plain Land Snail (*Meridolum corneovirens*)	Primarily inhabits Cumberland Plain Woodland (a critically endangered ecological community). This community is a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities.	E	-	Moderate	Known from numerous recent occurrence records from the locality. Subject Land contains marginal but suitable open woodland habitat containing mature trees with large piles of leaf litter. The Proposal would remove a portion of the available foraging habitat
Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*)	The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW. Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures.	V	-	Moderate	Species is known from recent occurrence records from the locality. The Subject Land contains suitable foraging habitat and hollow-bearing roost trees. The Proposal would remove a portion of the available foraging habitat

Species	Expected habitat from OEH.	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Large Bent-winged Bat (*Miniopterus orianae oceanensis*)	Eastern Bentwing-bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures	V	-	Low	Species known from recent occurrence records in the locality. However, Subject Land lacks suitable roosting resources for this species (caves, structures etc.). No significant impact on this species is anticipated as a result of the Proposal
Stuttering Frog (*Mixophyes balbus*)	Stuttering Frogs occur along the east coast of Australia from southern Queensland to north-eastern Victoria. Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range	E	V	Low	Species not known from recent occurrence records from the locality. Subject Land lacks suitable rainforest or tall wet sclerophyll forest habitat. No significant impact on this species is anticipated as a result of the Proposal
Black-faced Monarch (*Monarcha melanopsis*)	The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest	-	B	None/ absent	Species is not known from recent occurrence records in the locality. Subject Land does not contain preferred rainforest habitat. No significant impact on this species is anticipated as a result of the Proposal
Spectacled Monarch (*Monarcha trivirgatus*)	Usually considered a denizen of the dense rainforests and moist eucalypt forests of eastern and north-eastern Australia, the Spectacled Monarch sometimes also inhabits mangroves and other densely vegetated habitats. The species occurs at all strata of the forest, but stays mostly in the middle to lower levels	-	B	None/ absent	Species is not known from recent occurrence records in the locality. Subject Land does not contain preferred rainforest habitat. No significant impact on this species is anticipated as a result of the Proposal
Yellow Wagtail (*Motacilla flava*)	Favouring wet meadows, marshland, grassy and muddy lakeshores. Occurs in fields and often near livestock during migration	-	C,J,R	Low	Species not known from recent occurrence records in the locality. Subject Land does contain open grasslands but lacks riparian habitat. Nearby riparian habitat to the west would not be directly impacted by the Proposal. No significant impact on this species is anticipated as a result of the Proposal
Satin Flycatcher (*Myiagra cyanoleuca*)	Satin Flycatchers inhabit 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	-	B	Low	Species not known from recent occurrence records in the locality. Subject Land lacks preferred heavily vegetated gullies. No significant impact on this species is anticipated as a result of the Proposal

Species	Expected habitat from OEH.	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Southern Myotis (*Myotis macropus*)	The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. Generally roost 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	V	-	Moderate	Species is known from recent occurrence records from the locality. The Subject Land contains suitable foraging habitat within 200m of riparian areas and hollow-bearing roost trees. The Proposal would remove a portion of the available foraging habitat
Turquoise Parrot (*Neophema pulchella*)	The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland	V	-	Low	Species known recent occurrence records in the locality. The Subject Land lacks good connectivity with nearby areas of good quality habitat for this species. Considered unlikely to occur on the Subject Land. No significant impact on this species is anticipated as a result of the Proposal
Powerful Owl (*Ninox strenua*)	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine *Syncarpia glomulifera*, Black She-oak *Allocasuarina littoralis*, Blackwood Acacia melanoxylon, Rough-barked Apple *Angophora floribunda*, Cherry Ballart *Exocarpus cupressiformis* and a number of eucalypt species	V	-	Low	Species known from recent occurrence records in the locality. The Subject Land lacks good connectivity with nearby areas of good quality habitat for this species. Subject Land lacks dense roosting habitat for this species. No significant impact on this species is anticipated as a result of the Proposal
Eastern Curlew (*Numenius madagascariensis*)	It 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. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets	-	CE,B,C,J, R	None/absent	Subject Land lacks suitable intertidal, mudflat coastal habitat required by this species. Nearby riparian habitat would not be directly impacted by the Proposal. No significant impact on this species is anticipated as a result of the Proposal
Osprey (*Pandion haliaetus*)	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging	V	B	None/ absent	Not known from recent occurrence records in the locality. Subject Land and locality lacks suitable large waterbodies for foraging by this species. Nearby riparian habitat would not be directly impacted by the Proposal. No significant impact on this species is anticipated as a result of the Proposal

Species	Expected habitat from OEH.	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Greater Glider (*Petauroides volans*)	The greater glider chooses habitat based on several factors. A large factor determining habitat choice is the presence of specific species of eucalypt. Distribution levels are higher in regions of montane forest containing manna gum *(E. viminalis*) and mountain gum (*E. dalrympleana, E. obliqua*). Furthermore, the presence of *E. cypellocarpa* appears to improve the quality of habitat for the greater glider in forests dominated by *E. obliqua*. Another factor determining population density is elevation. Optimal levels are 845 m above sea level. Within a forest of suitable habitat, they prefer overstorey basal areas in old-growth tree stands	-	V	None/ absent	The Subject Land occurs below the optimal ASL for this species and lacks preferred feed tree species. The species is not known from recent occurrence records from the locality. No significant impact on this species is anticipated as a result of the Proposal
Squirrel Glider (*Petaurus norfolcensis*)	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey.	V	-	Low	Known from recent occurrence records from the locality. However, Subject Land lacks suitable mature forest and woodlands and connectivity with these areas in the locality. Species considered unlikely to occur. No significant impact on this species is anticipated as a result of the Proposal
Brush-tailed Rock-wallaby (*Petrogale penicillata*)	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees. Shelter or bask during the day in rock crevices, caves and overhangs and are most active at night	E	V	None/ absent	The Subject Land lacks rocky escarpment habitat. The species is not known from recent occurrence records from the locality. No significant impact on this species is anticipated as a result of the Proposal
Scarlet Robin (*Petroica boodang*)	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat	V	-	Low	Species not known from recent occurrence records from the locality. Subject Land lacks complex understory habitat preferred by this species. Considered unlikely to occur. No significant impact on this species is anticipated as a result of the Proposal
Koala *(Phascolarctos cinereus)*	Inhabit eucalypt woodlands and forests. Feed 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	Low	Not known from recent occurrence records in the locality. Subject Land lacks connectivity with areas of suitable habitat for this species. Considered unlikely to occur. No significant impact on this species is anticipated as a result of the Proposal

Species	Expected habitat from OEH.	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Dural Land Snail (*Pommerhelix duralen*sis)	The species has a strong affinity for communities in the interface region between shale-derived and sandstone-derived soils, with forested habitats that have good native cover and woody debris. It favours sheltering under rocks or inside curled-up bark. It does not burrow nor climb. The species has also been 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	None/ absent	Subject Land does not occur near to the shale/ sandstone transition zone. Preferred by this species. Considered unlikely to occur. No significant impact on this species is anticipated as a result of the Proposal
Australian Grayling (*Prototroctes maraena*)	Australian Grayling spend most of their lives in freshwater, inhabiting rivers and streams, usually in cool, clear waters with a gravel substrate and alternating pool and riffle zones but can also occur in turbid water. The species can penetrate well inland, and has been reported from over 100 km upstream from the sea	-	V	None/ absent	Subject Land lacks suitable waterway habitat for this species. Nearby habitat on lands to the west would not be directly impacted by the Proposal. No significant impact on this species is anticipated as a result of the Proposal
Pookila (*Pseudomys novaehollandiae*)	The New Holland Mouse has a fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes	-	V	None/ absent	Not known from recent occurrence records in the locality. Subject Land lacks suitable preferred heathy woodland habitat. No significant impact on this species is anticipated as a result of the Proposal
Grey-headed Flying-fox *(Pteropus poliocephalus)*	Occur 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.	V	V	High	The species is known from numerous occurrence records in the locality. The Subject Land contains suitable flowering native tree species. The Proposal would remove a portion of the available foraging habitat
Rufous Fantail (*Rhipidura rufifrons*)	In east and south-east Australia, the Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallow-wood (*Eucalyptus microcorys*), Mountain Grey Gum (*E. cypellocarpa*), Narrow-leaved Peppermint (*E. radiata*), Mountain Ash (*E. regnans*), Alpine Ash (*E. delegatensis*), Blackbutt (*E. pilularis*) or Red Mahogany (*E. resinifera*); usually with a dense shrubby understorey often including ferns	-	B	Low	Species is not known from recent occurrence records in the locality. Subject Land does not contain wet sclerophyll forest habitat preferred by this species. No significant impact on this species is anticipated as a result of the Proposal
Australian Painted Snipe *(Rostratula australis)*	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.	E	E	None/ absent	Subject Land lacks suitable freshwater wetland or riparian habitats. Nearby habitat on lands to the west would not be directly impacted by the Proposal. No significant impact on this species is anticipated as a result of the Proposal

Species	Expected habitat from OEH.	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)	The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and North West Slopes. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory	V	-	Moderate	Known from recent occurrence records from the locality. Subject Land contains suitable foraging habitat and hollow-bearing roost trees. The Proposal would remove most of this habitat from the Subject Land
Greater Broad-nosed Bat (*Scoteanax rueppellii*)	The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. It extends to the coast over much of its range. In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m. 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.	V	-	Moderate	Known from recent occurrence records from the locality. Subject Land contains suitable foraging habitat and hollow-bearing roost trees. The Proposal would remove most of this habitat from the Subject Land
Diamond Firetail (*Stagonopleura guttata*)	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum *Eucalyptus pauciflora* Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.	V	-	Low	Known from a single recent occurrence record in the locality. Subject Land lacks preferred open woodland habitat and connectivity to nearby areas of suitable habitat. Considered unlikely to occur. No significant impact on this species is anticipated as a result of the Proposal
Freckled Duck (*Stictonetta naevosa*)	Prefer 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 rest in dense cover during the day, usually in deep water. Feed at dawn and dusk and at night on algae, seeds and vegetative parts of aquatic grasses and sedges and small invertebrates.	V	-	None/ absent	Subject Land lacks suitable freshwater wetland or riparian habitats. Nearby habitat on lands to the west would not be directly impacted by the Proposal. No significant impact on this species is anticipated as a result of the Proposal
Wood Sandpiper (*Tringa glareola*)	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially *Melaleuca* and River Red Gums *Eucalyptus camaldulensis* and often with fallen timber	-	C,J,R	None/ absent	Subject Land lacks suitable freshwater wetland or riparian habitats. Nearby habitat on lands to the west would not be directly impacted by the Proposal. No significant impact on this species is anticipated as a result of the Proposal

Species	Expected habitat from OEH.	BC Act*	EPBC Act**	Likelihood of occurrence	Potential impacts
Common Greenshank (*Tringa nebularia*)	The Common Greenshank is 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. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms	-	B,C,J,R	None/ absent	Subject Land lacks suitable freshwater wetland or riparian habitats. Nearby habitat on lands to the west would not be directly impacted by the Proposal. No significant impact on this species is anticipated as a result of the Proposal
Sooty Owl (*Tyto tenebricosa*)	Occupies the easternmost one-eighth of NSW, occurring on the coast, coastal escarpment and eastern tablelands. Territories are occupied permanently. Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests	V	-	Low	Species not known from recent occurrence records in the locality. The Subject Land lacks preferred rainforest or moist sclerophyll forest habitat preferred by this species. No significant impact on this species is anticipated as a result of the Proposal

**BC Act Status: V=Vulnerable, E1=Endangered, E4A=Critically Endangered, E2=Endangered Population*

***EPBC Act Status: V=Vulnerable, E=Endangered, CE=Critically Endangered, X=Extinct, B=Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II (Bonn Convention), C=China-Australia Migratory Bird Agreement (CAMBA), J=Japan-Australia Migratory Bird Agreement (JAMBA), R=Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA)*

14. APPENDIX 7: ASSESSMENTS OF SIGNIFICANCE (BC ACT) AND TESTS OF SIGNIFICANCE (EPBC ACT)

A7.1: ASSESSMENTS OF SIGNIFICANCE (BC ACT)

Under Part 7.2A of the *Biodiversity Conservation Act 2016* (BC Act) a five-part test is required to determine whether a significant impact on any threatened species or TEC listed under the NSW BC Act known or considered likely to occur on a site as a result of a proposed action. If a significant impact is considered likely, based on the test then further assessment through a Species Impact Statement (SIS) is required or a Biodiversity proposal Assessment Report (BDAR) must be prepared by an accredited assessor in accordance with the Biodiversity Assessment Method (BAM).

The following listed entities are known to occur or to have suitable habitat and a potential to occur in the proposal Area and would be impacted upon by the proposal.

A7.1.1 Cumberland Plain Woodland in the Sydney Basin Bioregion

This TEC is listed as critically endangered under the BC Act.

The dominant canopy trees of Cumberland Plain Woodland are Grey Box (*Eucalyptus moluccana*) and Forest Red Gum (*E. tereticornis*), with Narrow-leaved Ironbark (*E. crebra*), Spotted Gum (*Corymbia maculata*) and Thin-leaved Stringybark (*E. eugenioides*) occurring less frequently. The shrub layer is dominated by Blackthorn (*Bursaria spinosa*), and it is common to find abundant grasses such as Kangaroo Grass (*Themeda australis*) and Weeping Meadow Grass (*Microlaena stipoides* var. *stipoides*).

Distribution

Occurs on soils derived from Wianamatta Shale, and throughout the driest part of the Sydney Basin. Before European settlement, was extensive across the Cumberland Plain, western Sydney. Today, only 9 percent of the original extent remains intact, with the remnants scattered widely across the Cumberland Plain. Good examples can be seen at Scheyville National Park and Mulgoa Nature Reserve.

Habitat and ecology

- Typically occurs on heavy clay soils derived from Wianamatta Shale;
- Well adapted to drought and fire, and the understorey plants often rely on underground tubers or profuse annual seed production to survive adverse conditions; and
- Cumberland Plain Woodland is habitat for threatened species such as the Cumberland land snail (*Meridolum corneovirens*).

This TEC was present within 103-109 Laycock Street as a single large remnant tree, planted native representative species and remnant understory grasses and forbs.

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

Not applicable to a TEC.

b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

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

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

The Proposal would remove the majority of the occurrence of this TEC from the Subject Land; however, the mature remnant tree would be retained. This would retain much of the remnant functionality of the vegetation (hollow-bearing and foraging resources). This patch of CPW has previously been heavily modified and the current management regime (mowing) has removed most of the understory and ground strata with significant proliferation of replacement exotic species. The patch is not considered to have good long-term retention potential and lacks direct connectivity with nearby reserves and areas of better condition CPW.

The Proposal is not considered likely to place the occurrence of this TEC at greater risk of extinction in comparison to the current management regime.

c) In relation to the habitat of a threatened species or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity;

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity; and

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 Proposal would remove approximately 2/3 of the current 0.05 ha of this community within the Subject Land.

No area of native vegetation would become fragmented or isolated as a result of the Proposal, the Subject Land is small and would retain fringing planted native vegetation along the northern and eastern boundaries following development. Native fauna would retain the capacity to disperse through this fringing vegetation and within vegetation on lands to the west which would not be impacted by the Proposal.

The CPW on the Subject Land is small, scattered and contains a high proportion of planted native and exotic species. It is not considered a high-quality representation of the TEC in the locality and is not important to the long-term survival of the TEC in the locality. The highest quality portion (hollow-bearing mature tree) will be retained following development.

d) Whether the action proposed is likely to have an adverse effect any declared area of outstanding biodiversity value (either directly or indirectly);

At the time of writing, there are four AOBV declared under the BC Act:

- Gould's Petrel - critical habitat declaration;
- Little penguin population in Sydney's North Harbour - critical habitat declaration;

- Mitchell's Rainforest Snail in Stotts Island Nature Reserve - critical habitat declaration; and
- Wollemi Pine - critical habitat declaration.

Of the above listed AOBV, the Little penguin population in Sydney's North Harbour - critical habitat is located closest to the proposal Area. However, as the Subject Land is located over 50 km from the AOBV, the proposal would not be expected to have any direct or indirect effect on this or any other declared AOBV.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The Proposal would or may constitute, introduce or exacerbate the following Key Threatening Processes (KTPs) relevant to this TEC:

- Anthropogenic climate change;
- Clearing of native vegetation;
- Infection of native plants by *Phytophthora cinnamomi*;
- Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae;
- Invasion and establishment of exotic vines and scramblers;
- Invasion and establishment of Scotch Broom (*Cytisus scoparius*);
- Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata* (Wall. ex G. Don) Cif;
- Invasion of native plant communities by *Chrysanthemoides monilifera*;
- Invasion of native plant communities by exotic perennial grasses;
- Invasion, establishment and spread of Lantana (*Lantana camara* L. sens. Lat);
- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants; and
- Removal of dead wood and dead trees.

The proposal would result in a small loss of native vegetation, production of greenhouse gases and removal of dead wood. However, these KTPs arising from the development are not considered significant on the locality scale.

The introduction of pest weeds and diseases may occur in untreated water, unclean fill and from revegetation plantings. However, these impacts can be mitigated through appropriate controls. As the development is for residential development, planted exotic species will occur; however, with appropriate species selection and maintenance, these species are not considered likely to pose a significant risk to nearby native vegetation.

With appropriate mitigation, the Proposal is not considered likely to significantly exacerbate these KTPs on the locality scale.

Conclusion

The Subject Land contains a small stand of highly modified CPW in the form of a mature remnant tree and a mixture of planted and remnant trees, grasses and forbs. Regular maintenance has removed much of vegetation complexity with little shrub or groundstory component present. The Proposal would remove the majority of this occurrence; however, the mature tree would be retained and continue to

provide ecosystem services (hollows, foraging etc.).
The Proposal is not considered likely to have a significant impact on this CPW. Further assessment through a BDAR is not considered necessary.

A7.1.2 Eucalyptus scoparia (Wallangarra White Gum) and Syzygium paniculatum (Magenta Lilly Pilly)

These species are listed as endangered under the BC Act.

Eucalyptus scoparia is a small tree to 15 m tall with smooth, powdery white to pale grey bark. The adult leaves are shiny green, 10 - 15 cm long and 6 - 10 mm wide. The flower buds are oval-shaped with a conical cap, and the small gumnuts are oval-shaped, 4-5 mm long and wide. This canopy is often open and pendulous.

Distribution

In NSW it is known from only three locations near Tenterfield, including Bald Rock National Park. In Queensland it is equally rare, occurring at three sites on the Stanthorp Plateau including one population in Girrawween National Park. Only one Queensland population has more than a dozen trees.

Habitat and ecology

- Found in open eucalypt forest, woodland and heaths on well-drained granite/rhyolite hilltops, slopes and rocky outcrops, typically at high altitudes; and
- At lower elevations can occur in less rocky soils in damp situations.

The Magenta Lilly Pilly is a small to medium sized rainforest tree that grows to 8 m tall. The bark is flaky and the leaves are shiny, dark-green above and paler underneath. Leaves can be up to 10 cm long. Plants produce white flower-clusters at the end of each branch, between November and February. The petals are small and are accompanied by prominent long stamens. The deep magenta fruits, which may be spherical or egg-shaped, mature in May, and contain a single seed.

Distribution

The Magenta Lilly Pilly is found only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest.

Habitat and ecology

- On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest; and
- On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.

These species were present as historical plantings on the Subject Land. Neither are located within their native extent and/or habitat.

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

These species are present on the Subject Land as historical plantings. Neither is indicative of a remnant native population. The native extent of *E. scoparia* is restricted to a small area near Tenterfield in northern NSW and *S. paniculatum* occurs naturally within littoral rainforests along the NSW east coast. Neither species is considered likely to persist on the Subject Land and form a viable long-term population. The Proposal would remove all resident individuals of both species.

The Proposal is not considered likely to place a local viable population of either species at risk of extinction.

b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

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

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 to a threatened species.

c) In relation to the habitat of a threatened species or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity;

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity; and

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 Proposal would remove all individuals of both species from the Subject Land as well as the majority of the remnant and planted native vegetation from the Subject Land.

No area of native vegetation would become fragmented or isolated as a result of the Proposal, the Subject Land is small and would retain fringing planted native vegetation along the northern and eastern boundaries following development. Native fauna would retain the capacity to disperse through this fringing vegetation and within vegetation on lands to the west which would not be impacted by the Proposal.

Neither of these species are native to the locality and are indicative of past landscaping choices. They occur within a highly modified landscape containing relatively low-quality native vegetation values. They are not considered important to the long-term survival of either species.

d) Whether the action proposed is likely to have an adverse effect any declared area of outstanding biodiversity value (either directly or indirectly);

At the time of writing, there are four AOBV declared under the BC Act:

- Gould's Petrel - critical habitat declaration;
- Little penguin population in Sydney's North Harbour - critical habitat declaration;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve - critical habitat declaration; and

- Wollemi Pine - critical habitat declaration.

Of the above listed AOBV, the Little penguin population in Sydney's North Harbour - critical habitat is located closest to the proposal Area. However, as the Subject Land is located over 50 km from the AOBV, the proposal would not be expected to have any direct or indirect effect on this or any other declared AOBV.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The Proposal would or may constitute, introduce or exacerbate the following Key Threatening Processes (KTPs) relevant to these species:

- Anthropogenic climate change;
- Clearing of native vegetation;
- Infection of native plants by *Phytophthora cinnamomi*;
- Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae;
- Invasion and establishment of exotic vines and scramblers;
- Invasion and establishment of Scotch Broom (*Cytisus scoparius*);
- Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata* (Wall. ex G. Don) Cif;
- Invasion of native plant communities by *Chrysanthemoides monilifera*;
- Invasion of native plant communities by exotic perennial grasses;
- Invasion, establishment and spread of Lantana (*Lantana camara* L. sens. Lat);
- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants; and
- Removal of dead wood and dead trees.

The proposal would result in a small loss of native vegetation, production of greenhouse gases and removal of dead wood. However, these KTPs arising from the development are not considered significant on the locality scale.

The introduction of pest weeds and diseases may occur in untreated water, unclean fill and from revegetation plantings. As the development is for residential development, planted exotic species will occur; however, with appropriate species selection and maintenance, these species are not considered likely to pose a significant risk to nearby native vegetation.

With appropriate mitigation, the Proposal is not considered likely to significantly exacerbate these KTPs on the locality scale.

Conclusion

The Subject Land contains planted representatives of both species; however, neither are native to the locality and are not representative of naturally occurring populations. The habitat present is highly modified and neither species is considered likely to constitute a viable long-term population in the locality. The Proposal would remove all representative of both species from the Subject Land.

The Proposal is not considered likely to have a significant impact on these species. Further assessment

through a BDAR is not considered necessary.

A7.1.3 Cumberland Plain Land Snail (Meridolum corneovirens)

This species is listed as endangered under the BC Act.

Superficially similar to the familiar exotic Garden Snail (*Helix aspera*). It differs most obviously in its 25 - 30 mm diameter shell. While this shell may be almost any shade of brown, it is always uniform in colour, while that of Helix consists of dark patches on a pale background. A green or yellow tinge may be present. The Cumberland Land Snail also has a more flattened shell that is very thin and fragile, compared with the thick shell of the Garden Snail.

The under side of the shell, especially in living individuals, tends to have a glossy appearance and is semitransparent, enabling the observer to see the animal colour and some internal organs. The upper side of the shell has a coarse wrinkly appearance. In adult shells the edge of the aperture is reflected, forming a slight lip. This is typically white in colour. However, the feature is absent in both juvenile and sub-adult individuals. The juveniles have a more angular shell and tend to have an open area in the central part of the underside of the shell, known as the umbilicus. Generally, in adults the umbilicus is closed or partially covered. Sometimes there is a reddish brown patch around the umbilical area. *M. corneovirens* can also be easily confused with other members of the genus Meridolum, especially those found along the edges of its' range.

Distribution

Lives in small areas on 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. known from over 100 different locations, but not all are currently occupied, and they are usually isolated from each other as a result of land use patterns.

Habitat and ecology

- Primarily inhabits Cumberland Plain Woodland (a critically endangered ecological community). This community is a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities;
- Lives under litter of bark, leaves and logs, or shelters in loose soil around grass clumps. Occasionally shelters under rubbish;
- Can dig several centimetres into soil to escape drought;
- Is a fungus specialist. Unlike the Garden Snail, does not eat green plants. It is generally active at night; and
- Little is known of its biology, including breeding biology. It is known to be hermaphroditic, laying clutches of 20-25 small, round, white eggs in moist, dark areas (such as under logs), with the eggs taking 2-3 weeks to hatch. There is a suggestion that the species breeds throughout the year when conditions are suitable.

This species was not detected during surveys; however, it is known from numerous occurrence records from the locality and suitable habitat is present on the Subject Land in the form of remnant and planted native vegetation with areas of deep leaf litter.

a) In the case of a threatened species, whether the proposed development or activity 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 Proposal would remove the majority of suitable habitat for this species from the Subject Land. However, this habitat is considered to be of low quality lacking a complex understory component and significant woody debris. The species is considered likely to utilise this habitat intermittently as part of a larger range and the local population is not considered dependent on this habitat for its long-term survival in the local area.

The Proposal is not considered likely to place a viable local population of this species at risk of extinction.

b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

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

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 to a threatened species.

c) In relation to the habitat of a threatened species or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity;

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity; and

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 Proposal would remove around 2/3 of the approximately 0.05 ha of suitable remnant and planted native vegetation from the Subject Land for this species.

No area of native vegetation would become fragmented or isolated as a result of the Proposal, the Subject Land is small and would retain fringing planted native vegetation along the northern and eastern boundaries following development. This species would retain the capacity to disperse through this fringing vegetation and within vegetation on lands to the west which would not be impacted by the Proposal.

The habitat present on the Subject Land is not considered to be high quality for this species, lacking a complex understory component and significant woody debris. It is not considered important for the long-term survival of the species in the locality.

d) Whether the action proposed is likely to have an adverse effect any declared area of outstanding biodiversity value (either directly or indirectly);

At the time of writing, there are four AOBV declared under the BC Act:

- Gould's Petrel - critical habitat declaration;

- Little penguin population in Sydney's North Harbour - critical habitat declaration;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve - critical habitat declaration; and
- Wollemi Pine - critical habitat declaration.

Of the above listed AOBV, the Little penguin population in Sydney's North Harbour - critical habitat is located closest to the proposal Area. However, as the Subject Land is located over 50 km from the AOBV, the proposal would not be expected to have any direct or indirect effect on this or any other declared AOBV.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The Proposal would or may constitute, introduce or exacerbate the following Key Threatening Processes (KTPs) relevant to this species:

- Anthropogenic climate change;
- Clearing of native vegetation; and
- Removal of dead wood and dead trees.

The proposal would result in a small loss of native vegetation, production of greenhouse gases and removal of dead wood. However, these KTPs arising from the development are not considered significant on the locality scale. The habitat present on the Subject Land is not considered high quality for this species as described above.

With appropriate mitigation, the Proposal is not considered likely to significantly exacerbate these KTPs on the locality scale.

Conclusion

The Subject Land contains suitable but degraded habitat for this species and it is known from numerous local occurrence records. The habitat present lacks understory complexity and significant woody debris preferred by this species. The habitat is not considered vital to the survival of the species in the locality.

The Proposal is not considered likely to have a significant impact on this species. Further assessment through a BDAR is not considered necessary.

A7.1.4 Dusky Woodswallow (Artamus cyanopterus cyanopterus)

This species is listed as vulnerable under the BC Act.

The Dusky Woodswallow is a medium-sized bird (16-19.5 cm, 35 g), with a longish tail. Mostly dark grey-brown, merging to blackish on the tail, with a small black-brown mask. Bluish bill with a black tip. Upper-wings are a dark blue-grey with a white leading edge. Conspicuous white corners on the tail. In flight the dark grey-brown under-body contrasts with the whitish under-wing. Juveniles may be distinguished by white streaking on the body and whitish tips on wing feathers. Immature individuals are similar to adults but retain pale-tipped wing feathers. No seasonal variation in appearance is evident, and sexes are alike. Calls consist of brassy chirps, chirups, a soft low 'vut vut' and a brisk 'peet peet'. Also known to mimic other birds, including the rufous whistler and grey shrike-thrush.

Distribution

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.

Habitat and ecology

- 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;
- Primarily eats invertebrates, mainly insects, which are captured whilst hovering or sallying above the canopy or over water. Also frequently hovers, sallies and pounces under the canopy, primarily over leaf litter and dead timber. Also occasionally take nectar, fruit and seed;
- Depending on location and local climatic conditions (primarily temperature and rainfall), the Dusky Woodswallow can be resident year round or migratory. In NSW, after breeding, birds migrate to the north of the state and to southeastern Queensland, while Tasmanian birds migrate to southeastern NSW after breeding. Migrants generally depart between March and May, heading south to breed again in spring. There is some evidence of site fidelity for breeding. Although Dusky Woodswallows generally breed as solitary pairs or occasionally in small flocks, large flocks may form around abundant food sources in winter. Large flocks may also form before migration, which is often undertaken with other species; and
- Nest is an open, cup-shape, made of twigs, grass, fibrous rootlets and occasionally casuarina needles, and may be lined with grass, rootlets or infrequently horsehair, occasionally unlined. Nest sites vary greatly, but generally occur in shrubs or low trees, living or dead, horizontal or upright forks in branches, spouts, hollow stumps or logs, behind loose bark or in a hollow in the top of a wooden fence post. Nest sites may be exposed or well concealed by foliage.

This species was not detected during surveys; however, it is known from numerous occurrence records from the locality and suitable habitat is present on the Subject Land in the form of remnant and planted native vegetation.

a) In the case of a threatened species, whether the proposed development or activity 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 Proposal would remove the majority of suitable habitat for this species from the Subject Land. However, this habitat is considered to be of low quality represented by scattered and largely immature trees interspersed with exotic vegetation. The species is considered likely to utilise this habitat intermittently as part of a larger range and the local population is not considered dependent on this habitat for its long-term survival in the local area. The mature eucalypt will also be retained following development and will continue to provide foraging and roosting resources for this species.

The Proposal is not considered likely to place a viable local population of this species at risk of extinction.

b) In the case of an endangered ecological community or critically endangered ecological

community, whether the proposed development or activity:

- ***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***
- ***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 to a threatened species.

c) In relation to the habitat of a threatened species or ecological community:

- ***I. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity;***
- ***II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity; and***
- ***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 Proposal would remove around 2/3 of the approximately 0.05 ha of suitable remnant and planted native vegetation from the Subject Land for this species.

No area of native vegetation would become fragmented or isolated as a result of the Proposal, the Subject Land is small and would retain fringing planted native vegetation along the northern and eastern boundaries following development. This species would retain the capacity to disperse through this fringing vegetation and within vegetation on lands to the west which would not be impacted by the Proposal.

The habitat present on the Subject Land is not considered to be high quality for this species, lacking significant mature trees and a scattered and disturbed nature with numerous exotic species present. It is not considered important for the long-term survival of the species in the locality.

d) Whether the action proposed is likely to have an adverse effect any declared area of outstanding biodiversity value (either directly or indirectly);

At the time of writing, there are four AOBV declared under the BC Act:

- Gould's Petrel - critical habitat declaration;
- Little penguin population in Sydney's North Harbour - critical habitat declaration;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve - critical habitat declaration; and
- Wollemi Pine - critical habitat declaration.

Of the above listed AOBV, the Little penguin population in Sydney's North Harbour - critical habitat is located closest to the proposal Area. However, as the Subject Land is located over 50 km from the AOBV, the proposal would not be expected to have any direct or indirect effect on this or any other declared AOBV.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The Proposal would or may constitute, introduce or exacerbate the following Key Threatening

Processes (KTPs) relevant to this species:

- Anthropogenic climate change;
- Clearing of native vegetation; and
- Removal of dead wood and dead trees.

The proposal would result in a small loss of native vegetation, production of greenhouse gases and removal of dead wood. However, these KTPs arising from the development are not considered significant on the locality scale. The habitat present on the Subject Land is not considered high quality for this species as described above.

With appropriate mitigation, the Proposal is not considered likely to significantly exacerbate these KTPs on the locality scale.

Conclusion

The Subject Land contains suitable but degraded habitat for this species and it is known from numerous local occurrence records. The habitat present is not considered to represent high quality habitat for this species and is not considered vital to the survival of the species in the locality. The Proposal would remove the majority of the habitat present; however, the mature remnant eucalypt would be retained and would continue to provide habitat resources for this species following development.

The Proposal is not considered likely to have a significant impact on this species. Further assessment through a BDAR is not considered necessary.

A7.1.5 Glossy Black Cockatoo (Calyptorhynchus lathami)

This species is listed as vulnerable under the BC Act.

The Glossy Black-Cockatoo is a small brown-black cockatoo with a massive, bulbous bill and a short crest. Males have a prominent red tail panel, while that of females is yellow to orange-red. The coloured tail panel is barred black in juvenile birds, with the extent of barring decreasing with age. The female usually has irregular pale-yellow markings on the head and neck, and may have yellow flecks on the underparts and underwing. They are usually seen in pairs or small groups feeding quietly in sheoaks.

Distribution

The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. An isolated population exists on Kangaroo Island, South Australia.

Habitat and ecology

- Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) are important foods;
- Inland populations feed on a wide range of sheoaks, including Drooping Sheoak, *Allocasuaraina diminuta*, and *A. gymnathera*. Belah is also utilised and may be a critical food source for some populations;

- In the Riverina, birds are associated with hills and rocky rises supporting Drooping Sheoak, but also recorded in open woodlands dominated by Belah (*Casuarina cristata*);
- Feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species), shredding the cones with the massive bill; and
- Dependent on large hollow-bearing eucalypts for nest sites. A single egg is laid between March and May.

This species was not detected during surveys; however, it is known from numerous occurrence records from the locality and suitable habitat is present on the Subject Land including hollow-bearing resources and suitable feed tree species (*Allocasuarina littoralis* (Black Sheoak)).

a) In the case of a threatened species, whether the proposed development or activity 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 Proposal would remove the majority of suitable habitat for this species from the Subject Land including a small stand of suitable feed tree species. However, this habitat is considered to be too exposed and open to provide a reliable food resource for this species. The species is considered likely to utilise this habitat intermittently as part of a larger range and the local population is not considered dependent on this habitat for its long-term survival in the local area. The mature eucalypt will also be retained following development and will continue to provide roosting and potential breeding resources for this species.

The Proposal is not considered likely to place a viable local population of this species at risk of extinction.

b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

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

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 to a threatened species.

c) In relation to the habitat of a threatened species or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity;

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity; and

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 Proposal would remove around 2/3 of the approximately 0.05 ha of suitable remnant and planted native vegetation from the Subject Land for this species including the stand of suitable feed trees. However, the mature hollow-bearing eucalypt would be retained.

No area of native vegetation would become fragmented or isolated as a result of the Proposal, the

Subject Land is small and would retain fringing planted native vegetation along the northern and eastern boundaries following development. This species would retain the capacity to disperse through this fringing vegetation and within vegetation on lands to the west which would not be impacted by the Proposal.

Although suitable feed tree species are present on the Subject Land, these are not considered a reliable food resource as the Subject Land is open and exposed, discouraging this relatively shy species from frequent usage. The local population is considered most likely to use this habitat intermittently as part of a wider foraging range. It is not considered important for the long-term survival of the species in the locality and the highest quality vegetation (mature hollow-bearing tree) would be retained.

d) Whether the action proposed is likely to have an adverse effect any declared area of outstanding biodiversity value (either directly or indirectly);

At the time of writing, there are four AOBV declared under the BC Act:

- Gould's Petrel - critical habitat declaration;
- Little penguin population in Sydney's North Harbour - critical habitat declaration;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve - critical habitat declaration; and
- Wollemi Pine - critical habitat declaration.

Of the above listed AOBV, the Little penguin population in Sydney's North Harbour - critical habitat is located closest to the proposal Area. However, as the Subject Land is located over 50 km from the AOBV, the proposal would not be expected to have any direct or indirect effect on this or any other declared AOBV.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The Proposal would or may constitute, introduce or exacerbate the following Key Threatening Processes (KTPs) relevant to this species:

- Anthropogenic climate change;
- Clearing of native vegetation;
- Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species; and
- Removal of dead wood and dead trees.

The proposal would result in a small loss of native vegetation, production of greenhouse gases and removal of dead wood. However, these KTPs arising from the development are not considered significant on the locality scale. The habitat present on the Subject Land is not considered high quality for this species as described above. The Proposal has the potential to introduce Psittacine circoviral disease through the keeping of future pets; however, the locality is already urbanised with significant pet ownership. The Proposal is not considered likely to significantly exacerbate the risk of introducing this disease to local psittacine populations.

With appropriate mitigation, the Proposal is not considered likely to significantly exacerbate these KTPs on the locality scale.

Conclusion

The Subject Land contains suitable but degraded habitat for this species and it is known from numerous local occurrence records. The habitat present is not considered to represent high quality habitat for this species and is not considered vital to the survival of the species in the locality. The Proposal would remove the majority of the habitat present; however, the mature remnant eucalypt would be retained and would continue to provide habitat resources for this species following development.

The Proposal is not considered likely to have a significant impact on this species. Further assessment through a BDAR is not considered necessary.

A7.1.6 Grey-headed Flying Fox (Pteropus poliocephalus)

This species is listed as vulnerable under the BC Act.

The Grey-headed Flying-fox is the largest Australian bat, with a head and body length of 23 - 29 cm. It has dark grey fur on the body, lighter grey fur on the head and a russet collar encircling the neck. The wing membranes are black and the wingspan can be up to 1 m. It can be distinguished from other flying-foxes by the leg fur, which extends to the ankle.

Distribution

Grey-headed Flying-foxes are generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. In times of natural resource shortages, they may be found in unusual locations.

Habitat and ecology

- Occur 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;
- Individual camps may have tens of thousands of animals and are used for mating, and for giving birth and rearing young;
- Annual mating commences in January and conception occurs in April or May; a single young is born in October or November;
- Site fidelity to camps is high; some camps have been used for over a century;
- Can travel up to 50 km from the camp to forage; commuting distances are more often <20 km;
- Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines; and
- Also forage in cultivated gardens and fruit crops.

This species was not detected during surveys; however, nocturnal surveys were not conducted and it is known from numerous recent occurrence records. The Subject Land contains suitable foraging resources in the form of mature flowering eucalypts.

a) In the case of a threatened species, whether the proposed development or activity 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 Proposal would remove the majority of suitable habitat for this species from the Subject Land. The species is considered likely to utilise this habitat intermittently as part of a larger range and the local

population is not considered dependent on this habitat for its long-term survival in the local area. The mature eucalypt will also be retained following development and will continue to provide roosting and foraging resources for this species. The locality supports a known camp of this species in the suburb of Emu Plains, approximately 3 km to the south-west of the Subject Land (Commonwealth of Australia, 2021).

The Proposal is not considered likely to place a viable local population of this species at risk of extinction.

b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

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

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 to a threatened species.

c) In relation to the habitat of a threatened species or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity;

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity; and

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 Proposal would remove around 2/3 of the approximately 0.05 ha of suitable remnant and planted native vegetation from the Subject Land for this species including suitable feed trees. However, the mature hollow-bearing eucalypt would be retained.

No area of native vegetation would become fragmented or isolated as a result of the Proposal, the Subject Land is small and would retain fringing planted native vegetation along the northern and eastern boundaries following development. This species would retain the capacity to disperse through this fringing vegetation and within vegetation on lands to the west which would not be impacted by the Proposal.

The habitat quality present on the Subject land is not limited in the locality with similar scattered native trees present on adjacent lands. The local population is considered most likely to use this habitat intermittently as part of a wider foraging range. It is not considered important for the long-term survival of the species in the locality and the highest quality vegetation (mature eucalypt) would be retained.

d) Whether the action proposed is likely to have an adverse effect any declared area of outstanding biodiversity value (either directly or indirectly);

At the time of writing, there are four AOBV declared under the BC Act:

- Gould's Petrel - critical habitat declaration;
- Little penguin population in Sydney's North Harbour - critical habitat declaration;

- Mitchell's Rainforest Snail in Stotts Island Nature Reserve - critical habitat declaration; and
- Wollemi Pine - critical habitat declaration.

Of the above listed AOBV, the Little penguin population in Sydney's North Harbour - critical habitat is located closest to the proposal Area. However, as the Subject Land is located over 50 km from the AOBV, the proposal would not be expected to have any direct or indirect effect on this or any other declared AOBV.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The Proposal would or may constitute, introduce or exacerbate the following Key Threatening Processes (KTPs) relevant to this species:

- Anthropogenic climate change; and
- Clearing of native vegetation.

The proposal would result in a small loss of native vegetation and production of greenhouse gases. However, these KTPs arising from the development are not considered significant on the locality scale. The habitat present on the Subject Land is not considered high quality for this species as described above.

With appropriate mitigation, the Proposal is not considered likely to significantly exacerbate these KTPs on the locality scale.

Conclusion

The Subject Land contains suitable but degraded habitat for this species and it is known from numerous local occurrence records. The habitat present is not considered to represent high quality habitat for this species and is not considered vital to the survival of the species in the locality. The Proposal would remove the majority of the habitat present; however, the mature remnant eucalypt would be retained and would continue to provide habitat resources for this species following development.

The Proposal is not considered likely to have a significant impact on this species. Further assessment through a BDAR is not considered necessary.

A7.1.7 Little Lorikeet (Glossopsitta pusilla)

This species is listed as vulnerable under the BC Act.

The Little Lorikeet is a small (16-19 cm; 40 g) bright green parrot, with a red face surrounding its black bill and extending to the eye. The undertail is olive-yellow with a partly concealed red base, and the underwing coverts are bright green. The mantle is imbued with light brown. The call in flight is diagnostically different from other lorikeets, being a shrill and rolling screech: ‘zit-zit’ or ‘zzet’. Although difficult to observe while foraging high in treetops, a flock’s constantly chattering contact calls give it away. Flight is fast, direct and through or above the canopy.

Distribution

The Little Lorikeet is distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. NSW provides a large portion of the species' core habitat, with

lorikeets found westward as far as Dubbo and Albury. Nomadic movements are common, influenced by season and food availability, although some areas retain residents for much of the year and 'locally nomadic' movements are suspected of breeding pairs.

Habitat and ecology

- Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity;
- Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species;
- Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards;
- Gregarious, travelling and feeding in small flocks (<10), though often with other lorikeets. Flocks numbering hundreds are still occasionally observed and may have been the norm in past centuries;
- Roosts in treetops, often distant from feeding areas;
- Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). These nest sites are often used repeatedly for decades, suggesting that preferred sites are limited. Riparian trees often chosen, including species like *Allocasuarina*; and
- Nesting season extends from May to September. In years when flowering is prolific, Little Lorikeet pairs can breed twice, producing 3-4 young per attempt. However, the survival rate of fledglings is unknown.

This species was observed flying over lands to the immediate south of the Subject Land during surveys. The Subject Land contains suitable native foraging vegetation and a mature eucalypt containing hollow-bearing resources.

a) In the case of a threatened species, whether the proposed development or activity 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 Proposal would remove the majority of suitable habitat for this species from the Subject Land. However, this habitat is not limited in the locality with similar scattered native trees and exotic vegetation present on lands to the north, south and west. The species is considered likely to utilise this habitat intermittently as part of a larger range and the local population is not considered dependent on this habitat for its long-term survival in the local area. The mature eucalypt will also be retained following development and will continue to provide roosting and potential breeding resources for this species.

The Proposal is not considered likely to place a viable local population of this species at risk of extinction.

b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

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

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 to a threatened species.

c) In relation to the habitat of a threatened species or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity;

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity; and

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 Proposal would remove around 2/3 of the approximately 0.05 ha of suitable remnant and planted native vegetation from the Subject Land for this species including the stand of suitable feed trees. However, the mature hollow-bearing eucalypt would be retained.

No area of native vegetation would become fragmented or isolated as a result of the Proposal, the Subject Land is small and would retain fringing planted native vegetation along the northern and eastern boundaries following development. This species would retain the capacity to disperse through this fringing vegetation and within vegetation on lands to the west which would not be impacted by the Proposal.

The local population is considered most likely to use this habitat intermittently as part of a wider foraging range. It is not considered important for the long-term survival of the species in the locality and the highest quality vegetation (mature hollow-bearing tree) would be retained.

d) Whether the action proposed is likely to have an adverse effect any declared area of outstanding biodiversity value (either directly or indirectly);

At the time of writing, there are four AOBV declared under the BC Act:

- Gould's Petrel - critical habitat declaration;
- Little penguin population in Sydney's North Harbour - critical habitat declaration;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve - critical habitat declaration; and
- Wollemi Pine - critical habitat declaration.

Of the above listed AOBV, the Little penguin population in Sydney's North Harbour - critical habitat is located closest to the proposal Area. However, as the Subject Land is located over 50 km from the AOBV, the proposal would not be expected to have any direct or indirect effect on this or any other declared AOBV.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The Proposal would or may constitute, introduce or exacerbate the following Key Threatening Processes (KTPs) relevant to this species:

- Anthropogenic climate change;
- Clearing of native vegetation;
- Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species; and
- Removal of dead wood and dead trees.

The proposal would result in a small loss of native vegetation, production of greenhouse gases and removal of dead wood. However, these KTPs arising from the development are not considered significant on the locality scale. The habitat present on the Subject Land is not considered high quality for this species as described above. The Proposal has the potential to introduce Psittacine circoviral disease through the keeping of future pets; however, the locality is already urbanised with significant pet ownership. The Proposal is not considered likely to significantly exacerbate the risk of introducing this disease to local psittacine populations.

With appropriate mitigation, the Proposal is not considered likely to significantly exacerbate these KTPs on the locality scale.

Conclusion

The Subject Land contains suitable but degraded habitat for this species and it is known from numerous local occurrence records. The habitat present is not considered to represent high quality habitat for this species and is not considered vital to the survival of the species in the locality. The Proposal would remove the majority of the habitat present; however, the mature remnant eucalypt would be retained and would continue to provide habitat resources for this species following development.

The Proposal is not considered likely to have a significant impact on this species. Further assessment through a BDAR is not considered necessary.

A7.1.8 Regent Honeyeater (Anthochaera phrygia)

This species is listed as critically endangered under the BC Act.

The Regent Honeyeater is a striking and distinctive, medium-sized, black and yellow honeyeater with a sturdy, curved bill. Adults weigh 35 - 50 grams, are 20 - 24 cm long and have a wings-pan of 30 cm. Its head, neck, throat, upper breast and bill are black and the back and lower breast are pale lemon in colour with a black scalloped pattern. Its flight and tail feathers are edged with bright yellow. There is a characteristic patch of dark pink or cream-coloured facial-skin around the eye. Sexes are similar, though males are larger, darker and have larger patch of bare facial-skin. The call is a soft metallic bell-like song; birds are most vocal in non-breeding season. It has recently been placed in the genus Anthochaera along with the wattlebirds, and was formerly known by the name *Xanthomyza phrygia*.

Distribution

The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. Once recorded between Adelaide and the central coast of Queensland, its range has contracted dramatically in the last 30 years to between north-eastern Victoria and south-eastern Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks

converge on flowering coastal woodlands and forests.

Habitat and ecology

- The Regent Honeyeater is a flagship threatened woodland bird whose conservation will benefit a large suite of other threatened and declining woodland fauna. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes;
- Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast. Birds are occasionally seen on the south coast;
- In the last 10 years Regent Honeyeaters have been recorded in urban areas around Albury where woodlands tree species such as Mugga Ironbark and Yellow Box were planted 20 years ago;
- The Regent Honeyeater is a generalist forager, although it feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany. Other tree species may be regionally important. For example the Lower Hunter Spotted Gum forests have recently been demonstrated to support regular breeding events. Flowering of associated species such as Thin-leaved Stringybark *Eucalyptus eugenioides* and other Stringybark species, and Broad-leaved Ironbark *E. fibrosa* can also contribute important nectar flows at times. Nectar and fruit from the mistletoes *Amyema miquelii*, *A. pendula* and *A. cambagei* are also utilised. When nectar is scarce lerp and honeydew can comprise a large proportion of the diet. Insects make up about 15% of the total diet and are important components of the diet of nestlings;
- Colour-banding of Regent Honeyeater has shown that the species can undertake large-scale nomadic movements in the order of hundreds of kilometres. However, the exact nature of these movements is still poorly understood. It is likely that movements are dependent on spatial and temporal flowering and other resource patterns. To successfully manage the recovery of this species a full understanding of the habitats used in the non-breeding season is critical;
- There are three known key breeding areas, two of them in NSW - Capertee Valley and Bundarra-Barraba regions. The species breeds between July and January in Box-Ironbark and other temperate woodlands and riparian gallery forest dominated by River Sheoak. Regent Honeyeaters usually nest in horizontal branches or forks in tall mature eucalypts and Sheoaks. Also nest in mistletoe haustoria; and
- An open cup-shaped nest is constructed of bark, grass, twigs and wool by the female. Two or three eggs are laid and incubated by the female for 14 days. Nestlings are brooded and fed by both parents at an average rate of 23 times per hour and fledge after 16 days. Fledglings fed by both parents 29 times per hour.

This species was not encountered on the Subject Land during surveys; however, it is known from recent occurrence records in the locality and suitable habitat is present in the form of remnant and planted native flowering eucalypts.

a) In the case of a threatened species, whether the proposed development or activity 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 Proposal would remove the majority of suitable habitat for this species from the Subject Land. However, this habitat is considered to be of low quality represented by scattered and largely immature trees interspersed with exotic vegetation. The species is considered likely to utilise this habitat intermittently as part of a larger range and the local population is not considered dependent on this habitat for its long-term survival in the local area. The mature eucalypt will also be retained following development and will continue to provide foraging and roosting resources for this species.

The Proposal is not considered likely to place a viable local population of this species at risk of extinction.

b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

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

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 to a threatened species.

c) In relation to the habitat of a threatened species or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity;

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity; and

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 Proposal would remove around 2/3 of the approximately 0.05 ha of suitable remnant and planted native vegetation from the Subject Land for this species.

No area of native vegetation would become fragmented or isolated as a result of the Proposal, the Subject Land is small and would retain fringing planted native vegetation along the northern and eastern boundaries following development. This species would retain the capacity to disperse through this fringing vegetation and within vegetation on lands to the west which would not be impacted by the Proposal.

The habitat present on the Subject Land is not considered to be high quality for this species, lacking significant mature trees and a scattered and disturbed nature with numerous exotic species present. It is not considered important for the long-term survival of the species in the locality.

d) Whether the action proposed is likely to have an adverse effect any declared area of outstanding biodiversity value (either directly or indirectly);

At the time of writing, there are four AOBV declared under the BC Act:

- Gould's Petrel - critical habitat declaration;
- Little penguin population in Sydney's North Harbour - critical habitat declaration;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve - critical habitat declaration; and

- Wollemi Pine - critical habitat declaration.

Of the above listed AOBV, the Little penguin population in Sydney's North Harbour - critical habitat is located closest to the proposal Area. However, as the Subject Land is located over 50 km from the AOBV, the proposal would not be expected to have any direct or indirect effect on this or any other declared AOBV.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The Proposal would or may constitute, introduce or exacerbate the following Key Threatening Processes (KTPs) relevant to this species:

- Anthropogenic climate change; and
- Clearing of native vegetation.

The proposal would result in a small loss of native vegetation and production of greenhouse gases. However, these KTPs arising from the development are not considered significant on the locality scale. The habitat present on the Subject Land is not considered high quality for this species as described above.

With appropriate mitigation, the Proposal is not considered likely to significantly exacerbate these KTPs on the locality scale.

Conclusion

The Subject Land contains suitable but degraded habitat for this species and it is known from recent local occurrence records. The habitat present is not considered to represent high quality habitat for this species and is not considered vital to the survival of the species in the locality. The Proposal would remove the majority of the habitat present; however, the mature remnant eucalypt would be retained and would continue to provide habitat resources for this species following development.

The Proposal is not considered likely to have a significant impact on this species. Further assessment through a BDAR is not considered necessary.

A7.1.9 Swift Parrot (Lathamus discolor)

This species is listed as critically endangered under the BC Act.

The Swift Parrot is small parrot about 25 cm long. It is bright green with red around the bill, throat and forehead. The red on its throat is edged with yellow. Its crown is blue-purple. There are bright red patches under the wings. One of most distinctive features from a distance is its long (12 cm), thin tail, which is dark red. This distinguishes it from the similar lorikeets, with which it often flies and feeds. Can also be recognised by its flute-like chirruping or metallic "kik-kik-kik" call.

Distribution

Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes.

Habitat and ecology

- Migrates to the Australian south-east mainland between February and October;
- On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations;
- Favoured feed trees include winter flowering species such as 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*;
- Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana*, Blackbutt *E. pilularis*, and Yellow Box *E. melliodora*;
- Return to some foraging sites on a cyclic basis depending on food availability; and
- Following winter they return to Tasmania where they breed from September to January, nesting in old trees with hollows and feeding in forests dominated by Tasmanian Blue Gum *Eucalyptus globulus*.

This species was not detected during surveys but is known from numerous recent occurrence records. The Subject Land contains suitable foraging resources in the form of mature flowering eucalypts.

a) In the case of a threatened species, whether the proposed development or activity 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 Proposal would remove the majority of suitable habitat for this species from the Subject Land. However, this habitat is considered to be of low quality represented by scattered and largely immature trees interspersed with exotic vegetation. The species is considered likely to utilise this habitat intermittently as part of a larger range and the local population is not considered dependent on this habitat for its long-term survival in the local area. The mature eucalypt will also be retained following development and will continue to provide foraging and roosting resources for this species.

The Proposal is not considered likely to place a viable local population of this species at risk of extinction.

b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

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

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 to a threatened species.

c) In relation to the habitat of a threatened species or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity;

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity; and

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 Proposal would remove around 2/3 of the approximately 0.05 ha of suitable remnant and planted native vegetation from the Subject Land for this species.

No area of native vegetation would become fragmented or isolated as a result of the Proposal, the Subject Land is small and would retain fringing planted native vegetation along the northern and eastern boundaries following development. This species would retain the capacity to disperse through this fringing vegetation and within vegetation on lands to the west which would not be impacted by the Proposal.

The habitat present on the Subject Land is not considered to be high quality for this species, lacking significant mature trees and a scattered and disturbed nature with numerous exotic species present. It is not considered important for the long-term survival of the species in the locality.

d) Whether the action proposed is likely to have an adverse effect any declared area of outstanding biodiversity value (either directly or indirectly);

At the time of writing, there are four AOBV declared under the BC Act:

- Gould's Petrel - critical habitat declaration;
- Little penguin population in Sydney's North Harbour - critical habitat declaration;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve - critical habitat declaration; and
- Wollemi Pine - critical habitat declaration.

Of the above listed AOBV, the Little penguin population in Sydney's North Harbour - critical habitat is located closest to the proposal Area. However, as the Subject Land is located over 50 km from the AOBV, the proposal would not be expected to have any direct or indirect effect on this or any other declared AOBV.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The Proposal would or may constitute, introduce or exacerbate the following Key Threatening Processes (KTPs) relevant to this species:

- Anthropogenic climate change;
- Clearing of native vegetation; and
- Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.

The proposal would result in a small loss of native vegetation and production of greenhouse gases. However, these KTPs arising from the development are not considered significant on the locality scale. The habitat present on the Subject Land is not considered high quality for this species as described above. The Proposal has the potential to introduce Psittacine circoviral disease through the keeping of future pets; however, the locality is already urbanised with significant pet ownership. The Proposal is not considered likely to significantly exacerbate the risk of introducing this disease to local psittacine populations.

With appropriate mitigation, the Proposal is not considered likely to significantly exacerbate these KTPs

on the locality scale.

Conclusion

The Subject Land contains suitable but degraded habitat for this species and it is known from recent local occurrence records. The habitat present is not considered to represent high quality habitat for this species and is not considered vital to the survival of the species in the locality. The Proposal would remove the majority of the habitat present; however, the mature remnant eucalypt would be retained and would continue to provide habitat resources for this species following development.

The Proposal is not considered likely to have a significant impact on this species. Further assessment through a BDAR is not considered necessary.

A7.1.10 Tree-dwelling Microchiropteran Bat

These species are listed as vulnerable under the BC Act.

- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*);
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*);
- Greater Broad-nosed Bat (*Scoteanax rueppellii*);
- Southern Myotis (*Myotis macropus*); and
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*).

The Eastern Freetail-bat has dark brown to reddish brown fur on the back and is slightly paler below. Like other freetail-bats it has a long (3 - 4 cm) bare tail protruding from the tail membrane. Freetail-bats are also known as mastiff-bats, having hairless faces with wrinkled lips and triangular ears. They weigh up to 10 grams.

Distribution

The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW.

Habitat and ecology

- Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range;
- Roost mainly in tree hollows but will also roost under bark or in man-made structures; and
- Usually solitary but also recorded roosting communally, probably insectivorous.

The Eastern False Pipistrelle is relatively large with a head-body length of about 65 mm. It weighs up to 28 grams. It is dark to reddish-brown above and paler grey on its underside. It has long slender ears set well back on the head and some sparse hair on the nose.

Distribution

The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania.

Habitat and ecology

- 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;
- Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy;
- Hibernates in winter; and
- Females are pregnant in late spring to early summer.

The Greater Broad-nosed Bat is a large powerful bat, up to 95 mm long, with a broad head and a short square muzzle. It is dark reddish-brown to mid-brown above and slightly paler below. It is distinguished from other broad-nosed bats by its greater size. While similar to the Eastern False Pipistrelle Falsistrellus tasmaniensis, it differs by having only two (not four) upper incisors.

Distribution

The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. It extends to the coast over much of its range. In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m.

Habitat and ecology

- 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;
- Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species; and
- Little is known of its reproductive cycle, however a single young is born in January; prior to birth, females congregate at maternity sites located in suitable trees, where they appear to exclude males during the birth and raising of the single young.

This species is now most often referred to as *Myotis macropus* or the Southern Myotis, but has previously been called the Large-footed Myotis (*M. adversus*). It has disproportionately large feet; more than 8 mm long, with widely-spaced toes which are distinctly hairy and with long, curved claws. It has dark-grey to reddish brown fur above and is paler below. It weighs up to 15 grams and has a wingspan of about 28 cm.

Distribution

The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers.

Habitat and ecology

- Generally roost 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;
- Forage over streams and pools catching insects and small fish by raking their feet across the water surface; and

- In NSW females have one young each year usually in November or December.

The Yellow-bellied Sheathtail-bat is a very distinctive, large, insectivorous bat up to 87 mm long. It has long, narrow wings, a glossy, jet-black back, and a white to yellow belly extending to the shoulders and just behind the ear. Characteristically, it has a flattened head and a sharply-pointed muzzle. The tail is covered with an extremely elastic sheath that allows variation in the tail-membrane area. Males have a prominent throat pouch; females have a patch of bare skin in the same place.

Distribution

The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and North West Slopes.

Habitat and ecology

- Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows;
- When foraging for insects, flies high and fast over the forest canopy, but lower in more open country;
- Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory;
- Breeding has been recorded from December to mid-March, when a single young is born; and
- Seasonal movements are unknown; there is speculation about a migration to southern Australia in late summer and autumn.

a) In the case of a threatened species, whether the proposed development or activity 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 Proposal would remove the majority of suitable habitat for these species from the Subject Land. However, this habitat is not limited in the locality with similar scattered native trees and exotic vegetation present on lands to the north, south and west. These species are considered likely to utilise this habitat intermittently as part of a larger range and the local population is not considered dependent on this habitat for its long-term survival in the local area. The mature eucalypt will also be retained following development and will continue to provide roosting and potential breeding resources for these species.

The Proposal is not considered likely to place a viable local population of these species at risk of extinction.

b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

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

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 to a threatened species.

c) In relation to the habitat of a threatened species or ecological community:

I. The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity;

II. Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity; and

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 Proposal would remove around 2/3 of the approximately 0.05 ha of suitable remnant and planted native vegetation from the Subject Land for these species including the stand of suitable feed trees. However, the mature hollow-bearing eucalypt would be retained.

No area of native vegetation would become fragmented or isolated as a result of the Proposal, the Subject Land is small and would retain fringing planted native vegetation along the northern and eastern boundaries following development. The species would retain the capacity to disperse through this fringing vegetation and within vegetation on lands to the west which would not be impacted by the Proposal.

The local populations are considered most likely to use this habitat intermittently as part of a wider foraging range. It is not considered important for the long-term survival of these species in the locality and the highest quality vegetation (mature hollow-bearing tree) would be retained.

d) Whether the action proposed is likely to have an adverse effect any declared area of outstanding biodiversity value (either directly or indirectly);

At the time of writing, there are four AOBV declared under the BC Act:

- Gould's Petrel - critical habitat declaration;
- Little penguin population in Sydney's North Harbour - critical habitat declaration;
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve - critical habitat declaration; and
- Wollemi Pine - critical habitat declaration.

Of the above listed AOBV, the Little penguin population in Sydney's North Harbour - critical habitat is located closest to the proposal Area. However, as the Subject Land is located over 50 km from the AOBV, the proposal would not be expected to have any direct or indirect effect on this or any other declared AOBV.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The Proposal would or may constitute, introduce or exacerbate the following Key Threatening Processes (KTPs) relevant to these species:

- Anthropogenic climate change;
- Clearing of native vegetation; and
- Removal of dead wood and dead trees.

The proposal would result in a small loss of native vegetation, production of greenhouse gases and removal of dead wood. However, these KTPs arising from the development are not considered significant on the locality scale. The habitat present on the Subject Land is not considered high quality for these species as described above.

With appropriate mitigation, the Proposal is not considered likely to significantly exacerbate these KTPs on the locality scale.

Conclusion

The Subject Land contains suitable but degraded habitat for these species and they are all known from numerous local occurrence records. The habitat present is not considered to represent high quality habitat for these species and is not considered vital to the survival of these species in the locality. The Proposal would remove the majority of the habitat present; however, the mature remnant eucalypt would be retained and would continue to provide habitat resources for these species following development.

The Proposal is not considered likely to have a significant impact on these species. Further assessment through a BDAR is not considered necessary.

A7.2: TESTS OF SIGNIFICANCE (EPBC ACT)

Under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), potential impacts on Matters of Environmental Significance (MNES) listed under the Act are assessed through "tests of significance". The MNES Significant Impact Guidelines provide these tests as well as guidelines for their application. These tests are used to determine if an action is likely to have a significant impact and consequently whether the action requires a referral to the federal Minister of the Environment as part of the development application.

Assessments under the EPBC Act for the species either detected on or considered likely to occur on the Subject Land are provided below.

A7.2.1 Eucalyptus scoparia (Wallangarra White Gum) and Syzygium paniculatum (Magenta Lilly Pilly)

These species are listed as vulnerable under the EPBC Act.

The Magenta Lilly Pilly is a small to medium sized rainforest tree that grows to 8 m tall. The bark is flaky and the leaves are shiny, dark-green above and paler underneath. Leaves can be up to 10 cm long. Plants produce white flower-clusters at the end of each branch, between November and February. The petals are small and are accompanied by prominent long stamens. The deep magenta fruits, which may be spherical or egg-shaped, mature in May, and contain a single seed.

Distribution

The Magenta Lilly Pilly is found only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest.

Habitat and ecology

- On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest; and

- On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.

These species were present on the Subject Land as mature individuals planted as part of historical landscaping, with eight *E. scoparia* present and a single *S. paniculatum*.

a) Lead to a long-term decrease in the size of an important population of a species;

The Subject Land is located outside of the preferred habitats and/or native region of these species. The individuals present are representative of a historical planting and do not represent members of a local, indigenous important population. The Proposal would remove all individuals of these species from the Subject Land.

No significant impact on important habitat for these species in the locality would result from the Proposal. The Proposal is not considered likely to lead to a long-term decrease in the size of an important population of these species.

b) Reduce the area of occupancy of an important population;

The habitat to be removed by the Proposal consists of Cumberland Plain open woodlands, unsuitable for a viable population of these species. The individuals present are representative of historical landscape planting and do not represent members of local, indigenous important populations. The Proposal is not considered likely to reduce the area of occupancy of an important population of either species.

c) Fragment an existing important population into two or more populations;

These species occur as planted individuals and are not representative of local endemic populations. The Proposal would not significantly increase local habitat fragmentation with the Subject Land already bounded by sealed roads to the south and urban development to the east. Habitat connectivity to the north, south and west would be retained through vegetation on these adjacent lands.

The Proposal is not considered likely to fragment an existing important population of these species.

d) Adversely affect habitat critical to the survival of a species;

These species are represented by planted individuals located in habitat not typical for wild members of the species. This habitat is not considered critical to the survival of either species.

The Proposal is not considered likely to adversely affect habitat critical to the survival of these species.

e) Disrupt the breeding cycle of an important population;

These species occur as planted individuals and are not representative of indigenous, local important populations. Due to the unsuitability of the surrounding habitat, it is not considered likely that the Subject Land would support viable ongoing recruitment of these species.

The Proposal is not considered likely to disrupt the breeding cycle of an important population of either species.

f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

These species are represented by single individual located in habitat not typical for wild members of either species. This habitat is not considered suitable for the ongoing persistence of these species on

the Subject Land.

The Proposal is not considered likely to adversely affect habitat to the extent that either species is likely to decline.

g) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;

The Subject Land is already highly disturbed by historical landscaping and exotic weed colonisation. The Proposal is considered unlikely to lead to significant increases in exotic species colonisation during or following development. The habitat on the Subject Land is not considered suitable for the long-term persistence of these species and the species are represented by planted individuals, not representative of endemic populations.

h) Introduce disease that may cause the species to decline; or

These species are susceptible to the fungal pathogen *Austropuccinia psidii* (Myrtle Rust) which can be introduced during development works on unclean machinery, fill and in infected or in the soil of landscaping plants. The Proposal has the potential to introduce this pathogen during works.

However, these species are represented by planted individuals and are not representative of endemic populations. The local area is already highly modified and many vectors are present for the introduction of new diseases independent of the Proposal.

The Proposal is not considered likely to introduce diseases which could cause these species to decline.

i) Interfere substantially with the recovery of the species.

The Subject Site does not contain typical habitat for these species. The individuals present are representative of a historical planting and do not represent members of endemic, local important populations. Due to the atypical and modified nature of the habitat present the species are considered unlikely to persist as viable populations in the long term.

The Proposal is not considered likely to interfere substantially with the recovery of these species.

Conclusion

No significant impact on these species is anticipated as a result of the Proposal. The habitat to be impacted consists of atypical habitat for the species and the species are representative of historical landscaping. These individuals are not considered to represent part of indigenous, local viable populations and are unlikely to persist in the long-term.

No significant impact on these species is considered likely as a result of the Proposal.

A7.2.2 Grey-headed Flying Fox (Pteropus poliocephalus)

This species is listed as vulnerable under the EPBC Act.

The Grey-headed Flying-fox is the largest Australian bat, with a head and body length of 23 - 29 cm. It has dark grey fur on the body, lighter grey fur on the head and a russet collar encircling the neck. The wing membranes are black and the wingspan can be up to 1 m. It can be distinguished from other flying-foxes by the leg fur, which extends to the ankle.

Distribution
Grey-headed Flying-foxes are generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. In times of natural resource shortages, they may be found in unusual locations.

Habitat and ecology

- Occur 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;
- Individual camps may have tens of thousands of animals and are used for mating, and for giving birth and rearing young;
- Annual mating commences in January and conception occurs in April or May; a single young is born in October or November;
- Site fidelity to camps is high; some camps have been used for over a century;
- Can travel up to 50 km from the camp to forage; commuting distances are more often <20 km;
- Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines; and
- Also forage in cultivated gardens and fruit crops.

This species was not detected during surveys; however, nocturnal surveys were not conducted and it is known from numerous recent occurrence records. The Subject Land contains suitable foraging resources in the form of mature flowering eucalypts.

a) Lead to a long-term decrease in the size of an important population;

The habitat present on the Subject Land is not considered important to the long-term survival of the species, with similar habitat present on adjacent lands and the wider locality. The habitat on the Subject Land represents part of a wider foraging range for this species. The nearest camp is located approximately 3 km to the south-west in the suburb of Emu plains (Commonwealth of Australia, 2021). The Proposal would not directly impact upon the viability of this camp.

The Proposal is not considered likely to lead to a long-term decrease in the size of an important population of this species.

b) Reduce the area of occupancy of an important population;

The habitat of the Subject Land is considered to represent a small part of the foraging range of the local population of this species. The Proposal will not inhibit this species' ability to disperse through the locality.

The Proposal is not considered likely to reduce the area of occupancy of an important population of this species.

c) Fragment an existing important population into two or more populations;

This species is highly mobile and capable of crossing large areas of unsuitable habitat. The Proposal will remove a small portion of foraging habitat for this species from the locality but will not affect the species' ability to disperse through the local area.

The Proposal is not considered likely to fragment an important population of this species.

d) Adversely affect habitat critical to the survival of a species;

The Subject Land does not contain resources critical for the survival of the species in the locality. Larger areas of better condition habitat are present in the wider local area. The Proposal would not represent a dispersal barrier for this highly mobile species.

The Proposal is not considered likely to adversely affect habitat critical to the survival of this species.

e) Disrupt the breeding cycle of an important population;

The habitat of the Subject Land represents a small part of the wider local foraging resources for this species and does not contain a breeding camp. This habitat is not limited in the locality with larger areas of better condition habitat present in the wider local area. The nearest known camp is located over 3 km away and would not be impacted by the Proposal.

The Proposal is not considered likely to disrupt the breeding cycle of an important population of this species.

f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

The Proposal would remove a small portion of foraging habitat for this species from the local area. This habitat is not limited in the locality for this highly mobile species. The removal of this habitat from the Subject Land would represent a small reduction in the local foraging habitat for the species.

The Proposal is not considered likely to adversely affect habitat to the extent that the species is likely to decline.

g) Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat;

This species is not highly susceptible to terrestrial exotic predators due to its arboreal and airborne habit. The Subject Land is located in an already highly urbanised locality with a significant population of domestic predators (dogs and cats). The Proposal may increase this population with new pets introduced by new landowners, but this is not considered likely to significantly increase the predation pressure on this species or any other native species in the locality.

h) Introduce disease that may cause the species to decline; or

The species is not susceptible to any disease likely to be introduced by the Proposal. The local area is already highly modified and many vectors are present for the introduction of new diseases independent of the Proposal.

The Proposal is not considered likely to introduce diseases which could cause the species to decline.

i) Interfere substantially with the recovery of the species.

The Subject Site does not contain breeding habitat for this species and the available habitat represents general foraging habitat not limited in the locality. The Proposal would not represent a barrier to the dispersal of this species across the locality and would not significantly affect the habitat utility of the local area for this highly mobile species.

The Proposal is not considered likely to interfere substantially with the recovery of the species.

Conclusion

No significant impact on this species is anticipated as a result of the Proposal. The habitat to be impacted consists of general foraging habitat and does not contain critical life stage habitat such as a breeding camp. The nearest known camp is over 3 km away and would not be impacted by the Proposal. The Subject Land is considered to represent a small part of a larger foraging range for this population, and the species is not considered reliant on the resources of the Subject Land for its persistence in the local area.

No significant impact on this species is considered likely as a result of the Proposal.

A7.2.2 Regent Honeyeater (Anthochaera phrygia)

This species is listed as critically endangered under the EPBC Act.

The Regent Honeyeater is a striking and distinctive, medium-sized, black and yellow honeyeater with a sturdy, curved bill. Adults weigh 35 - 50 grams, are 20 - 24 cm long and have a wings-pan of 30 cm. Its head, neck, throat, upper breast and bill are black and the back and lower breast are pale lemon in colour with a black scalloped pattern. Its flight and tail feathers are edged with bright yellow. There is a characteristic patch of dark pink or cream-coloured facial-skin around the eye. Sexes are similar, though males are larger, darker and have larger patch of bare facial-skin. The call is a soft metallic bell-like song; birds are most vocal in non-breeding season. It has recently been placed in the genus Anthochaera along with the wattlebirds, and was formerly known by the name *Xanthomyza phrygia*.

Distribution

The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. Once recorded between Adelaide and the central coast of Queensland, its range has contracted dramatically in the last 30 years to between north-eastern Victoria and south-eastern Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests.

Habitat and ecology

- The Regent Honeyeater is a flagship threatened woodland bird whose conservation will benefit a large suite of other threatened and declining woodland fauna. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes;
- Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast. Birds are occasionally seen on the south coast;
- In the last 10 years Regent Honeyeaters have been recorded in urban areas around Albury

where woodlands tree species such as Mugga Ironbark and Yellow Box were planted 20 years ago;

- The Regent Honeyeater is a generalist forager, although it feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany. Other tree species may be regionally important. For example the Lower Hunter Spotted Gum forests have recently been demonstrated to support regular breeding events. Flowering of associated species such as Thin-leaved Stringybark *Eucalyptus eugenioides* and other Stringybark species, and Broad-leaved Ironbark *E. fibrosa* can also contribute important nectar flows at times. Nectar and fruit from the mistletoes *Amyema miquelii*, *A. pendula* and *A. cambagei* are also utilised. When nectar is scarce lerp and honeydew can comprise a large proportion of the diet. Insects make up about 15% of the total diet and are important components of the diet of nestlings;
- Colour-banding of Regent Honeyeater has shown that the species can undertake large-scale nomadic movements in the order of hundreds of kilometres. However, the exact nature of these movements is still poorly understood. It is likely that movements are dependent on spatial and temporal flowering and other resource patterns. To successfully manage the recovery of this species a full understanding of the habitats used in the non-breeding season is critical;
- There are three known key breeding areas, two of them in NSW - Capertee Valley and Bundarra-Barraba regions. The species breeds between July and January in Box-Ironbark and other temperate woodlands and riparian gallery forest dominated by River Sheoak. Regent Honeyeaters usually nest in horizontal branches or forks in tall mature eucalypts and Sheoaks. Also nest in mistletoe haustoria; and
- An open cup-shaped nest is constructed of bark, grass, twigs and wool by the female. Two or three eggs are laid and incubated by the female for 14 days. Nestlings are brooded and fed by both parents at an average rate of 23 times per hour and fledge after 16 days. Fledglings fed by both parents 29 times per hour.

This species was not encountered on the Subject Land during surveys; however, it is known from recent occurrence records in the locality and suitable habitat is present in the form of remnant and planted native flowering eucalypts.

a) Lead to a long-term decrease in the size of a population;

The habitat present on the Subject Land is not considered important to the long-term survival of the species, with similar habitat present on adjacent lands and the wider locality. The habitat on the Subject Land represents part of a wider foraging range for this species.

The Proposal is not considered likely to lead to a long-term decrease in the size of a population of this species.

b) Reduce the area of occupancy of the species;

The habitat of the Subject Land is considered to represent a small part of the foraging range of the local population of this species. The Proposal will not inhibit this species' ability to disperse through the locality and the highest value native vegetation (mature flowering eucalypt) would be retained following development.

The Proposal is not considered likely to reduce the area of occupancy of the species.

c) Fragment an existing population into two or more populations;

This species is highly mobile and capable of crossing large areas of unsuitable habitat. The Proposal will remove a small portion of foraging habitat for this species from the locality but will not affect the species' ability to disperse through the local area.

The Proposal is not considered likely to fragment a population of this species.

d) Adversely affect habitat critical to the survival of a species;

The Subject Land does not contain resources critical for the survival of the species in the locality. Larger areas of better condition habitat are present in the wider locality. The Proposal would not represent a dispersal barrier for this highly mobile species.

The Proposal is not considered likely to adversely affect habitat critical to the survival of this species.

e) Disrupt the breeding cycle of a population;

The habitat of the Subject Land represents a small part of the wider local foraging resources for this species. This habitat is not limited in the locality with larger areas of better condition habitat present in the wider local area. The Regent Honeyeater prefers complex native vegetation assemblages which support high densities of flowering trees and high native bird diversity.

The Proposal is not considered likely to disrupt the breeding cycle of a population of this species.

f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

The Proposal would remove a small portion of foraging habitat for this species from the local area. This habitat is not limited in the locality for this highly mobile species. The removal of this habitat from the Subject Land would represent a small reduction in the local foraging habitat for the species and the highest value habitat would be retained following development.

The Proposal is not considered likely to adversely affect habitat to the extent that the species is likely to decline.

g) Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat;

This species is not highly susceptible to terrestrial exotic predators due to its arboreal and airborne habit. The Subject Land is located in an already highly urbanised locality with a significant population of domestic predators (dogs and cats). The Proposal may increase this population with new pets introduced by new landowners, but this is not considered likely to significantly increase the predation pressure on this species or any other native species in the locality.

h) Introduce disease that may cause the species to decline; or

The species is not susceptible to any disease likely to be introduced by the Proposal. The local area is already highly modified and many vectors are present for the introduction of new diseases independent of the Proposal.

The Proposal is not considered likely to introduce diseases which could cause the species to decline.

i) Interfere substantially with the recovery of the species.

The Subject Land contains general foraging habitat not limited in the locality. The Proposal would not represent a barrier to the dispersal of this species across the locality and would not significantly affect the habitat utility of the local area for this highly mobile species.

The Proposal is not considered likely to interfere substantially with the recovery of the species.

Conclusion

No significant impact on this species is anticipated as a result of the Proposal. The habitat to be impacted consists of general foraging habitat and does not contain critical life stage habitat as the habitat is not suitable for breeding. The Subject Land is considered to represent a small part of a larger foraging range for this population, and the species is not considered reliant on the resources of the Subject Land for its persistence in the local area. The highest value habitat (mature flowering eucalypt) would be retained following development.

No significant impact on this species is considered likely as a result of the Proposal.

A7.2.3 Swift Parrot (Lathamus discolor)

This species is listed as critically endangered under the EPBC Act.

The Swift Parrot is small parrot about 25 cm long. It is bright green with red around the bill, throat and forehead. The red on its throat is edged with yellow. Its crown is blue-purple. There are bright red patches under the wings. One of most distinctive features from a distance is its long (12 cm), thin tail, which is dark red. This distinguishes it from the similar lorikeets, with which it often flies and feeds. Can also be recognised by its flute-like chirruping or metallic "kik-kik-kik" call.

Distribution

Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes.

Habitat and ecology

- Migrates to the Australian south-east mainland between February and October;
- On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations;
- Favoured feed trees include winter flowering species such as 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*;
- Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana*, Blackbutt *E. pilularis*, and Yellow Box *E. melliodora*;
- Return to some foraging sites on a cyclic basis depending on food availability; and
- Following winter they return to Tasmania where they breed from September to January, nesting in old trees with hollows and feeding in forests dominated by Tasmanian Blue Gum *Eucalyptus globulus*.

This species was not detected during surveys but is known from recent occurrence records. The Subject

Land contains suitable foraging resources in the form of mature flowering eucalypts.

a) Lead to a long-term decrease in the size of a population;

The habitat present on the Subject Land is not considered important to the long-term survival of the species, with similar habitat present on adjacent lands and the wider locality. The habitat on the Subject Land represents part of a wider foraging range for this species during its winter migrations. The most important habitat resource (the mature flowering eucalypt) will be retained following development.

The Proposal is not considered likely to lead to a long-term decrease in the size of a population of this species.

b) Reduce the area of occupancy of the species;

The habitat of the Subject Land is considered to represent a small part of the foraging range of the local population of this species. The Proposal will not inhibit this species' ability to disperse through the locality.

The Proposal is not considered likely to reduce the area of occupancy of an important species.

c) Fragment an existing population into two or more populations;

This species is highly mobile and capable of crossing large areas of unsuitable habitat. The Proposal will remove a small portion of foraging habitat for this species from the locality but will not affect the species' ability to disperse through the local area.

The Proposal is not considered likely to fragment a population of this species.

d) Adversely affect habitat critical to the survival of a species;

The Subject Land does not contain resources critical for the survival of the species in the locality. Larger areas of better condition habitat are present in the wider local area and the highest value habitat would be retained. The Proposal would not represent a dispersal barrier for this highly mobile species.

The Proposal is not considered likely to adversely affect habitat critical to the survival of this species.

e) Disrupt the breeding cycle of a population;

This species does not breed on the Australian mainland. The habitat of the Subject Land represents a small part of the wider local foraging resources for this species during its winter migration. This habitat is not limited in the locality with larger areas of better condition habitat present in the wider local area.

The Proposal is not considered likely to disrupt the breeding cycle of a population of this species.

f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

The Proposal would remove a small portion of foraging habitat for this species from the local area. This habitat is not limited in the locality for this highly mobile species. The removal of this habitat from the Subject Land would represent a small reduction in the local foraging habitat for the species and the highest value habitat features would be retained.

The Proposal is not considered likely to adversely affect habitat to the extent that the species is likely to decline.

g) Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat;

This species is not highly susceptible to terrestrial exotic predators due to its arboreal and airborne habit. The Subject Land is located in an already highly urbanised locality with a significant population of domestic predators (dogs and cats). The Proposal may increase this population with new pets introduced by new landowners, but this is not considered likely to significantly increase the predation pressure on this species or any other native species in the locality.

h) Introduce disease that may cause the species to decline; or

The species is susceptible to Psittacine Circoviral Disease (PCD) or beak and feather disease. This viral disease is spread through shared food, excrement and through inhalation of infected skin and feather particles. The Proposal has the potential to introduce this disease to the local area through the keeping of domestic parrots by future landowners. However, this risk is not considered significant with the local area highly suburban with numerous domestic pets present, likely including parrots. The Proposal is not considered likely to significantly increase the existing risk of the introduction of this disease to wild parrot populations.

The Proposal is not considered likely to introduce diseases which could cause the species to decline.

i) Interfere substantially with the recovery of the species.

The Subject Site contains general foraging habitat not limited in the locality. This species is not known to breed on the Australian mainland. The Proposal would not represent a barrier to the dispersal of this species across the locality and would not significantly affect the habitat utility of the local area for this highly mobile species.

The Proposal is not considered likely to interfere substantially with the recovery of the species.

Conclusion

No significant impact on this species is anticipated as a result of the Proposal. The habitat to be impacted consists of general foraging habitat and does not contain critical life stage habitat as this species does not breed on the Australian mainland. The Subject Land is considered to represent a small part of a larger foraging range for this population, and the species is not considered reliant on the resources of the Subject Land for its persistence in the local area. The most important habitat values on the Subject Land would be retained following development.

No significant impact on this species is considered likely as a result of the Proposal.

15. APPENDIX 8: SITE PLAN

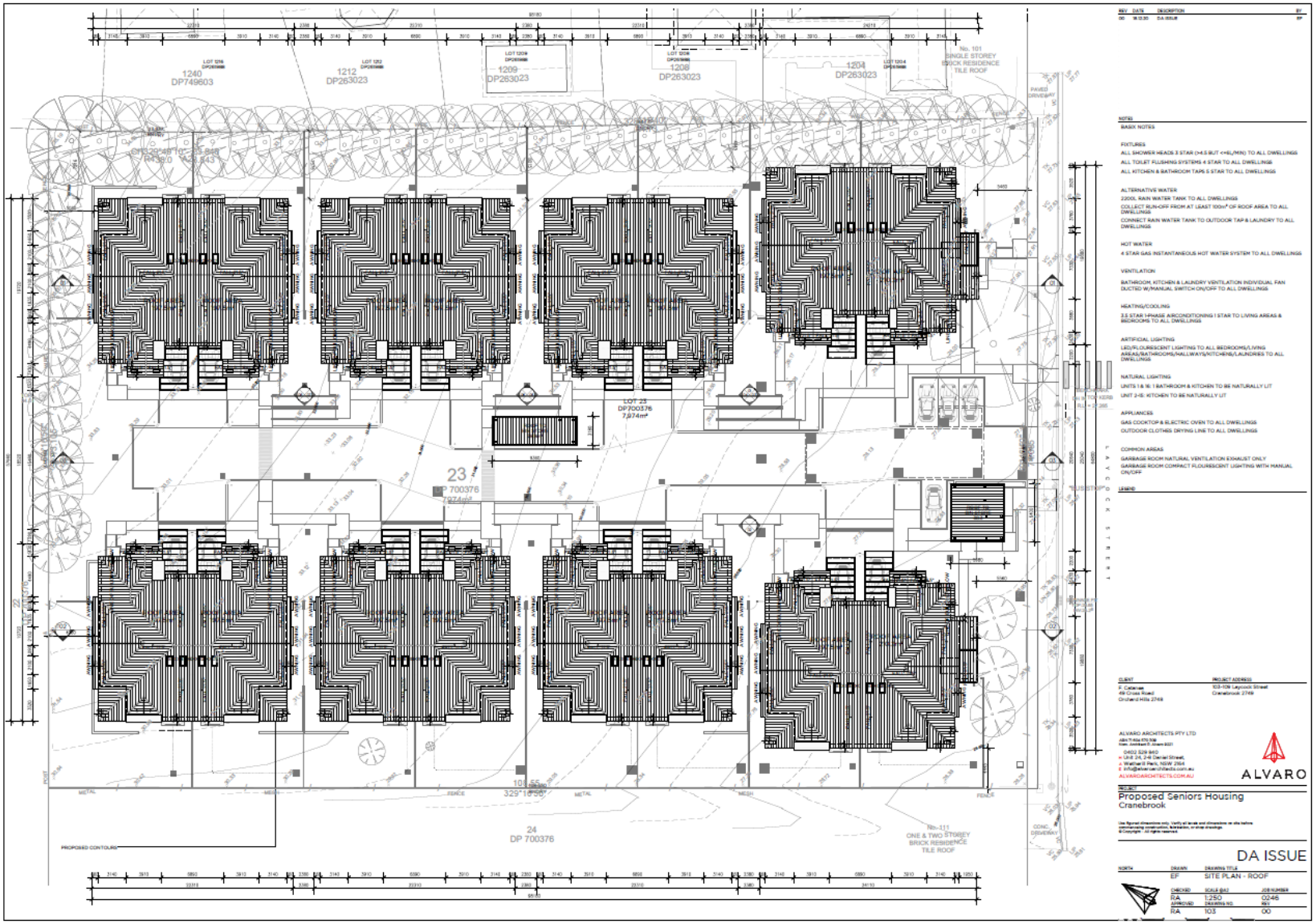

Figure A8.1: Site plan