BIODIVERSITY CONSTRAINTS AND OPPORTUNITIES REPORT

REDMOND PLACE, ORANGE

ORANGE LOCAL GOVERNMENT AREA, NSW

MAY 2024

Report prepared by

OzArk Environment & Heritage

for Landcom

OzArk
Environment & Heritage

145 Wingewarra St
(PO Box 2069)
Dubbo NSW 2830

Phone: (02) 6882 0118
Fax: (02) 6882 0630
enquiry@ozarkehm.com.au
www.ozarkehm.com.au

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Prepared for	**Prepared by**
Stephanie Wang Development Manager Landcom Level 14, 60 Station Street Parramatta NSW 2150 0459 769 393 E: swang@landcom.nsw.gov.au	Ian Griffith Ecologist OzArk Environment & Heritage 145 Wingewarra Street (PO Box 2069) Dubbo NSW 2830 P: 02 6882 0118 E: ian@ozarkehm.com.au

Acknowledgement

OzArk acknowledge the traditional custodians of the area on which this assessment took place and pay respect to their beliefs, cultural heritage and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

EXECUTIVE SUMMARY

OzArk Environment & Heritage (OzArk) has been engaged by Landcom, to complete a Preliminary Biodiversity Assessment (Opportunities and Constraints) report covering the Redmond Place project in Orange, New South Wales (NSW). The project is adjacent to the suburb of Glenroi, 4.4 km from Orange City Centre.

A preliminary ecological survey was carried out over a single day: the 18th of January 2024. This survey focused on determining Plant Community Types (PCTs) and establishing whether any Threatened Ecological Communities (TECs) listed under the *Biodiversity Conservation Act* 2016 (BC Act) and/or the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) occur. Further, the site was assessed for its potential to support threatened and/or migratory species listed under the BC and/or EPBC Act.

The subject site occurs on degraded land heavily cleared for grazing to the extent where very few remnant trees or shrubs persist. Two standing dead trees (stags) occur within the subject site, one of which contains five small hollows (<20 cm) that may provide suitable roosting habitat for microbats. Additionally, there are two areas of scattered bushrock and boulders that may provide refuge for reptiles and microbats. The surrounding environment is dominated by residential, industrial and rural development, and does not connect or share a boundary with any remnant habitat patches. The subject site is predominantly non-native vegetation, with 0.47 ha of a single PCT (PCT 3387 – Central West Creekflat Grassy Woodland) occurring along the low-lying wet areas in the north. No TECs occur within the subject site.

As per the requirements of the Biodiversity Assessment Method 2020 (BAM), the proposal would trigger entry into the NSW Biodiversity Offsets Scheme (BOS) if >0.25 ha of PCT 3387 is impacted by the proposal. If the impact footprint is designed in such a manner as to avoid triggering the BOS (i.e., by clearing <0.25 ha of PCT 3387), a Biodiversity Development Assessment Report (BDAR) would not be required, and the proposal would not generate an offset obligation under the BOS. If the BOS is not triggered, a Biodiversity Assessment Report (BAR) would be required for the proposal to proceed to the Development Application phase.

According to desktop searches, a total of 81 threatened species or populations recognised as threatened or migratory under the BC Act and/or the EPBC Act, are known or predicted to occur within the Interim Biogeographic Regionalisation of Australia (IBRA) subregions found within 10 km of the subject site. An EPBC Act Protected Matters Search identified no World Heritage Properties, five Wetlands of International Importance, two TECs, 47 threatened, and 11 migratory species that may be present within the subject site.

According to BioNET records, 28 threatened or migratory fauna species have been recorded within 10 km of the subject site. No threatened fauna species were detected during the field

survey, however, this does not serve as confirmation of absence, as some of these species are only reliably detected at specific times of year, or at night. Of the 28 species with records within 10 km, the species most likely to be impacted by the proposal (as discerned by suitable habitat, and numerous nearby records) include the Dusky Woodswallow, Grey-headed Flying-fox, Latham's Snipe, and the Superb Parrot. However, given the degraded nature of the site, limited habitat features, and the small amount of native vegetation, there is a low chance of the proposal significantly impacting any of these fauna species.

According to BioNET records, two threatened flora species have records occurring within 10 km of the subject site: the BC and EPBC Act-listed vulnerable species Black Gum (*Eucalyptus aggregata*) and the BC and EPBC Act-listed endangered species Silver-Leaf Candlebark (*Eucalyptus canobolensis*). Both species have four records within 10 km. No threatened flora species were detected during the field survey. Based on the absence of key habitat features required by these species, and considering that these species were not detected during the field survey, no significant impact to any threatened flora species is considered likely.

One unmapped watercourse occurs within the site, this watercourse appears to be an artificially created drainage line. No naturally occurring watercourses occur within the subject site and no major perennial watercourses occur within the subject site or study area. Seventeen minor, non-perennial watercourses occur within the wider study area:

- Fifteen Strahler 1st order - Minor, non-perennial waterways, including East Orange Creek
- Two Strahler 2nd order - Minor, non-perennial waterways, including Dairy Creek

One wetland, Spring Creek Reservoir slightly overlaps the study area. This wetland is known habitat for the BC Act-listed vulnerable species: the Freckled duck (*Stictonetta naevosa*) and the Blue-billed duck (*Oxyura australis*).

No areas recognised as Key Fish Habitat (KFH) by the Department of Primary Industries (Fisheries), or Protected Riparian Land (PRL), as mapped by the NSW Department of Climate Change, Energy the Environment and Water, is present within the subject site.

No threatened fish species or populations have been mapped as potentially occurring within the search area and the subject site is not part of any endangered aquatic ecological community listed under the FM Act.

This report covers the results of the ecological field survey and discusses potential impacts and opportunities to reduce impacts on biodiversity. This report is not a biodiversity assessment report and should be used to guide planning only.

CONTENTS

FIGURES

TABLES

ABBREVIATIONS

Term	Description
^{0}C	Degrees Celsius
AOBV	Areas of Outstanding Biodiversity Value
ASL	Above Sea Level
BAM	Biodiversity Assessment Method 2020
BAR	Biodiversity Assessment Report
BDAR	Biodiversity Development Assessment Report
BC Act	NSW *Biodiversity Conservation Act 2016*
BOS	NSW Biodiversity Offsets Scheme
CAMBA	China-Australia Migratory Bird Agreement
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
DCCEEW Cth.	Commonwealth Department of Climate Change, Energy the Environment and Water
DPE	Department of Planning and Environment
DPI	NSW Department of Primary Industries
DPIE	NSW Department of Planning, Industry and Environment
EEC	Endangered ecological community
EIS	Environmental Impact Statement
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
ESCP	Erosion and Sediment Control Plan
FM Act	NSW *Fisheries Management Act 1994*
GDEs	Groundwater dependent ecosystems
GPS	Global Positioning System
ha	Hectare
HTE	High Threat Exotic
IBRA	Interim Biogeographic Regionalisation of Australia. Each region is a land area made up of a group of interacting ecosystems repeated in similar form across the landscape.
JAMBA	Japan-Australia Migratory Bird Agreement
KAR	Koala Assessment Report
KFH	Key Fish Habitat
KTP	Key Threatening Process
LEP	Local Environmental Plan
LGA	Local Government Area
mm/cm/m/m^2/km	Millimetre/centimetre/metre/square metre/kilometre
MNES	Matters of National Environmental Significance
NPW Act	NSW *National Parks and Wildlife Act 1974*

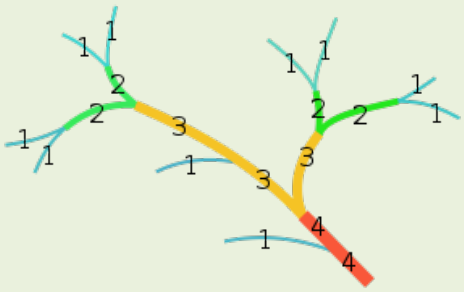
Term	Description
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change, Energy the Environment and Water
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
PMST	Protected Matters Search Tool
PW	Priority Weed
RAMSAR	Convention on Wetlands of International Importance
REF	Review of Environmental Factors
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
SEPP	State Environmental Planning Policy
SIS	Species Impact Statement
TECs	Threatened Ecological Communities
TSPD	Threatened Species Profile Database
VIS	Vegetation information system
WoNS	Weeds of National Significance

GLOSSARY OF TERMS

Term	Description
Affordable Housing	Is housing for very low to moderate income households.

Areas of outstanding biodiversity	An area of outstanding biodiversity value is:
	• an area important at a State, national or global scale, and
	• an area that makes a significant contribution to the persistence of at least one of the following:
	  ○ multiple species or at least one threatened species or ecological community
	  ○ irreplaceable biological distinctiveness
	  ○ ecological processes or ecological integrity
	  ○ outstanding ecological value for education or scientific research.
	The declaration of an area may relate, but is not limited, to protecting threatened species or ecological communities, connectivity, climate refuges and migratory species (BC Act).

Cumulative impact	The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Refer to Clause 228(2) of the EP&A Regulation 2000 for cumulative impact assessment requirements.
Direct impacts	Are those that directly affect the habitat of species and ecological communities and of individuals using the study area. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat (OEH 2018).
Habitat	The area occupied or used, including areas periodically or occasionally occupied or used, by any threatened species or ecological community and includes all the different aspects (both biotic and abiotic) used by species during the different stages of their life cycle (OEH 2018).
Important population	Is a population that is necessary for a species' long-term survival and recovery; this may include populations identified as such in recovery plans, and/or that are: • key source populations either for breeding or dispersal • populations that are necessary for maintaining genetic diversity, and/or • populations that are near the limit of the species range (DE 2013).
Indirect impact	Occur when project-related activities affect species or ecological communities in a manner other than direct loss within the subject site. Indirect impacts may sterilise or reduce the habitability of adjacent or connected habitats. Indirect impacts can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, reduction in viability of adjacent habitat due to edge effects, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, noise, light spill, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas (OEH 2018).
Invasive species	Is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources, or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.
Local occurrence (EEC)	The ecological community present within the study area. However, the local occurrence may include adjacent areas if the ecological community on the study area forms part of a larger contiguous area of the ecological community and the movement of individuals and exchange of genetic material across the boundary of the study area can be clearly demonstrated.
Local population (in regard to a threatened or migratory species)	A local population of a threatened plant species comprises those individuals occurring in a defined area or a cluster of individuals extends into habitat adjoining and contiguous with the study area where the individuals could reasonably be expected to cross-pollinate.

Term	Description
	A local population of fauna species comprises those individuals known or likely to occur in a defined area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area. The local population of migratory or nomadic fauna species comprises those individuals likely to occur in the study area from time to time (DECC 2007).
Low condition (vegetation)	Either: a) woody native vegetation with native over-storey percent foliage cover less than 50% of the lower value of the over-story percent foliage cover benchmark for that vegetation type, and where either: • less than 50% of ground cover vegetation is indigenous species, or • greater than 90% of ground cover vegetation is cleared or b) native grassland, wetland or herb field where either: • less than 50% of ground cover vegetation is indigenous species, or • more than 90% of ground cover vegetation is cleared. Note: The percentages for the ground cover calculations must be made in a season when the proportion of native ground cover vegetated compared to non-native ground cover vegetation is likely to be at its maximum.
Low density housing	Single detached dwellings and secondary dwellings.
Medium density housing	Includes a range of housing forms including dual occupancies, townhouses, terraces and manor housing. This is sometimes also referred to as low rise housing.
Moderate to good condition (vegetation)	If native vegetation is not in low condition (above), it is in moderate to good condition.
Mitigation	Action to reduce the severity of an impact.
Mitigation measure	Any measure that prevents, reduce or controls adverse environmental effects of a project.
NSW (Mitchell) landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000 (OEH 2018).
Proposal	Is considered to include 'all activities likely to be undertaken within the subject site to achieve the objective of the proposed development' (DECC 2007).
Residential flat building	Buildings which include three or more dwellings where some dwellings do not have access at ground level.
Risk of extinction	The likelihood that the local population will become extinct either in the short-term or in the long-term as a result of direct or indirect impacts on the viability of that population.
Shop-top housing	A form of development where one or more dwellings are located above the ground floor level and at least the ground floor is used for commercial premises or health services facilities.
Significant impact	A 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity.
Strahler stream order	Strahler stream orders are used to define stream size based on a hierarchy of tributaries, based on the diagram below. 
Study area	Means the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly. The study area should extend as far as is necessary to take all potential impacts into account (OEH 2018).
Study region	Is considered to 'include the lands that surround the subject site for a distance of 10 km' (DECC 2007). The study region has been used to search information sources to establish the landscape context of the subject site.

Term	Description
Subject site	Means the area directly affected by the proposal. The subject site includes the footprint of the proposal and any ancillary works, facilities, accesses or hazard reduction zones that support the construction or operation of the development or activity (OEH 2018).
Target species	A species that is the focus of a study or intended beneficiary of a conservation action or connectivity measure.

1 INTRODUCTION

1.1 DESCRIPTION OF THE PROPOSAL

OzArk Environment & Heritage (OzArk) has been engaged by Landcom, to complete a Preliminary Biodiversity Assessment (Opportunities and Constraints) report covering the Redmond Place project in Orange, New South Wales (NSW).

The site is owned by Orange City Council and Landcom are taking the lead in preparing a planning proposal to amend the Orange Local Environmental Plan 2011 (LEP) to rezone the Site for residential uses.

The key objectives of the project are:

- Supply – increase the supply of land to facilitate housing
- Diversity – promote housing diversity
- Affordability – increase the supply of land for affordable housing by delivering at least 20% of all residential dwellings for affordable housing
- Sustainability – develop a climate resilient, healthy and inclusive place, at the forefront of environmental and social sustainability.

The staging strategy for this site is to be determined and will need to take into consideration infrastructure availability, delivery timing, placemaking, and entry point to the area from Mitchell Highway.

The urban design approach for the project focuses on socio-economic activation, innovative sustainability solutions and urban vibrancy through place-making. The master plan for the future new community of Redmond Place will be based on a landscape-led approach to urban design, informed by the unique qualities of the site and Connecting with Country principles. A thorough community and stakeholder engagement process, including community workshops, a Walk on Country and indigenous stakeholder interviews, will also inform the urban design process.

1.2 SITE INFORMATION

The Site is located on the southeast fringe of Orange, the largest city in the Central West Region. It is adjacent to the suburb of Glenroi, 4.4 km from Orange City Centre and approximately 3.2 km from Orange train station.

The Site has a significant frontage along Mitchell Highway (A32) which runs from east to west from the M4 Motorway in Greater Sydney connecting through Penrith, Katoomba, Bathurst to Orange.

The Site lies on the southern side of Redmond Place, bounded by Bathurst Road / Mitchell Highway (on the northeast), Lone Pine Avenue (on the west) and Dairy Creek Road to the south.

It is surrounded by a mixture of land uses with low density residential to the west, retail and large format retail to the north, rural farmland to the south and east, as well as a kart racing track 250m north of the Mitchell highway.

The Site is approximately 24.22 ha in size and comprises three lots identified in **Table 1-1**.

Table 1-1. Lots comprising the site.

Lot DP	Address	Area (ha)
Lot 1 DP 153167	154 Lone Pine Avenue	4.10
Lot 6 DP 1031236	3 Redmond Place	2.28
Lot 200 DP 1288388	5255 Mitchell Highway	17.84
Total		24.22

Figure 1-1. Aerial of the site showing the lot boundaries.

1.3 REPORT PURPOSE

The purpose of this Biodiversity Opportunities and Constraints Report is to assist with understanding biodiversity values and constraints associated with the subject site, and therein, help inform the development of the project design.

1.4 SUBJECT SITE, STUDY AREA AND SEARCH AREA

This report uses the following terms to describe and contextualise the development location:

10 km search area the area within a 10 km radius of the subject site. This 10 km buffer has been used to search information sources to establish the landscape context of the subject site (**Figure 1-2**).

Study area the area within a 1,500 m radius of the subject site. Native vegetation has been mapped within this 1,500 m buffer to provide some context regarding the connectivity and cover of native vegetation in the area affected by the proposal, and to inform the impact assessment of the proposal (**Figure 1-2**).

Subject site the footprint of the proposal and the area directly affected by the development activities (**Figure 1-1**; **Figure 1-2**).

The regional context of the proposal is explored in **Table 1-2** and depicted in **Figure 1-2**.

Table 1-2. Regional context of the proposal.

Criteria	Value
Interim Biogeographic Regionalisation for Australia (IBRA Region)	• South Eastern Highlands
Interim Biogeographic Regionalisation for Australia Sub-region (IBRA Sub-Region)	• Orange
State	• NSW
Local Government Area	• Orange Regional Council
Nearest town	• Orange
Nearest park, state forest or reserve	• Mount Canobolas State Conservation Area • Mullion Range State Conservation Area • Kinross State Forest
Mitchell Landscapes	• Canobolas Sheet Basalts (Subject site) • Carcoar Intrusives (Study area) • Mullion Slopes (Study area)
Nearest waterway (Name, Type)	• Various Unnamed 1st 2nd Strahler order minor non perennial streams • Dairy Creek – 2nd Strahler order minor non-perennial • East Orange Creek 1s Strahler order minor non perennial streams
Surrounding land use	• Grazing Native Vegetation • Grazing modified Pasture • Residential and Farm infrastructure • Services
Surrounding land zone	• C3 – Environmental Management • E3 – Productivity Support • RE1 – Public Recreation

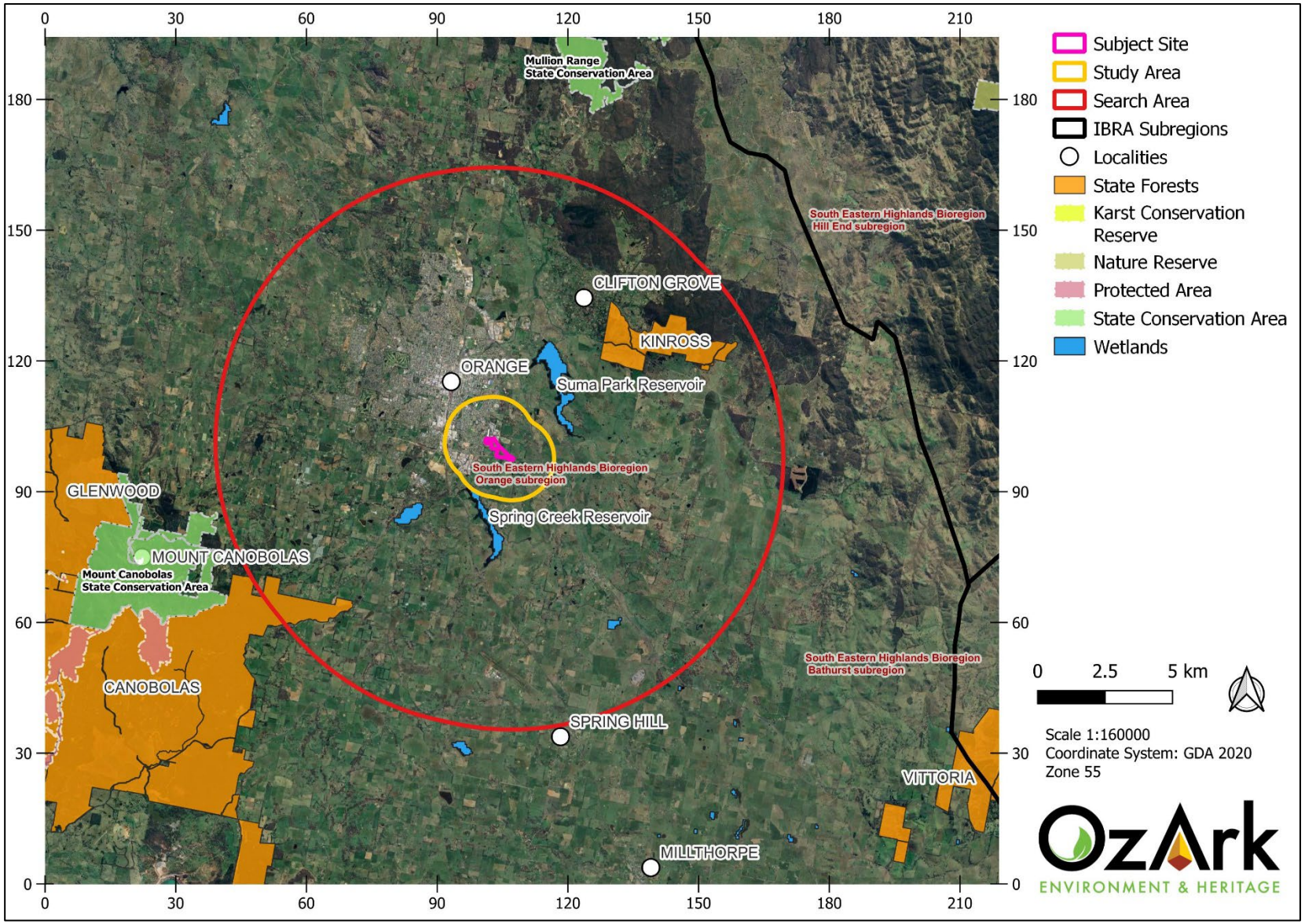


Figure 1-2. Regional context for the proposal.

2 STATUTORY AND PLANNING CONTEXT

2.1 COMMONWEALTH LEGISLATION

2.1.1 *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act)

Objects of the EPBC Act relevant to this project include:

- *to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance; and*
- *to promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources; and*
- *to promote the conservation of biodiversity; and*
- *to promote a co-operative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples.*

The Significant Impact Guidelines prepared under the EPBC Act are used to determine whether a proposed development or activity will have, or is likely to have, a significant impact on Matters of National Environmental Significance (MNES).

There are nine MNES to which the EPBC Act applies, three of which would be relevant to the project, should it proceed to the development stage:

1) wetlands of international importance (also called 'Ramsar' wetlands)
2) nationally threatened species and ecological communities
3) migratory species, comprising those listed under the:
    - Bonn Convention
    - Japan-Australia Migratory Bird Agreement (JAMBA)
    - China-Australia Migratory Bird Agreement (CAMBA)
    - Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA)

At the development application phase of the project, MNES would be addressed in a Biodiversity Assessment Report (BAR, where entry into the NSW Biodiversity Offsets Scheme [BOS] is not triggered, see below) or Biodiversity Development Assessment Report DAR (BDAR, where entry into the BOS is triggered, see below) and where a significant impact is expected to any of the above entities listed under the EPBC Act, the proposal would require referral of the matter to the Federal Minister for the Environment for further consideration or approval.

Matters which fall under this legislation are addressed in **Section 5.6**.

2.2 STATE LEGISLATION

2.2.1 *Environmental Planning and Assessment Act* 1979 (EP&A Act)

The EP&A Act sets out the laws under which planning in NSW takes place. Part 4 of the EP&A Act requires the proponent to examine and consider to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity. Should this project proceed to the development application phase, it would require a BAR or BDAR to satisfy the requirements for biodiversity assessment under the EP&A Act.

2.2.2 *Biodiversity Conservation Act* 2016 (BC Act)

The BC Act relates to the terrestrial environment and includes threatened species, ecological communities, key threatening processes and other protected animals and plants.

Section 7.3 of the BC Act contains a five-part test of significance for determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. This test of significance would be applied in a BAR or BDAR.

BC Act-listed communities are addressed in **Section 5.3**. BC Act-listed species are addressed in **Section 5.5.**

2.2.3 *Biodiversity Conservation Regulation* 2017 (BCR)

Under the BC Act, the BOS applies to Part 4 developments when clearing thresholds identified in Part 7 of the BCR are exceeded (**Table 2-1, Table 2-2**) or when a significant impact to a threatened entity is identified.

Regarding the development component of this proposal a BDAR would be required if entry into the BOS is triggered. If the BOS is not triggered, a BAR would be required, and no offset costs would be generated. Entry into the BOS is triggered when one, or more, of the triggers outlined in **Table 2-1** are triggered. In this case, the proposal would trigger the clearing threshold if >0.25 ha were cleared (**Table 2-1; Table 2-2**) and/or if any of the land to be developed falls on the Biodiversity Values Map (**Table 2-1**) and/or if the proposal is considered likely to result in a significant impact to any threatened species, population, or community (**Table 2-1**).

Table 2-1. Triggers for entering the NSW Biodiversity Offsets Scheme (BOS).

BOS Trigger	Triggered?
The proposal exceeds the clearing threshold for the relevant property.	Potentially. According to the minimum lot size mapping in the Orange Local Environmental Plan (2011), the minimum lot size associated with the property is 100 ha. However, once the land is rezoned, the clearing threshold will be reduced to 0.25 ha (**Appendix A; Table 2-2**). Therefore, once rezoned, the removal of 0.25 ha of native vegetation would trigger entry into the BOS. If the project can be designed such as to avoid impacting >0.25 ha of native vegetation, the BOS would not be triggered.
The proposal will impact a mapped area of biodiversity value on the state-wide Biodiversity Values Map.	No, the subject site does not contain any land mapped on the Biodiversity Values Map (**Appendix A**).
The proposal will result in a significant impact to one or more listed threatened entities.	Potentially, but considered unlikely. Tests of significance would be required within a future BAR or BDAR to establish where a significant impact is likely.

Table 2-2. Minimum lot size and allowable clearing threshold under the BAM 2020.

Minimum Lot Size	Clearing Threshold
Less than 1 ha	0.25 ha or more
1 ha to less than 40 ha	0.50 ha or more
40 ha to less than 1000 ha	1 ha or more
1000 ha or more	2 ha or more

2.2.4 *Biosecurity Act* 2015

The Biosecurity Act aims to manage biosecurity risks from animal and plant pests and diseases, weeds and contaminants in NSW. The Biosecurity Act imposes a general biosecurity duty to ensure that, so far as is reasonably practicable, any biosecurity risk is prevented, eliminated or minimised. The proponent is required to manage the presence of weeds in the subject site.

2.2.5 *Local Land Services Act* 2013 (LLS Act)

The objects of the LLS Act include 'to ensure the proper management of natural resources in the social, economic and environmental interests of the State, consistently with the principles of ecologically sustainable development' and 'to apply sound scientific knowledge to achieve a fully functioning and productive landscape". The LLS Act regulates the clearing of native vegetation on rural land. The subject site is within the Central Tablelands LLS Region.

2.2.6 *Fisheries Management Act 1994* (FM Act)

Section 201 of the FM Act states that a person must not carry out dredging work or reclamation work on water land except under the authority of a permit issued by the Minister.

According to Section 198A of the FM Act:

dredging work means—

(a) any work that involves excavating water land, or

(b) any work that involves moving material on water land or removing material from water land that is prescribed by the regulations as being dredging work to which this Division applies.

reclamation work means any work that involves—

(a) using any material (such as sand, soil, silt, gravel, concrete, oyster shells, tyres, timber or rocks) to fill in or reclaim water land, or

(b) depositing any such material on water land for the purpose of constructing anything over water land (such as a bridge), or

(c) draining water from water land for the purpose of its reclamation.

water land means land submerged by water—

(a) whether permanently or intermittently, or

(b) whether forming an artificial or natural body of water,

and includes wetlands and any other land prescribed by the regulations as water land to which this Division applies.

Matters relevant to the FM Act and watercourses are covered in **Section 4.3**.

2.2.7 *State Environmental Planning Policy (Biodiversity and Conservation) 2021*

The *SEPP (Biodiversity and Conservation)* 2021 is the collation of biodiversity and conservation related SEPP. Chapters 3 and 4 of this SEPP aim to encourage the 'proper conservation and management of areas of natural vegetation that provide habitat for Koalas to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline'. It includes provisions for councils to ensure potential impacts on Koalas and Koala habitat are properly considered when assessing developments. It also provides a process for councils to strategically manage habitat through development of Koala plans of management.

There are four koala records within 10 km of the subject site. The only Eucalyptus tree recorded within the subject site is *E. bridgesiana*, which is listed as a Koala use tree species in Schedule 3 of the *SEPP (Biodiversity and Conservation)* 2021. These trees exist as three isolated patches within the road corridor are not expected to be disturbed by the proposal.

The subject site is currently zoned as RE1, C3 and E3, therefore *SEPP (Biodiversity and Conservation)* 2021 Chapter 4 would typically apply except Orange is not listed in Schedule 2 of the SEPP, therefore the *SEPP (Biodiversity and Conservation)* 2021 does not apply to this land.

2.2.8 Orange Local Environmental Plan (2011)

A Local Environmental Plan (LEP) is a legal document prepared by a Council and approved by the State Government for the regulation of land-use and development. LEPs guide planning decisions for local governments. The plan allows Council to regulate the ways in which all land both private and public may be used and protected through zoning and development controls.

(1) This Plan aims to make local environmental planning provisions for land in Orange in accordance with the relevant standard environmental planning instrument under section 33A of the Act.

(2) The particular aims of this Plan are as follows:

(a) to encourage development that complements and enhances the unique character of Orange as a major regional centre boasting a diverse economy and offering an attractive regional lifestyle,

(b) to provide for a range of development opportunities that contribute to the social, economic and environmental resources of Orange in a way that allows the needs of present and future generations to be met by implementing the principles of ecologically sustainable development,

(c) to conserve and enhance the water resources on which Orange depends, particularly water supply catchments,

(d) to manage rural land as an environmental resource that provides economic and social benefits for Orange,

(e) to provide a range of housing choices in planned urban and rural locations to meet population growth,

(f) to recognise and manage valued environmental heritage, landscape and scenic features of Orange.

The LEP does not map any areas of the subject site as containing high biodiversity values (see **Appendix A**).

3 METHODS

The ecological investigation was carried out in three stages:

1. An investigation and review of the relevant ecological databases to identify threatened species, populations or ecological communities listed in the NSW *Biodiversity Conservation Act 2016*, *Fisheries Management Act 1994* and/or the Commonwealth *Environment Protection Biodiversity Conservation Act 1999* that have the potential to occur in the study area.
2. A field survey of the subject site for the purposes of:
    - Collating lists of present plant species; with these assisting in the identification of the site's vegetation communities.
    - Determining the likelihood of presence of threatened fauna or flora species.
    - Identifying and documenting the nature and extent of any threatened ecological communities.
3. The preparation of a written biodiversity constraints and opportunities report that describes the existing environment and indicates the likelihood of presence of any threatened species, populations, and ecological communities.

3.1 PERSONNEL

OzArk operates under NSW Scientific Research License 101908, and NSW Department of Primary Industries (DPI) Accreditation of a corporation as an animal research establishment Ref No. AW2022/012.

The field survey was conducted by Ecologist Jeff Lewis and Project Ecologist Ian Griffith, over a single day: 18th January 2024. Reporting components were completed by Ian Griffith, with quality control provided by Senior Ecologist Dr Crystal Graham. Key details of personnel are provided in **Table 3-1**.

Table 3-1. Summary of OzArk personnel qualifications.

Name	Position	CV Details
Ian Griffith	Ecologist	• Honours (Genetics) – La Trobe University • Bachelor of Biological Sciences – La Trobe University • First Aid Training • WH&S Induction Training for Construction Work • Rail Industry Worker Card • 4WD Training
Jeff Lewis	Ecologist	• Bachelor of Science in Ecology and Biodiversity – Victoria University of Wellington, New Zealand • Certificates in GIS – University of California, Davis • Certificate in Wild Animal Management – Unitec, New Zealand • WH&S Induction Training for Construction Work First Aid Training
Dr Crystal Graham	Senior Ecologist	• BAM-accredited Assessor #BAAS22024 • Postdoctoral Fellow – Smithsonian Tropical Research Institute • Doctor of Philosophy (Biology) – University of Sydney • Honours in Biology – University of Sydney • Bachelor of Advanced Science – University of Sydney • 4WD Training • First Aid Training • WH&S Induction Training for Construction Work • Worker at Heights Training

3.2 BACKGROUND RESEARCH

Database search results were used to assist in identifying distributions, suitability of habitats, and known records of threatened species to increase the effectiveness of field investigations. Information sources reviewed included:

- NSW Government Web Map Service (WMS) layers for NSW Imagery (compiled imagery, NSW Property, NSW Base Map and NSW Topographic Map) (https://www.spatial.nsw.gov.au/).
- EPBC Protected Matters Search Tool (https://www.environment.gov.au/epbc/protected-matters-search-tool)
- NSW State Vegetation Type Map C1.1.M1.1 (https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map)
- NSW DPI threatened fish indicative distribution maps (www.dpi.nsw.gov.au/fishing/species-protection/threatened-species-distributions-in-nsw/freshwater-threatened-species-distribution-maps)
- NSW BioNet Wildlife Atlas Vegetation classification (https://www.environment.nsw.gov.au/research/Visclassification.htm)
- NSW BioNet Threatened Biodiversity Data Collection (www.bionet.nsw.gov.au/)
- NSW BioNet Atlas (www.bionet.nsw.gov.au/)

- Register of Declared Areas of Outstanding Biodiversity Value (www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/about-threatened-species/critical-habitats)
- PlantNET, NSW Flora Online (www.plantnet.rbgsyd.nsw.gov.au/)
- NSW DCCEEW *Biodiversity Values Map* (https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap)
- Vulnerable Lands – Steep or Highly Erodible, Protected Riparian and Special Category land Mapping (https://datasets.seed.nsw.gov.au/dataset/vulnerable-land-protected-riparian73a9e)
- Acid Sulphate Soils Risk mapping (https://datasets.seed.nsw.gov.au/dataset/acid-sulfate-soils-risk0196c)
- Directory of Important Wetlands of Australia (DIWA) (https://www.environment.gov.au/water/wetlands/australian-wetlands-database/directory-important-wetlands)
- NSW wetlands mapping (https://datasets.seed.nsw.gov.au/dataset/nsw-wetlands047c7)

These searches indicated key species for field survey efforts and targeted searches. The results of the database searches are provided in **Appendix A**.

A series of other background searches were performed (**Table 3-2**).

Table 3-2. Presence and/or proximity of environmental considerations.

Environmental Considerations	In the study area?
Land identified on the Biodiversity Values Map under the NSW *BC Act 2016*	No (**Appendix A**)
Area of Outstanding Biodiversity Value (AOBV) under the NSW *BC Act 2016*	No
Critical habitat nationally?	No
An area reserved or dedicated under the *National Parks and Wildlife Act 1974*?	No
Is the proposal located within land reserved or dedicated within the meaning of the *Crown Lands Act 1989* for preservation of other environmental protection purposes?	No
A World Heritage Area?	No
Environmental Protection Zones in environmental planning instruments?	Yes, land zoned C3 – Environmental Management (**Figure 1-2**)
Lands protected under *SEPP (Biodiversity and Conservation) 2021*	No
Land identified as wilderness under the *Wilderness Act 1987* or declared as wilderness under the *National Parks and Wildlife Act 1974?*	No
Aquatic reserves dedicated under the *Fisheries Management Act 1994*?	No
Aquatic Threatened Ecological Community?	No
Wetland areas dedicated under the Ramsar Wetlands Convention?	No
Land subject to a conservation agreement under the *National Parks and Wildlife Act 1974*?	No
Land identified as State Forest under the *Forestry Act 1916*?	No
Acid sulphate area?	No
Protected riparian habitat?	No (**Section 4.3**)
Mapped Key Fish Habitat?	No (**Section 4.3**)

3.3 FIELD SURVEY

The objectives of the field survey were to:

- Identify native species and the vegetation communities present.
- Describe the quality and value of the vegetation and the flora and fauna that inhabit the subject site.
- Determine the presence of species, populations, or ecological communities listed as threatened under the BC Act or EPBC Act.

3.3.1 Vegetation surveys

Botanical surveys were conducted within, and up to 10 m beyond, the subject site. When surveying this area, the 'Random Meander Method' (Cropper 1993) was employed. This method involves conducting foot traverses through those sites that require investigation, during which time notes are made on the structure and floristic composition of the native vegetation present.

The 'Random Meander Method' is employed until no new species have been recorded for at least 30 minutes. Plant identification followed nomenclature in the Royal Botanic Gardens PlantNet online database (Royal Botanic Gardens and Domain Trust, 2024). Further, four vegetation plots were surveyed as follows:

- The survey plot consisted of a 20 m × 20 m plot.
- Species composition and structure (species and percent cover) data was collected from within 20 m × 20 plot.

Vegetation communities were compared to the online NSW Master Plant Community Type Classification (NSW DCCEEW, 2024c), which is the current state-wide vegetation classification system for Plant Community Types (PCT). This classification system is used for vegetation mapping, development assessment and site planning purposes. It describes PCTs across the state, and groups the vegetation communities into vegetation Class and Formation / Sub-formation as per Keith (2004).

In this study PCTs were identified on the basis of the following inputs:

- NSW State Vegetation Map C1.1.M1.1 (NSW DCCEEW, 2022d), which provides predictive mapping of PCTs in and around the subject land. This mapping is indicative only. It is not necessarily accurate at a fine scale for the purposes of the current study.
- Professional ecological knowledge about locally occurring vegetation types and landscape, soil, and topographic patterns, including transitions from one community to another and potential for intergrades between plant communities.
- Field survey results confirming the flora species present, vegetation structure, landscape position and soil type at the subject site and the extent and condition of native vegetation.
- The BioNet Vegetation Classification database was used to identify the candidate vegetation communities likely to be present based on the site conditions (flora species present, vegetation structure, bioregion, and landscape position and soil type) and the relevant published PCT descriptions.

If any of the PCTs were identified as having potential to be part of a Threatened Ecological Community (TEC), the relevant identification guidelines (NSW Scientific Committee listing criteria and Commonwealth identification guides) were consulted to determine the status of the vegetation community present on the subject site. These guidelines provide the identification criteria used to positively identify the community as being part of the TEC. The criteria include location, species present, overstorey species, weed cover, number and type of native species including whether certain ‘important’ native species are present.

3.3.2 Incidental Fauna Surveys

The subject site was incidentally searched for fauna use while undertaking floristic and habitat surveys. Some habitat trees (i.e., hollow-bearing trees or trees containing nests) were GPS tagged, though given time constraints and the densely vegetated nature of the site some habitat trees were not recorded. The size, number of hollows and/or type of nest was recorded for those habitat trees that were GPS tagged. Potential habitat (e.g., rocks, logs, loose bark, and coarse woody debris) was examined for cryptic species. Areas of suitable substrate were searched for animal tracks and burrows. Secondary evidence of fauna presence on the subject site (e.g., scats, feathers, and sloughed skin) was also recorded.

Considering the scope of the current constraints and opportunities study, combined with the substantial size of the subject site, no targeted surveys such as live trapping, nocturnal searches, aquatic surveys, deployment of bat echolocation detectors and so forth, were carried out.

3.4 LIMITATIONS

As this study is predicated on the data available at the time of the study, in addition to the environmental conditions, season, and time constraints imposed for the field survey, it has some limitations. These include:

- The field survey being completed over a single day (January 18th, 2024). This duration may not have been conducive to surveying all species and thus the fauna and flora list should not be considered wholly representative of the diversity of species at the site. Non-detection should therefore not be treated as absence.
- No targeted surveys for fauna were completed (e.g., no fauna trapping, aquatic and frog surveys, nocturnal spotlighting, and microbat ultrasonic call capture.

4 EXISTING ENVIRONMENT

4.1 BIOREGION

The bioregions and subregions of interest – as per the Interim Biogeographic Regionalisation of Australia (IBRA) – are the Orange subregion within the South Eastern Highlands Bioregion. (Thackway & Cresswell, 1995). A formal description for the Orange subregion entailing its geology, landforms, soil types and vegetation is provided in **Table 4-1**.

Table 4-1. Description of the Orange subregion.

Bioregion	**South Eastern Highlands**
Geology	Ordovician acid volcanics and slates and phyllites and Silurian volcanics. Extensive Tertiary basalts from Canobolas and small stocks of granite. Limited limestone and serpentinite.
Landforms	Low hilly to hilly plateau with Canobolas peaks rising above. Numerous volcanic features: plugs, dykes and domes in the Canobolas complex. Karst landscapes at Borenore and Molong
Soils	Deep structures red and brown loams on basalt and fine metasediments. Mellow texture contrast soils on any slopes with a sand component in the bedrock. Alluvial loams and black clays in swampy valley floors. Limited areas of shallow organic loams at high altitude on Canobolas
Vegetation	Yellow box and Blakely's red gum with red stringybark, white gum, broad-leaved peppermint across most of the plateau. Ribbon gum on lower slopes, snow gum in cold patches and high levels of Canobolas. River oak along main streams.

4.2 NSW (MITCHELL) LANDSCAPES

The landscapes of NSW were mapped in 2002 to provide a framework for reporting and for determining over-cleared landscapes and are known as NSW (or Mitchell) landscapes (Mitchell, 2002). These landscapes broadly describe areas of similar topography, geology, soils, and vegetation. The subject site is represented by a single landscape, Canobolas Sheet Basalts (**Figure 4-1**) described below. The wider study area overlaps the Carcoar Intrusives and Mullion Slopes.

Canobolas Sheet Basalts

Widespread undulating high-level plains on Tertiary basalt flows. General elevation 950 to 1200m, local relief 100m. Shallow red brown to black stony loams, yellow-brown texture-contrast soils on lower slopes, alluvial loams and black clays in swampy valley floors. Woodland with; yellow box, Blakely's red gum, red stringybark, white gum, broad-leaved peppermint, grey box, and apple box with grasses.

Clearing Status – Over-Cleared, 94% of this landscape has been cleared.

Carcoar Intrusives

Low hills with steep slopes on small intrusions of Ordovician gabbro and diorite, general elevation about 750m, local relief 50 to 100m. Red friable gradational profiles of loam and light clay. Open forest of; mountain gum (Eucalyptus dalrympleana) and broad-leaved peppermint (*Eucalyptus*

dives) on crests, with apple box (*Eucalyptus bridgesiana*), white box (*Eucalyptus albens*) and yellow box (*Eucalyptus melliodora*) on slopes and manna gum (*Eucalyptus viminalis*) along streams.

Clearing Status – Over-Cleared, 99% of this landscape has been cleared.

Mullion Slopes

Steep hills and strike ridges on tightly folded Ordovician andesite, conglomerate and tuff, Silurian rhyolite and shale, Devonian quartz sandstones, slate and minor limestone, general elevation 500 to 830m, local relief 200m. Stony uniform sand and loam in extensive rock outcrop along crests, stony red and brown texture-contrast soil on slopes, yellow harsh texture contrast soil in valleys with some evidence of salinity. Gravel and sand in streambeds. Open forest to woodland of; white gum, brittle gum, broad-leaved peppermint, red box, mountain grey gum, white box with yellow box on lower slopes and river oak along the streams.

Clearing Status – Over-Cleared, 93% of this landscape has been cleared.

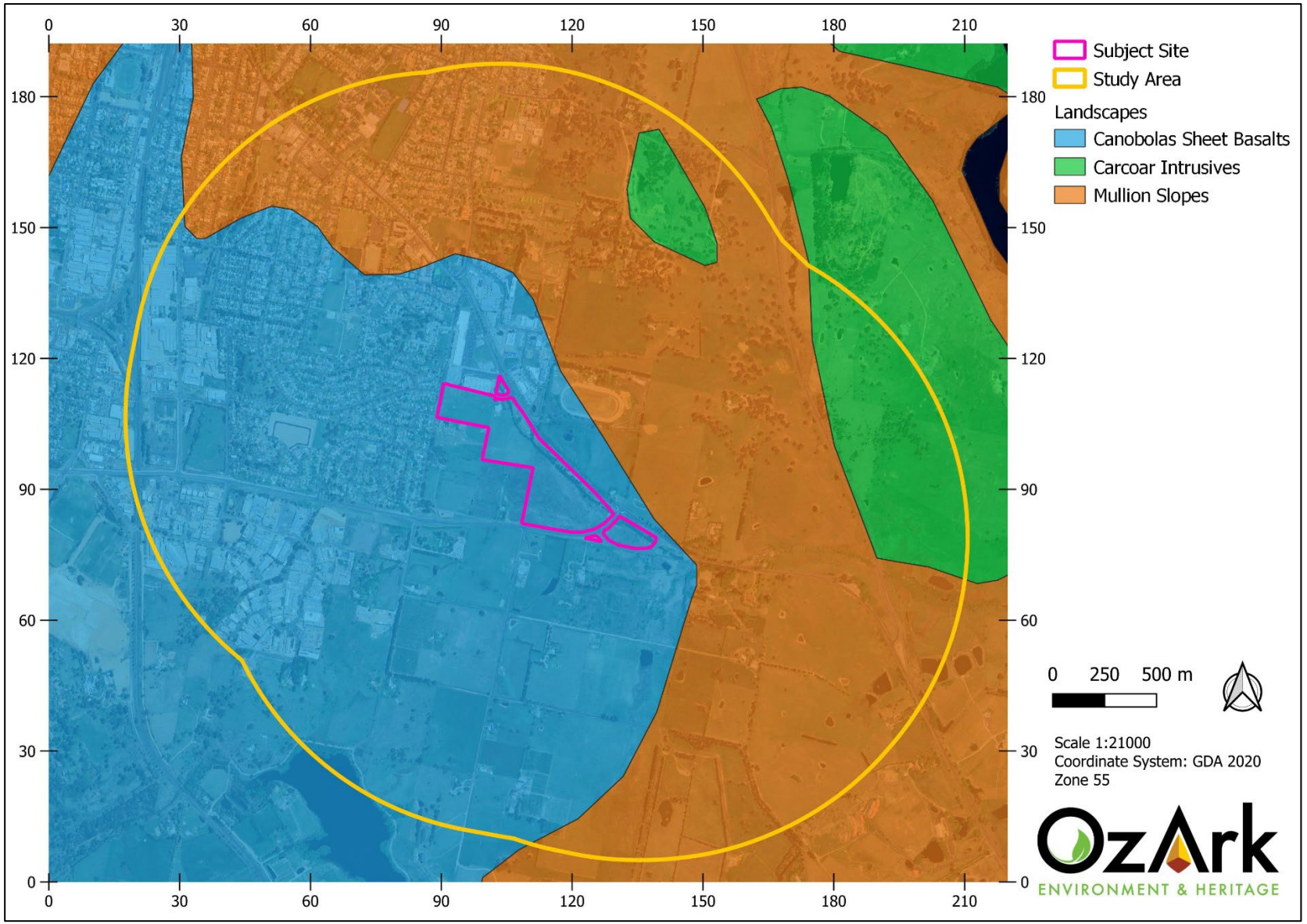


Figure 4-1. NSW landscapes within the study area.

4.3 WATERCOURSES

One unmapped watercourse occurs within the site, this watercourse appears to be an artificially created drainage line (**Figure 4-2**). No naturally occurring watercourses occur within the subject site and no major perennial watercourses occur within the subject site or study area (**Figure 4-3**). Seventeen minor, non-perennial watercourses occur within the wider study area:

- Fifteen Strahler 1st order - Minor, non-perennial waterways, including East Orange Creek
- Two Strahler 2nd order - Minor, non-perennial waterways, including Dairy Creek

One wetland, Spring Creek Reservoir slightly overlaps the study area (**Figure 4-3**). This wetland is known habitat for the BC Act-listed vulnerable species: the Freckled duck (*Stictonetta naevosa*) and the Blue-billed duck (*Oxyura australis*).

No areas recognised as Key Fish Habitat (KFH) by the Department of Primary Industries (Fisheries), or Protected Riparian land (PRL), as mapped by the NSW DCCEEW is present within the subject site (**Figure 4-3**).

No threatened fish species or populations have been mapped as potentially occurring within the search area.

The subject site is not part of any endangered aquatic ecological community listed under the FM Act.

Figure 4-2. Photograph of unmapped watercourse within the subject site.

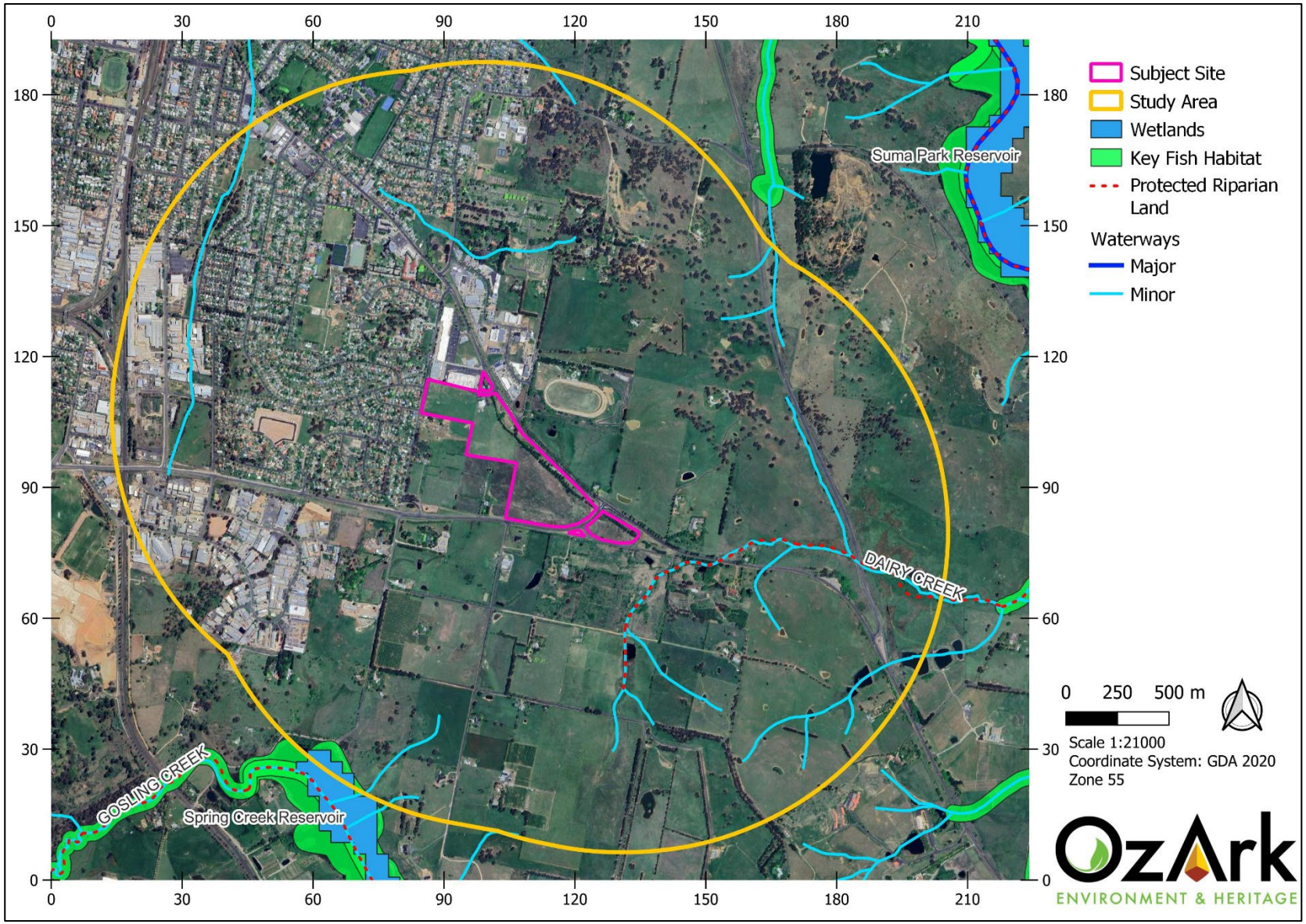


Figure 4-3. Watercourses, wetlands, Key Fish Habitat and Protected Riparian Land within the study area.

4.4 GROUNDWATER DEPENDENT ECOSYSTEMS

Groundwater plays an important ecological role in supporting terrestrial and aquatic ecosystems. Groundwater sustains terrestrial and aquatic ecosystems by supporting vegetation and providing discharge to channels and wetlands.

The NSW Atlas of Groundwater Dependant Ecosystems identified no GDEs within the subject site. Within the wider study area, GDEs with a low and moderate potential for interaction are predicted (**Figure 4-4**).

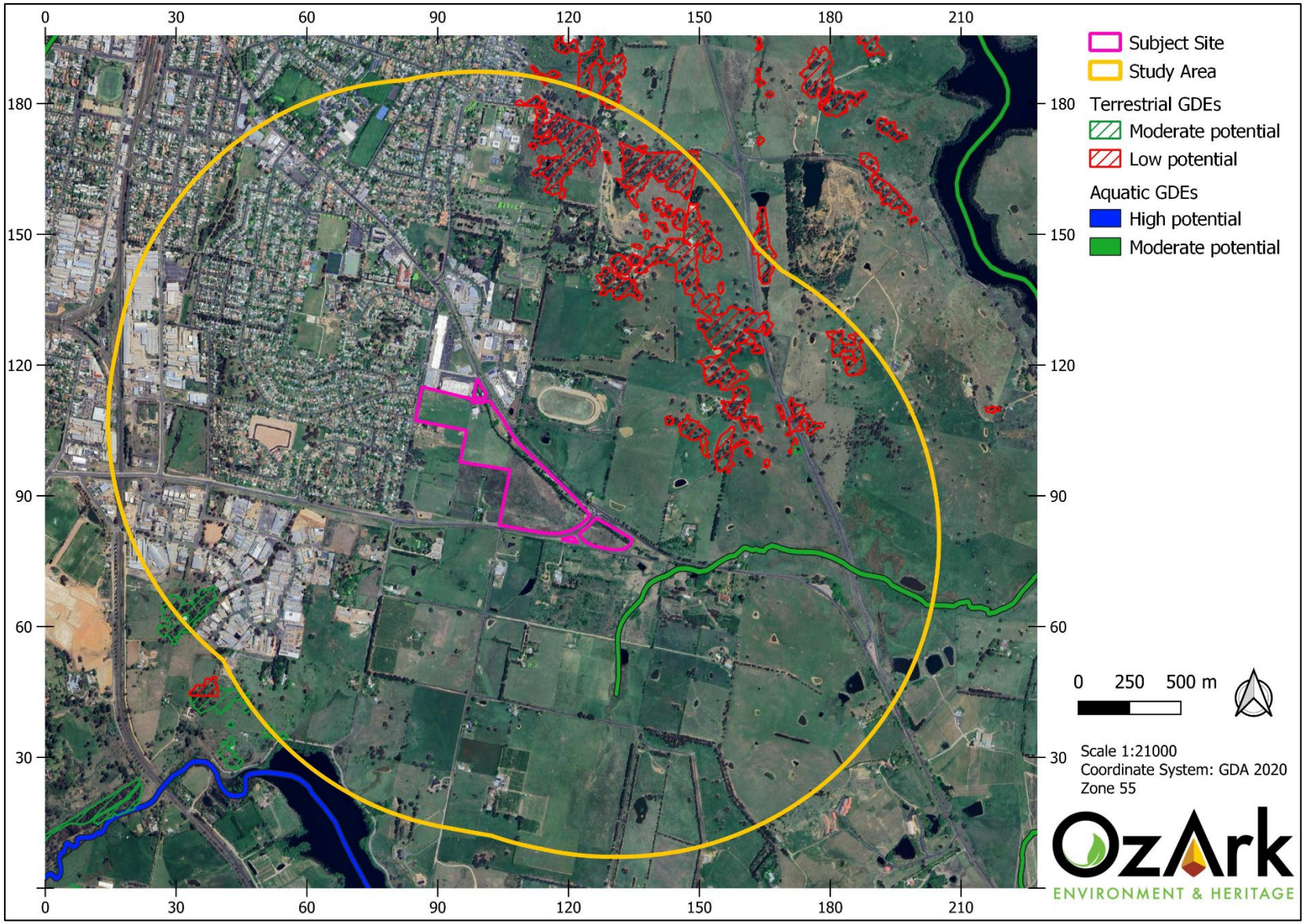


Figure 4-4. Groundwater-dependent ecosystems (GDEs) within the study area.

4.5 CLIMATE

The nearest weather station is at the Orange Airport (063303). Rainfall and temperatures have been monitored at this station since 1996 (**Figure 4-5**).

The area experiences a cool temperate climate, with the highest average maximum temperature of 27.4°C experienced in January. Temperatures in winter are mild to cool with the coldest temperatures being recorded in July, having an average minimum of 0.6°C and an average maximum of 9.9°C.

The average annual rainfall at this station is 887.0 mm. November records the highest average rainfall of 94.9 mm, followed by August (85.2 mm). The lowest monthly rainfall occurs in April (47.4 mm), followed by May (50.4 mm).

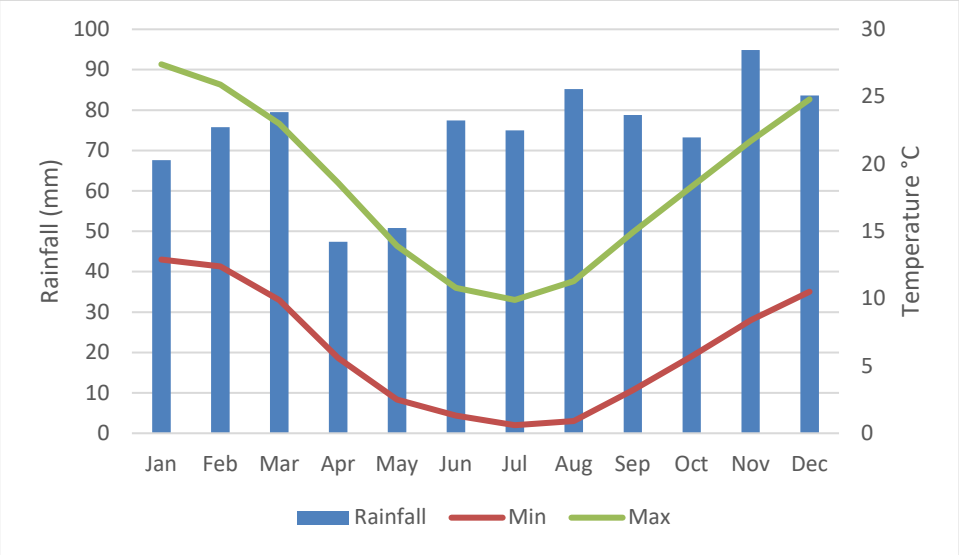


Figure 4-5. Climate data for the Orange airport weather station, showing minimum and maximum temperatures and average monthly rainfall.

5 RESULTS

5.1 ECOLOGICAL OVERVIEW OF THE SITE

The subject site occurs on degraded land heavily cleared for grazing to the extent where no remnant trees or shrubs remain within the patches. The surrounding environment is dominated by residential, industrial and rural development, and does not connect or share a boundary with any remnant habitat patches.

The three isolated patches of Apple box (*Eucalyptus bridgesiana*) remaining on the road corridor are not expected to be disturbed by the proposed development. Most native vegetation present within the paddocks were found along the low-lying wet area (**Figure 5-1**); these areas were dominated by *Carex appressa*, *Poa sieberiana* and *Juncus* spp. An additional area of native vegetation (consisting of two mature *Brachychiton populneus* trees) occurs in the northern section of the subject site, adjacent to the Driver Reviver shed. The remainder of the site was highly degraded. The edge of the paddocks and highway are lined with planted green poplar trees (*Populus nigra*) - these are expected to remain to preserve visual amenity. The paddocks left ungrazed were dominated by dense stands of non-native *Phalaris aquatica,* while the grazed paddocks were dominated by a variety of exotic weeds including *Paspalum dilatatum,* Spear Thistle (*Cirsium vulgare*) and Yorkshire fog grass (*Holcus lanatus*).

Representative photos of the subject site can be found in **Appendix E.**

5.2 NATIVE VEGETATION (PLANT COMMUNITY TYPES)

A list of all flora species encountered during the field survey is available in **Appendix B** and representative photos of the vegetation are provided in **Appendix E**. BAM plot data (species richness and abundance) is provided in **Appendix F**. The field survey identified that the subject site is majority non-native, with the remainder being assigned to a single PCT:

- PCT 3387 – Central West Creekflat Grassy Woodland

This PCT exists in a remnant and derived form and amounts to 0.47 ha. The extent of this PCT within the subject site is shown in **Table 5-1** and mapped in **Figure 5-1**.

Table 5-1. Plant Community Types recorded within the subject site.

Plant Community Type (PCT)	Total Area (ha)
PCT 3387 – Central West Creekflat Grassy Woodland	0.14
PCT 3387 Derived – Central West Creekflat Grassy Woodland	0.33
Total native vegetation	**0.47**
Non-native	**23.75**
Total Area	**24.22**

As 0.47 ha of native vegetation occurs within the subject site, the proposal would trigger entry into the BOS if >0.25 ha of native vegetation is impacted. Avoiding or sufficiently minimising impacts to the native vegetation mapped in **Figure 5-1** would negate the need to enter into the BOS and prepare a BDAR. Further, as “clearing of native vegetation” is recognised as a Key Threatening Process under the BC Act, the development design should aim to minimise the removal of native vegetation where possible.

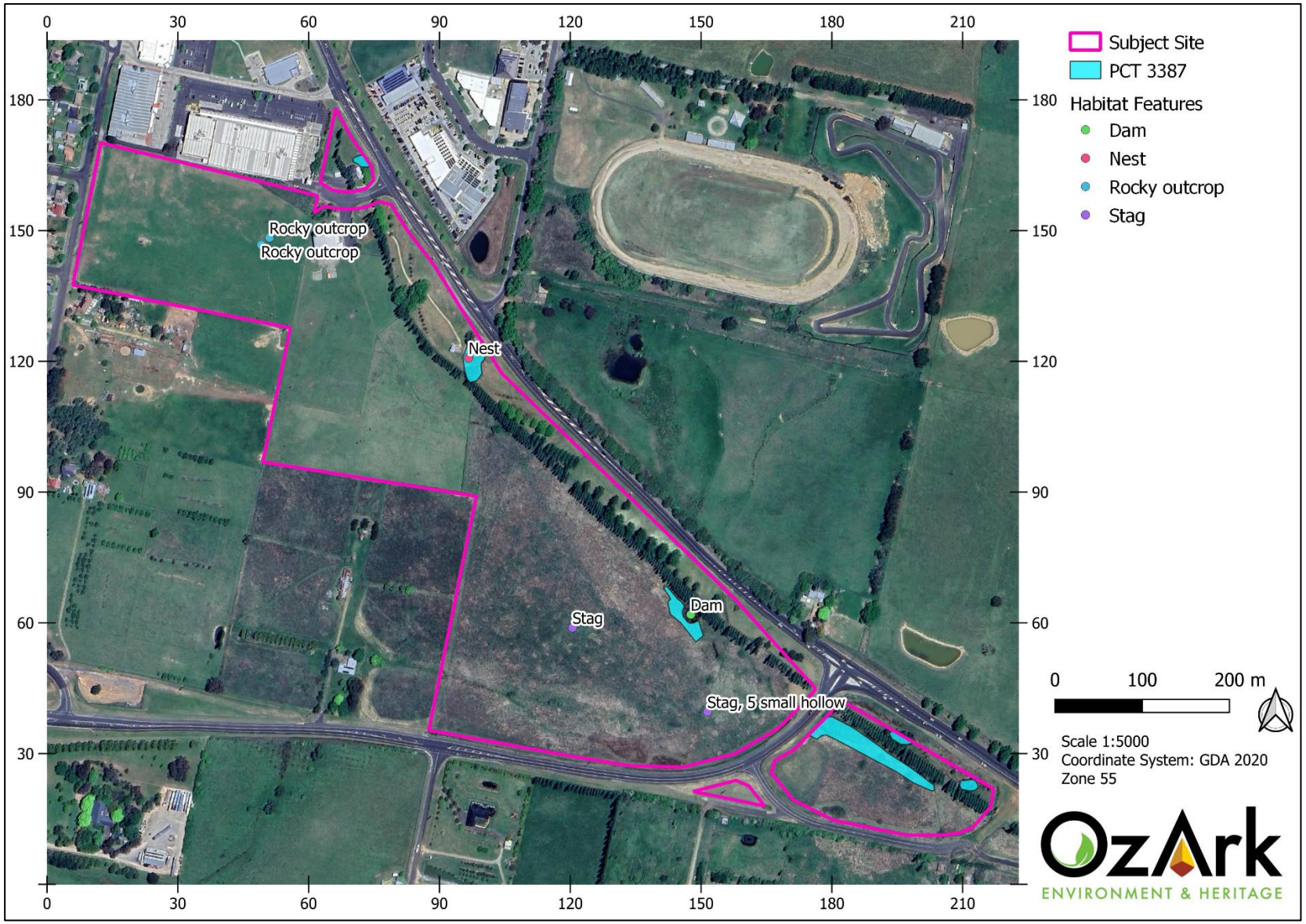


Figure 5-1. Location of confirmed PCTs and habitat features within the subject site.

5.3 THREATENED ECOLOGICAL COMMUNITIES (TECS)

Vegetation within the subject site was assessed against the conditional criteria for each BC Act- or EPBC Act-listed TEC known, or predicted, to occur within the relevant IBRA Subregions. No TECs were found to occur within the subject site.

5.4 HABITAT FEATURES

Very few habitat features remain within the subject site. One stag (standing dead tree) with no hollows and one stag containing five small hollows are likely to be impacted by the proposal. There was a single bird's nest detected during the field survey, though this was located within the road corridor and is not expected to be impacted. There are some boulders within the paddocks that may provide habitat for reptiles and microbats. It is recommended that these boulders remain in place to preserve habitat. One dam surrounded by wet sedges may provide temporary habitat for a variety of water birds. However, given the site lies in the middle of two large wetlands (Suma Park and Spring Creek Reservoir), the dam likely contributes little of value to the habitat of water birds within the search area. Habitat features are mapped in **Figure 5-1** and pictured in **Figure 5-2**.

Figure 5-2. Photographs of habitat features within the subject site. Top: boulders and surface rock. Bottom left: hollow-bearing stag. Bottom right: dam.

5.5 THREATENED SPECIES

A review of the Threatened Species Profiles database identified 81 threatened or migratory fauna and flora species/populations listed under the BC and/or EPBC Act that are known or predicted to occur within the Orange subregion of the South Eastern Highlands Bioregion (**Appendix A**).

5.5.1 Threatened Fauna

According to BioNET records, 28 threatened fauna species have been recorded within 10 km of the subject site (**Table 5-2**). The location of species recorded within 1.5 km can be seen in **Figure 5-3**. No threatened fauna species were detected during the field survey, however, this does not serve as confirmation of absence, as some of these species are only reliably detected at specific times of year, or at night.

Of the 28 species with records within 10 km, the species most likely to be impacted by the proposal (as discerned by suitable habitat, and numerous nearby records) include the Dusky Woodswallow, Grey-headed Flying-fox, Latham's Snipe, and the Superb Parrot. These four species are explored further below.

- Dusky Woodswallow (*Artamus cyanopterus cyanopterus*). Listed as Vulnerable under the BC Act. There are 109 Dusky Woodswallow records within 10 km, including five occurring within 1.5 km (**Figure 5-3**). Although this species is very likely to occur within the subject site, it is an ecosystem credit species, rather than a species credit species, therefore if the project is to proceed to a BDAR the species would not generate a species credit offset obligation. Further, given the degraded nature of the site and the small amount of native vegetation, there is a low chance of impact for this species.
- Grey-headed Flying-fox (*Pteropus poliocephalus*). Listed as Vulnerable under the BC and EPBC Act. The Grey-headed Flying-fox breeds in large camps containing hundreds to thousands of individuals. According to the National Flying Fox Camp Monitor, one camp has been recorded within 500 m east of the subject site, however previous surveys fail to record any individuals at this location and the camp was not observed during the field survey. The nearest recently occupied camp is on Ploughmans Lane in Orange. This camp contained between 1 and 499 Grey-headed Flying Fox when last surveyed in February 2022. Thirty-two records of the species have been recorded within 10 km, including two within 1.5 km (**Figure 5-3**). Given no camps occur within the subject site, and the site lacks ideal foraging habitat, there is a low chance of impact for this species. However, should the nearby historic camp become reoccupied by this species, there would be a high chance of the proposal impacting this species. The Grey-headed Flying-fox is a dual credit species (i.e., both ecosystem and species credit species), therefore, if the project is to proceed to a BDAR, and a breeding camp were to be impacted, a species credit offset obligation would be generated.
- Latham's Snipe (*Gallinago hardwickii*). Listed as Migratory under the EPBC Act. Latham's Snipe is a non-breeding migrant to Australia. They breed in eastern Russian and Japan before migrating to Australia for Summer. This species forages in wetland and grassland areas in dense vegetation. Of the 62 records within 10 km, all occur from nearby wetlands. The small area of grassland within the subject site may provide intermittent habitat while moving between the larger wetlands in the surrounding area. However, given the site lies in the middle of two large wetlands (Suma Park and Spring Creek Reservoir), the dam likely contributes little of value to the habitat of Latham’s Snipe and the impact to this species is very unlikely to be considered significant under the EPBC Act. This species is not an ecosystem species or a species credit species.
- Superb Parrot (*Polytelis swainsonii*). Listed as Vulnerable under the BC and EPBC Act. There are 314 Superb Parrot records within 10 km including six within 1.5 km (**Figure**

5-3). The Superb parrot breeds in tree hollows typically within Box-Gum and River Red Gum forests. Although there are five small hollows present in a stag within the subject site, this stag is unlikely a suitable breeding tree for this species. Further, this species primarily breeds in the area roughly bounded by Yass and Canberra in the east, and Grenfell, Cootamundra and Coola in the west; therefore, the subject site is north of the key breeding range of this species. Considering the small amount of vegetation within the subject site, and the absence of ideal breeding habitat, the proposal would be unlikely to significantly impact this species. The Superb Parrot is a dual credit species (i.e., both ecosystem and species credit species), therefore, if the project is to proceed to a BDAR, and a breeding hollow were to be impacted, a species credit offset obligation would be generated – this outcome is considered unlikely.

Table 5-2. BC and/or EPBC Act-listed threatened or migratory fauna recorded within 10km.

Class	Scientific Name	Common Name	*NSW Status	+Comm Status	Number of records within 10 km
Aves	*Aphelocephala leucopsis*	Southern Whiteface	V,P	V	1
Aves	*Apus pacificus*	Fork-tailed Swift	P	C,J,K	2
Aves	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V,P		109
Aves	*Calidris acuminata*	Sharp-tailed Sandpiper	P	C,J,K	4
Aves	*Certhionyx variegatus*	Pied Honeyeater	V,P		2
Aves	*Chthonicola sagittata*	Speckled Warbler	V,P		6
Aves	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P		17
Aves	*Daphoenositta chrysoptera*	Varied Sittella	V,P		6
Aves	*Gallinago hardwickii*	Latham's Snipe	P	J,K	62
Aves	*Glossopsitta pusilla*	Little Lorikeet	V,P		2
Aves	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	V,P		4
Aves	*Hieraaetus morphnoides*	Little Eagle	V,P		25
Aves	*Lathamus discolor*	Swift Parrot	E1,P	CE	1
Aves	*Melanodryas cucullata cucullata*	South-eastern Hooded Robin	E1,P	E	2
Aves	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V,P		1
Aves	*Neophema pulchella*	Turquoise Parrot	V,P,3		1
Aves	*Ninox connivens*	Barking Owl	V,P,3		2
Aves	*Oxyura australis*	Blue-billed Duck	V,P		42
Aves	*Petroica boodang*	Scarlet Robin	V,P		10
Aves	*Petroica phoenicea*	Flame Robin	V,P		7
Aves	*Polytelis swainsonii*	Superb Parrot	V,P,3	V	314
Aves	*Stagonopleura guttata*	Diamond Firetail	V,P		10
Aves	*Stictonetta naevosa*	Freckled Duck	V,P		34

Class	Scientific Name	Common Name	*NSW Status	+Comm Status	Number of records within 10 km
Mammalia	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E	2
Mammalia	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V,P		4
Mammalia	*Petaurus norfolcensis*	Squirrel Glider	V,P		3
Mammalia	*Phascolarctos cinereus*	Koala	E1,P	E	4
Mammalia	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	32

***NSW Status:** P=Protected, V=Vulnerable, E1=Endangered, 2=Category 2 sensitive species, 3=Category 3 sensitive species.
+Comm Status: C=CAMBA, J=JAMBA, K=ROKAMBA, CE=Critically endangered, E=Endangered, V=Vulnerable

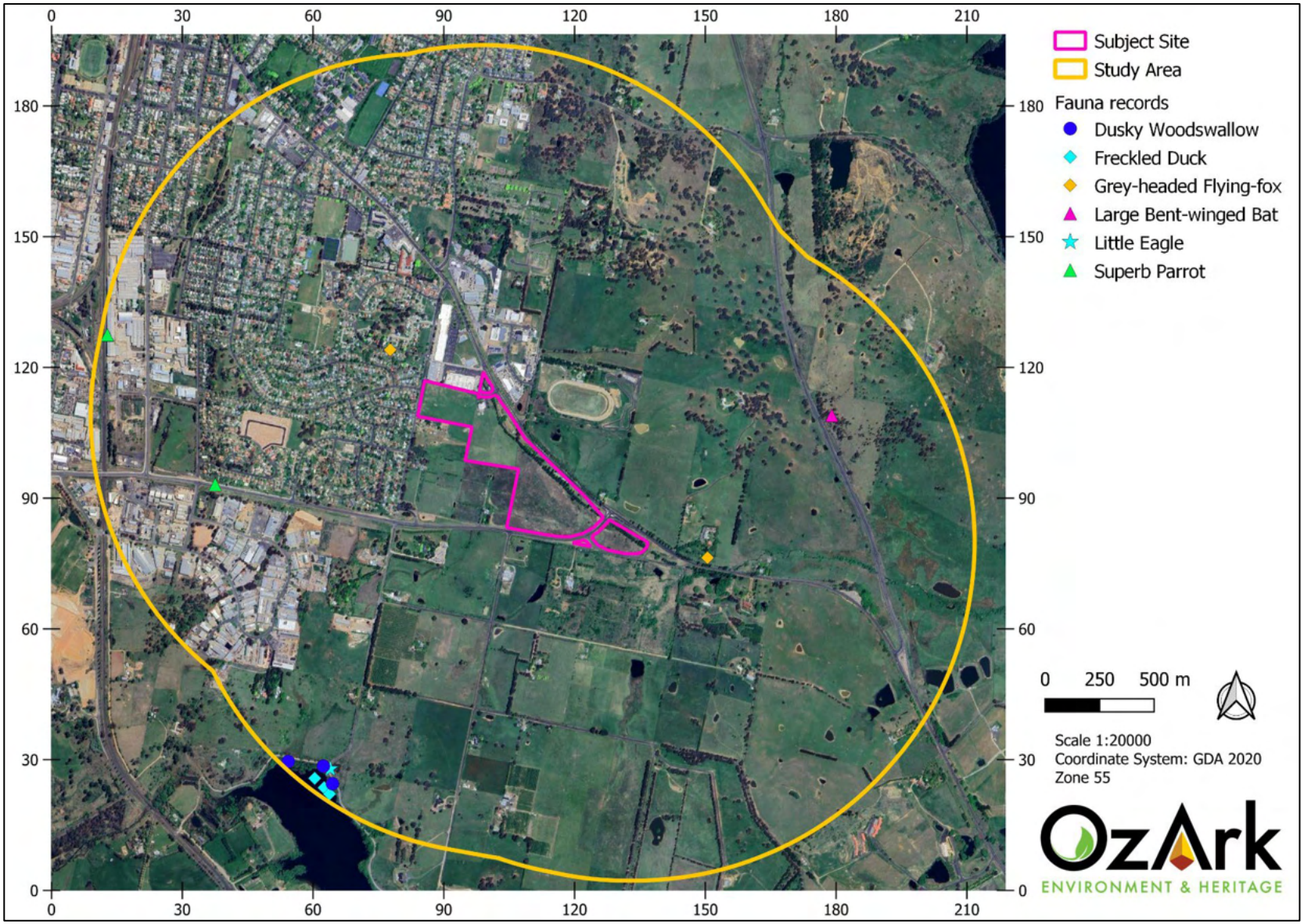


Figure 5-3. BC and/or EPBC Act-listed threatened fauna species recorded within 1.5 km.

5.5.2 Threatened Flora

According to BioNET records, two threatened flora species have been recorded within 10 km of the subject site (**Table 5-3**). Their location can be seen in **Figure 5-4.** No threatened flora species were recorded during the field survey.

Habitat requirements and the likelihood of the proposal impacting these species is explored below.

- Black Gum (*Eucalyptus aggregata*). Listed as Vulnerable under the BC and EPBC Act. This species is found within the Central and Southern Tablelands on alluvial soils on cold poorly drained flats. Commonly found in association with other cold-adapted species including Snow Gum (*Eucalyptus pauciflora*), Candlebark (*E. rubida*) and Black Sallee (*E. stellulata*); the subject site lacks these associated Eucalypts and no associated PCT exists within the site. Of the four records within 10 km, none occur within 1.5 km. Given the above, this proposal is unlikely to impact this species.
- Silver-Leaf Candlebark (*Eucalyptus canobolensis*). Listed as Endangered under the BC and EPBC Act. This species is only known from the high-altitude sub-alpine areas of Mt Canobolas, southwest of Orange. This species is not associated with any PCTs within the subject site and no individuals were observed during the field survey. This species prefers higher altitudes, and the subject site cannot be considered a sub-alpine environment. Of the four nearby records none occur within 1.5 km of the subject site. Given the above, this proposal is very unlikely to impact this species.

Table 5-3. BC and EPBC-listed threatened flora recorded within 10 km.

Scientific Name	Common Name	*NSW Status	+Comm Status	Number of records within 10km	Accepted Survey Period
Eucalyptus aggregata	Black Gum	V	V	4	Year Round
Eucalyptus canobolensis	Silver-Leaf Candlebark	E	E	4	Year Round

***NSW Status:** V=Vulnerable, E= Endangered.
+Comm Status: V=Vulnerable, E= Endangered.

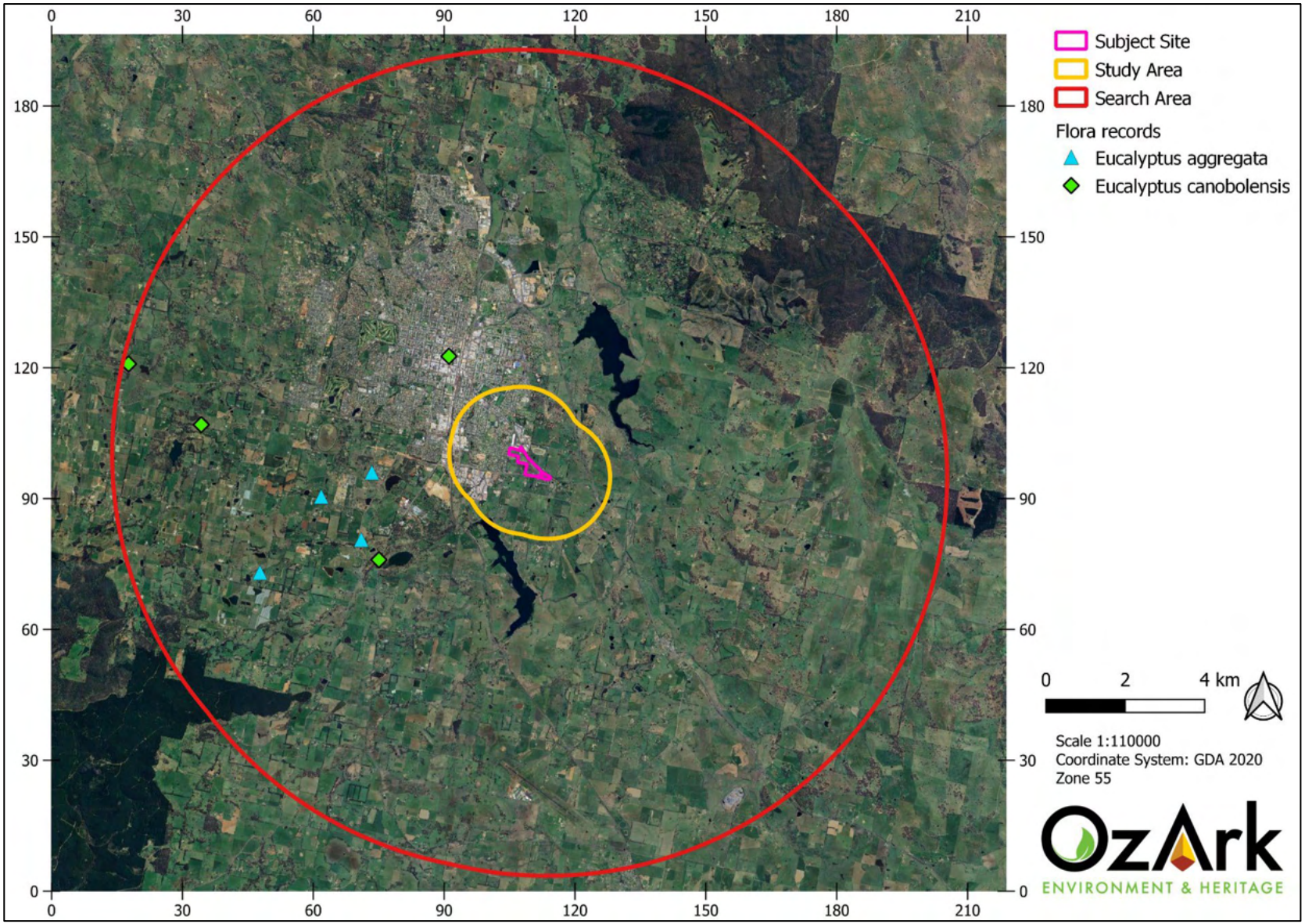


Figure 5-4. BC and EPBC Act-listed threatened flora species recorded within 10 km.

5.6 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE (MNES)

The EPBC Act protects nationally and internationally important flora, fauna, ecological communities, and heritage places, which are defined in the EPBC Act as matters of national environmental significance. The EPBC Act protected matters search identified no World Heritage Properties, five Wetlands of International Importance (**Table 5-4**), two Threatened Ecological Communities (**Table 5-5**), 47 threatened species, and 11 migratory species, that could occur within the subject site (**Appendix A**).

The EPBC Act policy Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (DoE, 2013) forms the basis of determining if an impact to protected matters is significant. As this project is still at the planning phase and potential impacts have not yet been detailed, tests of significance have not been completed for this constraints and opportunities report. **Table 5-4** and **Table 5-5** give an overview of which Wetlands of International Importance and EPBC Act-listed TECs would require a test of significance should the proposal proceed.

Table 5-4. Wetlands of International Importance.

Name	Proximity	Assessment of Significance Required if Land is to be Developed?
Banrock station wetland complex	800 – 900km upstream from Ramsar site	**No.** The proposal is not within proximity to this wetland.
Hattah-kulkyne lakes	600 – 700km upstream from Ramsar site	**No.** The proposal is not within proximity to this wetland.
Riverland	700 – 800km upstream from Ramsar site	**No.** The proposal is not within proximity to this wetland.
The Coorong, and Lakes Alexandrina and Albert Wetland	900 - 1000km upstream from Ramsar site	**No.** The proposal is not within proximity to this wetland.
The Macquarie Marshes	200 – 300kmupstream from Ramsar site	**No.** The proposal is not within proximity to this wetland.

Table 5-5. EPBC Act-Listed Threatened Ecological Communities with potential to occur on the subject site.

Name	Status	Assessment of Significance Required if Land is to be Developed?
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	**No,** this TEC was not recorded during the field survey.
White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	**No,** this TEC was not recorded during the field survey.

A summary of those MNES that would need to be considered for any development on the subject site is provided in **Table 5-6.**

Table 5-6. Summary of potential impacts to Matters of National Environmental Significance.

Consideration	Potential impact?
Any impact on a listed threatened species or communities?	Yes (tests of significance required for threatened species)
Any impacts on listed migratory species?	Yes (tests of significance required)
Any impacts on a Ramsar wetland of international importance?	No
Any impacts on a Commonwealth marine environment?	No
Any impacts on a World Heritage property?	No
Any impacts on a National Heritage place?	No
Any impacts on the Great Barrier Reef Marine Park?	No
Does the proposal involve a nuclear action (including uranium mining)?	No
Any impact on a water resource, in relation to coal seam gas development and large coal mining development?	No

5.7 WILDLIFE CONNECTIVITY CORRIDORS

The proposed rezoning site consists of largely degraded land already cleared for farming and is already extensively fragmented. The surrounding areas have already been cleared for urban, rural, and industrial industries, and does not connect to any remnant vegetation. The subject site is situated in the middle of two wetlands (Suma Park and Spring Creek Reservoir). The small area of wetland vegetation may provide temporary refuge for species migrating between the two wetlands.

5.8 SIGNIFICANT WEEDS

In total, nine significant weeds were recorded during the field survey (**Table 5-7**); all nine species are listed as high-threat exotic species (HTE) under the Biodiversity Assessment Method (2020), two are listed Weeds of National Significance (WoNS) and two as priority weeds (PW) for the Central Tablelands (PW). See **Appendix B** for a full list of exotic species recorded on site.

Table 5-7. List of significant weeds encountered at the subject site.

Growth Form[1]	Scientific Name	Common Name	HTE[2]	WoNS[3]	PW[4]
FG	*Carthamus lanatus*	Saffron thistle	Yes	No	No
SG	*Crataegus monogyna*	Hawthorn	Yes	No	No
FG	*Hypericum perforatum*	St. Johns Wort	Yes	No	Yes
GG	*Paspalum dilatatum*		Yes	No	No
TG	*Populus nigra*	Green poplar	Yes	No	No
SG	*Rosa rubiginosa*	Sweet Briar	Yes	No	No
SG	*Rubus fruticosus*	Blackberry complex	Yes	Yes	Yes
TG	*Salix fragilis*	Crack Willow	Yes	Yes	No
FG	*Xanthium spinosum*	Bathurst Burr	Yes	No	No

[1]Growth form: FG = Forb, GG = Grass and Grass-like, SG = Shrub, TG = Tree, EG = Fern, OG = Other. [2]High-threat exotic species (Yes/No). [3]Weed of National Significance (Yes/No). [4]Priority weed for the LGA (Yes/No).

5.9 CUMULATIVE IMPACTS

The potential impacts of this proposal, should it proceed to the development phase, must be considered as part of the wider loss of biodiversity in NSW. Rather than acting in isolation, this development would be an additive part contributing to biodiversity loss. The incremental effects of multiple impacts – past, present, and future – are referred to as cumulative impacts. Historic vegetation clearing for agriculture and infrastructure have caused significant biodiversity losses in the local area. Ongoing projects in the region include the construction of the Brown's Creek to Orange Gas pipeline and the Macquarie River Water Pipeline. These projects will inevitably lead to increased development resulting in additional land clearing and other activities that will impact local biodiversity. Considering the small amount of native vegetation within the subject site, and the degraded nature of the site, the proposal would have a negligible impact on the cumulative loss of biodiversity in the region.

5.10 SERIOUS AND IRREVERSIBLE IMPACTS

The BOS recognises that there are some types of Serious and Irreversible Impacts (SAII) "that the community expects will not occur except where the consent authority considers that this type of impact is outweighed by the social and economic benefits that the development will deliver to the State". For Part 4 Developments (under the *Environmental Planning and Assessment Act* 1979 [EP&A Act]), the approval authority must not grant approval for a proposal that is likely to have an SAII.

The Guidance to assist a decision-maker to determine a serious and irreversible impact (DPIE 2019) and the NSW threatened species data collection has been used to determine which threatened entities are likely to require further assessment for SAII. An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species (including endangered populations) or ecological community becoming extinct based on the following 4 principles (set out in clause 6.7 of the *Biodiversity Conservation Regulation* 2017):

- **Principle 1:** The impact will cause a further decline of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline,
- **Principle 2:** The impact will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size,

- **Principle 3:** The impact is made on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution,
- **Principle 4:** The impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity, and therefore its members are not replaceable.

AII entities known (or predicted to be) relevant to this proposal are explored below (**Section 5.10.1** and **5.10.2**).

5.10.1 Threatened Species

A list of all threatened species most likely to be present on the subject site (based on habitat features, PCTs, and records within 10 km) that are at risk of an SAII is provided in **Table 5-8**; this table also lists the SAII principles that would need to be explored if the project where to proceed under a BDAR pathway. Given the degraded nature of the site, the proposal is considered unlikely to result in an SAII for any of the species given in **Table 5-8**.

Table 5-8. SAII Threatened Species considered likely to occur on the subject site.

Threatened Species	SAII principles to be explored
Eucalyptus canobolensis – Silver-leaf Candlebark	3
Miniopterus orianae oceanensis – Large Bent-winged Bat	4
Lathamus discolor – Swift Parrot	1

5.10.2 Threatened Ecological Communities

There are no TECs within the subject site, therefore no SAII TECs are at risk of being impacted by this proposal.

6 SUMMARY AND CONCLUSIONS

OzArk has been engaged by Landcom, to complete a Biodiversity Opportunities and Constraints Report covering land on the south-eastern fringe of Orange, adjacent to the existing suburb of Glenroi, NSW. In partnership with Orange City Council, Landcom are preparing a Planning Proposal to rezone and subsequently subdivide three parcels of land to be known as the Redmond Place subdivision.

A preliminary ecological survey was carried out over a single day in January 2024. This survey focused on determining PCTs and establishing whether any TECs listed under the BC Act and/or the EPBC Act occur. Further, the site was assessed for its potential to support threatened and/or migratory species listed under the BC and/or EPBC Act.

The subject site occurs on degraded land heavily cleared for grazing to the extent where no remnant trees or shrubs persist. Two standing dead trees (stags) occur within the subject site, one of which contains five small hollows (<20 cm) that may provide suitable roosting habitat for microbats. Additionally, there are two areas of scattered bushrock and boulders that may provide refuge for reptiles and microbats. The surrounding environment is dominated by residential, industrial and rural development, and does not connect or share a boundary with any remnant habitat patches. The subject site is predominantly non-native vegetation, with 0.47 ha of a single PCT (PCT 3387 – Central West Creekflat Grassy Woodland) occurring along the low-lying wet areas in the north. No TECs occur within the subject site.

As per the requirements of the BAM, the proposal would trigger entry into the BOS if >0.25 ha of PCT 3387 is impacted by the proposal. If the impact footprint is designed in such a manner as to avoid triggering the BOS (i.e., by clearing <0.25 ha of PCT 3387), a BDAR would not be required, and the proposal would not generate an offset obligation under the BOS. If the BOS is not triggered, a BAR would be required for the proposal to proceed to the Development Application phase.

According to desktop searches, a total of 81 threatened species or populations recognised as threatened or migratory under the BC Act and/or the EPBC Act, are known or predicted to occur within the IBRA subregions found within 10 km of the subject site. An EPBC Act Protected Matters Search identified no World Heritage Properties, five Wetlands of International Importance, two TECs, 47 threatened, and 11 migratory species that may be present within the subject site.

According to BioNET records, 28 threatened or migratory fauna species have been recorded within 10 km of the subject site. No threatened fauna species were detected during the field survey, however, this does not serve as confirmation of absence, as some of these species are only reliably detected at specific times of year, or at night. Of the 28 species with records within 10 km, the species most likely to be impacted by the proposal (as discerned by suitable habitat,

and numerous nearby records) include the Dusky Woodswallow, Grey-headed Flying-fox, Latham's Snipe, and the Superb Parrot. However, given the degraded nature of the site, limited habitat features, and the small amount of native vegetation, there is a low chance of the proposal significantly impacting any of these fauna species.

According to BioNET records, two threatened flora species have records occurring within 10 km of the subject site: the BC and EPBC Act-listed vulnerable species Black Gum (*Eucalyptus aggregata*) and the BC and EPBC Act-listed endangered species Silver-Leaf Candlebark (*Eucalyptus canobolensis*). Both species have four records within 10 km. No threatened flora species were detected during the field survey. Based on the absence of key habitat features required by these species, and considering that these species were not detected during the field survey, no significant impact to any threatened flora species is considered likely.

One unmapped watercourse occurs within the site, this watercourse appears to be an artificially created drainage line. No naturally occurring watercourses occur within the subject site and no major perennial watercourses occur within the subject site or study area. Seventeen minor, non-perennial watercourses occur within the wider study area:

- Fifteen Strahler 1st order - Minor, non-perennial waterways, including East Orange Creek
- Two Strahler 2nd order - Minor, non-perennial waterways, including Dairy Creek

One wetland, Spring Creek Reservoir slightly overlaps the study area. This wetland is known habitat for the BC Act-listed vulnerable species: the Freckled duck (*Stictonetta naevosa*) and the Blue-billed duck (*Oxyura australis*).

No areas recognised as KFH by DPI - Fisheries, or PRL, as mapped by the NSW DCCEEW is present within the subject site.

No threatened fish species or populations have been mapped as potentially occurring within the search area and the subject site is not part of any endangered aquatic ecological community listed under the FM Act.

This report covers the results of the ecological field survey and discusses potential impacts and opportunities to reduce impacts on biodiversity. This report is not a biodiversity assessment report and should be used to guide planning only.

7 REFERENCES

Australian Virtual Herbarium (2024). <https://avh.chah.org.au/>

Australian Government Bureau of Meteorology (2024). Atlas of Groundwater Dependent Ecosystems. <http://www.bom.gov.au/water/groundwater/gde/map.shtml>

Australian Government Bureau of Meteorology (2024). Climate Data Online. <http://www.bom.gov.au/climate/data/>

Australian Government Department of Climate Change, Energy, the Environment and Water (2021). Directory of Important Wetlands. <https://www.dcceew.gov.au/water/wetlands/australian-wetlands-database/directory-important-wetlands>

Australian Government Department of Climate Change, Energy, the Environment and Water (2024a). National Flying-fox Monitoring Viewer. <https://www.environment.gov.au/webgis-framework/apps/ffc-wide/ffc-wide.jsf>

Australian Government Department of Climate Change, Energy, the Environment and Water (2024b). Protected Matters Search Tool. <https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool>

Australian Government Department of Sustainability, Environment, Water, Population and Communities (2011). Survey Guidelines for Australia's Threatened Mammals. Guidelines for detecting mammals listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*. < https://www.dcceew.gov.au/sites/default/files/documents/survey-guidelines-mammals.pdf>

Australian Government Department of Sustainability, Environment, Water, Population and Communities (2012). Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (Subregions). Canberra.

Australian Government Department of the Environment (2013). Matters of National Environmental Significance - Significant impact guidelines 1.1 - *Environment Protection and Biodiversity Conservation Act 1999*. Commonwealth of Australia. <http://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf>

Australian Government Department of the Environment, Water, Heritage and the Arts (2010). Survey Guidelines for Australia's Threatened Birds. Guidelines for detecting birds listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*.

Briggs, J and Leigh, J (1996), *Rare or Threatened Australian Plants*, CSIRO Publishing, Collingwood, Victoria

Fairfull, S. (2013). Policy and Guidelines for Fish Habitat Conservation and Management. Sydney: NSW Department of Primary Industries.

Keith, D. (2004). Ocean Shores to Desert Dunes: the Vegetation of New South Wales and the ACT. Department of Environment and Conservation NSW.

Mitchell, P. (2002). Descriptions for NSW (Mitchell) Landscapes. NSW Department of Planning and Environment.

Morgan, G., & Terrey, J. (1992). Nature conservation in western New South Wales. Sydney: National Parks Association.

NSW Department of Climate Change, Energy, the Environment and Water (2011a). NSW Wetlands. <https://datasets.seed.nsw.gov.au/dataset/nsw-wetlands047c7>

NSW Department of Climate Change, Energy, the Environment and Water (2011b). Vulnerable Lands – Steep or Highly Erodible, Protected Riparian and Special Category. <https://datasets.seed.nsw.gov.au/dataset/vulnerable-land-protected-riparian73a9e>

NSW Department of Climate Change, Energy, the Environment and Water (2016). NSW (Mitchell) Landscapes – version 3.1. <https://datasets.seed.nsw.gov.au/dataset/nsw-mitchell-landscapes-version-3-1>

NSW Department of Climate Change, Energy, the Environment and Water (2017). NSW Landuse mapping. <https://datasets.seed.nsw.gov.au/dataset/nsw-landuse-2017>

NSW Department of Climate Change, Energy, the Environment and Water (2022a). Koala (*Phascolarctos cinereus*) Biodiversity Assessment Method Survey Guide. <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/koala-phascolarctos-cinereus-biodiversity-assessment-method-survey-guide-220249.pdf>

NSW Department of Climate Change, Energy, the Environment and Water (2022b). Threatened Reptiles Biodiversity Assessment Method Survey Guide. <https://www.environment.nsw.gov.au/research-and-publications/publications-search/threatened-reptiles-biodiversity-assessment-method-survey-guide>

NSW Department of Climate Change, Energy, the Environment and Water (2022c). Areas of Outstanding Biodiversity Value. <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/areas-of-outstanding-biodiversity-value>

NSW Department of Climate Change, Energy, the Environment and Water (2022d). State Vegetation Type Map C1.1.M1.1. <https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map>

NSW Department of Climate Change, Energy, the Environment and Water (2022e). Acid Sulfate Soils Risk. <https://datasets.seed.nsw.gov.au/dataset/acid-sulfate-soils-risk0196c>

NSW Department of Climate Change, Energy, the Environment and Water (2024a). BioNet Atlas. Threatened Biodiversity Profiles <https://www.environment.nsw.gov.au/AtlasApp/Default.aspx>

NSW Department of Climate Change, Energy, the Environment and Water (2024b). Wetlands. <https://www.environment.nsw.gov.au/topics/water/wetlands>

NSW Department of Climate Change, Energy, the Environment and Water (2024c). NSW Plant Community Type Classification. <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet/nsw-plant-community-type-classification>

NSW Department of Climate Change, Energy, the Environment and Water (2024d). BioNet. <https://www.bionet.nsw.gov.au/>

NSW Department of Climate Change, Energy, the Environment and Water (2024e). Threatened Biodiversity Data Collection. < https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet/about-bionet-atlas/threatened-biodiversity-profiles>

NSW Department of Climate Change, Energy, the Environment and Water (2024f). Determining native vegetation land categorisation for application in the Biodiversity Offsets Scheme. <https://www.environment.nsw.gov.au/research-and-publications/publications-search/determining-native-vegetation-land-categorisation-for-application-in-the-biodiversity-offsets-scheme>

NSW Department of Climate Change, Energy, the Environment and Water (2024g). BioNet Vegetation Classification. <http://www.environment.nsw.gov.au/NSWVCA20PRapp/default.aspx>

NSW Department of Climate Change, Energy, the Environment and Water (2024h). NSW Biodiversity Values Map. <https://datasets.seed.nsw.gov.au/dataset/biodiversity-values-map>

NSW Department of Planning, Industry and Environment (2019). Guidance to assist a decision-maker to determine a serious and irreversible impact. <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Biodiversity/guidance-decision-makers-determine-serious-irreversible-impact-190511.pdf>

NSW Department of Planning, Industry and Environment (2020a). Surveying threatened plants and their habitats. NSW survey guide for the Biodiversity Assessment Method.

NSW Department of Planning, Industry and Environment (2020b). Biodiversity Assessment Method. <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-

Site/Documents/Animals-and-plants/Biodiversity/biodiversity-assessment-method-2020-200438.pdf>

NSW Department of Planning, Industry and Environment (2020c). NSW Survey Guide for Threatened Frogs: A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method. <https://www.environment.nsw.gov.au/research-and-publications/publications-search/nsw-survey-guide-for-threatened-frogs>

NSW Department of Primary Industries (2023). Freshwater threatened species distribution maps. <https://www.dpi.nsw.gov.au/fishing/threatened-species/threatened-species-distributions-in-nsw/freshwater-threatened-species-distribution-maps>

NSW National Parks and Wildlife Service (2003). The Bioregions of New South Wales their biodiversity, conservation and history.

NSW Office of Environment and Heritage (2018). 'Species credit' threatened bats and their habitats. NSW survey guide for the Biodiversity Assessment Method.

Royal Botanic Gardens and Domain Trust. (2023). PlantNET. <http://plantnet.rbgsyd.nsw.gov.au>

Serov, P, Kuginis, L, Williams, JP. (2012). Risk assessment guidelines for groundwater dependent ecosystems, Volume 1 – The conceptual framework, NSW Department of Primary Industries, Office of Water, Sydney.

Thackway, R., & Cresswell, I. (1995). An interim biogeographic regionalisation for Australia: a framework for setting priorities in the National Reserves System Cooperative Program.

Triggs, B (1996), *Tracks, scats and other traces: a field guide to Australian mammals*, Oxford University Press, Melbourne, Victoria

Van Dyck, S and Strahan, R (Eds) (2008), *The mammals of Australia (3rd edition)*. Reed New Holland, Sydney, NSW

Van Dyck et al. (2012). Field Companion to The Mammals of Australia. New Holland Books.

APPENDIX A – DATABASE SEARCH RESULTS

Biodiversity Values Map

NSW GOVERNMENT Department of Planning and Environment

Biodiversity Values Map and Threshold Report

This report is generated using the Biodiversity Values Map and Threshold (BMAT) tool. The BMAT tool is used by proponents to supply evidence to your local council to determine whether or not a Biodiversity Development Assessment Report (BDAR) is required under the Biodiversity Conservation Regulation 2017 (Cl. 7.2 & 7.3).

The report provides results for the proposed development footprint area identified by the user and displayed within the blue boundary on the map.

There are two pathways for determining whether a BDAR is required for the proposed development:

1. Is there Biodiversity Values Mapping?
2. Is the 'clearing of native vegetation area threshold' exceeded?

Biodiversity Values Map and Threshold Report

Date of Report Generation		01/05/2024 8:07 AM
1. Biodiversity Values (BV) Map - Results Summary (Biodiversity Conservation Regulation Section 7.3)		
1.1	**Does the development Footprint intersect with BV mapping?**	no
1.2	**Was ALL BV Mapping within the development footprinted added in the last 90 days?** (dark purple mapping only, no light purple mapping present)	no
1.3	**Date of expiry of dark purple 90 day mapping**	N/A
1.4	**Is the Biodiversity Values Map threshold exceeded?**	no
2. Area Clearing Threshold - Results Summary (Biodiversity Conservation Regulation Section 7.2)		
2.1	**Size of the development or clearing footprint**	271,848.6 sqm
2.2	**Native Vegetation Area Clearing Estimate (NVACE)** (within development/clearing footprint)	57,891.8 sqm
2.3	**Method for determining Minimum Lot Size**	Lot size
2.4	**Minimum Lot Size** (10,000sqm = 1ha)	2,086 sqm
2.5	**Area Clearing Threshold** (10,000sqm = 1ha)	2,500 sqm
2.6	**Does the estimate exceed the Area Clearing Threshold?** (NVACE results are an estimate and can be reviewed using the Guidance)	yes
REPORT RESULT: Is the Biodiversity Offset Scheme (BOS) Threshold exceeded for the proposed development footprint area? (Your local council will determine if a BDAR is required)		**yes**

Page 1 of 4

Department of Planning and Environment

What do I do with this report?

• If the result above indicates the BOS Threshold has been exceeded, your local council **may require** a Biodiversity Development Assessment Report with your development application. Seek further advice from Council. An accredited assessor can apply the Biodiversity Assessment Method and prepare a BDAR for you. For a list of accredited assessors go to: https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor.

• If the result above indicates the BOS Threshold has not been exceeded, you may not require a Biodiversity Development Assessment Report. This BMAT report can be provided to Council to support your development application. Council can advise how the area clearing threshold results should be considered. Council will review these results and make a determination if a BDAR is required. Council may ask you to review the area clearing threshold results. You may also be required to assess whether the development is "likely to significantly affect threatened species" as determined under the test in Section 7.3 of the *Biodiversity Conservation Act 2016*.

• If a BDAR is not required by Council, you may still require a permit to clear vegetation from your local council.

• If **all** Biodiversity Values mapping within your development footprint was less than 90 days old, i.e. areas are displayed as dark purple on the BV map, a BDAR may not be required if your Development Application is submitted within that 90 day period. Any BV mapping less than 90 days old on this report will expire on the date provided in Line item 1.3 above.

For more detailed advice about actions required, refer to the **Interpreting the evaluation report** section of the Biodiversity Values Map Threshold Tool User Guide .

Review Options:

• If you believe the Biodiversity Values mapping is incorrect please refer to our BV Map Review webpage for further information.

• If you or Council disagree with the area clearing threshold estimate results from the NVACE in Line Item 2.6 above (i.e. area of Native Vegetation within the Development footprint proposed to be cleared), review the results using the Guide for reviewing area clearing threshold results from the BMAT Tool.

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: _____

(Typing your name in the signature field will be considered as your signature for the purposes of this form)

01/05/2024 08:07 AM

Page 2 of 4

Department of Planning and Environment

Biodiversity Values Map and Threshold Tool

The Biodiversity Values (BV) Map and Threshold Tool identifies land with high biodiversity value, particularly sensitive to impacts from development and clearing.

The BV map forms part of the Biodiversity Offsets Scheme threshold, which is one of the factors for determining whether the Scheme applies to a clearing or development proposal. You have used the Threshold Tool in the map viewer to generate this BV Threshold Report for your nominated area. This report calculates results for your proposed development footprint and indicates whether Council may require you to engage an accredited assessor to prepare a Biodiversity Development Assessment Report (BDAR) for your development.

This report may be used as evidence for development applications submitted to councils. You may also use this report when considering native vegetation clearing under the State Environmental Planning Policy (Biodiversity and Conservation) 2021 - Chapter 2 vegetation in non-rural areas.

What's new? For more information about the latest updates to the Biodiversity Values Map and Threshold Tool go to the updates section on the Biodiversity Values Map webpage.

Map Review: Landholders can request a review of the BV Map where they consider there is an error in the mapping on their property. For more information about the map review process and an application form for a review go to the Biodiversity Values Map Review webpage.

If you need help using this map tool see our Biodiversity Values Map and Threshold Tool User Guide or contact the Map Review Team at map.review@environment.nsw.gov.au or on 1800 001 490.

Biodiversity Values Map

1,385.9 0 692.94 1,385.9 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days
- Native Vegetation Area Clearing Estimate (NVACE)
- Development area selected by proponent

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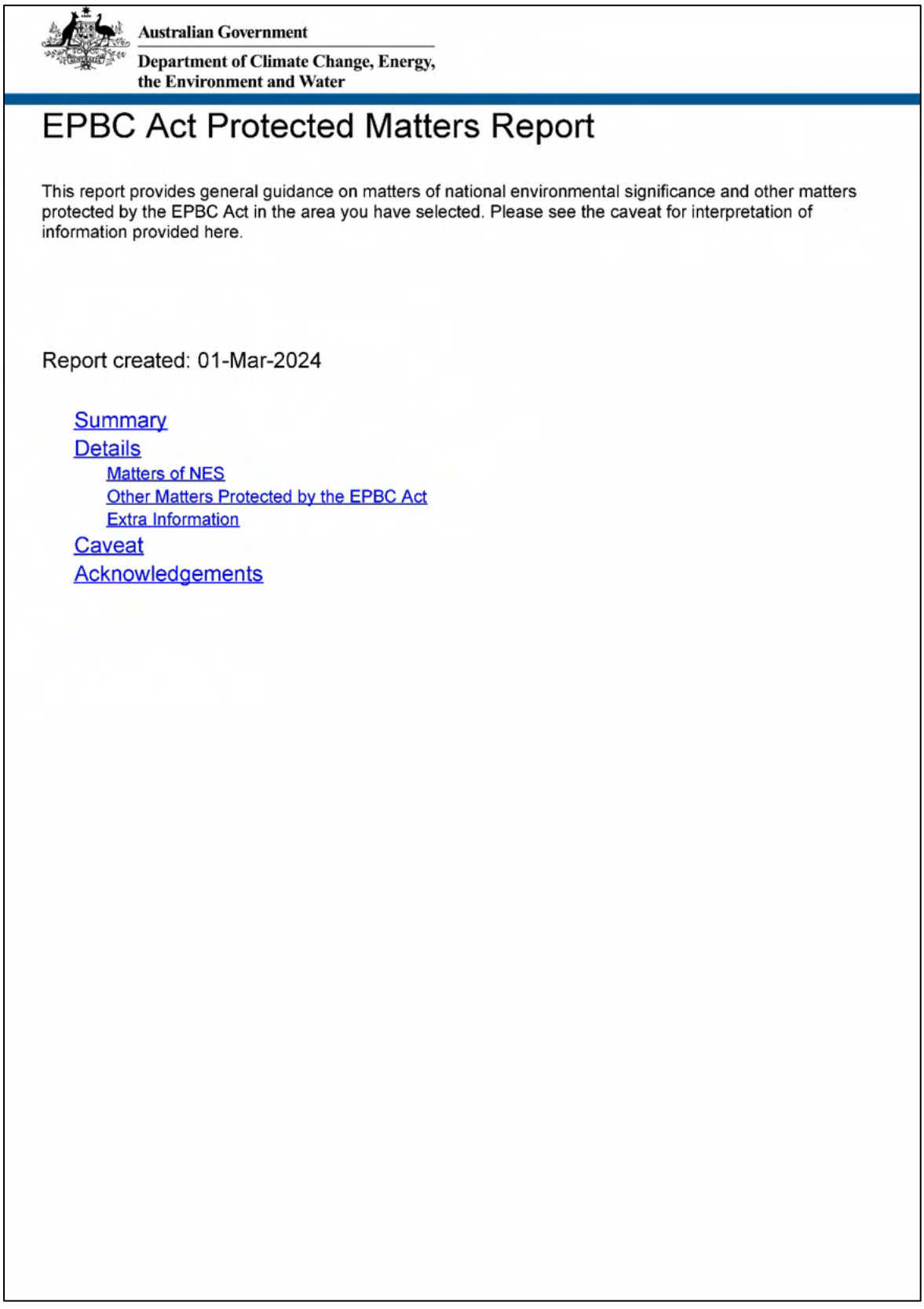
The results provided in this tool are generated using the best available mapping and knowledge of species habitat requirements.

This map is valid as at the date the report was generated. Checking the Biodiversity Values Map viewer for mapping updates is recommended.

Page 4 of 4

EPBC Act Protected Matters Report



Australian Government
Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 01-Mar-2024

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	5
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	47
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

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

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

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

Commonwealth Lands:	21
Commonwealth Heritage Places:	1
Listed Marine Species:	18
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	5
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	800 - 900km upstream from Ramsar site	In feature area
Hattah-kulkyne lakes	600 - 700km upstream from Ramsar site	In buffer area only
Riverland	700 - 800km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	900 - 1000km upstream from Ramsar site	In feature area
The macquarie marshes	200 - 300km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community likely to occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In buffer area only
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat may occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
FISH			
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area	In buffer area only
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area
FROG			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Litoria booroolongensis Booroolong Frog [1844]	Endangered	Species or species habitat likely to occur within area	In feature area
Litoria castanea Yellow-spotted Tree Frog, Yellow-spotted Bell Frog [1848]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area	In feature area
INSECT			
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat likely to occur within area	In feature area
MAMMAL			
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat known to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ammobium craspedioides Yass Daisy [20758]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eucalyptus aggregata Black Gum [20890]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus canobolensis Silver-leaf Candlebark, Mt Canobolas Candlebark [64896]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eucalyptus pulverulenta Silver-leaved Mountain Gum, Silver-leaved Gum [21537]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eucalyptus robertsonii subsp. hemisphaerica Robertson's Peppermint [56223]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area	In feature area
Lepidium aschersonii Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area	In feature area
Swainsona recta Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Tympanocryptis mccartneyi Bathurst Grassland Earless Dragon [90478]	Critically Endangered	Species or species habitat may occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area	In buffer area only
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

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

Commonwealth Land Name	State	Buffer Status
Commonwealth Bank of Australia		
Commonwealth Land - Commonwealth Bank of Australia [12445]	NSW	In buffer area only
Commonwealth Trading Bank of Australia		
Commonwealth Land - Commonwealth Trading Bank of Australia [12434]	NSW	In buffer area only
Communications, Information Technology and the Arts - Australian Broadcasting Corporation		
Commonwealth Land - Australian Broadcasting Corporation [12443]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [15534]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [15686]	NSW	In buffer area only
Defence		
Commonwealth Land - Defence Service Homes Corporation [12437]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [12441]	NSW	In buffer area only
Defence - ROMANI DEPOT - ORANGE ; ORANGE TRAINING DEPOT [11196]	NSW	In buffer area only
Defence - Defence Housing Authority		

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [15978]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15612]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14107]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12446]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12440]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12444]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12439]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12436]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12435]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12438]	NSW	In buffer area only
Transport and Regional Services - Airservices Australia		
Commonwealth Land - Airservices Australia [12424]	NSW	In buffer area only
Unknown		
Commonwealth Land - [16339]	NSW	In buffer area only
Commonwealth Land - [12442]	NSW	In buffer area only

Commonwealth Heritage Places [Resource Information]

Name	State	Status	Buffer Status
Historic			
Orange Post Office	NSW	Listed place	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Construction of a 36 km Pipeline and Ancillary Infrastructure	2011/6202	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Ploughmans Creek Stormwater Harvesting Scheme Wetlands	2010/5317	Not Controlled Action	Completed	In buffer area only
Specialists Supported Living Services, Bloomfield Hospital Site, Orange, NSW	2011/5883	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Aerial baiting for wild dog control	2006/2713	Not Controlled Action	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
		(Particular Manner)		

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

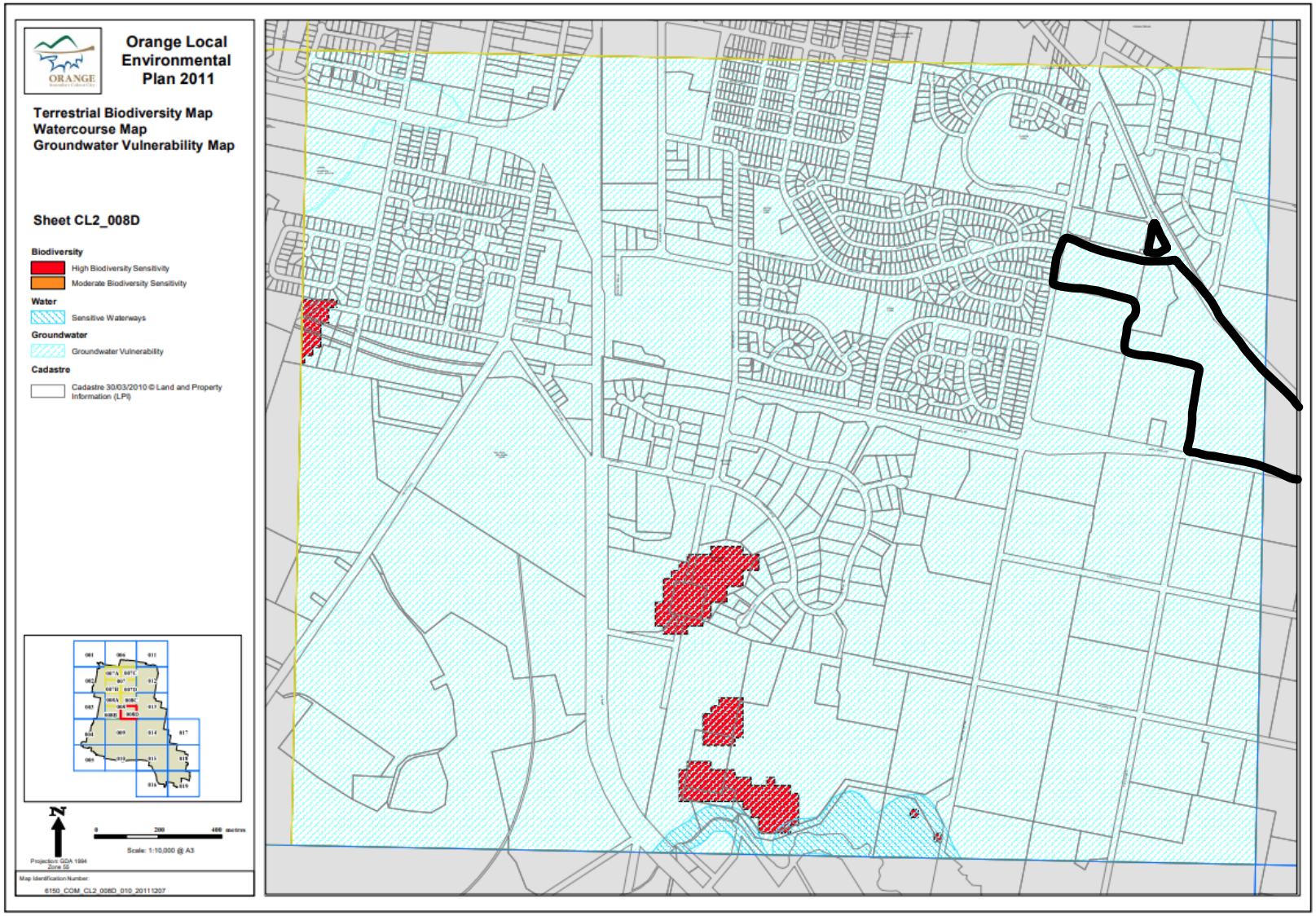
The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

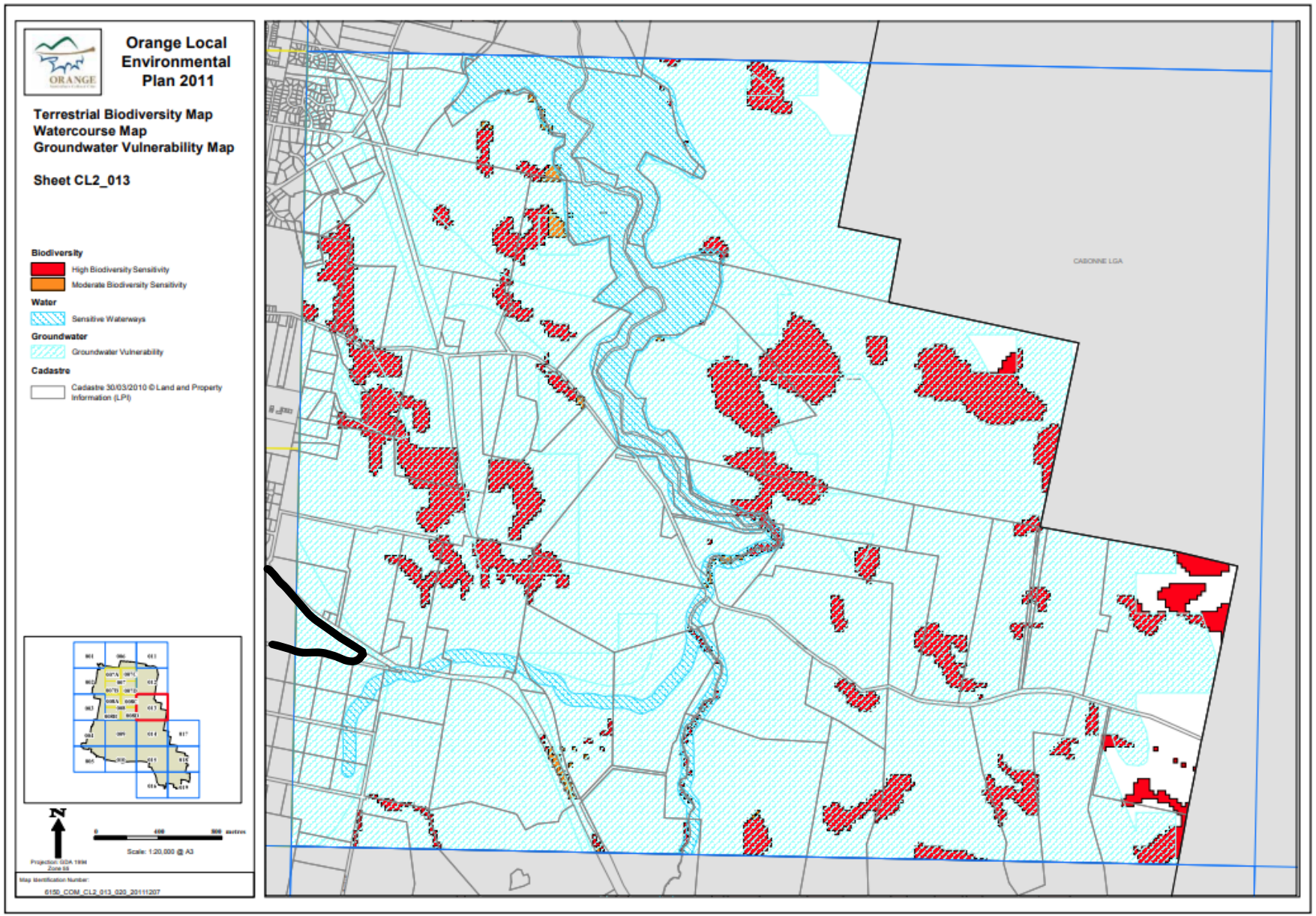
Please feel free to provide feedback via the Contact us page.

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111

Orange Local Environmental Plan 2011

Subject site is outlined in Black (continued overleaf).




Orange Local Environmental Plan 2011
Terrestrial Biodiversity Map
Watercourse Map
Groundwater Vulnerability Map
Sheet CL2_013
Biodiversity
High Biodiversity Sensitivity
Moderate Biodiversity Sensitivity
Water
Sensitive Waterways
Groundwater
Groundwater Vulnerability
Cadastre
Cadastre 30/03/2010 © Land and Property Information (LPI)
CABONNE LGA
N
Scale: 1:20,000 @ A3
Projection: GDA 1994 Zone 55
Map Identification Number:
6150_COM_CL2_013_020_20111207

BioNET Atlas search – threatened species predicted to occur within the Orange Subregion of the South Eastern Highlands Bioregion

Class	Scientific Name	Common Name	NSW status*	Comm. status+	Records‡
Actinopterygii	*Maccullochella macquariensis*	Trout Cod	E1,P		P
Actinopterygii	*Maccullochella peelii*	Murray Cod			P
Actinopterygii	*Macquaria australasica*	Macquarie Perch	E1,P		P
Amphibia	*Litoria aurea*	Green and Golden Bell Frog	E1,P	V	1
Amphibia	*Litoria booroolongensis*	Booroolong Frog	E1,P	E	P
Amphibia	*Litoria castanea*	Yellow-spotted Tree Frog	E4A,P	CE	1
Amphibia	*Litoria raniformis*	Southern Bell Frog	E1,P	V	P
Aves	*Anthochaera phrygia*	Regent Honeyeater	E4A,P,2	CE	1
Aves	*Aphelocephala leucopsis*	Southern Whiteface	V,P	V	4
Aves	*Apus pacificus*	Fork-tailed Swift	P	C,J,K	2
Aves	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V,P		186
Aves	*Botaurus poiciloptilus*	Australasian Bittern	E1,P	E	P
Aves	*Burhinus grallarius*	Bush Stone-curlew	E1,P		2
Aves	*Calidris acuminata*	Sharp-tailed Sandpiper	P	C,J,K	4
Aves	*Calidris ferruginea*	Curlew Sandpiper	E1,P	CE	P
Aves	*Callocephalon fimbriatum*	Gang-gang Cockatoo	V,P,3	E	14
Aves	*Calyptorhynchus lathami lathami*	South-eastern Glossy Black-Cockatoo	V,P	V	P
Aves	*Certhionyx variegatus*	Pied Honeyeater	V,P		3
Aves	*Chthonicola sagittata*	Speckled Warbler	V,P		12
Aves	*Circus assimilis*	Spotted Harrier	V,P		1
Aves	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P	V	40
Aves	*Daphoenositta chrysoptera*	Varied Sittella	V,P		36
Aves	*Epthianura albifrons*	White-fronted Chat	V,P		P
Aves	*Falco hypoleucos*	Grey Falcon	V,P	V	P
Aves	*Falco subniger*	Black Falcon	V,P		2
Aves	*Gallinago hardwickii*	Latham's Snipe	P	J,K	67
Aves	*Glossopsitta pusilla*	Little Lorikeet	V,P		6
Aves	*Grantiella picta*	Painted Honeyeater	V,P	V	4
Aves	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	V,P		9
Aves	*Hieraaetus morphnoides*	Little Eagle	V,P		35
Aves	*Hirundapus caudacutus*	White-throated Needletail	P	V,C,J,K	5
Aves	*Lathamus discolor*	Swift Parrot	E1,P	CE	1
Aves	*Leipoa ocellata*	Malleefowl	E1,P	V	P
Aves	*Limosa limosa*	Black-tailed Godwit	V,P	E,C,J,K	P
Aves	*Lophoictinia isura*	Square-tailed Kite	V,P,3		2
Aves	*Melanodryas cucullata cucullata*	South-eastern Hooded Robin	E1,P	E	5

Class	Scientific Name	Common Name	NSW status*	Comm. status+	Records‡
Aves	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V,P		3
Aves	*Neophema chrysostoma*	Blue-winged Parrot	V,P	V	P
Aves	*Neophema pulchella*	Turquoise Parrot	V,P,3		2
Aves	*Ninox connivens*	Barking Owl	V,P,3		4
Aves	*Ninox strenua*	Powerful Owl	V,P,3		7
Aves	*Oxyura australis*	Blue-billed Duck	V,P		43
Aves	*Petroica boodang*	Scarlet Robin	V,P		63
Aves	*Petroica phoenicea*	Flame Robin	V,P		56
Aves	*Polytelis swainsonii*	Superb Parrot	V,P,3	V	587
Aves	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V,P		2
Aves	*Pycnoptilus floccosus*	Pilotbird	P	V	P
Aves	*Rostratula australis*	Australian Painted Snipe	E1,P	E	P
Aves	*Stagonopleura guttata*	Diamond Firetail	V,P	V	24
Aves	*Stictonetta naevosa*	Freckled Duck	V,P		35
Flora	*Acacia meiantha*		E1	E	1312
Flora	*Ammobium craspedioides*	Yass Daisy	V,P	V	P
Flora	*Eucalyptus aggregata*	Black Gum	V	V	10
Flora	*Eucalyptus canobolensis*	Silver-Leaf Candlebark	E1	E	185
Flora	*Eucalyptus pulverulenta*	Silver-leaved Mountain Gum	V,P	V	P
Flora	*Eucalyptus robertsonii* subsp. *hemisphaerica*	Robertson's Peppermint	V	V	17
Flora	*Euphrasia arguta*		E4A,2	CE	P
Flora	*Isotoma fluviatilis* subsp. *fluviatilis*		3	X	2
Flora	*Leucochrysum albicans subsp. tricolor*	Hoary Sunray	E1	E	P
Flora	*Lepidium aschersonii*	Spiny Peppercress	V,P	V	P
Flora	*Lepidium hyssopifolium*	Basalt Pepper-cress	E1,P	E	P
Flora	*Prostanthera gilesii*		E4A,2	CE	2
Flora	*Swainsona recta*	Small Purple-pea	E1	E	1
Flora	*Thesium australe*	Austral Toadflax,	V,P	V	P
Insecta	*Keyacris scurra*	Key's Matchstick Grasshopper	E1	E	1
Insecta	*Synemon plana*	Golden Sun Moth	V,P	V	P
Mammalia	*Cercartetus nanus*	Eastern Pygmy-possum	V,P		P
Mammalia	*Chalinolobus dwyeri*	Large-eared Pied Bat	V,P	E	5
Mammalia	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E	7
Mammalia	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V,P		44
Mammalia	*Myotis macropus*	Southern Myotis	V,P		3
Mammalia	*Petauroides volans*	Southern Greater Glider	E1,P	E	57
Mammalia	*Petaurus australis*	Yellow-bellied Glider	V,P	V	1

Class	Scientific Name	Common Name	NSW status*	Comm. status+	Records‡
Mammalia	*Petaurus norfolcensis*	Squirrel Glider	V,P		21
Mammalia	*Phascogale tapoatafa*	Brush-tailed Phascogale	V,P		P
Mammalia	*Phascolarctos cinereus*	Koala	E1,P	E	90
Mammalia	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	39
Mammalia	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P		5
Reptilia	*Aprasia parapulchella*	Pink-tailed Legless Lizard	V,P	V	P
Reptilia	*Delma impar*	Striped Legless Lizard	V,P	V	P
Reptilia	*Tympanocryptis mccartneyi*	Bathurst Grassland Earless Dragon	E4A,2	CE	P
Reptilia	*Varanus rosenbergi*	Rosenberg's Goanna	V,P		1

***NSW Status:** P=Protected, V=Vulnerable, E1=Endangered, 2=Category 2 sensitive species, 3=Category 3 sensitive species.
+ Comm. Status: C=CAMBA, J=JAMBA, K=ROKAMBA, CE=Critically endangered, E=Endangered, V=Vulnerable

BioNET Atlas search – Threatened ecological communities predicted to occur within the Orange subregion of the South Eastern Highlands Bioregion.

Community	*NSW Status	+Common. status	Records
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia		E	K
Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion	E4B		K
Mt Canobolas *Xanthoparmelia* Lichen Community	E3		K
Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	E3		K
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion		E	K
Werriwa Tablelands Cool Temperate Grassy Woodland in the South Eastern Highlands and South East Corner Bioregions	E4B		K
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	E4B		K
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		CE	K

***NSW Status:** P=Protected, P13=Protected native plant, V=Vulnerable, E1=Endangered, E2=Endangered population, E4=Extinct, E4A=Critically endangered, 2=Category 2 sensitive species, 3=Category 3 sensitive species.
+Comm. Status: C=CAMBA, J=JAMBA, K=ROKAMBA, CE=Critically endangered, E=Endangered, V=Vulnerable.
- Number of Records: P = predicted to occur, K = known to occur.

BioNET Atlas search – Key Threatening Processes predicted to occur within the Orange subregion of the South Eastern Highlands Bioregion.

Threats	NSW Status	Comm Status
Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners, *Manorina melanocephala* (Latham, 1802)	KTP	KTP
Alteration of habitat following subsidence due to longwall mining	KTP	
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	KTP	
Anthropogenic Climate Change	KTP	KTP
Bushrock removal	KTP	
Clearing of native vegetation	KTP	KTP
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)	KTP	KTP
Competition and habitat degradation by Feral Goats, *Capra hircus* Linnaeus 1758	KTP	KTP
Competition from feral honey bees, *Apis mellifera* L.	KTP	
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	KTP	
Habitat degradation and loss by Feral Horses (brumbies, wild horses), Equus caballus Linnaeus 1758	KTP	
Herbivory and environmental degradation caused by feral deer	KTP	
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	KTP	
Importation of Red Imported Fire Ants *Solenopsis invicta* Buren 1972	KTP	KTP
Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	KTP	KTP
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	KTP	KTP
Infection of native plants by *Phytophthora cinnamomi*	KTP	KTP
Introduction of the Large Earth Bumblebee *Bombus terrestris* (L.)	KTP	
Invasion and establishment of exotic vines and scramblers	KTP	
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)	KTP	
Invasion and establishment of the Cane Toad (*Bufo marinus*)	KTP	KTP
Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata* (Wall. ex G. Don) Cif.	KTP	
Invasion of native plant communities by *Chrysanthemoides monilifera*	KTP	
Invasion of native plant communities by exotic perennial grasses	KTP	
Invasion of the Yellow Crazy Ant, *Anoplolepis gracilipes* (Fr. Smith) into NSW	KTP	
Invasion, establishment and spread of Lantana (*Lantana camara* L. sens. Lat)	KTP	
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	KTP	KTP
Loss of Hollow-bearing Trees	KTP	
Loss or degradation (or both) of sites used for hill-topping by butterflies	KTP	
Predation and hybridisation by Feral Dogs, *Canis lupus familiaris*	KTP	

Threats	NSW Status	Comm Status
Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or Mosquito Fish)	KTP	
Predation by the European Red Fox *Vulpes Vulpes* (Linnaeus, 1758)	KTP	KTP
Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)	KTP	KTP
Predation, habitat degradation, competition and disease transmission by Feral Pigs, *Sus scrofa* Linnaeus 1758	KTP	KTP
Removal of dead wood and dead trees	KTP	

APPENDIX B – FIELD SURVEY RESULTS

Flora species list

The following table lists all 63 flora species recorded within, or immediately adjacent to the subject site. Of these, 20 (31.75%) were native and 43 (68.25%) were introduced.

Growth form[1]	Family	Scientific name	Common Name	Status[2]	HTE[3]	WoNS[4]	PW[5]
FG	Asphodelaceae	*Dianella longifolia*	Blueberry Lily	N	-	-	-
FG	Asteraceae	*Carthamus lanatus*	Saffron thistle	I	Yes	No	No
FG	Asteraceae	*Centaurea calcitrapa*	Star Thistle	I	No	No	No
FG	Asteraceae	*Chondrilla juncea*	Skeleton Weed	I	No	No	No
FG	Asteraceae	*Cichorium intybus*	Chicory	I	No	No	No
FG	Asteraceae	*Cirsium vulgare*	Spear Thistle	I	No	No	No
FG	Asteraceae	*Conyza sumatrensis*	Tall fleabane	I	No	No	No
FG	Asteraceae	*Hypochaeris radicata*	Catsear	I	No	No	No
FG	Asteraceae	*Senecio quadridentatus*	Cotton Fireweed	N	-	-	-
FG	Asteraceae	*Sonchus asper*	Prickly Sowthistle	I	No	No	No
FG	Asteraceae	*Taraxacum officinale*	Dandelion	I	No	No	No
FG	Asteraceae	*Xanthium spinosum*	Bathurst Burr	I	Yes	No	No
FG	Boraginaceae	*Echium plantagineum*	Patterson's Curse	I	No	No	No
FG	Boraginaceae	*Echium vulgare*	Viper's Bugloss	I	No	No	No
FG	Brassicaceae	*Brassica* sp.		I	No	No	No
FG	Clusiaceae	*Hypericum gramineum*	Small St John's Wort	N	-	-	-
FG	Clusiaceae	*Hypericum perforatum*	St. Johns Wort	I	Yes	No	Yes
FG	Cyperaceae	*Carex appressa*	Tall Sedge	N	-	-	-
FG	Cyperaceae	*Carex inversa*	Knob Sedge	N	-	-	-

Growth form[1]	Family	Scientific name	Common Name	Status[2]	HTE[3]	WoNS[4]	PW[5]
FG	Cyperaceae	*Fimbristylis* sp.	Fringe Sedge	N	-	-	-
GG	Cyperaceae	*Schoenus apogon*	Fluke Bogrush	N	-	-	-
FG	Fabaceae (Faboideae)	*Trifolium angustifolium*	Narrow-leaved Clover	I	No	No	No
FG	Fabaceae (Faboideae)	*Trifolium arvense*	Haresfoot Clover	I	No	No	No
FG	Fabaceae (Faboideae)	*Trifolium glomeratum*	Clustered Clover	I	No	No	No
FG	Fabaceae (Faboideae)	*Trifolium repens*	White Clover	I	No	No	No
FG	Fabaceae (Faboideae)	*Vicia sativa*	Common vetch	I	No	No	No
TG	Fagaceae	*Quercus robur*	English Oak	I	No	No	No
FG	Gentianaceae	*Centaurium erythraea*	Common Centaury	I	No	No	No
FG	Geraniaceae	*Geranium solanderi*	Native Geranium	N	-	-	-
FG	Haloragaceae	*Gonocarpus tetragynus*	Poverty Raspwort	N	-	-	-
FG	Juncaceae	*Juncus* sp		N	-	-	-
FG	Lamiaceae	*Salvia verbenaca*	Vervain	I	No	No	No
TG	Malaceae	*Brachychiton populneus*	Kurrajong	N	-	-	-
SG	Malaceae	*Crataegus monogyna*	Hawthorn	I	Yes	No	No
FG	Malaceae	*Modiola caroliniana*	Red Flowered Mallow	I	No	No	No
TG	Moraceae	*Ficus carica*	Fig	I	No	No	No
TG	Myrtaceae	*Eucalyptus bridgesiana*	Apple Box	N	-	-	-
FG	Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	I	No	No	No
GG	Poaceae	*Agrostis viridis*	Water Bent	I	No	No	No
GG	Poaceae	*Bothriochloa macra*	Red Grass	N	-	-	-
GG	Poaceae	*Bromus catharticus*	Prairie Grass	I	No	No	No
GG	Poaceae	*Cynodon dactylon*	Common Couch	N	-	-	-
GG	Poaceae	*Dactylis glomerata*	Cocksfoot	I	No	No	No
GG	Poaceae	*Eleusine tristachya*	Goose Grass	I	No	No	No

Growth form[1]	Family	Scientific name	Common Name	Status[2]	HTE[3]	WoNS[4]	PW[5]
GG	Poaceae	*Eragrostis leptostachya*	Paddock Lovegrass	N	-	-	-
GG	Poaceae	*Holcus lanatus*	Yorkshire Fog	I	No	No	No
GG	Poaceae	*Lolium perenne*	Perennial Ryegrass	I	No	No	No
GG	Poaceae	*Paspalum dilatatum*		I	Yes	No	No
GG	Poaceae	*Paspalum distichum*	Water Couch	N	-	-	-
GG	Poaceae	*Phalaris aquatica*	Phalaris	I	No	No	No
GG	Poaceae	*Poa labillardierei*	Tussock	N	-	-	-
GG	Poaceae	*Setaria parviflora*	Pigeon Grass	I	No	No	No
GG	Poaceae	*Sporobolus creber*	Slender Rat's Tail Grass	N	-	-	-
FG	Polygonaceae	*Polygonum aviculare*	Wireweed	I	No	No	No
FG	Polygonaceae	*Rumex brownii*	Swamp Dock	N	-	-	-
FG	Polygonaceae	*Rumex crispus*	Curled Dock	I	No	No	No
SG	Rosaceae	*Rosa rubiginosa*	Sweet Briar	I	Yes	No	No
SG	Rosaceae	*Rubus fruticosus*	Blackberry complex	I	Yes	Yes	Yes
TG	Salicaceae	*Populus simonii*	Chinese cottonwood (planted)	I	No	No	No
TG	Salicaceae	*Populus nigra*	Green poplar	I	Yes	No	No
TG	Salicaceae	*Salix fragilis*	Crack Willow	I	Yes	Yes	No
GG	Typhaceae	*Typha orientalis*	Broad-leaved Cumbungi	N	-	-	-
FG	Verbenaceae	*Verbena bonariensis*	Purpletop	I	No	No	No

[1]Growth form: FG = Forb, GG = Grass and Grass-like, SG = Shrub, TG = Tree, EG = Fern, OG = Other. [2]Status: N = Native, I = Introduced. [3]High-threat exotic species (Yes/No). [4]Weed of National Significance (Yes/No). [5]Priority weed for the region (Yes/No).

Fauna species list

In total, eight fauna species (all native) were recorded within or immediately adjacent to the subject site. A list of all fauna species encountered is provided below.

Class	Scientific Name	Common Name
Aves	*Cisticola exilis*	Golden-headed Cisticola
Aves	*Grallina cyanoleuca*	Magpie Lark
Aves	*Gymnorhina tibicen*	Australian Magpie
Aves	*Hirundo neoxena*	Welcome Swallow
Aves	*Lichenostomus penicillatus*	White-plumed Honeyeater
Aves	*Malurus cyaneus*	Superb Fairy Wren
Aves	*Platycerus eximius*	Eastern Rosella
Aves	*Psephotus haematonotus*	Red-rumped Parrot

APPENDIX C – LIKELIHOOD OF OCCURRENCE FOR BC & EPBC ACT-LISTED THREATENED SPECIES

The results of the desktop review and the field assessment were collated and reviewed in the context of local ecological knowledge to determine the likelihood of occurrence of threatened species and ecological communities, and potential impacts of the proposal. List generated by conducting a vegetation association within the relevant IBRA subregions. To determine whether any threatened species were known to occur near the subject site, BioNet Atlas records of threatened species were downloaded and the records clipped to within 10 km of the subject site in QGIS.

Likelihood of occurrence description is sourced from https://www.environment.nsw.gov.au/threatenedSpeciesApp

The likelihood of occurrence of threatened species, populations or ecological communities was categorised as follows:

- 'Present' – the species was observed or has been previously recorded on the site.
- 'High' – a medium to high probability that a species uses the site, based on nearby records and suitable habitat being present.
- 'Moderate' – suitable habitat for a species occurs on the site, but the species has not been observed or previously recorded at the site ***or*** habitat not ideal, but there are nearby records.
- 'Low' – a very low likelihood that the species uses the site, based on lack of the preferred type and size of habitat.

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
Maccullochella macquariensis	Trout Cod	E1,P		0	Trout Cod tend to occupy areas which have lots of large in-stream woody debris or 'snags', which provide complex habitats for each stage of the species' life cycle. They form pairs and spawn during spring and early summer when the water temperature is around 15ºC. Females produce 1,200 – 11,000 adhesive eggs (2.5 – 3.6 mm in diameter) that attach to hard substrates and are guarded by the male. **Absent – No ideal habitat features (waterways) are present within the subject site.**
Maccullochella peelii	Murray Cod			0	The Murray Cod is a moderately elongate, deep-bodied fish. It has a concave snout profile, a large mouth and small eyes. This species is olive to cream or yellowish with a reticulated pattern of green markings on the back and sides. It is white to cream below. The median fins are dusky

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					with white margins. The pelvic fins are white. This fish is endemic to Australia, occurring in freshwaters of the Murray-Darling River drainage in Queensland, New South Wales, Victoria and South Australia. There are also erroneous reports from the Dawson-Fitzroy drainage. It preys on fishes, molluscs, turtles and some small terrestrial animals such as birds, mammals and snakes. **Absent – No ideal habitat features (waterways) are present within the subject site.**
Macquaria australasica	Macquarie Perch	E1,P		0	Macquarie Perch are found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury/Nepean and Shoalhaven catchments. The conservation status of the different populations is not well known, but there have been long-term declines in their abundance. Macquarie Perch numbers have declined in Victoria, and the species is now restricted to a small number of fragmented populations mostly in cool, rocky, fast flowing streams in relatively undisturbed upland catchments, such as King Parrot Creek in the in the Goulburn Broken Catchment in northern Victoria. A self-sustaining population also exists in the Yarra River from fish translocated in the 1920s. **Absent – No ideal habitat features (waterways) are present within the subject site.**
Litoria aurea	Green and Golden Bell Frog	E1,P	V	0	Formerly distributed from the NSW north coast near Brunswick Heads, southwards along the NSW coast to Victoria where it extends into east Gippsland. Records from west to Bathurst, Tumut and the ACT region. Since 1990 there have been approximately 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. These locations occur over the species' former range, however they are widely separated and isolated. Large populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast (one an island population). There is only one known population on the NSW Southern Tablelands. 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. **Absent – Subject Site is outside known species distribution**
Litoria booroolongensis	Booroolong Frog	E1,P	E	0	The Booroolong Frog is restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. It has disappeared from much of the Northern Tablelands, however several populations have recently been recorded in the Namoi

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					catchment. The species is rare throughout most of the remainder of its range. Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. **Moderate – Subject site within predicted species distribution, associated PCT (3387) present, and no records within 10km.**
Litoria castanea	Yellow-spotted Tree Frog	E4A,P	CE	0	Historically, this species occurred in two separate highland ranges: on the New England Tableland, and on the southern and central tablelands from Bathurst to Bombala. Following the chytrid virus pandemic in the 1970s, this species went unrecorded for 30 years and was believed to be extinct, until it was rediscovered in 2009 on the Southern Tablelands. This population - near Yass - remains the only known extant site of the species. Require large permanent ponds or slow flowing 'chain-of-ponds' streams with abundant emergent vegetation such as bulrushes and aquatic vegetation. **Moderate – Subject site within predicted species distribution, associated PCT (3387) present, and no records within 10km.**
Litoria raniformis	Southern Bell Frog	E1,P	V	0	In NSW the species was once distributed along the Murray and Murrumbidgee Rivers and their tributaries, the southern slopes of the Monaro district and the central southern tablelands as far north as Tarana, near Bathurst. Currently, the species is known to exist only in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. A few yet unconfirmed records have also been made in the Murray Irrigation Area in recent years. The species is also found in Victoria, Tasmania and South Australia, where it has also become endangered. Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat. **Absent – Subject Site is outside known species distribution**
Anthochaera phrygia	Regent Honeyeater	E4A,P,2	CE	0	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

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					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. 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. **Moderate – Subject site within predicted species distribution, associated PCT (3387) present, and no records within 10km.**
Aphelocephala leucopsis	Southern Whiteface	V,P	V	1	Prefers the drier habitats of southern Australia. Commonly found in dry open forests and woodland, mallee, mulga and saltbush. Prefers sites with fallen timber or dead trees and stumps **High – Subject site within predicted species distribution, no associated PCT present, and records within 10km.**
Apus pacificus	Fork-tailed Swift	P	C,J,K	2	In NSW, the Fork-tailed Swift is recorded in all regions. Many records occur east of the Great Divide; however, a few populations have been found west of the Great Divide. These are widespread but scattered further west of the line joining Bourke and Dareton. Sightings have been recorded at Milparinka, the Bulloo River and Thurloo Downs (Higgins 1999). The Fork-tailed Swift is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher. **Moderate – Subject site within predicted species distribution, associated PCT (3387) present, and no records within 10km.**
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V,P		109	Dusky woodswallows are widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					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. **High – Subject site within predicted species distribution, associated PCT (3387) present, and records within 10km.**
Botaurus poiciloptilus	Australasian Bittern	E1,P	E	0	Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. 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. Feeding platforms may be constructed over deeper water from reeds trampled by the bird; platforms are often littered with prey remains. Breeding occurs in summer from October to January; nests are built in secluded places in densely-vegetated wetlands on a platform of reeds; there are usually six olive-brown eggs to a clutch. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Burhinus grallarius	Bush Stone-curlew	E1,P		0	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range. Inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber. Largely nocturnal, being especially active on moonlit nights. Feed on insects and small vertebrates, such as frogs, lizards and snakes. Nest on the ground in a scrape or small bare patch. Two eggs are laid in spring and early summer. **Moderate – Subject site within predicted species distribution, associated PCT (3387) present, and no records within 10km.**
Calidris acuminata	Sharp-tailed Sandpiper	P	C,J,K	4	The Sharp-tailed Sandpiper spends the non-breeding season in Australia with small numbers occurring regularly in New Zealand. Most of the population migrates to Australia, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. Many inland records are of birds on passage. 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,

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					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. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. They may be attracted to mats of algae and water weed either floating or washed up around terrestrial wetlands. **Moderate – Subject site within species distribution, no associated PCTs present, and records within 10km.**
Calidris ferruginea	Curlew Sandpiper	E1,P	CE	0	In Australia, Curlew Sandpipers occur around the coasts and are also quite widespread inland, though in smaller numbers. Records occur in all states during the non-breeding period, and also during the breeding season when many non-breeding one-year old birds remain in Australia rather than migrating north. In NSW, they are widespread east of the Great Divide, especially in coastal regions. They are occasionally recorded in the Tablelands and are widespread in the Riverina and south-west NSW, with scattered records elsewhere. Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters. **Absent – Subject Site is outside known species distribution**
Callocephalon fimbriatum	Gang-gang Cockatoo	V,P,3	E	0	The Gang-gang Cockatoo is distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. It is rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee. In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests.

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					Low – Subject site within species distribution, associated PCTs present, and no records within 10km, however subject site lacks preferred vegetation, old growth forests.
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V,P	V	0	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. 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. **Low – Subject site within species distribution, associated PCTs present (3387), and no records within 10km, however subject site lacks preferred feed trees, *Casuarina* and *Allocasuarina* species,**
Certhionyx variegatus	Pied Honeyeater	V,P		2	Pied Honeyeater is widespread throughout acacia, mallee and spinifex scrubs of arid and semi-arid Australia. Occasionally occurs further east, on the slopes and plains and the Hunter Valley, typically during periods of drought. Inhabits wattle shrub, primarily Mulga (Acacia aneura), mallee, spinifex and eucalypt woodlands, usually when shrubs are flowering; feeds on nectar, predominantly from various species of emu-bushes (Eremophila spp.); also from mistletoes and various other shrubs (e.g. *Grevillea* spp.); also eats saltbush fruit, berries, seed, flowers and insects. Highly nomadic, following the erratic flowering of shrubs; can be locally common at times. **Low – Subject site within species distribution, no associated PCTs present, and two records within 10km, both from 2002. However subject site lacks required habitat features, including any stick nests and native shrubs**
Chthonicola sagittata	Speckled Warbler	V,P		6	The Speckled Warbler has a patchy distribution throughout south-eastern Queensland, the eastern half of NSW and into Victoria, as far west as the Grampians. The species is most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast. There has been a decline in population density throughout its range, with the decline exceeding 40% where no vegetation remnants larger than 100ha survive. 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. The diet consists of seeds and insects,

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					with most foraging taking place on the ground around tussocks and under bushes and trees. Pairs are sedentary and occupy a breeding territory of about ten hectares, with a slightly larger home-range when not breeding. The rounded, domed, roughly built nest of dry grass and strips of bark is located in a slight hollow in the ground or the base of a low dense plant, often among fallen branches and other litter. A side entrance allows the bird to walk directly inside. A clutch of 3-4 eggs is laid, between August and January, and both parents feed the nestlings. The eggs are a glossy red-brown, giving rise to the unusual folk names 'Blood Tit' and 'Chocolatebird'. Some cooperative breeding occurs. The species may act as host to the Black-eared Cuckoo. Speckled Warblers often join mixed species feeding flocks in winter, with other species such as Yellow-rumped, Buff-rumped, Brown and Striated Thornbills. **High – Subject site within species distribution, associated PCTs present (3387) and records within 10km.**
Circus assimilis	Spotted Harrier	V,P		0	The Spotted Harrier occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population. 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. **Moderate – Subject site within predicted species distribution, associated PCT (3387) present, and no records within 10km.**
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V,P	V	17	The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. The western boundary of the range of *Climacteris picumnus victoriae* runs approximately through Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell and along this line the subspecies intergrades with the arid zone subspecies of Brown Treecreeper *Climacteris picumnus picumnus* which then occupies the remaining parts of the state. The eastern subspecies lives in eastern NSW in eucalypt woodlands through central NSW and in coastal areas with drier open woodlands such as the Snowy River Valley, Cumberland Plains, Hunter Valley and parts of the Richmond and Clarence Valleys. The population density of this subspecies has been greatly reduced over much of its range, with major declines recorded in central NSW and the northern and southern tablelands. Declines have occurred in remnant

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					vegetation fragments smaller than 300 hectares, that have been isolated or fragmented for more than 50 years. **High – Subject site within species distribution, associated PCTs present (3387) and records within 10km.**
Daphoenositta chrysoptera	Varied Sittella	V,P		6	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. The Varied Sittella's population size in NSW is uncertain but is believed to have undergone a moderate reduction over the past several decades. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. **High – Subject site within species distribution, associated PCTs present (3387) and records within 10km**.
Epthianura albifrons	White-fronted Chat	V,P		0	The White-fronted Chat is found across the southern half of Australia, from southernmost Queensland to southern Tasmania, and across to Western Australia as far north as Carnarvon. Found mostly in temperate to arid climates and very rarely sub-tropical areas, it occupies foothills and lowlands up to 1000 m above sea level. In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Falco hypoleucos	Grey Falcon	V,P	V	0	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW. 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.

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					Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.
Falco subniger	Black Falcon	V,P		0	The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. Some reports of 'Black Falcons' on the tablelands and coast of New South Wales are likely to be referable to the Brown Falcon. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly travelling hundreds of kilometres. The Black Falcon occurs as solitary individuals, in pairs, or in family groups of parents and offspring. **Moderate – Subject site within predicted species distribution, associated PCT (3387) present, and no records within 10km.**
Gallinago hardwickii	Latham's Snipe	P	J,K	62	Latham's Snipe is a non-breeding visitor to south-eastern Australia and is a passage migrant through northern Australia (i.e. it travels through northern Australia to reach non-breeding areas located further south). The species has been recorded along the east coast of Australia from Cape York Peninsula through to south-eastern South Australia (including the Adelaide plains and Mount Lofty Ranges, and the Eyre Peninsula). The range extends inland over the eastern tablelands in south-eastern Queensland (and occasionally from Rockhampton in the north), and to west of the Great Dividing Range in New South. The species is widespread in Tasmania and is found in all regions of Victoria except for the north-west. Most birds spend the non-breeding period at sites located south of the Richmond River in New South Wales. 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. **Moderate – Subject site within predicted species distribution, no associated PCT present, and records within 10km.**
Glossopsitta pusilla	Little Lorikeet	V,P		2	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

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					much of the year and 'locally nomadic' movements are suspected of breeding pairs. 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. **High – Subject site within species distribution, associated PCTs present (3387) and records within 10km.**
Grantiella picta	Painted Honeyeater	V,P	V	0	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Haliaeetus leucogaster	White-bellied Sea-Eagle	V,P		4	The White-bellied Sea-eagle is distributed around the Australian coastline, including Tasmania, and well inland along rivers and wetlands of the Murray Darling Basin. In New South Wales it is widespread along the east coast, and along all major inland rivers and waterways. 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. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass. Feed mainly on fish and freshwater turtles, but also waterbirds, reptiles, mammals and carrion. Hunts its prey from a perch or whilst in flight (by circling slowly, or by sailing along 10–20 m above the shore). Prey is usually carried to a feeding platform or (if small) consumed in flight, but some items are eaten on the ground. May be solitary, or live in pairs or small family groups consisting of a pair of adults and dependent

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					young. Typically lays two eggs between June and September with young birds remaining in the nest for 65-70 days. **High – Subject site within species distribution, associated PCTs present (3387) and records within 10km.**
Hieraaetus morphnoides	Little Eagle	V,P		2	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. **High – Subject site within species distribution, associated PCTs present (3387) and records within 10km.**
Hirundapus caudacutus	White-throated Needletail	P	V,C,J,K	0	The White-throated Needletail is widespread in eastern and south-eastern. In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable, but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitat, they are probably 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. **Moderate – Subject site within predicted species distribution, associated PCT (3387) present, and no records within 10km.**
Lathamus discolor	Swift Parrot	E1,P	CE	1	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. 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*.

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					High – Subject site within species distribution, associated PCTs present (3387) and records within 10km.
Leipoa ocellata	Malleefowl	E1,P	V	0	The stronghold for this species in NSW is the mallee in the south west centred on Mallee Cliffs NP and extending east to near Balranald and scattered records as far north as Mungo NP. West of the Darling River a population also occurs in the Scotia mallee including Tarawi NR and Scotia Sanctuary and is part of a larger population north of the Murray River in South Australia. The population in central NSW has been significantly reduced through land clearance and fox predation and now occurs chiefly in Yathong, Nombinnie and Round Hill NRs and surrounding areas, though birds continue to survive in Loughnan NR. To the south of this area the species is probably locally extinct in such reserves as Pulletop NR (last recorded 1989), Ingalba NR (1982) and Buddigower NR (1990) and the intensely studied population at Yalgogrin was still known to have at least one active mound in 2017. Further east, a population continues to persist in the Goonoo forest near Dubbo, though the size of this population is unknown. Outside these areas, occasional records have been made in the Pilliga forests (most recently 1999), around Cobar (1991) and Goulburn River NP (1989) though the extent and status of populations in these areas are unknown. Predominantly inhabit mallee communities, preferring the tall, dense and floristically rich mallee found in higher rainfall (300 - 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Limosa limosa	Black-tailed Godwit	V,P	E,C,J,K	0	The Black-tailed Godwit is a migratory wading bird that breeds in Mongolia and Eastern Siberia and flies to Australia for the southern summer, arriving in August and leaving in March. In NSW, it is most frequently recorded at Kooragang Island (Hunter River estuary), with occasional records elsewhere along the coast, and inland. Records in western NSW indicate that a regular inland passage is used by the species, as it may occur around any of the large lakes in the western areas during summer, when the muddy shores are exposed. The species has been recorded within the Murray-Darling Basin, on the western slopes of the Northern Tablelands and in the far north-western corner of the state. Primarily a coastal species.

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					Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.
Lophoictinia isura	Square-tailed Kite	V,P,3		0	The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW and Victoria. In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. **Moderate – Subject site within predicted species distribution, associated PCT (3387) present, and no records within 10km.**
Melanodryas cucullata cucullata	South-eastern Hooded Robin	E1,P	E	2	The Hooded Robin is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. However, it is common in few places, and rarely found on the coast. It is considered a sedentary species, but local seasonal movements are possible. The south-eastern form (subspecies *cucullata*) is found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies *picata*. Two other subspecies occur outside NSW. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. **Moderate – Subject site within predicted species distribution, no associated PCT present, and records within 10km.**
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V,P		1	The Black-chinned Honeyeater has two subspecies, with only the nominate (*gularis*) occurring in NSW. he eastern subspecies extends south from central Queensland, through NSW, Victoria into south eastern South Australia, though it is very rare in the last state. In NSW it is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. 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

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees. A gregarious species usually seen in pairs and small groups of up to 12 birds. Feeding territories are large making the species locally nomadic. Recent studies have found that the Black-chinned Honeyeater tends to occur in the largest woodland patches in the landscape as birds forage over large home ranges of at least 5 hectares. Moves quickly from tree to tree, foraging rapidly along outer twigs, underside of branches and trunks, probing for insects. Nectar is taken from flowers, and honeydew is gleaned from foliage. Breeds solitarily or co-operatively, with up to five or six adults, from June to December. The nest is placed high in the crown of a tree, in the uppermost lateral branches, hidden by foliage. It is a compact, suspended, cup-shaped nest. **Low – Subject site within species distribution, no associated PCTs present, and only one records within 10km. Subject site lacks ideal tree species and is not connected to a large woodland patch.**
Neophema chrysostoma	Blue-winged Parrot	V,P	V	0	Blue-winged Parrots occur in range of habitats from coastal to semi-arid and favour grasslands and grassy woodlands. Mainly found in Tasmania and Victoria but some populations can be found in Western NSW and Eastern SA. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Neophema pulchella	Turquoise Parrot	V,P,3		1	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. **Low – Subject site within species distribution, no associated PCTs present, and only one record 9 km from the subject site in 2009.**
Ninox connivens	Barking Owl	V,P,3		2	The Barking Owl is found throughout continental Australia except for the central arid regions. Although common in parts of northern Australia, the species has declined greatly in southern Australia and now occurs in a wide but sparse distribution in NSW. Core populations exist on the western slopes and plains and in some northeast coastal and escarpment forests. Many populations crashed as woodland on fertile soils was cleared over the past century, leaving linear riparian strips of remnant trees as the last inhabitable areas. Surveys in 2001 demonstrated that the Pilliga Forest supported the largest population in southern Australia. The owls sometimes extend their home range into urban areas, hunting birds in garden trees and insects attracted to

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					streetlights. Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey on these fertile riparian soils. **High – Subject site within species distribution, associated PCTs present (3387) and records within 10km.**
Ninox strenua	Powerful Owl	V,P,3		0	The Powerful Owl is endemic to eastern and south-eastern Australia, mainly on the coastal side of the Great Dividing Range from Mackay to south-western Victoria. In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains suggesting occupancy prior to land clearing. Now at low densities throughout most of its eastern range, rare along the Murray River and former inland populations may never recover. 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. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old. While the female and young are in the nest hollow the male Powerful Owl roosts nearby (10-200 m) guarding them, often choosing a dense "grove" of trees that provide concealment from other birds that harass him. **Moderate – Subject site within predicted species distribution, associated PCT (3387) present, and no records within 10km.**
Oxyura australis	Blue-billed Duck	V,P		42	The Blue-billed Duck is endemic to south-eastern and south-western Australia. It is widespread in NSW, but most common in the southern Murray-Darling Basin area. Birds disperse during the breeding season to deep swamps up to 300 km away. It is generally only during summer or in drier years that they are seen in coastal areas. The Blue-billed Duck prefers deep water in large

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. **High – Subject site within species distribution, associated PCTs present (3387) and records within 10km.**
Petroica boodang	Scarlet Robin	V,P		10	The Scarlet Robin is found from south east Queensland to south east South Australia and also in Tasmania and south west Western Australia. In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter. 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. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat. The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude. The Scarlet Robin is primarily a resident in forests and woodlands, but some adults and young birds disperse to more open habitats after breeding. In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees. The Scarlet Robin is a quiet and unobtrusive species which is often quite tame and easily approached. Birds forage from low perches, fenceposts or on the ground, from where they pounce on small insects and other invertebrates which are taken from the ground, or off tree trunks and logs; they sometimes forage in the shrub or canopy layer. **High – Subject site within species distribution, associated PCTs present (3387) and records within 10km.**
Petroica phoenicea	Flame Robin	V,P		7	The Flame Robin is endemic to south eastern Australia, and ranges from near the Queensland border to south east South Australia and also in Tasmania. In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains. It is likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. Prefers clearings

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					or areas with open understoreys. In winter, birds migrate to drier more open habitats in the lowlands (i.e. valleys below the ranges, and to the western slopes and plains), in dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees. **High – Subject site within species distribution, associated PCTs present (3387) and records within 10km.**
Polytelis swainsonii	Superb Parrot	V,P,3	V	314	The Superb Parrot is found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the upper Namoi and Gwydir Rivers. The other main breeding sites are in the Riverina along the corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. This species inhabits Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. May forage up to 10 km from nesting sites, and feed in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants. **High – Subject site within species distribution, associated PCTs present (3387) and records within 10km.**
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V,P		0	The eastern subspecies (temporalis) occurs from Cape York south through Queensland, NSW and Victoria and formerly to the south east of South Australia. This subspecies also occurs in the Trans-Fly Region in southern New Guinea. In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions. Lives in family groups that consist of a breeding pair and young from previous breeding seasons. A group may consist of up to fifteen individuals. Feed on invertebrates and nests in several conspicuous, dome-shaped stick structures that are about the size of a football. A nest is used as a dormitory for

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					roosting each night. Nests are maintained year-round, and old nests are often dismantled to build new ones. **Moderate – Subject site within predicted species distribution, associated PCT (3387) present, and no records within 10km.**
Pycnoptilus floccosus	Pilotbird	P	V	0	Pilotbirds are endemic to south-east Australia, can occur above 600 m in the Brindabella Ranges in the Australian Capital Territory, and in the Snowy Mountains throughout New South Wales and north-east Victoria. Also occur in forests in the Blue Mountains and around the wetter forests of eastern Australia, to Dandenong near Melbourne. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Rostratula australis	Australian Painted Snipe	E1,P	E	0	The Australian Painted Snipe is restricted to Australia. Most records are from the south east, particularly the Murray Darling Basin, with scattered records across northern Australia and historical records from around the Perth region in Western Australia. In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. 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. Forages nocturnally on mud-flats and in shallow water. Feeds on worms, molluscs, insects and some plant-matter. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km**
Stagonopleura guttata	Diamond Firetail	V,P	V	10	The Diamond Firetail is endemic to south-eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia. It is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina. Not commonly found in coastal districts, though there are records from near Sydney, the Hunter Valley and the Bega Valley. This species has a scattered distribution over the rest of NSW, though is very rare west of the Darling River. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					pauciflora Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. **High – Subject site within species distribution, associated PCTs present (3387), and records within 10km**
Stictonetta naevosa	Freckled Duck	V,P		34	The Freckled Duck is found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. It breeds in large temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system, particularly along the Paroo and Lachlan Rivers, and other rivers within the Riverina. The duck is forced to disperse during extensive inland droughts when wetlands in the Murray River basin provide important habitat. The species may also occur as far as coastal NSW and Victoria during such times. 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. Nesting usually occurs between October and December but can take place at other times when conditions are favourable. Nests are usually located in dense vegetation at or near water level. **Moderate – Subject site within species distribution, no associated PCTs present, and records within 10km.**
Acacia meiantha		E1	E	0	The species is found in three disjunct populations, all within the Central Tablelands and within 100kms of each other. These populations include Clarence, which covers an area of approximately 1 hectare; Mullions Range, covering approximately 5 hectares; and Aarons Pass, which is confined to 2.5km of road easements. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km**
Ammobium craspedioides	Yass Daisy	V,P	V	0	Found from near Crookwell on the Southern Tablelands to near Wagga Wagga on the South Western Slopes. Most populations are in the Yass region. Found in moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities. Grows in association with a large range of eucalypts (E*ucalyptus blakelyi, E.*

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					bridgesiana, E. dives, E. goniocalyx, E. macrorhyncha, E. mannifera, E. melliodora, E. polyanthemos, E. rubida). **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km**
Eucalyptus aggregata	Black Gum	V	V	4	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. Black Gum has a moderately narrow distribution, occurring mainly in the wetter, cooler and higher parts of the tablelands, for example in the Blayney, Crookwell, Goulburn, Braidwood and Bungendore districts. Grows on alluvial soils, on cold, poorly-drained flats and hollows adjacent to creeks and small rivers. Often grows with other cold-adapted eucalypts, such as Snow Gum or White Sallee (*Eucalyptus pauciflora*), Manna or Ribbon Gum (*E. viminalis*), Candlebark (*E. rubid*a), Black Sallee (*E. stellulata*) and Swamp Gum (*E. ovata*). Black Gum usually occurs in an open woodland formation with a grassy groundlayer dominated either by River Tussock (Poa labillardierei) or Kangaroo Grass (*Themeda australis*), but with few shrubs. **Moderate – Subject site within species distribution, no associated PCTs present, and records within 10km.**
Eucalyptus canobolensis	Silver-Leaf Candlebark	E1	E	4	Known only from Mt Canobolas near Orange. Found chiefly between 1100-1300m, but can occur down to 1000m and above 1300m. The species predominantly occurs in the Mt Canobolas State Recreation Area. **Moderate – Subject site within species distribution, no associated PCTs present, and records within 10km.**
Eucalyptus pulverulenta	Silver-leaved Mountain Gum	V,P	V	0	The Silver-leafed Gum is found in two quite separate areas, the Lithgow to Bathurst area and the Monaro (Bredbo to Bombala). Grows in shallow soils as an understorey plant in open forest, typically dominated by Brittle Gum (*Eucalyptus mannifera*), Red Stringybark (E. macrorhynca), Broad-leafed Peppermint (*E. dive*s), Silvertop Ash (*E. sieberi*) and Apple Box (*E. bridgesiana*). **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km**

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
Eucalyptus robertsonii subsp. hemisphaerica	Robertson's Peppermint	V	V	0	Known only from the central tablelands of NSW, at small disjunct localities from north of Orange to Burraga. Locally frequent in grassy or dry sclerophyll woodland or forest, on lighter soils and often on granite. Usually found in closed grassy woodlands in locally sheltered sites. Habitats include quartzite ridges, upper slopes and a slight rise of shallow clay over volcanics. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km**
Euphrasia arguta		E4A,2	CE	0	Euphrasia arguta was rediscovered in the Nundle area of the NSW north western slopes and tablelands in 2008. Prior to this, it had not been collected for 100 years. Historically, Euphrasia arguta has only been recorded from relatively few places within an area extending from Sydney to Bathurst and north to Walcha. The Royal Botanic Gardens Specimen Register records an additional location reported and vouchered in 2002 from near the Hastings River; and Euphrasia arguta was also recorded from the Barrington Tops in 2012. Historic records of the species noted the following habitats: 'in the open forest country around Bathurst in sub humid places', 'on the grassy country near Bathurst', and 'in meadows near rivers'. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km**
Isotoma fluviatilis subsp. fluviatilis		3	X	0	Currently known from only two adjacent sites on a single private property at Erskine Park in the Penrith LGA. Previous sightings are all from western Sydney, at Homebush and at Agnes Banks. Known to grow in damp places, on the Cumberland Plain, including freshwater wetland, grassland/alluvial woodland and an alluvial woodland/shale plains woodland (Cumberland Plain Woodland) ecotone. May be an early successional species that benefits from some disturbance. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km**
Leucochrysum albicans subsp. tricolor	Hoary Sunray	E1	E	0	Endemic to south-eastern Australia, where it is currently known from three geographically separate areas in Tasmania, Victoria and south-eastern NSW and ACT. In NSW it currently occurs on the Southern Tablelands adjacent areas in an area roughly bounded by Albury, Bega and Goulburn, with a few scattered locatlities know from beyond this region. Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils.

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					Low – Subject site within species distribution, no associated PCTs present, and no records within 10km
Lepidium aschersonii	Spiny Peppercress	V,P	V	0	Not widespread, occurring in the marginal central-western slopes and north-western plains regions of NSW (and potentially the south western plains). In the north of the State recent surveys have recorded a number of new sites including Brigalow Nature Reserve, Brigalow State Conservation Area, Leard State Conservation Area and Bobbiwaa State Conservation Area. Also known from the West Wyalong in the south of the State. The Spiny Peppercress occurs in periodically wet sites such as gilgai depressions and the margins of freshwater and saline marshes and shallow lakes, usually on heavy clay soil. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km**
Lepidium hyssopifolium	Basalt Pepper-cress	E1,P	E	0	In NSW, there is a small population near Bathurst, one populations at Bungendore, and one near Crookwell. The species was also recorded near Armidale in 1945 and 1958; however it is not known whether it remains in this area. A specimen collected in the Cooma area about 100 years ago may also be Aromatic Peppercress. In NSW the species was known to have occurred in both woodland with a grassy understorey and in grassland. The species may be a disturbance opportunist, as it was discovered at the most recently discovered site (near Bungendore) following soil disturbance. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km**
Prostanthera gilesii		E4A,2	CE	0	Known only from Mount Canobolas State Conservation Area, south-west of Orange in central western NSW. There are two known populations within the Mount Canobolas State Conservation Area. The largest population occurs on a protected slope above a creek in shrubby open forest dominated by tall *Eucalyptus dalrympleana* subsp. *dalrympleana*, with scattered *E. canobolensis* and *E. dives*. The soil is a deep basaltic clay-loam with alluvial deposits on the lower slopes. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km**
Swainsona recta	Small Purple-pea	E1	E	0	Small Purple-pea was recorded historically from places such as Carcoar, Culcairn and Wagga Wagga where it is probably now extinct. Populations still exist in the Queanbeyan and Wellington-

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
					Mudgee areas. Over 80% of the southern population grows on a railway easement. It is also known from the ACT and a single population of four plants near Chiltern in Victoria. Grows in association with understorey dominants that include Kangaroo Grass *Themeda australis*, poa tussocks *Poa* spp. and spear-grasses *Austrostipa* spp. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km**
Thesium australe	Austral Toadflax,	V,P	V	0	Austral Toad-flax is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. It is also found in Tasmania and Queensland and in eastern Asia. Although originally described from material collected in the SW Sydney area, populations have not been seen in a long time. It may persist in some areas in the broader region. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Keyacris scurra	Key's Matchstick Grasshopper	E1	E	0	Key's Matchstick grasshopper was originally distributed from Victoria to Orange (NSW) across the wheat/sheep belt, typically recorded in native grasslands and grassy woodland. Typically found in native grasslands and grassy woodlands but it has also been recorded in other vegetation associations usually containing a native grass understory (especially kangaroo grass *Themeda triandra*) and known food plants (particularly Asteraceae). **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Synemon plana	Golden Sun Moth	V,P	V	0	The Golden Sun Moth's NSW populations are found in the area between Queanbeyan, Gunning, Young and Tumut. The species' historical distribution extended from Bathurst (central NSW) through the NSW Southern Tablelands, through to central and western Victoria, to Bordertown in eastern South Australia. Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by wallaby grasses *Austrodanthonia* spp. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
Cercartetus nanus	Eastern Pygmy-possum	V,P		0	The Eastern Pygmy-possum is found in south-eastern Australia, from southern Queensland to eastern South Australia and in Tasmania. In NSW it extents from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes. Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. **Moderate – Subject site within species distribution, associated PCTs present (3387), and no records within 10km**
Chalinolobus dwyeri	Large-eared Pied Bat	V,P	E	4	Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. There are scattered records from the New England Tablelands and North West Slopes. 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. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. They remain loyal to the same cave over many years. Found in well-timbered areas containing gullies. **High – Subject site within species distribution, associated PCTs present (3387), and records within 10km**
Dasyurus maculatus	Spotted-tailed Quoll	V,P	E	2	The range of the Spotted-tailed Quoll has contracted considerably since European settlement. It is now found in eastern NSW, eastern Victoria, south-east and north-eastern Queensland, and Tasmania. Only in Tasmania is it still considered relatively common. 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. **High – Subject site within species distribution, associated PCTs present (3387), and records within 10km**

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
Miniopterus orianae oceanensis	Large Bent-winged Bat	V,P		4	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. **Moderate – Subject site within species distribution, no associated PCTs present, and records within 10km.**
Myotis macropus	Southern Myotis	V,P		0	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. Forage over streams and pools catching insects and small fish by raking their feet across the water surface. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Petauroides volans	Southern Greater Glider	E1,P	E	0	The Southern Greater Glider occurs in eastern Australia, in eucalypt forests and woodlands, where it has a broad distribution from around Proserpine in Queensland, south through NSW and the Australian Capital Territory into Victoria. **Moderate – Subject site within species distribution, associated PCTs present (3387), and no records within 10km**
Petaurus australis	Yellow-bellied Glider	V,P	V	0	The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Petaurus norfolcensis	Squirrel Glider	V,P		3	Inhabits woodlands and dry sclerophyll forests, usually in diverse stands of shrubs and trees. Shelters and breeds in tree hollows, and is primarily an insectivorous animal but, has also been known to ingest plant exudates. **High – Subject site within species distribution, associated PCTs present (3387), and records within 10km.**

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
Phascogale tapoatafa	Brush-tailed Phascogale	V,P		0	The Brush-tailed Phascogale has a patchy distribution around the coast of Australia. In NSW it is mainly found east of the Great Dividing Range although there are occasional records west of the divide. Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Phascolarctos cinereus	Koala	E1,P	E	4	The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In New South Wales, koala populations are found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range. Inhabit eucalypt woodlands and forests. **High – Subject site within species distribution, associated PCTs present (3387), and records within 10km.**
Pteropus poliocephalus	Grey-headed Flying-fox	V,P	V	32	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. 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. Also forage in cultivated gardens and fruit crops. **Moderate – Subject site within species distribution, no associated PCTs present, and records within 10km.**

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V,P		0	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. 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. Seasonal movements are unknown; there is speculation about a migration to southern Australia in late summer and autumn. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Aprasia parapulchella	Pink-tailed Legless Lizard	V,P	V	0	The Pink-tailed Legless Lizard is only known from the Central and Southern Tablelands, and the South Western Slopes. There is a concentration of populations in the Canberra/Queanbeyan Region. Other populations have been recorded near Cooma, Yass, Bathurst, Albury and West Wyalong. This species is also found in the Australian Capital Territory. Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*). **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Delma impar	Striped Legless Lizard	V,P	V	0	The Striped Legless Lizard occurs in the Southern Tablelands, the South West Slopes, the Upper Hunter and possibly on the Riverina. Populations are known in the Goulburn, Yass, Queanbeyan, Cooma, Muswellbrook and Tumut areas. Also occurs in the ACT, Victoria and south-eastern South Australia. Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**

Scientific Name	Common Name	*NSW status	+Comm. Status	Records within 10 km?	Likelihood of Occurrence
Tympanocryptis mccartneyi	Bathurst Grassland Earless Dragon	E4A,2	CE	0	*Tympanocryptis mccartneyi* is endemic to New South Wales (NSW), Australia where it is restricted to the grasslands and open country on the alluvial plains around Bathurst in the Central Tablelands of NSW. The grasslands occur at altitudes up to approximately 1200 m and are naturally treeless or sparsely treed, with native tussock grasses being the dominant vegetation. **Low – Subject site within species distribution, no associated PCTs present, and no records within 10km.**
Varanus rosenbergi	Rosenberg's Goanna	V,P		0	Rosenberg's Goanna occurs on the Sydney Sandstone in Wollemi National Park to the north-west of Sydney, in the Goulburn and ACT regions and near Cooma in the south. There are records from the South West Slopes near Khancoban and Tooma River. Also occurs in South Australia and Western Australia. Found in heath, open forest and woodland. **Moderate – Subject site within species distribution, associated PCTs present (3387) and no records within 10km.**

APPENDIX D – KEY THREATENING PROCESSES

Key Threatening Processes (KTP) predicted as acting on the study area that may be exacerbated should development proceed.

Name	NSW status	Comm status	Likelihood of Occurrence	Exacerbated by Proposal
Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners, *Manorina melanocephala* (Latham, 1802)	KTP	KTP	**Unlikely**	**No** No woodland or forest habitat present.
Alteration of habitat following subsidence due to longwall mining	KTP		**Very Unlikely**	**No** The proposal does not involve longwall mining.
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	KTP		**Likely**	**Yes** The proposal would alter the flow of the unmapped stream that occurs within the site.
Anthropogenic Climate Change	KTP	KTP	**Likely**	**Yes** Some unavoidable emissions would occur from construction and operation.
Bushrock removal	KTP		**Likely**	**Yes** Bushrock was observed during the field survey, and may be impacted by this proposal.
Clearing of native vegetation	KTP	KTP	**Very Likely**	**Yes** Up to 0.47 ha of native vegetation would be removed if the land is to be developed.
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)	KTP	KTP	**Likely**	**Potentially** The spread of weedy grasses that could result from development could encourage rabbit activity.
Competition and habitat degradation by Feral Goats, *Capra hircus* Linnaeus 1758	KTP	KTP	**Unlikely**	**No** Development would not exacerbate this threat.
Competition from feral honey bees, *Apis mellifera* L.	KTP		**Likely**	**Yes** One hollow-bearing tree occurs. Should this tree be removed, this would exacerbate this KTP.
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	KTP		**Very unlikely**	**No** Development would not exacerbate this threat.
Habitat degradation and loss by Feral Horses (brumbies, wild horses), *Equus caballus* Linnaeus 1758	KTP		**Very unlikely**	**No** Development would not exacerbate this threat.

Name	NSW status	Comm status	Likelihood of Occurrence	Exacerbated by Proposal
Herbivory and environmental degradation caused by feral deer	KTP		**Very unlikely**	**No** Development would not exacerbate this threat.
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	KTP		**Very unlikely**	**No** Development would not exacerbate this threat.
Importation of Red Imported Fire Ants *Solenopsis invicta* Buren 1972	KTP	KTP	**Unlikely**	**Potentially** Machinery used on site can potentially act as a transport for biosecurity risks.
Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	KTP	KTP	**Likely**	**Yes** One hollow-bearing tree occurs. Should this tree be removed, this would exacerbate this KTP.
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	KTP	KTP	**Unlikely**	**Potentially** Machinery used on site can potentially act as a transport for biosecurity risks.
Infection of native plants by *Phytophthora cinnamomi*	KTP	KTP	**Unlikely**	**Potentially** Machinery used on site can potentially act as a transport for biosecurity risks.
Introduction of the Large Earth Bumblebee *Bombus terrestris* (L.)	KTP		**Very unlikely**	**No** This species only occurs in Tasmania. It is unlikely that the proposal will result in the importation of this species to the mainland.
Invasion and establishment of exotic vines and scramblers	KTP		**Likely**	**Potentially** Machinery used on site can potentially act as a transport for biosecurity risks.
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)	KTP		**Likely**	**Potentially** This species occurs extensively through the southern and central tablelands and more sporadically in the north. Although it was not recorded during the field survey, records exist from Orange township. Consequently, it is possible that an infestation could become established within the subject site. Machinery used on site can potentially act as a transport for biosecurity risks.
Invasion and establishment of the Cane Toad (*Bufo marinus*)	KTP	KTP	**Unlikely**	**No** This species is primarily confined to wetter subtropical and tropical sites, however, isolated populations can survive close to water inland (e.g., near Longreach). Should the cane toad be introduced to the subject site it would likely be too cold to permit establishment.

Name	NSW status	Comm status	Likelihood of Occurrence	Exacerbated by Proposal
Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata* (Wall. ex G. Don) Cif.	KTP		**Likely**	**Potentially** Although was not recorded during the field survey, this species is known from the district, though from relatively few records, and machinery used on site can potentially act as a transport for biosecurity risks.
Invasion of native plant communities by *Chrysanthemoides monilifera*	KTP		**Unlikely**	**Potentially** This species is known from the Tamworth district, machinery used on site can potentially act as a transport for biosecurity risks.
Invasion of native plant communities by exotic perennial grasses	KTP		**Very likely**	**Yes** These species already occur on the subject site and will likely spread further into the adjacent native vegetation during and after the proposal.
Invasion of the Yellow Crazy Ant, *Anoplolepis gracilipes* (Fr. Smith) into NSW	KTP		**Unlikely**	**Potentially** This species is not known within the area, however machinery used on site can potentially act as a transport for biosecurity risks.
Invasion, establishment and spread of *Lantana* (*Lantana camara* L. sens. Lat)	KTP		**Unlikely**	**Potentially** This species is not known within the area, however machinery used on site can potentially act as a transport for biosecurity risks.
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	KTP	KTP	**Likely**	**Potentially** Machinery used on site can potentially act as a transport for biosecurity risks.
Loss of Hollow-bearing Trees	KTP		**Very likely**	**Yes** Hollow-bearing trees were recorded during field survey. Should these be removed, this would exacerbate this KTP.
Loss or degradation (or both) of sites used for hill-topping by butterflies	KTP		**Unlikely**	**No** Development would not exacerbate this threat.
Predation and hybridisation by Feral Dogs, *Canis lupus familiaris*	KTP		**Unlikely**	**No** Development would not exacerbate this threat.
Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or Mosquito Fish)	KTP		**Unlikely**	**No** Development would not exacerbate this threat.
Predation by the European Red Fox *Vulpes Vulpes* (Linnaeus, 1758)	KTP	KTP	**Unlikely**	**No** Development would not exacerbate this threat.
Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)	KTP	KTP	**Likely**	**Yes** Urban development results in increased presence of house cats.

Name	NSW status	Comm status	Likelihood of Occurrence	Exacerbated by Proposal
Predation, habitat degradation, competition and disease transmission by Feral Pigs, *Sus scrofa* Linnaeus 1758	KTP	KTP	**Likely**	**Potentially** Development along creek lines may encourage feral pigs
Removal of dead wood and dead trees	KTP		**Very Likely**	**Yes** Some dead trees and dead wood are likely to be removed if the land were to be developed. It is recommended that this wood be relocated to retained areas of habitat, where possible, to avoid exacerbating this KTP.

APPENDIX E – SITE PHOTOS

PCT	Image
3387	

3387 Derived	

Non-Native Grazed Paddock	

Non-Native Grazed Paddock	

Non-Native Ungrazed Paddock	

APPENDIX F – BAM PLOT DATA

Plot 1

Page ..... of .....

BAM Plant Species Richness Plot Survey data sheet

Project no.		**Field Staff**	Ian Griffith/Jeff Lewis	**Signature**		**Date**	18/01/2024
Proposal Name	Redmond Place Rezoning	**Vegetation Zone ID**		**PCT / BVT**	3387 Derived	**Condition**	Moderate

Sample	ID'd	Stratum	Species	Cover	Abundance	Sample	ID'd	Stratum	Species	Cover	Abundance
			Carex inversa	20	200						
			Paspalum dilatatum	15	100						
			Agrostis viridis	15	100						
			Carex appressa	50	200						
			Phalaris aquatica	25	100						
			Fimbristylis sp.	5	50						
			Poa sp	5	50						
			Rumex brownii	1	20						
			Juncus sp	2	50						

Stratum in which each species occurs: E – emergent, o – overstorey; M – midstorey; G – groundcover.

Cover 0.1, 0.2, 0.3, …., 1, 2, 3, …., 10, 15, 20, 25, …100% (foliage cover); 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m

Abundance: species with cover less than or equal to 5%, count or estimate the number of individuals or shoots of each species within the plot, using the following intervals: 1,2,3,4,5,6,7,8,9,10,20, 50,100,500,1000,1500,2000, etc. Numbers above 20 are estimates only, and the recorded abundance is the upper end of each class (e.g. 50 represents an estimated abundance of between 20 and 50)

Plot 2

Page ..... of .....

BAM Plant Species Richness Plot Survey data sheet

Project no.		**Field Staff**	Ian Griffith/Jeff Lewis	**Signature**		**Date**	18/01/2024
Proposal Name	Redmond Place Rezoning	**Vegetation Zone ID**		**PCT / BVT**	**Non-Native**	**Condition**	Poor

Sample	ID'd	Stratum	Species	Cover	Abundance	Sample	ID'd	Stratum	Species	Cover	Abundance
			Holcus lanatus	35	500						
			Paspalum dilatatum	25	500						
			Eragrostis leptostachya	10	200						
			Phalaris aquatica	15	200						
			Setaria parviflora	1	10						
			Hypochaeris radicata	5	50						
			Trifolium repens	2.5	50						
			Vulpia bromoides	1	20						
			Rumex acetosella	1	20						
			Eleusine tristachya	1	20						
			Carex inversa	0.5	20						
			Rubus fruticosus	1	3						
			Lolium perenne	1	10						
			Cynodon dactylon	5	50						
			Juncus sp	0.1	3						
			Cirsium vulgare	0.5	5D						

Stratum in which each species occurs: E – emergent, o – overstorey; M – midstorey; G – groundcover.

Cover 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m

Abundance: species with cover less than or equal to 5%, count or estimate the number of individuals or shoots of each species within the plot, using the following intervals: 1,2,3,4,5,6,7,8,9,10,20, 50,100,500,1000,1500,2000, etc. Numbers above 20 are estimates only, and the recorded abundance is the upper end of each class (e.g. 50 represents an estimated abundance of between 20 and 50)

Plot 3

Page ……. of …….

BAM Plant Species Richness Plot Survey data sheet

Project no.		**Field Staff**	Ian Griffith/Jeff Lewis	**Signature**		**Date**	18/01/2024
Proposal Name	Redmond Place Rezoning	**Vegetation Zone ID**		**PCT / BVT**	**Non-Native**	**Condition**	Poor

Sample	ID'd	Stratum	Species	Cover	Abundance	Sample	ID'd	Stratum	Species	Cover	Abundance
			Cirsium vulgare	5	50						
			Centaurea calcitrapa	5	50						
			Eleusine tristachya	20	200						
			Echium plantagineum	1	10						
			Carthamus lanatus	1	10						
			Lolium perenne	25	200						
			Cynodon dactylon	10	100						
			Modiola caroliniana	5	50						
			Bromus catharticus	1	20						
			Polygonum aviculare	1	20						
			Plantago lanceolata	5	50						
			Brassica sp.	0.1	3						
			Geranium solanderi	0.5	10						
			Trifolium arvense	1	20						
			Dactylis glomerata	1	20						

Stratum in which each species occurs: E – emergent, o – overstorey; M – midstorey; G – groundcover.

Cover 0.1, 0.2, 0.3, …, 1, 2, 3, …, 10, 15, 20, 25, …100% (foliage cover); 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m

Abundance: species with cover less than or equal to 5%, count or estimate the number of individuals or shoots of each species within the plot, using the following intervals: 1,2,3,4,5,6,7,8,9,10,20, 50,100,500,1000,1500,2000, etc. Numbers above 20 are estimates only, and the recorded abundance is the upper end of each class (e.g. 50 represents an estimated abundance of between 20 and 50)

Plot 4

Page ..... of .....

BAM Plant Species Richness Plot Survey data sheet

Project no.		**Field Staff**	Ian Griffith/Jeff Lewis	**Signature**		**Date**	18/01/2024
Proposal Name	Redmond Place Rezoning	**Vegetation Zone ID**		**PCT / BVT**	**Non-Native**	**Condition**	Poor

Sample	ID'd	Stratum	Species	Cover	Abundance	Sample	ID'd	Stratum	Species	Cover	Abundance
			Phalaris aquatica	80	500						
			Holcus lanatus	10	200						
			Carex appressa	5	50						
			Juncus sp.	1	10						
			Rumex crispus	5	50						
			Bromus catharticus	5	50						
			Conyza sumatrensis	5	50						
			Eragrostis leptostachya	5	50						
			Geranium solanderi	0.5	10						
			Paspalum dilatatum	5	50						
			Cirsium vulgare	0.1	2						
			Avena barbata	1	10						

Stratum in which each species occurs: E – emergent, o – overstorey; M – midstorey; G – groundcover.

Cover 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m

Abundance: species with cover less than or equal to 5%, count or estimate the number of individuals or shoots of each species within the plot, using the following intervals: 1,2,3,4,5,6,7,8,9,10,20, 50,100,500,1000,1500,2000, etc. Numbers above 20 are estimates only, and the recorded abundance is the upper end of each class (e.g. 50 represents an estimated abundance of between 20 and 50)