NOVEMBER 2022

PLANNING PROPOSAL - 12-20 SHIRALEE ROAD, ORANGE NSW

CURRAJONG
PLANNING, PROPERTY + PROJECT MANAGEMENT

Appendix A

Biodiversity Assessment Report

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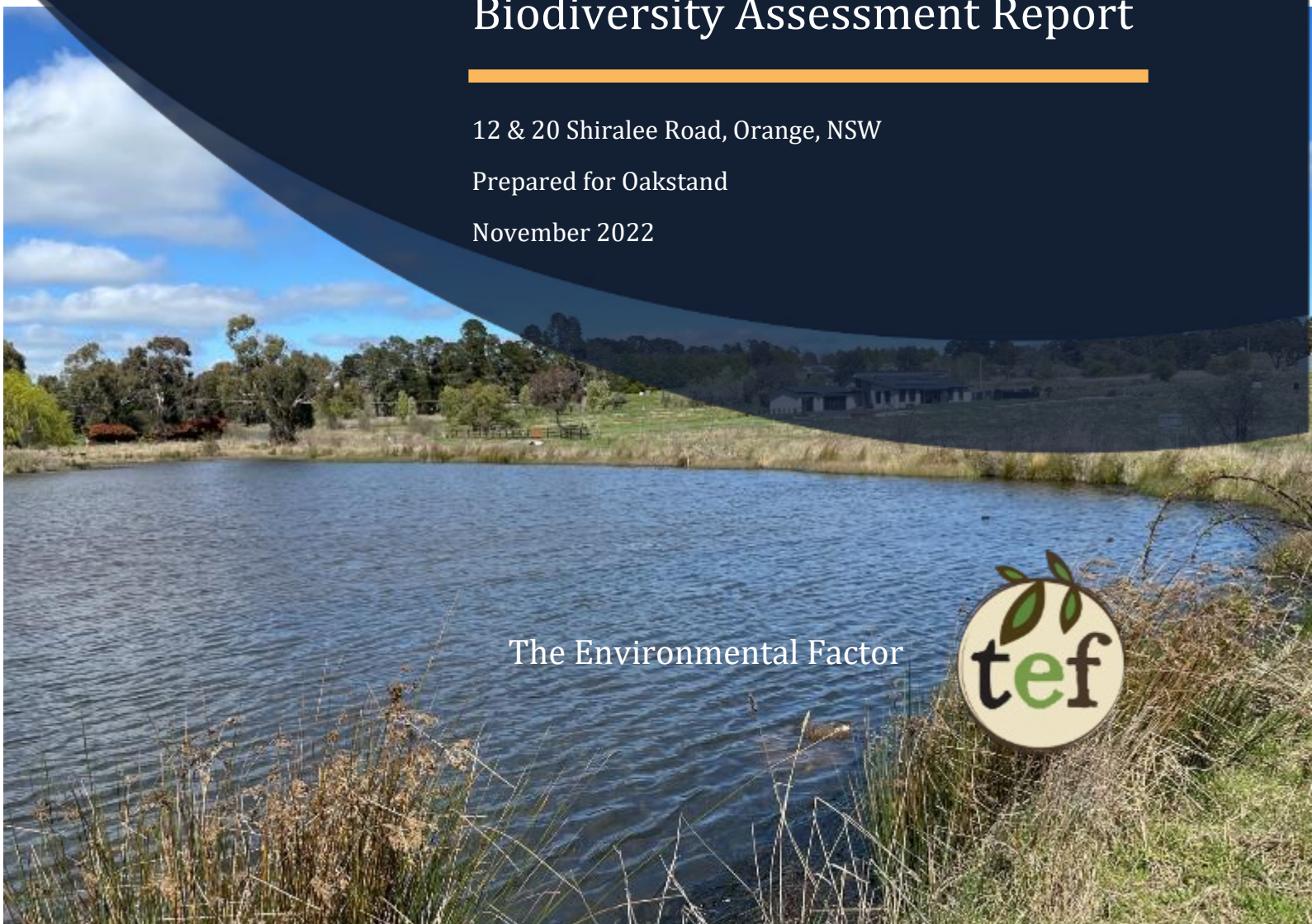
Biodiversity Assessment Report

12 & 20 Shiralee Road, Orange, NSW

Prepared for Oakstand

November 2022



The Environmental Factor

Biodiversity Assessment Report – 12 & 20 Shiralee Road, Orange, NSW

Revision	Author/s	Internal Review	Date submitted	Client Review and Approval	
				Name	Date
1.0	P. Holliday, B. Perrott, J. Sanderson	E. Cotterill	14/11/2022	Jon Hopkins - Oakstand	22/11/11
1.1 Updates to site plans	P. Holliday, B. Perrott, J. Sanderson, G. Stirling	G Stirling	22/11/2022		
Endorsed by BAM Accredited Assessor			E Cotterill (BAAS 20011)		

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This Report has been prepared by The Environmental Factor (TEF) at the request of Oakstand Property Group Pty Ltd (Oakstand, or The Client) in order to assess the ecological impacts arising from the proposed subdivision and establishment of building envelopes at 12 and 20 Shiralee Road, Orange NSW (The Proposal). The purpose of this report is to document the biodiversity assets found on site, to assess those that are likely to be impacted either directly or indirectly as a result of the Proposal and to determine whether the Proposal is required to participate in the Biodiversity Offset Scheme (BOS).

This document is not intended to be utilised or relied upon by any persons other than the Client and Orange City Council (OCC) through the Development Application (DA) process, nor to be used for any purpose other than that articulated above. Accordingly, TEF accepts no responsibility in any way whatsoever for the use of this report by any other persons or for any other purpose.

The information, statements, recommendations and commentary (together the "Information") contained in this report have been prepared by TEF on the basis of information provided by the Client and from material provided by OCC, the NSW department of Planning and the Environment (DPE) and the Commonwealth Department of Climate Change, Energy, Environment and Water (DCCEEW), and through the survey process. TEF has not sought any independent confirmation of the reliability, accuracy or completeness of this information. It should not be construed that TEF has carried out any form of audit of the information which has been relied upon.

Information contained within the Report is current as at the date of the Report and may not reflect any event or circumstances which occur after the date of the Report. TEF is not responsible for updating the report if site conditions change.

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Tables, Figures and Plates

Abbreviations

Abbreviation	Description
AOBV	Areas of Outstanding Biodiversity Value
BAM	Biodiversity Assessment Methodology
BAR	Biodiversity Assessment Report
BDAR	Biodiversity Development Assessment Report
BC Act	*Biodiversity Conservation Act 2016*
BOS	Biodiversity Offset Scheme
CEEC	Critically Endangered Ecological Community
DCCEEW	Department of Climate Change, Energy, Environment and Water (formerly DAWE)
DPI	Department of Primary Industries
DPE	Department of Planning and Environment (formerly DPIE, formerly OEH)
EPA	Environmental Protection Agency
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
FM Act	*Fisheries Management Act 1994*
HTE	High Threat Exotic
KFH	Key Fish Habitat
LEP	Local Environment Plan
MNES	Matters of National Environmental Significance
OEH	Office of Environment and Heritage
POEO Act	*Protection of the Environment Operations Act 1997*
TEC	Threatened Ecological Community
TEF	The Environmental Factor
WoNS	Weeds of National Significance

EXECUTIVE SUMMARY

The Environmental Factor (TEF) was commissioned by Oakstand ('the Client'), to undertake a Biodiversity Assessment Report (BAR) to fully consider the potential ecological impacts arising from the proposed subdivision and development of Lot 1 DP 630681, Lot A DP 381933, Lot 1 DP 381932 and Lot A DP 381935, including bulk earthworks required to enable the formation of a new suburban residential area comprising one hundred and ninety-nine (199) separate new residential Lots, associated access roads and an area of proposed open space at 12 and 20 Shiralee Road, Orange NSW (herein 'the Proposal'). The site is a heavily modified residential and agricultural block, located within a rapidly developing rural residential area.

Direct impacts associated with the Proposal are as follows:

- Bulk earthworks and vegetation clearing across the Subject Site, for a total direct impact area of **16.22 ha**. Within this area, construction will include:
    - Establishment of one hundred and ninety-nine (199) new residential building allotments and access driveways, to be constructed through a two-stage development process, specifically:
        - Stage 1 establishment of multiple residential Lots (for a total area of 4.33 ha) and roads (1.39 ha)
        - Stage 2 establishment of multiple residential Lots (for a total of 5.89 ha) and roads (2.78 ha)
        - Stage 3 rezoning of area and establishment of multiple residential lots (for a total of 1.83 ha)

In addition, the Proposal includes the establishment of an area of proposed open space, comprising **4.05 ha**.

The Subject Land (Figure 1) is surrounded by active subdivision construction to the east, with rural roads, low density residential and rural land to the north, south and west.

Surveys undertaken on site included habitat identification, vegetation community mapping, identification of Threatened Ecological Communities (TECs) and collection of floristic data, as well as opportunistic threatened flora and fauna surveys.

During field investigations, the condition and habitat values of the vegetation present was assessed in accordance with the Biodiversity Assessment Method (BAM), and it was found that vegetation communities varied across the Subject Site, both in type and condition. This can be attributed to localised variations in topography and geology, as well as impacts from previous and current land management practices. Three (3) small stands of remnant native vegetation were identified to occur on site, with a non-native dominated understorey. A further one (1) area of native grassland derived from grassy woodland / open forest was present in proximity to a small waterway within the site. In addition, several small areas of planted native vegetation were present within the site, as well as a number of scattered individual planted native trees. A total of three (3) BAM plots were completed within the Subject Land, which confirmed the presence of Plant Community Type (PCT) 3347 *Southern Tableland Creekflat Ribbon Gum Forest* on site. Planted native vegetation did not align with a PCT and was therefore assessed for habitat values as specified in the BAM 2020. In addition to areas of native vegetation, the Subject Land also contained large expanses of exotic vegetation in the form of pasture with scattered exotic trees and shrubs, as well as landscaped gardens primarily planted with exotic species.

Numerous threatened species records exist for the broader locality (DPE 2022) with one (1) species recorded during surveys:

- Superb Parrot (*Polytelis swainsonii*)

A further four (4) species were determined as likely to use habitat within the Subject Land. These include:

- Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)
- Scarlet Robin (*Petroica boodang*)
- Flame Robin (*Petroica phoenicea*)
- Diamond Firetail (*Stagonopleura guttata*)

A number of other species are predicted and have the potential to occur within the Subject Land based on habitat attributes present. No targeted surveys were undertaken to date to confirm these additional species' presence or absence within the Subject Land.

Assessments of Significance and / or Significant Impact Criteria Assessments for the above species and TEC's were prepared in accordance with Section 1.7 of the EP&A Act and the EPBC Act *Matters of National Environmental Significance – Significant Impact Criteria Guidelines* (DEWHA, 2009). These assessments have concluded that the Proposal is **unlikely** to have a significant negative effect on the threatened species occurring within the impact footprint. Therefore, Species Impact Statements and / or a Referral to the Environment Minister are **not** required.

A total of forty-seven (47) species were recorded within the vegetation plots completed and incidental species observed on site, consisting of sixteen (16) native species and thirty-one (31) exotic species, including seven (7) High-Threat Exotics (HTE). The field data collected is available in Appendix D.

Guided by the current survey effort, no Serious and Irreversible Impacts (SAII) to threatened biota are anticipated as a result of the proposed works. In addition, no prescribed impacts are anticipated in association with the proposal.

The Subject Land measures a total area of **20.27 ha** with a total direct impact area of **16.22 ha** of which **0.93 ha** constitutes native vegetation. The Proposal involves clearing of both native and non-native vegetation to accommodate the proposed roads and residential lots. Two unnamed waterways and several areas of rocky outcrop habitat will also be impacted by the Proposal. The client has committed to completing planting of native species appropriate to the PCT as part of landscaping for the proposed development.

Entry to the Biodiversity Offset Scheme (BOS) is triggered by developments, projects and activities that meet certain thresholds for significant impacts on biodiversity; one (1) of these triggers is exceedance of the 'clearing threshold'. The applicable threshold for clearing for this proposed development is 0.25 ha based on a minimum lot size of 0.2 ha as prescribed in the Orange Local Environment Plan 2011. As the potential clearing allowed for by the Proposal exceeds this threshold, **participation in the BOS is required** and offset obligations will need to be calculated through preparation of a Biodiversity Development Assessment Report (BDAR) prior to the development proceeding.

A number of mitigation measures and recommendations have been made to help ensure avoidance and minimisation of impacts of the Proposal, and to protect the remaining biodiversity attributes of

the Subject Land and broader locality should the Proposal proceed. Preclearance Surveys and the presence of a fauna spotter during clearing works are recommended.

Due to proposed works along a waterway, the Proposal will require the preparation of a Vegetation Management Plan (VMP) to support an application for a Controlled Activity Approval to be obtained from NSW DPE Water, as specified by the Water Management Act 2000.

1 INTRODUCTION

The Environmental Factor (TEF) was commissioned by Oakstand ('the Client'), to undertake a Biodiversity Assessment Report (BAR) to fully consider the potential ecological impacts arising from the proposed subdivision and development of Lot 1 DP 630681, Lot A DP 381933, Lot 1 DP 381932 and Lot A DP 381935, including bulk earthworks required to enable the formation of a new suburban residential area comprising one hundred and ninety-nine (199) separate new residential Lots, associated access roads and an area of proposed open space at 12 and 20 Shiralee Road, Orange NSW (herein 'the Proposal').

This report provides an assessment of potential impacts to native biota from the proposed development to a level sufficient to inform the approval pathway required under both the NSW *Biodiversity Conservation Act 2016* (BC Act) and the *Environmental Planning and Assessment Act 1979* (EP&A Act). The assessment and conclusions contained in this report are based on information obtained through database searches and field surveys completed, in conjunction with the Proposal details provided by the Client and Orange City Council (OCC). The report classifies the vegetation on site in proximity to the Proposal, and describes the potential for occurrence of threatened species, populations and communities and associated habitat features within the Subject Land. The Subject Land is a heavily modified residential and agricultural block, located within a rapidly developing rural residential area in the Orange Local Government Area (LGA) and is subject to the planning provisions of the Orange Local Environmental Plan (LEP) 2011.

The Subject Land is currently zoned as R1 – General Residential, R2 – Low Density Residential, and RE1 – Public Recreation.

- Activities permitted with consent in zone R1 include:
  Attached dwellings; Bee keeping; Boarding houses; Building identification signs; Business identification signs; Camping grounds; Caravan parks; Centre-based child care facilities; Community facilities; Dwelling houses; Electricity generating works; Environmental facilities; Exhibition homes; Exhibition villages; Group homes; Home businesses; Home industries; Hostels; Information and education facilities; Kiosks; Multi dwelling housing; Neighbourhood shops; Oyster aquaculture; Places of public worship; Pond-based aquaculture; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Residential accommodation; Residential flat buildings; Respite day care centres; Roads; Semi-detached dwellings; Seniors housing; Shop top housing; Tank-based aquaculture; Tourist and visitor accommodation; Veterinary hospitals and Water supply systems.
- Activities permitted with consent in zone R2 include:
  Bed and breakfast accommodation; Bee keeping; Building identification signs; Business identification signs; Centre-based child care facilities; Community facilities; Dual occupancies; Dwelling houses; Electricity generating works; Environmental facilities; Exhibition homes; Group homes; Health consulting rooms; Home businesses; Home industries; Hostels; Information and education facilities; Kiosks; Neighbourhood shops; Oyster aquaculture; Places of public worship; Pond-based aquaculture; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Respite day care centres; Roads; Secondary dwellings; Semi-detached dwellings; Serviced apartments; Tank-based aquaculture; Veterinary hospitals and Water supply systems.
- Activities permitted with consent in zone RE1 include:

Aquaculture; Boat launching ramps; Building identification signs; Business identification signs; Community facilities; Eco-tourist facilities; Environmental facilities; Heliports; Information and education facilities; Jetties; Kiosks; Markets; Recreation areas; Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Roads and Water recreation structures.

As a subdivision and development intended for housing, the Proposal is permitted with consent within Zones R1 and R2. Consent may need to be sought from OCC regarding potential constraints where the proposed residential Lots and roads encroach into areas currently zoned as RE1, where dwellings and roads are not currently permitted under the Orange LEP 2011.

The broader legislative context of the Proposal, methods used, and recommendations are included within this report.

1.1 Aim of the report and assessment principles

This BAR is aimed at providing an up to date understanding of the biodiversity assets present within the Subject Land (as at September 2022), which may act as constraints to the proposed development, or be impacted by delivery of the Proposal. Knowledge of these constraints can help the Client best plan for future usage of the site without significantly affecting any important ecological/biodiversity features, thereby avoiding and minimising impacts where possible, in accordance with the principles of the BC Act. This report also considers the principles for Significant Impact Criteria assessments under the EPBC Act, for the purpose of assessing the level of impact the Proposal is likely to have on any Matters of National Environmental Significance (MNES) that are present, or likely to be present, within the Subject Land. The potential for impacts that could be characterised as serious and irreversible (aka Serious and Irreversible Impacts or SAII) have thereby also been considered.

Field data was collected by Ecologist Pandora Holliday in accordance with the Biodiversity Assessment Method (BAM). Reporting and analyses were completed by Pandora Holliday, Janet Sanderson and Ben Perrot, with sign-off undertaken by Emily Cotterill (BAAS 20011) as an accredited assessor.

1.2 Terms and definitions

The following terms are used in this report:

Subject Site (Direct Impact Footprint)	The area to be directly affected by the Proposal, including earthworks and vegetation clearing. Includes planned residential lots and roads, measuring **16.22 ha** of new impacts, of which native vegetation comprises **0.93 ha.**
Subject Land	The area to be both directly and indirectly affected by the Proposal, including earthworks and vegetation clearing. Includes planned residential lots, roads, and proposed open space, measuring **20.27 ha** of new impacts, of which native vegetation comprises **1.12 ha.** Includes the Subject Site (as described above) and any proximal areas that could be potentially directly or indirectly impacted by the Proposal. For the purposes of this report the Subject Land has been kept to the boundary of existing Lots: Lot 1 DP 630681, Lot A DP 381933, Lot 1 DP 381932 and Lot A DP 381935.
Assessment Area	Includes the Subject Land plus a buffer radius area of 1.5 km around the Subject Site; total area **1030.90 ha,** of which native vegetation comprises **70.87 ha.**
The Locality	The area within 10 kilometres of the Subject Land.

1.3 Context and Proposal description

The Proposal is for the subdivision and development of Lot 1 DP 630681, Lot A DP 381933, Lot 1 DP 381932 and Lot A DP 381935, including bulk earthworks required to enable the formation of a new suburban residential area comprising one hundred and ninety-nine (199) separate new residential Lots, associated access roads and an area of proposed open space at 12 and 20 Shiralee Road, Orange NSW (herein 'the Proposal').

The Subject Land is a heavily modified residential and agricultural block of private land, located within a rapidly developing rural residential area and is zoned R1 – General Residential, R2 – Low Density Residential, and RE1 – Public Recreation.

Direct impacts associated with the Proposal are as follows:

- Bulk earthworks and vegetation clearing across the Subject Site, for a total direct impact area of **16.22 ha**. Within this area, construction will include:
    - Establishment of one hundred and ninety-nine (199) new residential building allotments and access driveways, to be constructed through a three-stage development process, specifically:
        - Stage 1 establishment of multiple residential Lots (for a total area of 4.33 ha) and roads (1.39 ha)
        - Stage 2 establishment of multiple residential Lots (for a total of 5.89 ha) and roads (2.78 ha)
        - Stage 3 rezoning of area and establishment of multiple residential lots (for a total of 1.83 ha)

In addition, the Proposal includes the establishment of an area of proposed open space, comprising 4.05 ha.

For the purposes of this assessment, indirect impacts have been assumed to be limited to the Subject Land comprising **20.27 ha** of which native vegetation equals **1.12 ha** (Figure 1). This includes the direct impact area (the Subject Site) as well as an area of Proposed Open Space (**4.05 ha**).

Approximately **0.93 ha** of native vegetation will be directly impacted by the Proposal. Two unnamed waterways and several areas of rocky outcrop habitat will also be impacted.

The site assessed is intended to be of sufficient size and provide a cleared area for the construction of the infrastructure and site access as described above, including the movement of plant and machinery, the provision for adequate water (runoff, erosion and sediment controls) management and clean water diversion throughout the site, the provision for necessary drinking water reservoirs and effluent management structures to be contained within the area of proposed envelopes, and to allow for all foreseeable direct and indirect impacts arising from the Proposed works.

The plans for the Proposal, including areas to be affected by proposed earthworks, have been provided as Appendix A.

Table 1 Proposed impact areas

Development area		Total Area (ha)
Bulk Earthworks zone to enable establishment of new residential Lots and roads (Direct Impact Area or Subject Site)	Development to be established within Bulk Earthworks zone: Stage 1: establishment of multiple residential Lots (for a total area of 4.33 ha) and roads (1.39 ha). Stage 2: establishment of multiple residential Lots (for a total of 5.89 ha) and roads (2.78 ha) Stage 3: establishment of multiple residential Lots (for a total of 1.83 ha)	**16.22 ha**
Proposed Open Space (Indirect Impact Area)		**4.05 ha**
Total direct impacts (both native and non-native vegetation)		**16.22 ha**
Total direct and indirect impacts (both native and non-native vegetation)		**20.27 ha**

Oakstand, Shiralee Road Subdivision - Subject Land and Proposed Developments

Legend

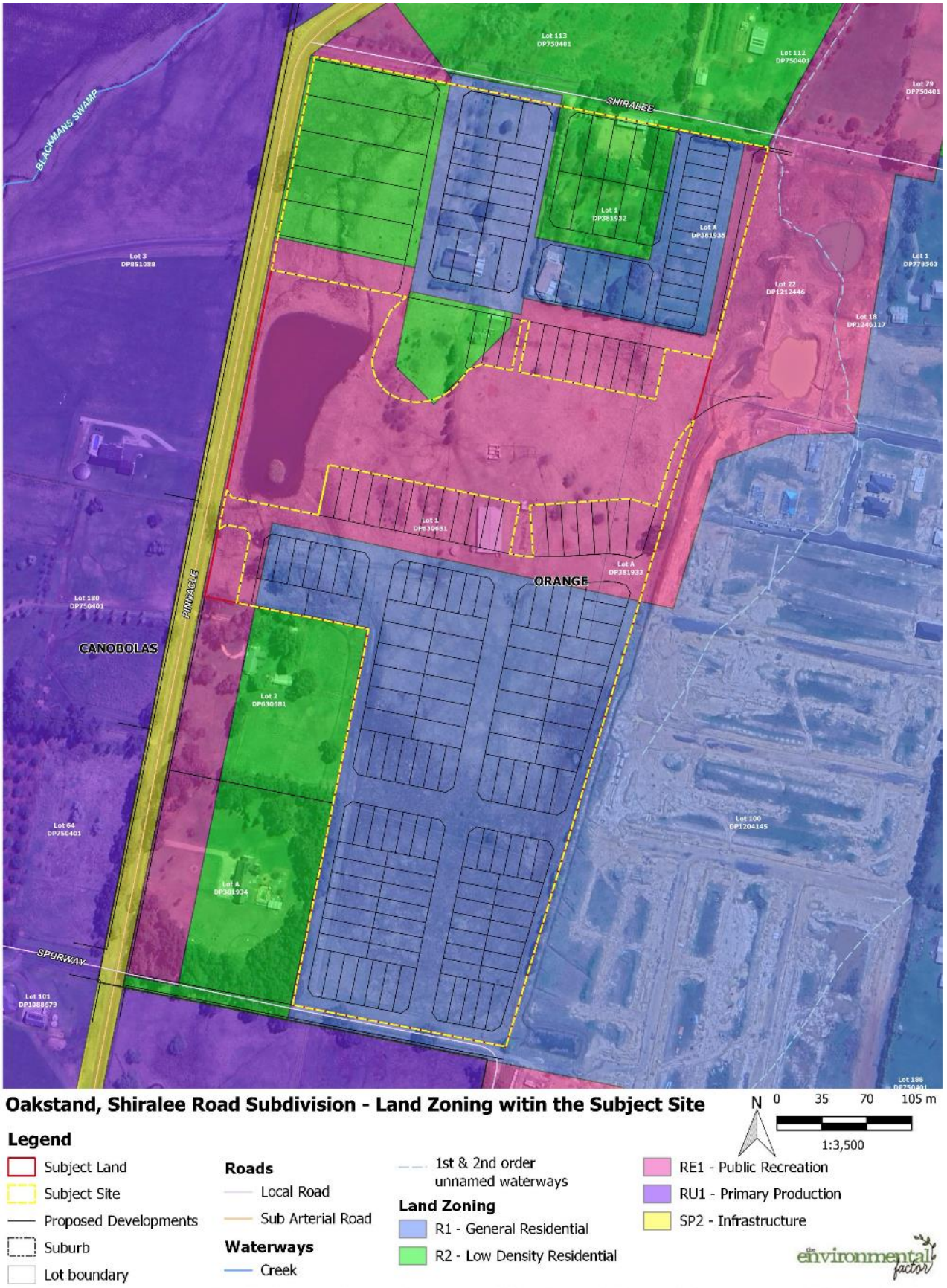
- Subject Land
- Subject Site
- Suburb
- Lot boundary

Roads
- Local Road
- Sub Arterial Road

Waterways
- Creek
- 1st & 2nd order unnamed waterways

Proposed Developments
- Residential Lots
- Open Space
- Roads
- Dam

Figure 1 Subject Land and Proposed Development



Oakstand, Shiralee Road Subdivision - Land Zoning witin the Subject Site

N 0 35 70 105 m

1:3,500

Legend

- Subject Land
- Subject Site
- Proposed Developments
- Suburb
- Lot boundary

Roads

- Local Road
- Sub Arterial Road

Waterways

- Creek
- 1st & 2nd order unnamed waterways

Land Zoning

- R1 - General Residential
- R2 - Low Density Residential
- RE1 - Public Recreation
- RU1 - Primary Production
- SP2 - Infrastructure

the environmental factor

Figure 2 Land zoning within the Subject Site

2 LEGISLATIVE CONTEXT

The following legislation, policies and guidelines applicable to the Proposal have been reviewed, and the implications have been assessed accordingly as part of this BAR.

2.1 Commonwealth (Federal) Legislation

2.1.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) establishes a requirement for Commonwealth environmental assessment and approval for actions that are likely to have a significant impact on matters of national environmental significance (MNES), the environment on Commonwealth land, or actions taken on Commonwealth land MNES include:

- World heritage properties
- National heritage places
- Wetlands of international importance
- Listed threatened species and ecological communities
- Listed migratory species
- Commonwealth marine areas
- Nuclear actions

Federally listed threatened species and ecological communities with the potential to be impacted by the Proposal have been assessed as part of this BAR; no significant impact to Commonwealth listed species or ecological communities is anticipated (refer Section 6).

2.2 State (NSW) Legislation, Policies and Guidelines

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

The *Environmental Planning and Assessment Act 1979* (EP&A Act) forms the legal and policy platform for the assessment and approval of works in NSW and aims to ensure that public authorities examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment before they undertake or approve activities that do not require development consent.

All development in NSW is assessed in accordance with the provisions of the EP&A Act and the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation).

The proposal is being assessed as 'development that requires consent', in line with Part 4 Section 4.2 of the EP&A Act.

2.2.2 Local Land Services Amendment Act 2016 (LLSA Act)

The *Local Land Services Amendment Act 2016* (LLSA Act), which amended the *Local Land Services Act 2013,* authorised the making of the Land Management (Native Vegetation) Code 2018 (Div 5, Sch 1 of the LLSA Act). The aim of the Code is to authorise clearing of native vegetation on Category 2 regulated land under certain conditions and provide for the establishment and maintenance of set aside areas.

Review of the Native Vegetation Regulatory map (Appendix B) confirmed that the Subject Land contains land excluded from the LLS Act. No clearing of land is proposed within areas mapped as Category 2 – Vulnerable Regulated Land. Consequently, the clearing regulations under Part 14 of the LLSA Act do not apply.

2.2.3 Biodiversity Conservation Act 2016 (BC Act)

Sections 7.2 and 7.8 of the *Biodiversity Conservation Act 2016* (BC Act) state that the determining authority must consider the effect of an activity on:

- Areas of Outstanding Biodiversity Value (AOBV), and/or
- Species, populations or ecological communities, or their habitats and whether there is likely to be a 'significant effect' on those species, populations or ecological communities.

The BC Act provides legal status for biota of conservation significance in NSW. It provides a framework for the Biodiversity Assessment Method (BAM) and the calculation of offset requirements for projects participating in the BOS. If a species of flora or fauna listed in the BC Act is identified, a review must be carried out of the factors set out to establish if there is likely to be a significant impact on that species, population, ecological community, or habitat. If any of these could be impacted by the Proposal, assessments of significance that addresses the requirements of section 1.7 of the Environmental Planning and Assessment Act 1979 (EP&A Act) must be completed to determine the significance of the impact.

In essence, the BC Act aims to:

- Conserve biological diversity on a bioregional and state scale
- Lists Areas of Outstanding Biodiversity Value (AOBV)
- Assess the extinction risk of species and ecological communities
- Identify Key Threatening Processes
- Slow the rate of biodiversity loss, and
- Conserve threatened species

Impacts to threatened species and ecological communities as a result of the Proposal are assessed in Section 6 of this report, and assessments of significance for species at risk of impact located within the Subject Land were undertaken (Appendix G).

These assessments concluded that no significant impact to any threatened species or ecological community would occur as a result of this Proposal (refer to Section 6).

2.2.4 Biodiversity Conservation Regulatory Act 2017 (BC Regulatory Act)

The *Biodiversity Conservation Regulation 2017* (BCR Act) provides a number of considerations and practices to be implemented as part of the BC Act, as follows:

- Identifies clearing thresholds and the Biodiversity Values Map for the application of the Biodiversity Offsets Scheme (BOS)
- Outlines principles for serious and irreversible impacts (SAII) to biodiversity
- Rules for meeting biodiversity offset obligations
- Biodiversity certification criteria

Section 7.2 of the BC Act states that entry into the BOS is required when a development will:

- Significantly impact a threatened species or ecological community, or their habitats (as per an assessment of significance pursuant to Section 7.3 of BC Act)
- Exceeds the maximum for clearing of native vegetation
- Occurs in an area identified as containing biodiversity values, as outlined on the biodiversity values (BV) map

Significant impacts to threatened species or communities

Impacts to threatened species and ecological communities as a result of the Proposal are assessed in Section 6 of this report.

Areas of Outstanding Biodiversity Value

The BVM (Appendix C) shows no areas of vegetation mapped as containing High Biodiversity Values within the Subject Land. An area of mapped biodiversity value is present < 100 m distance from the Subject Land, in a corridor along Blackmans Swamp Creek which flows to the north and west of the Subject Land on the far side of Pinnacle Road.

Area Clearing Threshold

Native vegetation clearing thresholds as outlined in Part 7 of the *Biodiversity Conservation Regulation 2017* indicates when a project would need to enter the BOS according to the minimum lot sizes and the corresponding native clearing thresholds (refer Table 2 Below).

Table 2 Area criteria – Biodiversity Offset Scheme threshold

Minimum lot size	Threshold for clearing (ha) to enter BOS
<1 ha	>0.25
1 ha < 40 ha	>0.5
40 ha – 1000 ha	>1
>1000 ha	>2

Field surveys confirmed that the site does contain areas of native vegetation. The clearing threshold for the site, based on the minimum lot size, is **0.25 ha**.

The clearing threshold for native vegetation **will** be exceeded by this Proposal; therefore, participation in the BOS is required.

2.2.5 NSW Biosecurity Act 2015 (Biosecurity Act)

The NSW *Biosecurity Act 2015* (Biosecurity Act) outlines mandatory measures that persons are to take with respect to biosecurity matters including the management of weeds (Part 2, Division 8 including Weeds of National Significance (WoNS)). Under the Biosecurity Act the responsibilities for weed management by public and private landholders are consistent reflecting that weed management is a shared community responsibility. The Act introduces the legally enforceable concept of a General Biosecurity Duty (GBD). Priority weeds are listed within Regional Strategic Weed Management Plans, however the GBD is not restricted to listed weeds.

The Biosecurity Act is administered by NSW Department of Primary Industries which determines the weed species covered by regulatory tools including Prohibited Matters, Control Orders and Biosecurity Zones. Existing Local Control Authorities (Councils) continue to be responsible for enforcing weed legislation.

Weeds identified on site are discussed in Section 5.3.1.

2.2.6 Fisheries Management Act 1994 (FM Act)

The *Fisheries Management Act 1994* (FM Act) aims to conserve threatened species, populations and ecological communities of fish and marine vegetation native to NSW and to promote ecologically sustainable development, including the conservation of biological diversity. It also aims to reduce the threats faced by native fish and marine vegetation in NSW.

Section 220ZZ of the FM Act states that the determining authority must consider the effect of an activity on:

- Areas of Outstanding Biodiversity Value (AOBV) as defined by the BC Act, and
- Species, populations or ecological communities, or their habitats as listed under the FM Act, and whether there is likely to be a 'significant effect' on those species, populations or ecological communities

If a planned development or activity is likely to have an impact on an aquatic threatened species, population or ecological community this must be taken into account in the development approval process. If the impact is likely to be significant, as determined through an Assessment of Significance, participation in the BOS is required.

Council will need to seek a Part 2 or Part 7 Fisheries Management Act (FM Act) permit for works to be completed if the waterway is mapped as supporting Key Fish Habitat, if the Project includes:

- Activities involving dredging and reclamation work (Part 7 permit)
- Activities temporarily or permanently obstructing fish passage (Part 7 permit)
- Using explosives, electrical devices or other dangerous substances in a waterway (Part 2 permit)
- Harming marine vegetation
- Permits are required for works within a third order (or higher) streams (based on the Strahler system of stream order classification), and first and second order streams that are known or likely to be habitat for listed threatened species, populations or communities.

An area of mapped riparian land is present < 100 m distance from the Subject Land, in a corridor along Blackmans Swamp Creek which flows to the north and west of the Subject Land on the far side of Pinnacle Road. In addition, Key Fish Habitat is mapped in two (2) areas on site (Figure 3);

a) intersecting the north-west corner of the Subject Land, in association with an unnamed waterway flowing north-east and east of the Subject Land; and
b) Surrounding a large dam on Blackman's Swamp Creek, < 300 m distant from the boundary of the Subject Land, to the south-west.

One (1) first-order waterway flows through the Subject Land, extending both north and south-west of the large dam by the western boundary. This small waterway is likely to be ephemeral but has a defined stream-bed and banks, and was flowing strongly at the time of survey. Surrounding vegetation indicates that surrounding areas are annually waterlogged on a seasonal basis.

Consultation with Department of Primary Industries – Fisheries (DPI Fisheries) confirmed that a Part 7 Permit is not required for the works, as the waterways on site are not considered to support Key Fish Habitat (Appendix J).

2.2.7 Orange Local Environmental Plan 2011

The Subject Land for the Proposal is located in the Orange City Council Local Government Area (LGA) and is zoned as R1 – General Residential, R2 – Low Density Residential, and RE1 – Public Recreation within the Orange LEP 2011.

The objectives of zone R1 are to provide for the housing needs of the community, to provide for a variety of housing types and densities, to enable other land uses that provide facilities or services to

meet the day to day needs of residents, to ensure development is ordered in such a way as to maximise public transport patronage and encourage walking and cycling in close proximity to settlement, and to ensure that development along the Southern Link Road has an alternative access.

The objectives of zone R2 are to provide for the housing needs of the community within a low density residential environment, to enable other land uses that provide facilities or services to meet the day to day needs of residents, to ensure development is ordered in such a way as to maximise public transport patronage and encourage walking and cycling in close proximity to settlement, and to ensure that development along the Southern Link Road has an alternative access.

The objectives of zone RE1 are to enable land to be used for public open space or recreational purposes, to provide a range of recreational settings and activities and compatible land uses, to protect and enhance the natural environment for recreational purposes, to ensure development is ordered in such a way as to maximise public transport patronage and encourage walking and cycling in close proximity to settlement, and to ensure development along the Southern Link Road has alternative access.

As a subdivision and development intended for housing, the Proposal is permitted with consent within Zones R1 and R2. Consent may need to be sought from OCC regarding potential constraints where the proposed residential Lots and roads encroach into areas currently zoned as RE1, where dwellings and roads are not currently permitted under the Orange LEP 2011.

2.2.8 Water Management Act 2000

The objects of the Water Management Act 2000 (WMA 2000) are to provide for the sustainable and integrated management of the water sources of the state for the benefit of both present and future generations. Other objectives of this Act include aiming to promote ecologically sustainable development, to protect, enhance and restore water recourses, to provide efficient and equitable sharing of water and to integrate management of water sources with other aspects of the environment including native vegetation and native fauna.

Under the WMA 2000, to carry out earthworks, development or other specified activities on waterfront land, a Controlled Activity Approval through NSW DPE Water is required.

The definition of waterfront land includes the bed and banks of any watercourse, whether perennial or intermittent (WMA 2000). Therefore, the waterways within and in close proximity to the Subject Land meet this definition, and any works to be undertaken within specified buffer distances surrounding these waterways will require a Controlled Activity Approval through NSW DPE Water. Specified buffer distances for each waterway are shown in Figure 4.

The development must comply with Section 91E (1) under the WM Act for projects approved under Part 4 of the EP&A Act, in relation to all controlled activities that it carries out in, on or under waterfront land (cl 41 *Water Management (General) Regulation 2018*).

As the waterway crossing works will occur within waterfront land on the property, Oakstand must gain a CAA pursuant to clause 38 of the *Water Management Act (2000)* (WM Act) before work on the waterway commences.

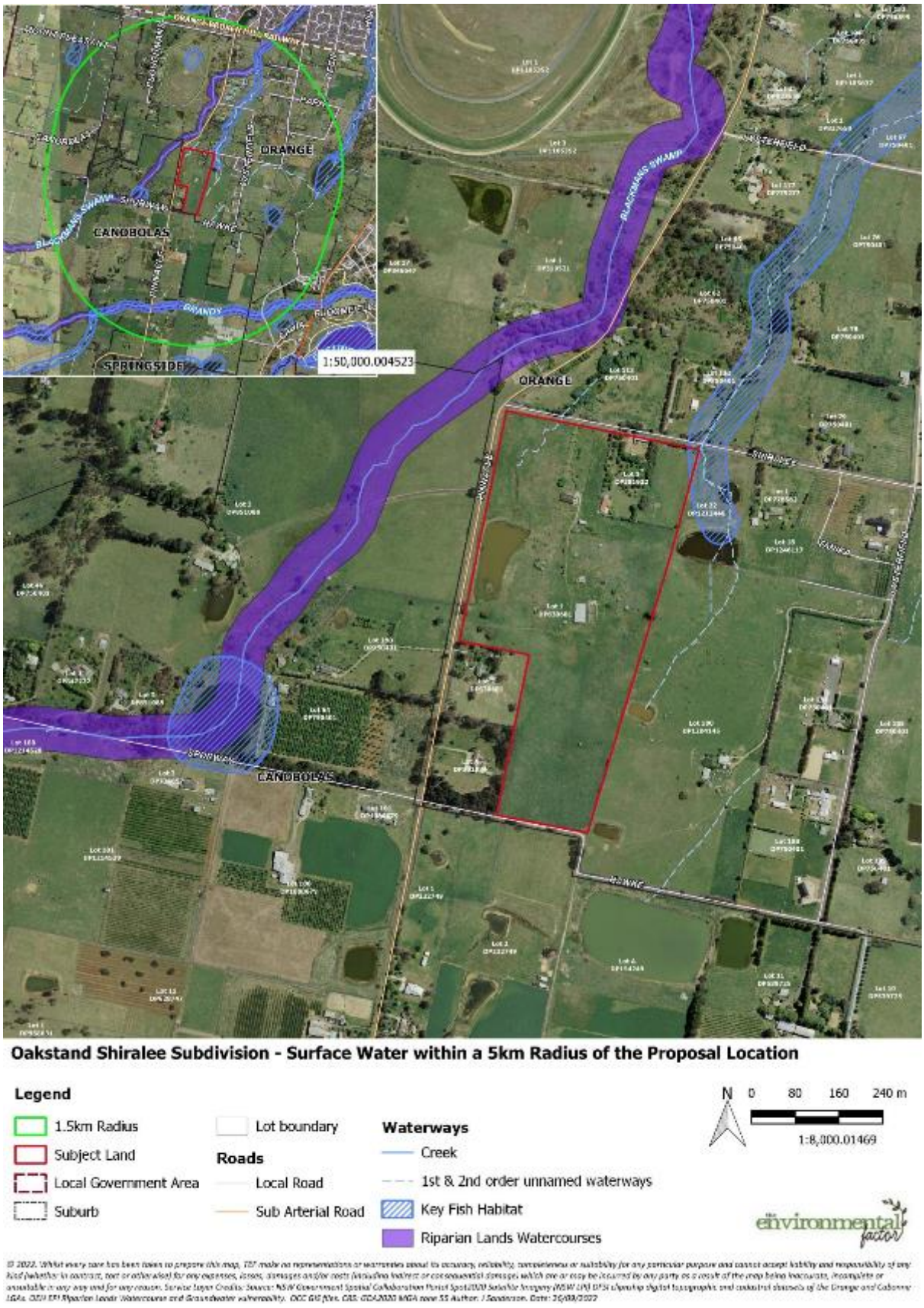
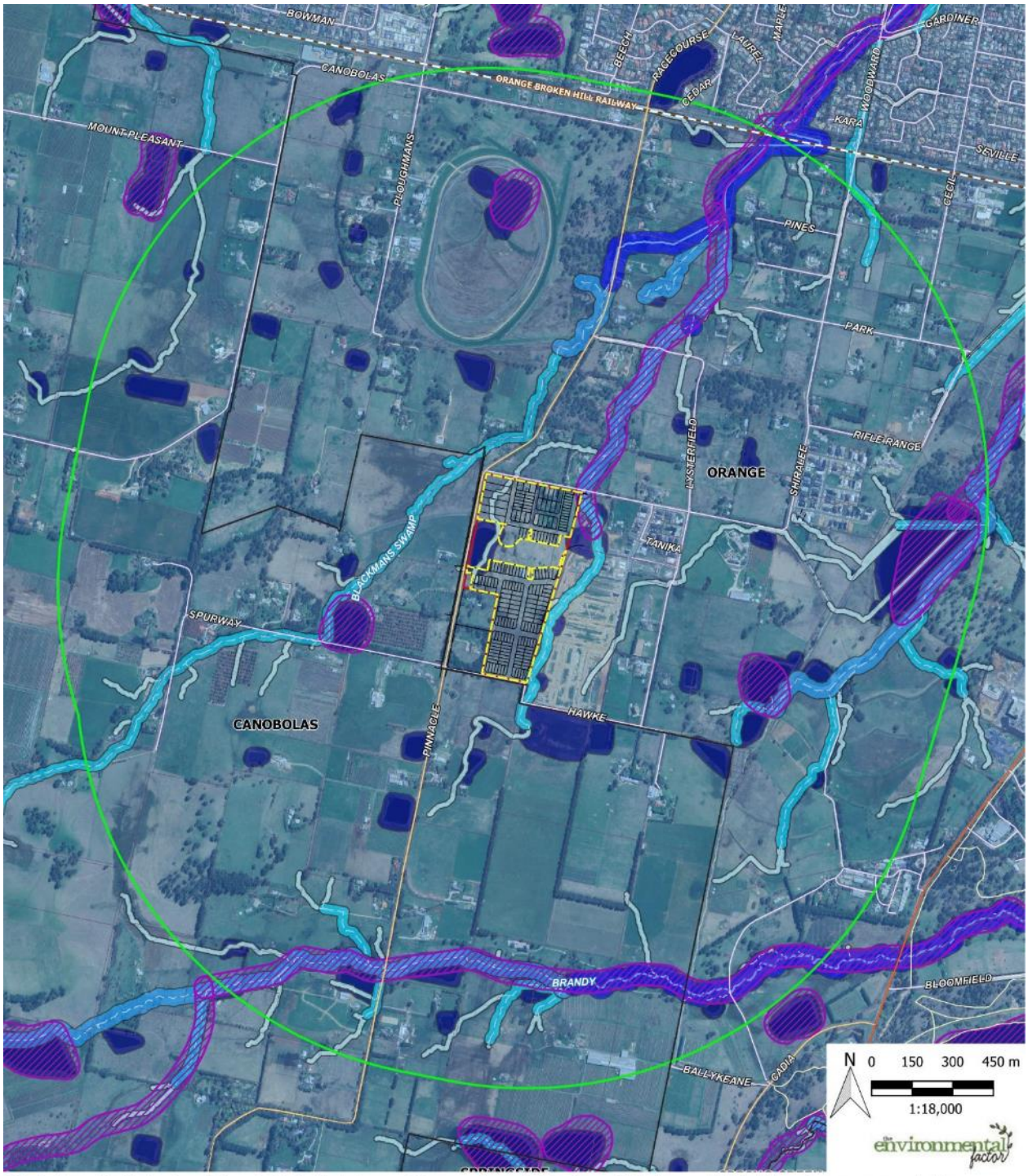


Figure 3 Mapped Key Fish Habitat within the Subject Land and Assessment Area



Oakstand, Shiralee Road Subdivision - Ground and Surface Water within the Assessment Area

Legend

- Assessment Area
- Subject Land
- Subject Site
- Proposed Developments
- Suburb
- Lot boundary

Roads

- Arterial Road
- Local Road
- Sub Arterial Road

Waterways

- Creek
- 1st, 2nd & 3rd Order unnamed waterways

Riparian Corridors

- 1st order streams (10m buffer)
- 2nd order streams (20m buffer)
- 3rd order streams (30m buffer)
- 4th & 5th order streams (40m buffer)
- Wetlands (20m buffer)
- Key Fish Habitat
- Groundwater Vulnerability

Figure 4 Mapped waterways and key fish habitat within the Subject Land and Assessment Area (inset)

3 LANDSCAPE CONTEXT

The following chapters describe the current landscape features and condition of the Subject Land and broader locality, as observed on site and according to available resources accessed at the time of assessment.

3.1 Bioregions and landscapes

The Subject Land occurs within the South Eastern Highlands Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion, and contains one (1) mapped NSW Soil Landscape (previously Mitchell Soil Landscape). Details on these are provided below.

3.1.1 Bioregion

A detailed description of the Subject Land IBRA sub region is provided in Table 3 below; further information can be found at:

https://www.environment.nsw.gov.au/bioregions/SouthEasternHighlands-Subregions.htm

Table 3 Subject Land IBRA region and IBRA sub region

Category	Description
IBRA region	South Eastern Highlands
IBRA sub region	**Orange**
Characteristics	***Geology*** Ordovician acid volcanics and slates and phyllites and Silurian volcanics. Extensive Tertiary basalts from Mount Canobolas and small stocks of granite. Limited limestone and serpentinite. ***Characteristic 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. ***Typical soils*** Deep structured 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 altitudes on Canobolas. ***Vegetation*** Yellow Box and Blakely's Red Gum with Red Stringybark, White Gum and 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.

3.1.2 NSW Landscape (Mitchell Soil)

The Subject Land is mapped as occurring on one (1) NSW Landscape): *Canobolas Sheet Basalts* (Figure 5). This Mitchell Landscape Soil type is described as widespread and undulating high-level plains with a general elevation between 950 – 1200 m. The *Canobolas Sheet Basalts* landscape is characterised by shallow red brown to black stony loams, yellow-brown texture contrast soils and lower slopes and alluvial loams and black clays in swampy valley floors.

3.2 Waterways and wetlands

One first-order waterway flows through the Subject Land, extending both north and south-west of a large dam by the western boundary (Figure 4). This small waterway is likely to be ephemeral but has a defined stream-bed and banks, and was flowing strongly at the time of survey. Surrounding vegetation indicates that surrounding wetland areas are annually waterlogged on a seasonal basis.

A second-order waterway flows in close proximity to the eastern boundary of the Subject Land (Figure 4).

One (1) very large dam with a small island is present along the western boundary of the Subject Land, adjacent to Pinnacle Road. This dam contains aquatic habitat and fringing wetland vegetation. Some recent drainage earthworks have been undertaken south-east of the dam.

Other areas of the property were inundated with shallow water during the survey, notably south of the dam, as well as along the north-eastern and southern boundaries of the property. These ephemeral pools and wetlands are likely due to ongoing La Nina rainfall during 2021-2022, as well as possibly due to soil compaction from historic agricultural disturbance. It is unknown how often these areas become inundated.

The site is poorly-drained overall, apart from the hillslope and hilltop areas within the central and northern portions of the Subject Land.

The entirety of the Subject Land is mapped as a recognised Area of Groundwater Vulnerability under NSW state legislation (Figure 4).

3.3 Native vegetation extent

The extent of native vegetation in the Subject Land was mapped using the NSW State Vegetation Type Map vC1.1.M1, within a 1,500 m buffer as specified under the BAM. Vegetation was later verified on site.

A total area of approximately **1030.90 ha** occurs within a 1,500 m radius of the Subject Land with approximately **70.87 ha** of mapped native vegetation present.

3.4 Assessment of patch size and connectivity

According to the BAM, a layer of native vegetation cover (patch size) is required to be examined within a 1,500 m buffer around the Subject Land, to determine the vegetative context of the site. A patch, as defined by the BAM, is an area of native vegetation that:

a) occurs on the development site or biodiversity stewardship site, and
b) includes native vegetation that has a gap of less than 100 m from the next area of moderate to good condition native vegetation (or ≤30 m for non-woody ecosystems).

Patch size may extend onto adjoining land that is not part of the development site or biodiversity stewardship site.

Patch size for the Subject Land was calculated for the vegetation on the development site using the field-validated map of vegetation types identified, and aerial photography interpretation for the 1,500 m buffer (Figure 6) (based on NSW State Vegetation Type mapping) and broader locality (10 km). Patch size is required to be assessed as one (1) of four (4) classes per vegetation zone mapped, being <5 ha, 5-24 ha, 25-100 ha or >100 ha.

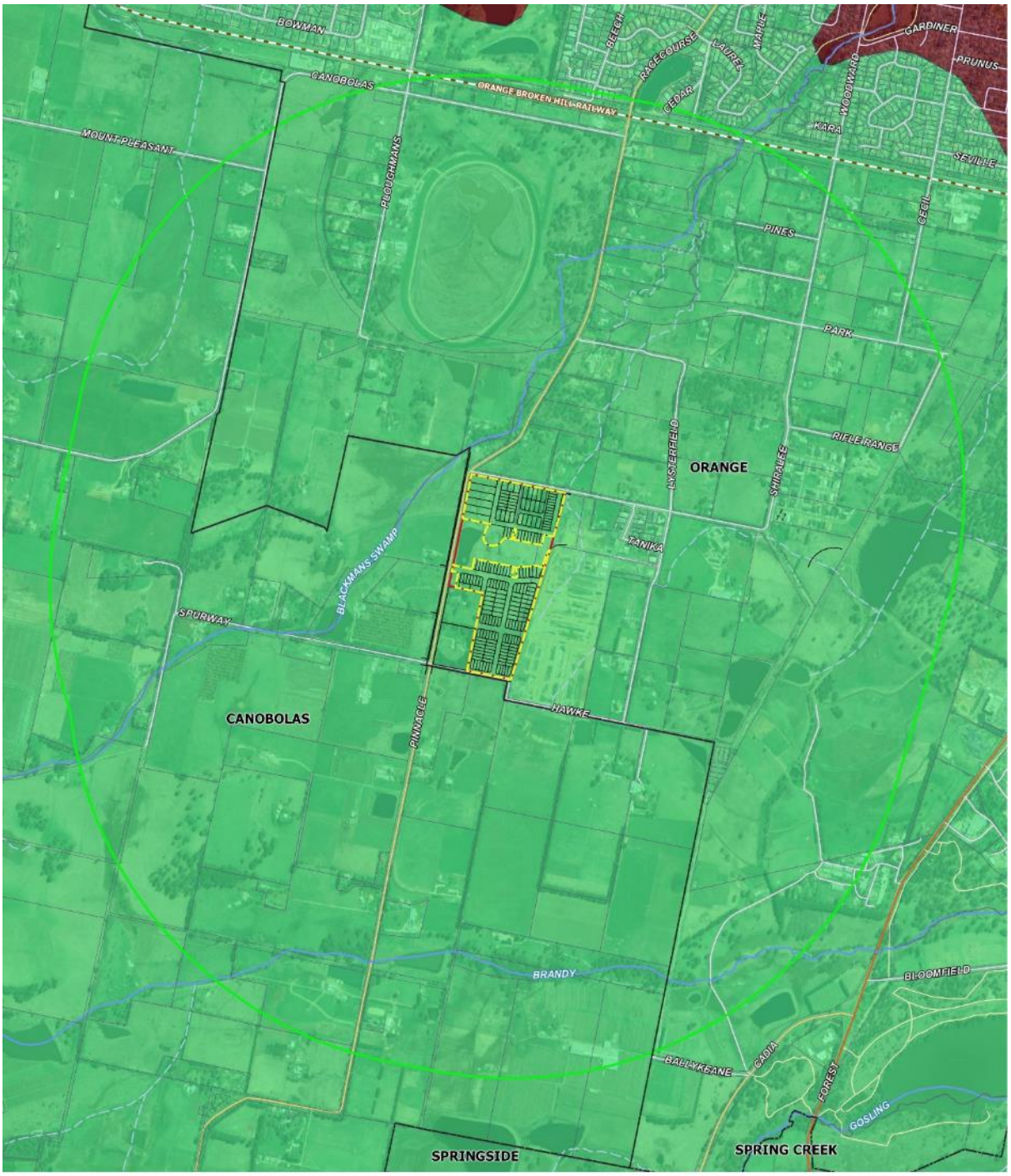
Three (3) small patches of native vegetation occur within and / or extending beyond, the Subject Land. This patch includes modified grassy woodland and derived native grassland. Areas of grassy woodland and derived native grassland continue beyond the Subject Land and into adjacent land to the west and south of the Assessment Area.

A total area of approximately **1030.90 ha** occurs within a 1,500 m radius of the Subject Land with approximately **70.87 ha** of mapped native vegetation present.

The total area of the 1,500 m buffer around the Subject Land is equivalent to a potential native vegetation cover of **6.87 %**, therefore falling in the **0 - 10 %** class as defined under the BAM.

The small patches of native vegetation extend some minor distances beyond the Subject Land. For the purposes of this assessment, a patch size of **<1.0 ha** has been used.

Based upon vegetation mapping and aerial photography interpretation beyond the Subject Land, the total area of the patch of native vegetation was calculated as falling into the **< 5 ha** bracket.



Oakstand, Shiralee Road Subdivision - Mitchell Landscape Soils within the Assessment Area

Legend

- Assessment Area
- Subject Land
- Subject Site
- Proposed Developments
- Suburb
- Lot boundary

Roads

- Arterial Road
- Local Road
- Sub Arterial Road

Waterways

- Creek
- 1st & 2nd order unnamed waterways

Mitchell Landscape Soils

- Canobolas Sheet Basalts
- Mullion Slopes

N 0 150 300 450 m

1:18,000

Figure 5 Mitchell Landscape Soils

Oakstand, Shiralee Road Subdivision - Plant Community Types within the Assessment Area

Legend

- Assessment Area
- Subject Land
- Subject Site
- Proposed Developments
- Suburb
- Lot boundary

Roads

- Arterial Road
- Local Road
- Sub Arterial Road

Waterways

- Creek
- 1st & 2nd order unnamed waterways

NSW State Vegetation Types

- PCTID: 0 - Not native vegetation
- PCTID: 3258 - Sydney Basin Creekflat Blue Gum-Apple Forest
- PCTID: 3347 - Southern Tableland Creekflat Ribbon Gum Forest
- PCTID: 3366 - Central Tableland Clay Apple Box Grassy Forest
- PCTID: 3376 - Southern Tableland Grassy Box Woodland
- PCTID: 3387 - Central West Creekflat Grassy Woodland
- PCTID: 4063 - Central and Southern Tableland River Oak Forest

Figure 6 Mapped Plant Community Types within the Assessment Area

4 METHODOLOGY

The following chapters describe the desktop and onsite investigations completed in order to catalogue the predicted and actual biodiversity assets occurring on site, in order to ascertain the potential impacts to biodiversity arising as a result of the Proposal.

4.1 Desktop assessment

The following resources were accessed to inform the survey methodology used during field investigations, and to aid in the preparation of this BAR.

4.1.1 Publications and databases

Relevant State and Commonwealth Databases

- Protected Matters Search Tool (DCCEEW 2022)
- NSW BioNet. The website of the Atlas of NSW Wildlife (DPIE 2022)
- NSW Scientific Committee Final Determinations
- Priority Weeds for the Central Tablelands Region (DPI 2022)

State and Federal Guidelines

- Threatened Species Survey and Assessment: Guidelines for developments and activities. Working Draft (DEC 2004)
- NSW Survey Guide for Threatened Frogs (DPIE 2020)
- NSW Guideline to Surveying Threatened Plants and their Habitats (DPIE 2020)
- Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth of Australia 2010)
- Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth of Australia 2010)
- Survey guidelines for Australia's threatened mammals. Guidelines for detecting mammals listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth of Australia 2011)
- Draft survey guidelines for Australia's threatened orchids.

Council Documents

- Orange Local Environmental Plan (LEP) 2011

4.1.2 Spatial data

- New South Wales Vegetation Information System (VIS) (DPIE 2022)
- Near Maps (2021)
- SIX Maps (LPI 2022)
- OEH Mitchell Landscape Soil v3.1
- CRS GDA 94 MGA zone 55
- OEH Bionet Atlas Threatened Species list, extracted October 2022.
- SE Local Land Services (SE LLS) Biometric Vegetation (OEH 2014),
- Forested Ecosystems: Vegetation of the Southern Forest VIS ID 3895 (OEH 2011)
- Google Satellite Imagery 2019
- NSW Spatial Portal ss-sdi Spot 6/7 Satellite Imagery 2020

4.2 Onsite Investigations and application of the Biodiversity Assessment Method

Site assessment was undertaken over one (1) day in September 2022 by Ecologist Pandora Holliday. During the site assessment, the following activities were undertaken:

- Identifying and recording the vegetation communities present on the Subject Land, with focus on identifying any threatened ecological communities (TEC)
- Recording a detailed list of flora species encountered on the Subject Land, including searches for locally occurring threatened species, species diagnostic of threatened ecological communities and priority weeds (High Threat Exotics or HTE)
- Recording opportunistic sightings of any fauna species, seen or heard, on the Subject Land or within the broader Assessment Area
- Identifying and recording the locations of threatened fauna habitat such as important nesting, roosting or foraging microhabitats
- Undertaking targeted searches for the habitat of any threatened and regionally significant fauna including:
- Tree hollows (habitat for threatened large forest owls, parrots, cockatoos, bats and arboreal mammals)
- Caves and crevices (habitat for threatened reptiles, small mammals and microbats),
- Termite mounds (habitat for threatened reptiles and the echidna)
- Waterbodies (habitat for threatened fish, frogs and water birds)
- Fruiting / flowering trees (food for threatened birds and mammals)
- Rocky outcrops and overhangs (habitat for threatened microbats, herpetofauna and marsupials)
- Trees and shrubs supporting nest structures (habitat for threatened birds and arboreal
- mammals)
- Any other habitat features that may support fauna (particularly threatened) species
- Assessing the connectivity and quality of the vegetation within the Subject Land and surrounding area.

4.2.1 Survey of native vegetation

Native Vegetation Assessment

Assessment and on-ground mapping of PCTs was undertaken during the field survey. The Subject Land was traversed on foot to identify the vegetation structure, including identifying dominant species and native vegetation.

Three (3) vegetation plots were completed using a 20 x 50 m functional, structural and floristic plot survey method, consistent with Section 4.3 of the BAM 2020 (Figure 7). The identification of PCTs was in accordance with the NSW PCT classification as described in the BioNet Vegetation Classification database (DPE 2022) and involved the use of the database to identify PCT types which matched the geographic distribution (based upon IBRA subregions), vegetation formation, and floristics of vegetation within the Subject Land and broader Assessment Area. The data for the potential PCT's were then reviewed to determine the most appropriate PCT for the vegetation communities sampled within the Subject Land. Observations of vegetation structure and composition made during surveys of the site, as well as reference to previous ecological surveys and mapping conducted within the Subject Land, also helped to inform the determination of appropriate PCTs.

4.2.2 Threatened flora surveys

During site assessment the Subject Land was opportunistically surveyed for threatened flora species. Information on species with potential to occur within the Subject Land was collated, to guide in-field identification if encountered. Locations of species found were intended to be recorded using handheld GPS units (mobile phones / tablets) equipped with the Avenza mapping software.

Seasonal, targeted, threatened flora surveys were not undertaken as part of this assessment.

4.2.3 Terrestrial fauna surveys

Opportunistic observations

Opportunistic and incidental observations of fauna species were recorded at all times during field surveys; for instance, fallen timber was scanned for reptiles, rock fragments and logs were lifted (where possible) to check for sheltering fauna, and habitat trees and water bodies were scanned for active and roosting birds. All species observed or heard utilising the site during surveys were identified. Any evidence of faunal activity (tracks, scats, feathers, pellets) were noted and specimens collected and sent for analysis (Scats About 2022) and identification. Disturbance along tracks caused by animals including diggings and burrows were noted and any roadkill was recorded.

Habitat assessment

In addition to the targeted surveys and direct observations, the following general assessments were made throughout the time spent in the field by TEF staff.

Habitat assessments on site included active searches for the following habitat features:

- Trees with bird nests or other potential fauna roosts
- Burrows, dens and warrens, bridges, culverts and hollow-bearing trees for evidence (e.g. guano or bat droppings) of roosting microbats
- Hollow-bearing trees and logs which provide refuge, nest and den sites for a range of threatened fauna species
- Koala food trees and/or evidence of scratches or scats
- Distinctive scats or latrine sites, owl whitewash and regurgitated pellets under roost sites
- Tracks or animal remains
- Evidence of activity such as feeding scars, scratches and diggings
- Leaf litter and fallen timber were inspected for reptile habitat
- Presence of potential habitat for threatened frog species

Table 4 Survey Effort

Survey method	Description		
Survey Effort	**Date**	**# Days**	**# Staff**
	September 30th	1	1
BAM Plots, Rapid Data Points and PCT mapping	Three (3) BAM plots were strategically placed within the Subject Land to determine the type and condition of vegetation present. The PCT was identified based on floristics present and mapped based on condition (extent of remnant native canopy and / or native groundcover). Rapid data points were completed in areas of planted vegetation throughout the residential block to cross-check on-ground vegetation against BAM requirements and local PCTs.		

Survey method	Description
Opportunistic general surveys	Opportunistic and incidental observations of fauna species were recorded at all times during field surveys, with location and number of threatened species recorded. Any faunal evidence (nests, tracks, scats, feathers, pellets) were noted. Disturbance including diggings and burrows were noted.

4.2.4 Survey conditions and limitations

Survey conditions on site during surveys on 30th September 2022 were moderate and sunny with light winds.

Results from field investigations were influenced by the timing and duration of surveys, weather conditions prior to, and during the surveys. Survey conditions on site at Shiralee Road may have varied from those measured at the nearest weather station at Orange Airport. Details are outlined in Table 5 below.

Table 5 Weather conditions preceding and during field surveys (weather station: Orange Airport AWS 063303, Bureau of Meteorology 2022).

Date (2022)	Temperature (˚C)		Total Rain (mm)	Max Wind Speed km/hr	Wind Direction
	Minimum	Maximum			
24/9/22	9.9	14.9	3.8	43	W
25/9/22	1.7	14.3	0.2	31	SW
26/9/22	**1.2**	15.5	0.0	28	NW
27/9/22	7.6	**16.9**	4.4	**46**	WNW
28/9/22	2.0	12.0	**15.8**	37	SSW
29/9/22	3.6	16.1	0.4	**46**	SSE
30/9/22	5.6	15.6	0.8	**46**	SE

Given the nature and timing of the surveys undertaken, it is likely that some species that occur in the Subject Land either permanently, seasonally or transiently were not detected during the survey. These species may include annual, ephemeral or cryptic flora and fauna species; nocturnal fauna; birds and frogs which call at other times of year; and mobile or transient fauna in general. The habitat assessment conducted allows for identification of habitat resources for such species, in order to assess their likelihood of occurring within the Subject Land. As such, the survey was not designed to detect all species, rather to provide an overall assessment of the ecological values within the Proposal footprint in accordance with the BAM. This information was used to predict potential impacts of the Proposal on ecological values and to provide this as input to design development, so that impacts to native biota can be avoided, mitigated and / or offset through the BOS.

4.3 Assessments of Significance

Assessment of the likely significance of impacts resulting from the Proposal are prepared in accordance with Section 1.7 of the EP&A Act and the EPBC Act *Matters of National Environmental Significance – Significant Impact Criteria Guidelines* (DEWHA, 2013) for threatened biota known or likely to occur within the Proposal footprint, and with potential to be impacted by the Proposal, based on the results of the desktop investigations and field survey.

5 RESULTS

The following chapters describe the findings of the desktop and onsite investigations completed for the Proposal, within the categories of vegetation types, vegetation zones, vegetation integrity, flora and fauna species, weeds and threatened species.

5.1 Native Vegetation

Determination of the most appropriate PCTs for the vegetation communities within the Subject Land involved the use of the BioNet Vegetation Classification database to identify PCT types which matched the geographic distribution (based upon IBRA subregions) and the native vegetation mapped on site (Table 6); vegetation formation on site, including any canopy species present within and immediately outside the Subject Land; soils, elevation and location within the landscape; and, the floristic (BAM) plot completed within the Subject Land (Appendix D). The data for the potential PCTs collected on site was then reviewed against the range of potential or likely PCTs for the area, to determine the most appropriate match for the vegetation communities sampled within the Subject Land.

The Assessment Area is currently mapped as supporting six (6) PCTs as outlined in Table 6 below.

Table 6 Native Plant Community Types mapped within 1,500 m of the Subject Land

PCT ID	Plant Community Type Name	Area (ha)
0	Non-native vegetation	960.04
3258	Sydney Basin Creekflat Blue Gum-Apple Forest	5.99
3347	Southern Tableland Creekflat Ribbon Gum Forest	0.10
3366	Central Tableland Clay Apple Box Grassy Forest	52.06
3376	Southern Tableland Grassy Box Woodland	11.14
3387	Central West Creekflat Grassy Woodland	0.84
4063	Central and Southern Tableland River Oak Forest	0.74
	Total Area within 1,500 m buffer (ha):	**1030.90**
	Total Native Vegetation within 1,500 m buffer (ha):	**70.87**

Surveys confirmed that the following PCT was present within the Subject Land:

PCT 3347 *Southern Tableland Creekflat Ribbon Gum Forest* (Plate 1)

In addition, the Subject Land contained scattered planted individual native trees (within existing landscaped garden areas), as well as small areas of planted native vegetation in the form of windbreak plantings (Plate 5 - Plate 6). Due to the extremely limited size of these native windbreak plantings, no floristic plots were completed within the planted native vegetation.

Further discussion on these conclusions is provided below. A map showing PCT distribution and vegetation types within the Subject Land is presented in Figure 7.

5.1.1 Nominated Plant Community Types for the Subject Land

Based on the assessment process described above, the PCTs in

Table 7 are nominated as the most appropriate for the species assemblages present within the Subject Land.

Table 7 PCT Nominations for Vegetation Formations occurring within the Subject Land

Vegetation formation	Potential Plant Community Type	Nominated PCT & Reasoning
Wet Sclerophyll Forests	Option 1: PCT 3303 *Central Tableland Ribbon Gum Sheltered Forest*	PCT 3347 *Southern Tableland Creekflat Ribbon Gum Forest.* This PCT is characterized by the floristic and structural vegetation attributes observed within the Subject Land and adjacent areas, including remnant canopy species Ribbon Gum (*Eucalyptus viminalis*) and Candlebark (*Eucalyptus rubida*) with Apple Box (*Eucalyptus bridgesiana*), with an absent mid layer over a grassy ground layer dominated by Phalaris (*Phalaris aquatica*), Cocksfoot (*Dactylis glomerata*) and Prairie Grass (*Bromus catharticus*). Remnant native ground layer species present included Tall Sedge (*Carex appressa*) and Pinrush (*Juncus* spp.). PCT 3303 is known to occur in association with deeper, more sheltered valley sites, grading into PCT 3347 in more open tablelands areas such as those within the Subject Land. PCT 3366 is primarily dominated by Apple Box (*Eucalyptus bridgesiana*), which was not a dominant species within the Subject Land. Therefore PCT 3347 was considered the most appropriate PCT for this site. PCT 3347 occurs on a variety of substrates on creek flats and gentle footslopes in undulating high altitude tableland within eastern parts of the South Eastern Highlands bioregion. Typically PCT 3347 is found between elevations of 600-1300 metres asl, with means of 550-1000 mm precipitation and 10-80 frost days annually. These site characteristics are consistent with those observed within the Subject Land. PCT 3347 is listed as occurring in the Orange IBRA sub-region, where the Subject Land occurs.
Grassy Woodlands	Option 2: PCT 3347 *Southern Tableland Creekflat Ribbon Gum Forest*	
	Option 2: PCT 3366 *Central Tableland Clay Apple Box Grassy Forest*	

5.1.2 Plant Community Type descriptions

Detailed PCT descriptions are provided below, including information on vegetation formation, class and condition. The VI scores have not been calculated

Grassy Woodland

PCT 3347 Southern Tableland Creekflat Ribbon Gum Forest and Derived Native Grassland	
 **Plate 1 PCT 3347 with remnant overstorey**  **Plate 2 PCT 3347 in derived grassland condition**	
Structure	Tall to very tall grassy sclerophyll open forest to grassy woodland. Original overstorey and mid stratum primarily historically cleared.
Overstorey	Ribbon Gum (*Eucalyptus viminalis*) and Candlebark (*Eucaluptus rubida*)
Mid Stratum	Not present. Original mid stratum historically cleared.
Ground Stratum	Dominated by exotic species.

PCT 3347 Southern Tableland Creekflat Ribbon Gum Forest and Derived Native Grassland	
PCT number	PCT 3347
Vegetation formation	Grassy Woodland
Vegetation class	Tableland Clay Grassy Woodlands
Condition	This PCT occurred in degraded remnant and derived grassland conditions. Remnant areas contain scattered mature trees over a primarily exotic grassy ground layer, with some limited regeneration of overstorey species occurring. No mid stratum species were present in these areas. Derived grassland areas contained no remnant or regenerating overstorey or mid stratum species, but the ground stratum contained a high proportion of native tussock species. The general area surrounding patches of this PCT was highly modified, with exotic grasses and shrubs widespread.
Conservation Status	This PCT is not associated with any threatened ecological communities.
PCT estimated remaining	Approximately 35 % remaining
Threatened Species	Superb Parrot (*Polytelis swainsonii*) (listed as vulnerable under both the BC Act and EPBC Act) was recorded within this PCT during surveys.
Comments	This PCT occurred in isolated patches on the lower areas of the Subject Land and adjacent properties. Remnant areas of the PCT were considered to be limited to the drip line of the remnant trees on site. Within these areas, the ground-stratum was predominantly exotic due to a history of livestock grazing and overstorey clearing. Derived grassland areas were defined by the proportion of native tussock cover present in areas north of the large dam.

PCT 0 Not native vegetation

Plate 3 PCT 0 Exotic pasture grassland with hawthorn (*Crataegus monogyna*)

Plate 4 PCT 0 Landscaped gardens with planted exotic species

Structure	Primarily exotic pasture, with scattered woody exotic shrubs and low trees. Also areas of landscaped garden, containing trees, shrubs and garden beds scattered throughout mown exotic lawn dominated by exotic grasses.
Overstorey	Scattered Cherry Plum (*Prunus* sp.) in pasture paddocks, with some planted windbreaks of *Cypress* sp.. A variety of planted exotics in landscaped gardens, including Black Locust (*Robinia pseudoacacia), Photinia* sp., Silver Birch (*Betula pendula*) and *Magnolia* sp.

PCT 0 Not native vegetation	
	Original native vegetation historically cleared.
Mid Stratum	Hawthorn (*Crategus* monogyna) and Blackberry (*Rubus fruiticosus* spp. agg.) in pasture paddocks. Scattered planted shrubs in landscaped gardens. Original native vegetation historically cleared.
Ground Stratum	A mixture of exotic grasses and forbs, with dominant species being Cocksfoot (*Dactylis glomerata*), Phalaris (*Phalaris aquatica*) and Prairie Grass (*Bromus catharticus*).
PCT number	PCT 0
Vegetation formation	N/A
Vegetation class	N/A
Condition	N/A
Conservation Status	This PCT is not associated with any threatened ecological communities.
PCT estimated remaining	N/A
Threatened Species	Superb Parrot (*Polytelis swainsonii*) (listed as vulnerable under both the BC Act and EPBC Act) was recorded on site during surveys.
Comments	Exotic vegetation was widespread throughout the majority of the Subject Land.

PCT N/A Planted native vegetation	
 **Plate 5 Planted native trees and shrubs along a fence line**  **Plate 6 Planted native tree within landscaped garden area**	
Structure	Primarily exotic pasture, with small areas of planted native trees and shrubs. Original overstorey vegetation historically cleared.
Overstorey	Red Box (*Eucalyptus polyanthemos*), Brittle Gum (*Eucalyptus mannifera*), Blakely's Red Gum (*Eucalyptus blakelyi)* and others.
Mid Stratum	Weeping Boree (*Acacia vesita),* Callistemon sp., Hakea sp.. Original native vegetation historically cleared.

PCT N/A Planted native vegetation	
Ground Stratum	A mixture of exotic grasses and forbs, with dominant species being Cocksfoot (*Dactylis glomerata*), Phalaris (*Phalaris aquatica*) and Prairie Grass (*Bromus catharticus*).
PCT number	N/A
Vegetation formation	N/A
Vegetation class	N/A
Condition	N/A
Conservation Status	N/A
PCT estimated remaining	N/A
Threatened Species	Superb Parrot (*Polytelis swainsonii*) (listed as vulnerable under both the BC Act and EPBC Act) was recorded on site during surveys.
Comments	Due to the extremely limited size of these native windbreak plantings, no floristic BAM plots were completed within these areas.

5.2 Management Zones and vegetation types

Plans provided confirmed that there are three (3) proposed management zones occurring within the Subject Land (Figure 1), as follows:

- Zone 1: Proposed Residential Lots
- Zone 2: Proposed Roads
- Zone 3: Proposed Open Space

Onsite surveys confirmed that each of these zones contains the following vegetation types, as described in Table 8. Further details of impacts to each of these vegetation types are presented in Table 10 (Section 6.2).

Table 8 Descriptions of proposed management zones present within the Subject Land

Proposed Management Zones	Vegetation types present within all zones	Vegetation Characteristics
Proposed Residential Lots Proposed Roads Proposed Open Space	PCT 0: Exotic Vegetation and Landscaped Gardens	Areas dominated by a) exotic pasture, with scattered woody exotics such as blackberry, hawthorn and prunus (Plate 3 - Plate 4); and b) Trees, shrubs and garden beds scattered throughout mown exotic lawn dominated by exotic grasses (Plate 4). The majority of trees and shrubs in these areas are exotic, with limited numbers of scattered planted native trees (Figure 7).

Proposed Management Zones	Vegetation types present within all zones	Vegetation Characteristics
	PCT 3347 Southern Tableland Creekflat Ribbon Gum Forest	Areas containing mature remnant overstorey trees with an absent mid-storey and a grassy ground layer dominated by exotic species (Plate 1).
	PCT 3347 Derived Native Grassland	Areas of grassland dominated by native sedge species where the native overstorey and mid-stratum were absent due to historic clearing (Plate 2).
	Planted Native Vegetation	Native vegetation plantings which could not be assigned to an appropriate PCT. Primarily single-row windbreak plantings (Plate 5).
	Aquatic Habitat	Dam and creek line areas, primarily submerged but also containing aquatic plants and fringing wetland rushes (Plate 12).

It should be noted that the relative cover of native versus exotic species is dependent on seasonal variability.

Oakstand, Shiralee Subdivision - Survey Effort and Verified Plant Community Types

Legend

- Subject Land
- Subject Site
- Proposed Developments
- Suburb
- Lot boundary
- BAMPlots

Roads
- Local Road
- Sub Arterial Road

Waterways
- Creek
- 1st & 2nd order unnmaed waterways

Survey Effort
- Dredged channel
- Remnant Habitat Trees (Recommend Retain)
- Rock Outcrop
- Superb Parrots
- Trench
- Waterway with culvert
- Wetland Beside Creek
- Planted Eucalyptus Species

Verified PCTs
- PCTID: 0 - Not native vegetation
- PCTID: 3347 - Southern Tableland Creekflat Ribbon Gum Forest
- PCTID: 3347 - Derived grassland of Southern Tableland Creekflat Ribbon Gum Forest
- Planted native vegetation

Figure 7 Survey effort, vegetation zones and verified Plant Community Type

5.3 Species recorded

5.3.1 Flora species

A total of forty-seven (47) species were recorded within the vegetation plots completed and incidental species observed on site, consisting of sixteen (16) native species and thirty-one (31) exotic species, including seven (7) High-Threat Exotics (HTE). The field data collected is available in Appendix D.

Threatened flora

No previous records for threatened flora species occur within the Assessment area, however, a number of threatened species are recorded as occurring within the locality (BioNET 2022), including:

- Black Gum (*Eucalyptus aggregata*) – V, BC Act & V, EPBC Act
- Silky Swainson-pea (*Swainsona sericea*) – V, BC Act
- Silver-leafed Gum (*Eucalyptus pulverulenta)* – V, BC Act & V, EPBC Act

None of these species were recorded as occurring within the Subject Land during surveys, however targeted surveys for these species have not been undertaken as part of this assessment.

Native vegetation

The Subject Land supported three (3) small and isolated stands of grassy woodland occurring as mature Eucalypts with an exotic dominated understory (Plate 1), as well as one (1) patch of native grassland derived from grassy woodland (Plate 2). This grassy woodland aligns with PCT 3347 *Southern Tableland Creekflat Ribbon Gum Forest* in a degraded condition. Very limited regeneration or succession of canopy species was present. The general area surrounding the patches of this PCT was highly modified, with exotic pasture and areas of exotic woody weed species (Plate 3). The Subject Land also supported some small areas of planted native vegetation which did not align to a PCT (Plate 5,) (Figure 7). These small patches were linear in shape and appeared to have been planted as short windbreaks along fence lines (Plate 9). Remnant tree guards were present as further evidence of this vegetation being planted rather than naturally occurring (Plate 9).

In addition, the Subject Land contained areas of landscaped garden surrounding the two (2) existing residences (Plate 4, Plate 11). These garden areas primarily contained plantings of exotic trees and shrubs, but some planted native trees and shrubs were also scattered throughout (Plate 6). These individuals have been marked in Figure 7. Native species present within these garden areas did not align with any local PCT.

Grassy Woodlands

Canopy species recorded within the Subject Land that align with this vegetation community included Ribbon Gum (*Eucalyptus viminalis*) and Candlebark (*Eucalyptus rubida*). Naturally occurring Apple Box (*Eucalyptus bridgesiana*) was also observed on adjacent land. Only small numbers of mature overstorey trees were present in the woodland areas within the Subject Land. No mid stratum species were observed within this vegetation community and the ground layer was dominated by exotic pasture species. In contrast, the small area of native grassland derived from grassy woodland was lacking native overstorey and mid-stratum species, but the ground layer vegetation was dominated by native sedges including Tall Sedge (*Carex appressa*) and Pinrush (*Juncus* spp.).

Exotic vegetation

The Subject Land and surrounding areas have experienced a high proportion of disturbance from historic land management including historic clearing, agriculture, possible historic orchard management, suburban development and grazing by domestic animals. This disturbance has altered

soil properties and encouraged the proliferation of common exotic species recorded onsite during surveys, including common exotic pasture grasses Phalaris (*Phalaris aquatica*) and Cocksfoot (*Dactylis glomerata*), as well as a number of High Threat Exotic (HTE) weed species including Blackberry (*Rubus fruiticosus* spp. agg.), Hawthorn (*Crataegus monogyna*) (Plate 3, Plate 10).

The Subject Land also contains substantial areas of exotic landscaped gardens mainly characterised by diverse planted exotic trees over mown lawns dominated by exotic grasses (Plate 6, Plate 11). Exotic species present within these areas include Black Locust (*Robinia pseudoacacia*), *Photinia* sp., Silver Birch (*Betula pendula*) and *Magnolia* sp. A number of High Threat Exotic (HTE) weed species are present within these areas. All original native vegetation within the landscaped garden areas has been historically cleared.

Weeds listed as High Threat Exotics, WoNS, and/or Priority Weeds for the Central West region are listed in Table 9.

Table 9 High Threat Exotic, WoNS and Priority weed species identified within the Subject Land

Scientific Name	Common Name	Status	Regional/National Listing
Cotoneaster sp.	Broad-leaved Cotoneaster	HTE	-
Crataegus monogyna	Hawthorn	HTE	-
Pyracantha sp.	Firethorn	HTE	-
Robinia pseudoacacia	Black Locust	HTE	-
Rosa rubiginosa	Briar Rose	HTE	Central Tablelands Community Concern list
Rubus fruiticosus spp. agg.	Blackberry	HTE	WONS, NSW listed Prohibition on certain dealings, Central Tablelands Regional Asset Protection
Salix sp.	Willow	HTE	WONS, Central Tablelands Community Concern list

Wetland and Aquatic vegetation

The Subject Land also contained a large area of wetland and aquatic habitat, in the form of a very large dam including a small vegetated island, sections of waterway north and south of the dam, and several ephemeral wetland areas. These wetland habitats contained a mix of native and exotic vegetation species, including fringing vegetation and aquatic / submerged plants (Plate 12). The waterway also intersects the areas of native grassy woodland and derived native grassland described above.

Plate 7 PCT 3347 including several large remnant hollow-bearing Ribbon Gums (*Eucalyptus viminalis)*

Plate 8 Planted native trees in linear windbreak formation

Plate 9 PCT 0 Planted native vegetation showing linear planting configuration (left, centre) and remnant plastic tree guard (right)

Plate 10 PCT 0 Exotic pasture with sparse scattered trees including exotic fruit trees and planted native species

Plate 11 Landscaped garden areas with planted exotic and native tree species

Plate 12 Wetland and aquatic vegetation

5.3.2 Fauna species

Twenty (20) species of fauna were recorded within the Subject Land during surveys. These consisted of sixteen (16) species of native bird, one (1) species of exotic bird, one (1) species of native amphibian, one (1) species of native mammal and one (1) species of domestic mammal (livestock).

Threatened fauna

Two hundred and eighty-six (286) threatened fauna records occur within the locality (BioNET 2022; Appendix F).

One of these species, Superb Parrot (*Polytelis swainsonii*) (listed as vulnerable under the BC Act and EPBC Act) was recorded within the Subject Land during surveys. Targeted surveys for threatened species have not been undertaken as part of this assessment.

Fauna habitats

The Subject Land contains a variety of habitat types and resources for fauna throughout the remnant Grassy Woodland patches with mature trees (Plate 1, Plate 7), the native vegetation plantings (Plate 6, Plate 8 – 9), the exotic pasture with shrubs and trees, and also in the landscaped garden areas with mixed plantings of native and exotic species (Plate 3, Plate 10 – 11). In addition, the large dam and waterways provide both wetland and aquatic fauna habitats (Plate 12).

Canopy species including *Eucalyptus sp.* provide potential foraging, roosting and breeding habitat for a range of locally occurring threatened species including birds such as the Dusky Woodswallow (*Artamus cyanopterus cyanopterus*), as well as microbats and arboreal mammal species. The remnant grassy woodland areas contain a number of very significant large old trees (*Eucalyptus* spp.) containing multiple small to medium-large hollows, providing important habitat resources for threatened hollow-dependent species including the Superb Parrot (*Polytelis swainsonii*) (observed within the grassy woodland during surveys), as well as for other bird and mammal species.

Areas of planted native trees and shrubs provide nesting and foraging habitat for native birds and mammals. Native Australian Magpies (*Craticus tibicen*) were observed to be nesting in a planted tree (*Eucalyptus sp.*) within one of the garden areas. Mixed plantings of exotic and native trees and shrubs within the landscaped gardens and fence line plantings provide shelter, nest sites and foraging habitat for a range of native fauna species.

Exotic trees and shrubs within the pasture areas also provide habitat for native bird species. A large number of cup and dome nests were observed within exotic shrubs such as Hawthorn and Blackberry scattered throughout the pasture paddocks. Cleared open paddocks provide foraging opportunities for grassland birds and birds of prey such as the Little Eagle (*Hieraaetus morphnoides*).

The large dam and associated waterway and wetland areas provide important breeding and foraging habitat for wetland birds, amphibians, reptiles and fish. Native tussocks surrounding the waterway provide shelter for wetland birds, amphibians and reptiles.

Large areas of rocky outcrops are present on the north-west slope of the hill. These contain loose rocks and crevices which are habitat for native reptile species such as skinks, lizards, legless lizards and snakes.

5.4 Conservation significance

The following section describes the conservation significance of vegetation communities and species likely to be present within the Subject Land.

5.4.1 Threatened ecological communities

Vegetation within the Subject Land was not associated with any threatened ecological communities.

5.4.2 Migratory species

Of the listed terrestrial migratory species (PMST 2022) with the potential to occur within the locality, none of these species were considered likely to use resources within the Subject Land following the field survey and habitat assessment. The potential for the proposal to impact on any of these species is considered low (Appendix F62). Therefore, Assessments of Significance have not been completed for these species.

5.4.3 Habitat connectivity

The Subject Land exists within a highly modified landscape where habitat connectivity is disrupted by existing rural and residential fencing, roads, cleared areas and the encroachment of suburban development. Two (2) small patches of native vegetation occur within and extend slightly beyond the Subject Land. These patches include grassy woodland and derived native grassland. Other small areas of modified grassy woodland and derived native grassland exist beyond the Subject Land to the north, and south.

The primary connectivity for terrestrial fauna is via remnant and planted trees. Terrestrial fauna movement is restricted in most areas by cleared land, rural roads, agricultural fencing and scattered residential residences within a 1.5 km radius, however, enough scattered remnant vegetation patches remain to allow fauna movement between patches. Within the broader Locality, the Mt Canobolas State Conservation Area and State Forests are located approximately 5-6 km south-west of the Subject Land. These areas contain tracts of high quality native vegetation providing important habitat resources for many native fauna species.

6 IMPACT ASSESSMENT

The following chapters detail the impact assessment completed for the Proposal, in order to determine whether the Proposal will be required to enter the BOS or be referred to the NSW or Commonwealth Minister for Environment for further assessment. Impacts assessed include direct and indirect impacts arising from the Proposal to native vegetation, threatened species, ecological communities and their habitats, and Key Threatening Processes (KTP).

6.1 Biodiversity Offset Scheme

The assessment requirements of the BC Act 2016 and *Biodiversity Conservation Regulation 2017* are mandatory for all development applications assessed under Part 4 of the EP&A Act.

This legislation and regulation stipulate clearing 'area threshold' values that determine whether a development is required to be assessed in accordance with, and therefore participate in, the 'Biodiversity Offset Scheme' (BOS). Minimum entry thresholds for vegetation clearing depend on the minimum lot size (shown in the Lot Size Maps made under the relevant LEP), or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP).

The Subject Land measures a total of **20.27 ha**. The minimum lot size for the Subject Land is **0.02 ha** as nominated in the ORC LEP; therefore, a maximum clearance footprint of **0.25 ha** of native vegetation is applicable for this assessment.

The area of derived native grassland has been assessed as specified under the BAM 2020. This method ensures that only the percentage of native grassland cover present within derived grassland areas is factored into calculations for the BOS area clearing threshold. This equated to 36 % of native vegetation cover within the derived grassland area in the Subject Land.

The proposal will directly impact **0.93 ha** of native vegetation, meaning the clearing threshold for native vegetation **will** be exceeded by this Proposal. The BVM (Appendix C) shows no areas of vegetation mapped as containing High Biodiversity Values within the Subject Land.

Areas of Outstanding Biodiversity Value

No listed Areas of Outstanding Biodiversity Value (AOBV) occur within the Subject Land or will be impacted by the Proposal.

Assessment of Significance Threshold

Threatened species and ecological communities recorded or with the potential to occur within the locality (Figure 8) were considered for their potential to be supported by the Subject Land or to use the Subject Land at some stage during their lifecycle. The total list of threatened species and communities deemed as having potential to occur in the Subject Land is presented in Table 16 (Appendix F).

Desktop analysis indicated that a number of threatened fauna species have the potential to use habitat on the Subject Land during part of their lifecycles. This assessment was refined based on the results of the field survey. Fauna mobility and limiting habitat resources were taken into account when assessing the likelihood of impact for species considered to have the potential to occur in the Subject Land. For species considered likely to occur that have large home ranges, are highly mobile, and have either no breeding habitat in the Subject Land or are highly unlikely to breed in the Subject Land, only negligible impacts are considered likely.

Based on the field surveys and validation of vegetation condition on site, five (5) species of threatened bird with the potential to occur within the locality were considered at risk of impact as a result of the proposal (Appendix F). These include:

- Dusky Woodswallow, *Artamus cyanopterus cyanopterus* – Vulnerable (BC Act)
- Scarlet Robin, *Petroica boodang* – Vulnerable (BC Act)
- Flame Robin, *Petroica phoenicea* – Vulnerable (BC Act)
- Superb Parrot (*Polytelis swainsonii*) – Vulnerable (BC Act and EPBC Act) (recorded within study area)
- Diamond Firetail, *Stagonopleura guttata* – Vulnerable (BC Act)

No threatened ecological communities were recorded within the Subject Land or are considered at risk of impact as a result of the proposal.

Assessments of significance for the above species were prepared in accordance with Section 1.7 of the EP&A Act and the EPBC Act *Matters of National Environmental Significance – Significant Impact Criteria Guidelines* (DEWHA, 2009). These assessments have concluded that the Proposal is **unlikely** to have a significant negative effect on the threatened species occurring within the impact footprint. Therefore, a Species Impact Statements and / or Referral to the Environment Minister, are **not** required.

6.2 Management Zones

Each of the Management zones and PCTs recorded within the Subject Land will be impacted as per the table below.

Table 10 Management zones and PCTs

Management Zone	PCT	Direct Impact Area (Subject Site) (ha)	Indirect Impact Area (ha)	Proposed management actions
Zone 1: Residential Lots	3347 Remnant Grassy Woodland and Derived Native Grassland	0.69	N/A	Clearly delineate vegetation to be retained. Following construction of dwellings, gardens and yard areas to be revegetated with appropriate native vegetation.
	N/A Planted Native Vegetation	0.1	N/A	
	0 Non-native vegetation	11.1	N/A	
Zone 2: Proposed Roads	3347 Remnant Grassy Woodland and derived	0.1	N/A	Clearly delineate vegetation to be retained, implement weed control measures.

Management Zone	PCT	Direct Impact Area (Subject Site) (ha)	Indirect Impact Area (ha)	Proposed management actions
	native grassland			Following construction of roads, verges and landscaped areas to be revegetated as soon as practical with appropriate native vegetation.
	N/A Planted Native Vegetation	0.05	N/A	
	0 Non-native vegetation	4.19	N/A	
Zone 3: Proposed Open Space (including areas of Aquatic Habitat)	3347 Remnant Grassy Woodland and derived native grassland	N/A	0.16	Planting of native species appropriate to the Southern Tableland Creekflat Ribbon Gum Forest community, to provide habitat for native fauna as part of landscaping for the proposed development. Biodiversity values within this zone to be maintained or enhanced through weed control measures.
	N/A Planted Native Vegetation	N/A	0.03	
	0 Non-native vegetation	N/A	3.86	
	Total Area	**16.22 ha**	**4.05 ha**	

Table 11 below details the actions proposed for relevant management zones for the Subject Land as well as the implications for each of the ecological attributes associated with the PCT impacted.

Table 11 Management zone approach and resulting ecological attributes

Development area	Management approach	Ecological attributes to be retained
Direct impact areas	All vegetation removed to allow for access, bulk earthworks, and infrastructure construction. Footprint to be clearly defined to ensure no impact to mature trees or vegetation outside minimum required areas. Native trees recommended to be protected and retained wherever possible.	All existing vegetation and biodiversity values to be removed.

Development area	Management approach	Ecological attributes to be retained
Indirect impact areas	Recommendation for all vegetation to be subject to weed control measures to impede weed growth and enhance biodiversity values. Planted native trees recommended to be protected and retained. Recommended planting of native species appropriate to the Southern Tableland Creekflat Ribbon Gum Forest community, to provide habitat for native fauna as part of landscaping for the proposed development.	Biodiversity values within this zone to be maintained or enhanced through weed control measures.

6.3 Direct impacts

6.3.1 Native vegetation loss

The Proposal will result in direct impacts to **0.93 ha** of remnant and planted native vegetation, including removal of several mature remnant hollow bearing trees, one regenerating native tree and a number of younger planted native trees and shrubs, as well as an area of derived native grassland.

The removal of this native vegetation will permanently reduce foraging and nesting potential for native fauna present within the Subject Land, disturb and expose soils, and will likely impact the movement of water through the Assessment Area. This disturbance will occur throughout the entire Subject Site during both the constructional and operational phases of the Proposal.

Areas outside the Subject Site are recommended to be revegetated with appropriate local native species and subject to weed management measures. Areas outside the Subject Land have not been factored into this assessment however further direct impacts to mature hollow bearing native trees are anticipated in road reserves directly adjacent to the boundaries of the Subject Land.

Safeguards and management measures (Section 7) have been developed to minimise impacts to native vegetation outside of the Subject Site and will be implemented during construction.

6.3.2 Fauna habitat removal

Clearing of native vegetation will occur within the Subject Site, including removal of several mature remnant hollow bearing trees, one regenerating native tree and a number of younger planted native trees and shrubs, as well as an area of derived native grassland. Exotic trees, shrubs and pasture will also be removed. The loss of this vegetation will result in a reduction of both foraging and breeding habitat for a number of native fauna species, including removal of potential nesting habitat for the threatened Superb Parrot (*Polytelis swainsonii*), which was observed within the Subject Land during surveys.

Hollow bearing trees provide valuable habitat resources for a number of threatened and common native species within the disturbed landscape, and it is recommended to retain these habitat resources where possible.

Areas of rocky outcrop habitat will be removed within the north-western portion of the Subject Site, resulting in loss of foraging and breeding habitat for native reptiles.

The Proposal also involves potential removal / disturbance of wetland habitat along the waterway present within the western area of the Subject Site. This will reduce nesting and foraging habitat for native fauna such as amphibians and wetland birds including some threatened species. Disturbance of the waterway may also cause disruption of habitat for native fish species.

Some obstruction to the movement of fauna species is anticipated as a result of the construction of new roads and residential developments under the Proposal. The majority of key habitat components outside the Subject Land within the broader Assessment Area are anticipated to be largely unaffected by the Proposal. An exception to this is where direct impacts to mature hollow bearing native trees are anticipated within the road reserves directly adjacent to the boundaries of the Subject Land.

Safeguard and management measures (Section 7) have been developed to minimise impacts to native vegetation outside of the Subject Site and will be implemented during construction.

6.3.3 Fauna injury and mortality

Direct injury/mortality to fauna species using the site is possible, particularly where mature hollow-bearing trees will be removed, and also where earthworks are likely to impact areas of rocky outcrop habitat. In addition, fauna mortality associated with vehicle strikes within the Assessment Area may increase as a result of increased levels of residential traffic.

Direct impacts to ground dwelling fauna such as reptiles and amphibians may occur during earthworks, while impacts to arboreal and hollow dependent or nesting fauna may occur during clearing of trees. This includes potential direct impacts to the threatened species Superb Parrot (*Polytelis swainsonii*), which was recorded within the Subject Land during surveys and is likely to use the mature hollow-bearing trees on site for nesting.

Safeguard and management measures, including seasonal construction and pre-clearing surveys, are proposed to reduce the likelihood of direct impacts to native fauna potentially using the site (Section 7).

6.3.4 Impacts to waterways and Key Fish Habitat

One (1) first-order waterway flows through the Subject Land, extending both north and south-west of a large dam by the western boundary. A second-order waterway flows in close proximity to the eastern boundary of the Subject Land, and some seasonally-waterlogged areas are present within the margins of the Subject Site in association with this waterway. An area of mapped Key Fish Habitat also exists along this second-order waterway (Figure 3).

One (1) very large dam with a small island is present along the western boundary of the Subject Land, adjacent to Pinnacle Road. This dam contains aquatic habitat and fringing wetland vegetation. Some recent drainage earthworks have been undertaken south-east of the dam.

Existing creeks and drainage lines in proximity to the Subject Land are already disturbed and degraded, due to historic clearing, erosion and weed encroachment as well as current disturbance through human activity.

Significant impacts to waterways within and in proximity to the Subject Land are likely to occur as a result of the Proposal, due to the plans involving bulk earthworks and potential realignment of

waterways within the Subject Land. A Controlled Activity Approval through NSW DPE Water will be required before commencement of works affecting waterways (See Section 2.2.8).

In addition, during construction, safeguards and management measures outlined in Section 7 should be implemented to reduce the risk of construction related sedimentation and contamination impacting on the health of riparian areas within and in proximity to the Subject Land.

6.4 Indirect impacts

Indirect impacts arising as part of the proposal may include noise, dust and vibration during earthworks and construction of infrastructure, further spread or introduction of weeds, erosion and/or sediment migration to some extent associated with construction, and ongoing disturbance and impacts to fauna from increased land usage including human activity, vehicular strike and noise disturbance. These impacts have not been quantified. Within the Subject Land, impacts arising from the further introduction of weeds, dust, noise and vibration is likely to be similar to those effects seen in other parts of the Assessment Area that are undergoing residential conversion, with a potential increase in these impacts most likely following the completion of the subdivision and increased residency on the existing site.

6.4.1 Habitat fragmentation

The Proposal involves conversion of the Subject Land from a low-density rural residential and agricultural property into a densely settled suburban development. This is expected to increase habitat fragmentation within the Assessment Area, however a high degree of habitat fragmentation does already exist within the Subject Land, as the majority of trees and shrubs have already been removed through historic clearing. Tracts of similar habitat present on the land immediately adjacent to the Subject Land will not be directly impacted.

Existing fences already intersect portions of the Subject Land. Extensive areas of suburban development are also present within the Assessment Area, adjacent to the Subject Land along the eastern boundary. Species that inhabit the Subject Land are currently exposed to similar, existing levels of fragmentation within the broader Assessment Area, and are likely to be disturbance tolerant and highly mobile, so are unlikely to be further impacted by the additional fragmentation brought about by the Proposal.

6.5 Key threatening processes

A key threatening process (KTP) is defined in the BC Act as an action, activity or Proposal that:

- Adversely affects two or more threatened species, populations or ecological communities
- Could cause species, populations or ecological communities that are not currently threatened to become threatened.

There are currently thirty-nine (39) KTPs listed under the BC Act (DPE 2022) eight (8) listed under the FM Act (DAFF 2022) and twenty-one (21) under the EPBC Act (DCCEEW 2022). Several KTPs are listed under more than one Act.

Several KTP listed under the BC Act currently exist within the Subject Land. The Proposal has the potential to add to a number of these, including:

- Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands
- Bushrock Removal
- Clearing of native vegetation

- Invasion and establishment of exotic vines and scramblers
- Invasion of native plant communities by exotic perennial grasses
- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants
- Loss of Hollow-bearing Trees
- Removal of dead wood and dead trees

Several KTP listed under the EPBC Act currently exist within the Subject Land. The Proposal has the potential to add to two of these processes:

- Land clearance
- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants

Several KTP listed under the FM Act currently exist within the Subject Land. The Proposal has the potential to add to two of these processes:

- Degradation of native riparian vegetation along New South Wales water courses
- Installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams

Several pathogens known from NSW have potential to impact on biodiversity as a result their movement and infection during construction. Of these, three (3) are listed as a key threatening process under either the EPBC Act and/or BC Act including:

- Dieback caused by Phytophthora (Root Rot; EPBC Act and BC Act)
- Infection of frogs by amphibian chytrid fungus causing the disease chytridiomycosis (EPBC Act and BC Act)
- Introduction and establishment of exotic Rust Fungi of the order Pucciniales on plants of the family Myrtaceae (BC Act)

While these pathogens were not observed or tested for in the Subject Land, the potential for pathogens to occur should be treated as a risk of the proposal. The most likely causes of pathogen dispersal include earthworks, movement of soil (including on boots/shoes), and attachment of plant matter and soil to vehicles (including bicycle tyres) and machinery during all of the project phases (construction and operation).

Impacts of KTPs would be managed via the safeguard and management measures outlined in Section 7.

7 IMPACT AVOIDANCE AND MINIMISATION MEASURES

This section of the report demonstrates the efforts taken to avoid and minimise impacts on biodiversity values in accordance with Section 8 of the BAM.

A key part of management for biodiversity is the application of the 'avoid, minimise, mitigate and offset' hierarchy as follows:

1) Avoid and minimise impacts as the highest priority;

2) Mitigate impacts where avoidance is not feasible or practicable in the particular circumstance; and

3) Offset where residual, significant unavoidable impacts would occur (if required).

Avoidance, mitigation and offset provisions for this proposal are outlined below.

7.1 Avoiding and minimising clearance of native vegetation and habitat

The proposal has been designed to minimise removal of habitat features through retention of an area of proposed open space.

7.2 Recommendations to mitigate or manage biodiversity impacts

The following recommendations are provided to further mitigate or manage impacts resulting from the Proposal.

Timing of Vegetation Clearing

- Where practicable, it is recommended to time construction works outside of key breeding seasons (fledging of active nests/roosts) (approximately August to January) for species likely to utilise the site to avoid or minimise the chance of nest abandonment, injury or death to native fauna utilising habitats (trees) within the Subject Land.

Tree Protection

- Clearly delineate vegetation to be retained with the assistance of an ecologist, or similarly qualified professional, and induct all site personnel as to the approved extent of clearing during construction works.
- Ensure mature trees (DBH > 10cm) are retained within direct impact areas wherever possible and ensure that no clearing of vegetation occurs outside of marked boundaries.
- Maintain Vegetation Protection Zones outside direct impact area to avoid compaction of soils. This includes no movement of excavation machinery or parking or storing equipment outside designated clearing areas or laydown areas.
- The presence of a suitably qualified arborist is recommended during earthworks occurring near retained trees to avoid rootzones impacts.
- Where any trees requiring removal contain hollows, nests or other signs of occupation, a staged clearing approach must be undertaken where hollow limbs are removed carefully and incrementally by a qualified tree surgeon/arborist. Care should be taken to inspect limbs for fauna prior to their removal.
- Prior to clearing, a preclearance survey should be undertaken including inspection for threatened species (flora and fauna), and hollows/burrows to confirm occupation by fauna. Care should be taken to identify nests and/or roosting sites. If fauna habitat is present (nests or potential tree hollows) the appointed contractor would contact the project ecologist for further advice prior to clearing.

- Ensure the presence of an ecologist or fauna spotter catcher at all times during pre-clearing and clearing activities to remove and relocate wildlife as necessary, and to attend to any wildlife that are injured as a result of works.
- All tree hollows removed are to be replaced with artificial hollows (nest boxes or augmented hollows) at a rate of 2:1. The size of nest box entrances is to be suited to the requirements of the threatened species that occupy the area/matched to those that have been removed. Nest boxes should be erected near the habitat to be removed in a suitable position prior to the commencement of vegetation clearing works. The project ecologist should be consulted to determine appropriate size and number to be erected.

Rehabilitation

- Clearly delineate areas to have revegetation works undertaken.
- Revegetation activities should be undertaken using native species sourced from local seed wherever possible and be specific to the PCT occurring on the site.
- Control and management of High Threat Exotic weeds within the Subject Land is recommended to reduce the risks associated with the further spread of these species within the Subject Land and surrounding landscape.

General Construction

- Vehicles and machinery to utilise and work from existing roads, or existing cleared areas, and are not to extend into adjacent vegetation areas.
- Vehicles are to be parked in designated parking areas only, or along existing roads/dirt tracks away from tree canopy/drip lines to avoid soil compaction and impacts to adjacent vegetation.
- Ensure vehicles and machinery are cleaned and checked for any traces of weeds, seeds and mud prior to entering work site to reduce the spread of weeds and disease (e.g. Phytophthora cinnamomi) to the site.
- Strict hygiene protocols must be followed to ensure that no environmental weeds spread around during works or are introduced to site as a result of the proposed works. If weeds are accidentally transported to site, or identified during construction activities, all weed material should be immediately contained and removed from site and disposed of in accordance with Council regulations.
- All soils to be stockpiled at designated stockpile locations in a cleared area, within pre-approved zones away from waterways, drainage lines and native vegetation, and are appropriately stabilized in accordance with the 'Blue Book' (Landcom 2004).
- Any chemicals or pollutants on site to be stored appropriately in bunded areas to prevent pollution of soils or waters which may impact upon biodiversity.
- Sediment and erosion controls must be installed downslope of any disturbance areas prior to any earthworks commencing, to prevent migration of sediments down slope into adjacent waterways or off site.
- Recently disturbed soils must be stabilised progressively and promptly after works are completed to prevent erosion and consequent sediment migration of the site.

Operational use / General maintenance

- Declared (WoNS) and Priority weeds must be managed according to requirements under the Biosecurity Act 2015. It is recommended these weeds be managed to ensure they do not spread, and where possible be eradicated from the Subject Land.

- No vegetation is to be burnt; large limbs, trunks and fallen timber to be placed in adjacent areas to supplement habitat availability. Rocks to be removed from access roads / structure footprints should be placed in adjacent areas as appropriate.
- Smaller branches and leaves of native species only to be chipped and used on site for erosion control and within landscaped areas.
- Site is to be kept tidy and free from rubbish at all times, to prevent wastes being blown into adjacent areas of native vegetation or waterways.
- Mandatory requirement that pets in the assessment area should be contained / leashed at all times and installation of clear signage to communicate this requirement.

8 CONCLUSION

The Environmental Factor (TEF) was commissioned by Oakstand ('the Client'), to undertake a Biodiversity Assessment Report (BAR) to fully consider the potential ecological impacts arising from the proposed subdivision and development of Lot 1 DP 630681, Lot A DP 381933, Lot 1 DP 381932 and Lot A DP 381935, including bulk earthworks required to enable the formation of a new suburban residential area comprising one hundred and ninety-nine (199) separate new residential Lots, associated access roads and an area of proposed open space at 12 and 20 Shiralee Road, Orange NSW (herein 'the Proposal').

The surveys undertaken to support this assessment included habitat identification, vegetation community mapping, identification of threatened ecological communities and collection of floristic BAM data, as well as opportunistic threatened flora and fauna surveys.

The site is a heavily modified residential and agricultural block, located within a rapidly developing rural residential area, with the analysis of floristic data collected during this survey assigned to one (1) PCT to the Subject Land:

- PCT 3347: *Southern Tableland Creekflat Ribbon Gum Forest* and associated derived native grassland (**0.93 ha**)

No threatened ecological communities were recorded within the Subject Land or considered likely to be impacted by the Proposal.

Numerous threatened species records exist for the broader locality (DPE 2022) with one (1) species recorded during surveys:

- Superb Parrot (*Polytelis swainsonii*)

A further four (4) species were determined as likely to use habitat within the Subject Land. These include:

- Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)
- Scarlet Robin (*Petroica boodang*)
- Flame Robin (*Petroica phoenicea*)
- Diamond Firetail (*Stagonopleura guttata*)

A number of other species are predicted and have the potential to occur within the Subject Land based on habitat attributes present. No targeted surveys were undertaken to date to confirm these additional species' presence or absence within the Subject Land.

Assessments of Significance and / or Significant Impact Criteria Assessments for the above species and TEC's were prepared in accordance with Section 1.7 of the EP&A Act and the EPBC Act *Matters of National Environmental Significance – Significant Impact Criteria Guidelines* (DEWHA, 2009). These assessments have concluded that the Proposal is **unlikely** to have a significant negative effect on the threatened species occurring within the impact footprint. Therefore, Species Impact Statements and / or a Referral to the Environment Minister are **not** required.

Guided by the current survey effort, no Serious and Irreversible Impacts (SAII) to threatened biota are anticipated as a result of the proposed works. In addition, no prescribed impacts are anticipated in association with the proposal.

A total of forty-seven (47) species were recorded within the vegetation plots completed and incidental species observed on site, consisting of sixteen (16) native species and thirty-one (31) exotic species, including seven (7) High-Threat Exotics (HTE). The field data collected is available in Appendix D.

The Subject Land measures a total area of 20.49 ha with a total direct impact area of 16.22 ha of which 0.93 ha constitutes native vegetation. The proposal involves clearing of both native and non-native vegetation to allow extensive earthworks and to accommodate the proposed roads and residential lots. Two unnamed waterways and several areas of rocky outcrop habitat will also be impacted by the proposal. The client has committed to completing planting of native species appropriate to the PCT as part of landscaping for the proposed development.

Entry to the Biodiversity Offset Scheme (BOS) is triggered by developments, projects and activities that meet certain thresholds for significant impacts on biodiversity; one (1) of these triggers is exceedance of the 'clearing threshold'. The applicable threshold for clearing for this proposed development is 0.25 ha based on a minimum lot size of 0.2 ha as prescribed in the Orange Local Environment Plan 2011. As the potential clearing allowed for by the Proposal exceeds this threshold, participation in the BOS is required and offset obligations will need to be calculated through preparation of a Biodiversity Development Assessment Report (BDAR) prior to the development proceeding.

A number of mitigation measures and recommendations have been made to help ensure avoidance and minimisation of impacts of the Proposal, and to protect the remaining biodiversity attributes of the Subject Land and broader locality should the Proposal proceed. Preclearance Surveys and the presence of a fauna spotter during clearing works are recommended.

Due to proposed works along a waterway, the Proposal will require a Controlled Activity Approval to be obtained from NSW DPE Water, as specified by the Water Management Act 2000.

In addition, to support the Development Application for this Proposal, a Vegetation Management Plan for the site will be required.

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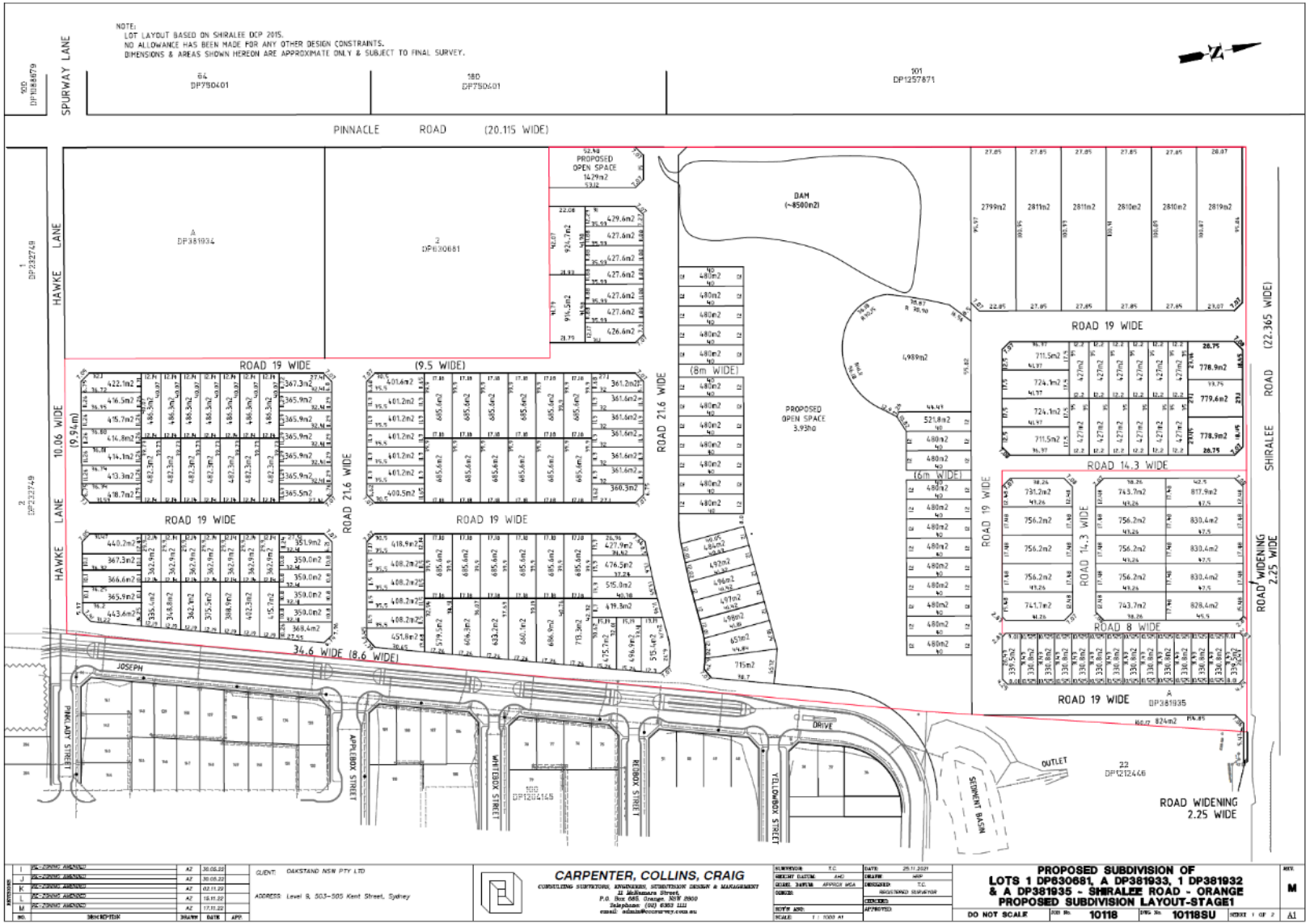
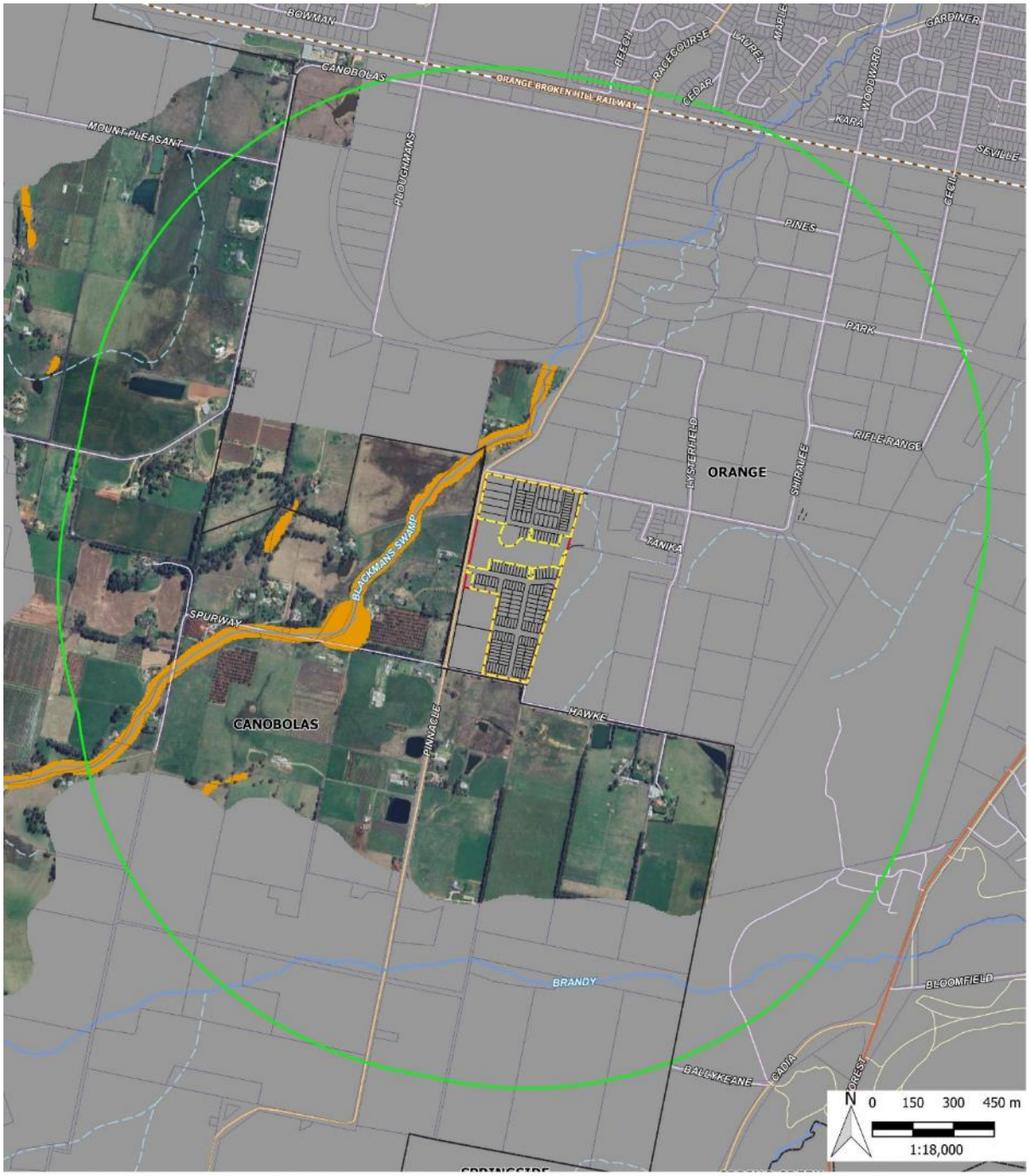
10 APPENDICES

Appendix	Item
Appendix A	Design Drawings
Appendix B	Native Vegetation Regulatory Map
Appendix C	Biodiversity Values Map and Threshold Report
Appendix D	Species Lists
Appendix E	BAM Data sheets
Appendix F	Threatened species likelihood of occurrence table
Appendix G	Assessments of Significance under BC Act
Appendix H	Significant Impact Criteria Assessments under the EPBC Act
Appendix I	Climate Data
Appendix J	DPI Fisheries Advice

Appendix A – Design Drawings



Appendix B – Native Vegetation Regulatory Map



Oakstand, Shiralee Road Subdivision - Native Vegetation Regulaory Map within the Assessment Area

Legend

- Assessment Area
- Subject Land
- Subject Site
- Proposed Developments
- Suburb
- Lot boundary

Roads

- Arterial Road
- Local Road
- Sub Arterial Road

Waterways

- Creek
- 1st & 2nd order unnamed waterway

Native Vegetation Regulatory Map (in force)

- Category 2 - Vulnerable Regulated Land
- Category 2 - Sensitive Regulated Land
- Category 2 - Sensitive & Vulnerable Regulated Land
- Land Excluded from Local Land Services Act 2013
- Werriwa & Monaro CEEC Advisory Layer

Appendix C – Biodiversity Values Map

Oakstand, Shiralee Road Subdivision - Biodiveristy Values within the Assessment Area

Legend

- Assessment Area
- Subject Land
- Subject Site
- Proposed Developments
- Suburb
- Lot boundary

Roads

- Arterial Road
- Local Road
- Sub Arterial Road

Waterways

- Creek
- 1st & 2nd order unnamed waterways

Biodiversity Values

N 0 150 300 450 m

1:18,000

Appendix D – Species List

Table 12 Flora recorded during surveys

Scientific name	Common Name	N/E/HTE	WONS	Priority Listing
Acacia vestita	Weeping Boree	N		-
Asperula conferta	Common Woodruff	N		-
Avena barbata	Wild Oats	E		-
Betula sp.	Birch	E		-
Bromus catharticus	Prairie Grass	E		-
Callistemon sp.	a Bottlebrush	N		-
Carex appressa	Tall Sedge	N		-
Cerastium glomeratum	Mouse-ear chickweed	E		-
Cirsium vulgare	Spear Thistle	E		-
Cotoneaster sp.	Cotoneaster	HTE		-
Crataegus monogyna	Hawthorn	HTE		-
Cypress sp.	Cypress	E		-
Dactylis glomerata	Cocksfoot	E		-
Eucalyptus blakelyi	Blakely's Red Gum	N		-
Eucalyptus globulus	Blue Gum	N		-
Eucalyptus mannifera	Brittle Gum	N		-
Eucalyptus polyanthemos	Red Box	N		-
Eucalyptus rubida	Candlebark	N		-
Eucalyptus viminalis	Manna Gum / Ribbon Gum	N		-
Festuca arundinacea	Tall Fescue	E		-
Hakea sp.	Hakea	N		-
Holcus lanatus	Yorkshire Fog	E		-
Hypochaeris radicata	Flatweed / Cat's Ear	E		-
Juncus australis	Austral Rush	N		-
Juncus sp.	a Pinrush	N		-
Juncus usitatus	Common Rush	N		-
Lolium sp.	Rye Grass	E		-
Magolia	Magnolia	E		-
Microlaena stipoides	Weeping Grass	N		-
Phalaris aquatica	Phalaris	E		-
Photinia sp.	Photinia	E		-
Poa bulbosa	Bulbous Poa	E		-
Poa pratensis	Kentecky Bluegrass	E		-
Poa sp.	a Poa	E		-
Prunus sp.	Prunus / Cherry Plum	E		-
Pyracantha sp.	Firethorn	HTE		-
Robinia pseudoacacia	Black Locust	HTE		-

Scientific name	Common Name	N/E/HTE	WONS	Priority Listing
Rosa rubiginosa	Briar Rose	HTE		Central Tablelands Community Concern list
Rubus fruiticosus agg.	Blackberry	HTE	WONS	NSW listed Prohibition on certain dealings, Central Tablelands Regional Asset Protection
Rumex crispus	Curly Dock	E		-
Rytidosperma sp.	Wallaby Grass	N		-
Salix Sp.	Willow	HTE	WONS	Central Tablelands Community Concern list
Sonchus asper	Sow Thistle	E		-
Taraxacum officianale	Dandelion	E		-
Ulmus sp.	Elm	E		-
Vica sativa	Common Vetch	E		-
Wisteria sp.	Wisteria	E		-

Table 13 Fauna recorded during surveys (Key: O=Seen; W=Heard; P=Indirect evidence (Burrow, scat, tracks etc)

Class	Scientific name	Common name	Observation type	Exotic	Conservation Status
Amphibia	*Crinia parinsignifera*	Eastern Sign-bearing Froglet	W		
Aves	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	O		
Aves	*Anas superciliosa*	Pacific Black Duck	O		
Aves	*Corvus sp.*	Raven, unidentified	W		
Aves	*Cracticus tibicen*	Australian Magpie	O, nesting		
Aves	*Fulica atra*	Eurasian Coot	O		
Aves	*Gerygone fusca*	Western Gerygone	W		
Aves	*Hirundo neoxena*	Welcome Swallow	O		
Aves	*Lichenostomus chrysops*	Yellow-faced Honeyeater	W		
Aves	*Malurus cyaneus*	Superb Fairy Wren	O		
Aves	*Pardalotus striatus*	Striated Pardalote	W		
Aves	*Platycercus elegans*	Crimson Rosella	O, nesting		
Aves	*Platycercus eximius*	Eastern Rosella	O		
Aves	*Polytelis swainsonii*	Superb Parrot	O		V (BC Act and EPBC Act)

Class	Scientific name	Common name	Observation type	Exotic	Conservation Status
Aves	*Sturnus vulgaris*	Common Starling	O	*	
Aves	*Threskiornis molucca*	Australian White Ibis	O		
Aves	*Vanellus miles*	Black-Shouldered Lapwing	W		
Aves	*Zosterops lateralis*	Silvereye	W		
Mammalia	*Bos taurus*	Domestic cattle	O	*	
Mammalia	*Macropus giganteus*	Eastern Grey Kangaroo	O, breeding		

Appendix E – BAM datasheets

BAM Site – Field Survey Form | Site Sheet no: 1 of ____

		Survey Name	Zone ID	Recorders			
Date	30/09/22	Oakstand Shiralee		PH			
Zone	Datum	Plot ID	Plot 1	Plot dimensions	20x50	Photo #	
Easting 692682	Northing 6312531	Midline bearing from 0 m (start)	186 °S	IBRA region	South Eastern Highlands		
Easting	Northing	Midline bearing from 50 m (finish)		IBRA sub region	Orange		

Vegetation Class	Grassy Woodland		Confidence: H M L
Plant Community Type	PCT 0 Non-native	EEC: N	Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	T (Trees)	-
	S (Shrubs)	-
	G (Grasses)	2
	F (Forbs)	-
	E (Ferns)	-
	O (Other)	-
Sum of Cover of native vascular plants by growth form group	T (Trees)	-
	S (Shrubs)	-
	G (Grasses)	0.2
	F (Forbs)	-
	E (Ferns)	-
	O (Other)	-
High Threat Weed cover		15

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	-	-
50 – 79 cm	-	-
30 – 49 cm	-	-
20 – 29 cm	-	-
10 – 19 cm	-	-
5 – 9 cm	-	-
< 5 cm	N	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0 m	Total 0m

Counts apply when the **number of tree stems** within a **size class is ≤ 10**. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	25	30	30	40	50	5	0	15	0	3	2	0	0	0	0	5	0	0	0	0
Average of the 5 subplots	35					4.6					0.4					1				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Igneous	Landform Element	Lower slope	Landform Pattern	undulating	Microrelief	Rocky
Lithology	Basalt	Soil Surface Texture	Clay Loam	Soil Colour	Dark Brown	Soil Depth	Mod
Slope	gentle	Aspect	W	Site Drainage	Mod	Distance to nearest water and type	creek <50m

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)	3	O	Historically cleared – scattered remnant trees and stumps in general area.
Cultivation (inc. pasture)			Exotic pasture species widespread
Soil erosion			Disturbance / pugging from cattle
Firewood / CWD removal	3	O	No fallen timber present.
Grazing (identify native/stock)	2	R	Cattle
Fire damage	-	-	
Storm damage	-	-	
Weediness	3	R	Ground layer primarily exotic. Blackberry and hawthorn present.
Other			Rocky basalt outcrops.

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders
Date	30/09/22	Oakstand Shiralee	Plot 1	PH

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
-	*Dactylis glomerata*	E	40	2000		
-	*Phalaris aquatica*	E	40	2000		
-	*Crataegus monogyna*	HTE	10	1000		
-	*Hypochaeris radicata*	E	5	500		
-	*Avena barbata*	E	10	4000		
-	*Taraxacum officianale*	E	0.5	50		
-	*Sonchus asper*	E	0.5	50		
-	*Poa bulbosa*	E	1	1000		
G	*Rytidosperma sp.*	N	0.1	100		
-	*Cerastium glomeratum*	E	0.1	20		
-	*Poa pratensis*	E	2	500		
-	*Bromus catharticus*	E	2	500		
-	*Rubus fruiticosus agg.*	HTE	5	5		
-	*Vica sativa*	E	0.5	100		
-	*Festuca arundinacea*	E	0.5	50		
G	*Microlaena stipoides*	N	0.1	5		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code if 'top 3'.**
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *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: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...
Stratum: E (emergent) T1, T2, T3, S1, S2, S3, G1, G2, G3 etc

BAM Site – Field Survey Form

Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders			
Date	30/09/22	Oakstand Shiralee		PH			
Zone — —	Datum	Plot ID	Plot 2	Plot dimensions	20x50	Photo #	
Easting 692573	Northing 6312259	Midline bearing from 0 m (start)	154 °SE	IBRA region	South Eastern Highlands		
Easting	Northing	Midline bearing from 50 m (finish)		IBRA sub region	Orange		

Vegetation Class	Grassy Woodland		Confidence: H M L
Plant Community Type	PCT 3347	EEC: N	Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	T (Trees)	1
	S (Shrubs)	0
	G (Grasses)	2
	F (Forbs)	0
	E (Ferns)	0
	O (Other)	0
Sum of Cover of native vascular plants by growth form group	T (Trees)	25
	S (Shrubs)	-
	G (Grasses)	2
	F (Forbs)	-
	E (Ferns)	-
	O (Other)	-
High Threat Weed cover		1.5

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	3	3
50 – 79 cm	-	-
30 – 49 cm	-	-
20 – 29 cm	-	-
10 – 19 cm	-	-
5 – 9 cm	-	-
< 5 cm	N	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	22 m	Total 22 m

Counts apply when the **number of tree stems** within a **size class is ≤ 10**. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	5	10	15	15	25	30	40	15	80	35	0	0	0	0	0	0	2	0	0	0
Average of the 5 subplots	14					40					0					0.4				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Igneous	Landform Element	Creek flat	Landform Pattern	undulating	Microrelief	Water ponds
Lithology	Basalt	Soil Surface Texture	Clay Loam	Soil Colour	Dark Brown	Soil Depth	deep
Slope	flat	Aspect	N	Site Drainage	Very poor	Distance to nearest water and type	Wetland in plot

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)	3	O	Historically cleared – scattered remnant trees and stumps in general area.
Cultivation (inc. pasture)			Exotic pasture species widespread
Soil erosion			Disturbance / pugging from cattle, drainage earthworks
Firewood / CWD removal	3	O	Evidence of historic removal of timber
Grazing (identify native/stock)	3	R	Cattle
Fire damage	-	-	
Storm damage	-	-	
Weediness	2	-	Ground layer primarily exotic. Moderate blackberry and briar rose present.
Other			Severe waterlogging and pugging / soil damage from cattle grazing wet soils.

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date: 30/09/22	Oakstand Shiralee	Plot 2	PH

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
T	*Eucalyptus viminalis*	N	25	1		
	Bromus catharticus	E	30	4000		
-	*Dactylis glomerata*	E	10	2000		
-	*Phalaris aquatica*	E	70	2000		
-	*Poa sp.*	E	10	4000		
G	*Juncus sp.*	N	2	10		
-	*Crataegus monogyna*	HTE	0.5	1		
-	*Taraxacum officianale*	E	1	500		
-	*Lolium sp.*	E	5	1000		
-	*Cirsium vulgare*	E	2	50		
G	*Juncus sp.*	N	1	2		
-	*Rubus fruiticosus agg.*	HTE	1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code if 'top 3'.**

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); **Note:** *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: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Stratum: E (emergent) T1, T2, T3, S1, S2, S3, G1, G2, G3 etc

BAM Site – Field Survey Form

Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders			
Date	30/09/22	Oakstand Shiralee		PH			
Zone	Datum	Plot ID	Plot 3	Plot dimensions	20x50	Photo #	
Easting 692684	Northing 63115558	Midline bearing from 0 m (start)	354 °N	IBRA region	South Eastern Highlands		
Easting	Northing	Midline bearing from 50 m (finish)		IBRA sub region	Orange		

Vegetation Class			Confidence: H M L
Plant Community Type	PCT 3347 Derived grassland	EEC: N	Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	T (Trees)	0
	S (Shrubs)	0
	G (Grasses)	3
	F (Forbs)	0
	E (Ferns)	0
	O (Other)	0
Sum of Cover of native vascular plants by growth form group	T (Trees)	0
	S (Shrubs)	0
	G (Grasses)	60
	F (Forbs)	0
	E (Ferns)	0
	O (Other)	0
High Threat Weed cover		0

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	-	-
50 – 79 cm	-	-
30 – 49 cm	-	-
20 – 29 cm	-	-
10 – 19 cm	-	-
5 – 9 cm	-	-
< 5 cm	N	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0 m	Total 0m

Counts apply when the **number of tree stems** within a **size class is ≤ 10**. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	6 7 9 7 7 / 0 0 0 5 0	0 0 0 20 0	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	73	4	0	0

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Igneous	Landform Element	Lower slope	Landform Pattern	undulating	Microrelief	tussocky
Lithology	Basalt	Soil Surface Texture	Clay Loam / silty clay loam	Soil Colour	Dark Brown	Soil Depth	Deep
Slope	gentle	Aspect	N	Site Drainage	Very Poor	Distance to nearest water and type	creek in plot

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)	3	O	Historically cleared – scattered remnant trees and stumps in general area.
Cultivation (inc. pasture)			Exotic pasture species widespread
Soil erosion			Disturbance / pugging from cattle
Firewood / CWD removal	3	O	No fallen timber present.
Grazing (identify native/stock)	2	R	Cattle
Fire damage	-	-	
Storm damage	-	-	
Weediness	2	R	Blackberry and hawthorn present, also exotic grasses.
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date: 30/09/22	Oakstand Shiralee	Plot 3	PH

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
G	*Carex appressa*	N	45	200		
G	*Juncus australis*	N	10	100		
-	*Phalaris aquatica*	E	35	500		
-	*Holcus lanatus*	E	15	2000		
-	*Festuca arundinacea*	E	5	50		
-	*Poa sp.*	E	1	1000		
-	*Rumex crispus*	E	0.5	5		
-	*Taraxacum officianale*	E	0.1	10		
G	*Juncus usitatus*	N	5	50		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code if 'top 3'.**
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *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: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...
Stratum: E (emergent) T1, T2, T3, S1, S2, S3, G1, G2, G3 etc

Appendix F – Threatened species likelihood of occurrence

The below map (Figure 8) and assessment includes national and state significant species from the following sources:

- DAWE database (PMST accessed October 2022).
- Search area is 10 km radius.
- Not considered further pelagic seabirds, shorebirds, sandpipers, turtles, whales, sharks - no preferred marine or coastal habitat in Subject Land.

All habitat information is taken from NSW OEH and Commonwealth DCCEEW Threatened Species profiles (DPE 2022 DCCEEW 2020) unless otherwise stated.

The codes used in this table are:

CE – Critically Endangered	J – JAMBA
E – Endangered	R – ROKAMBA
V – Vulnerable	CEEC – Critically Endangered Ecological Community
EP – Endangered Population	EEC – Endangered Ecological Community
C – CAMBA	Mi - Migratory

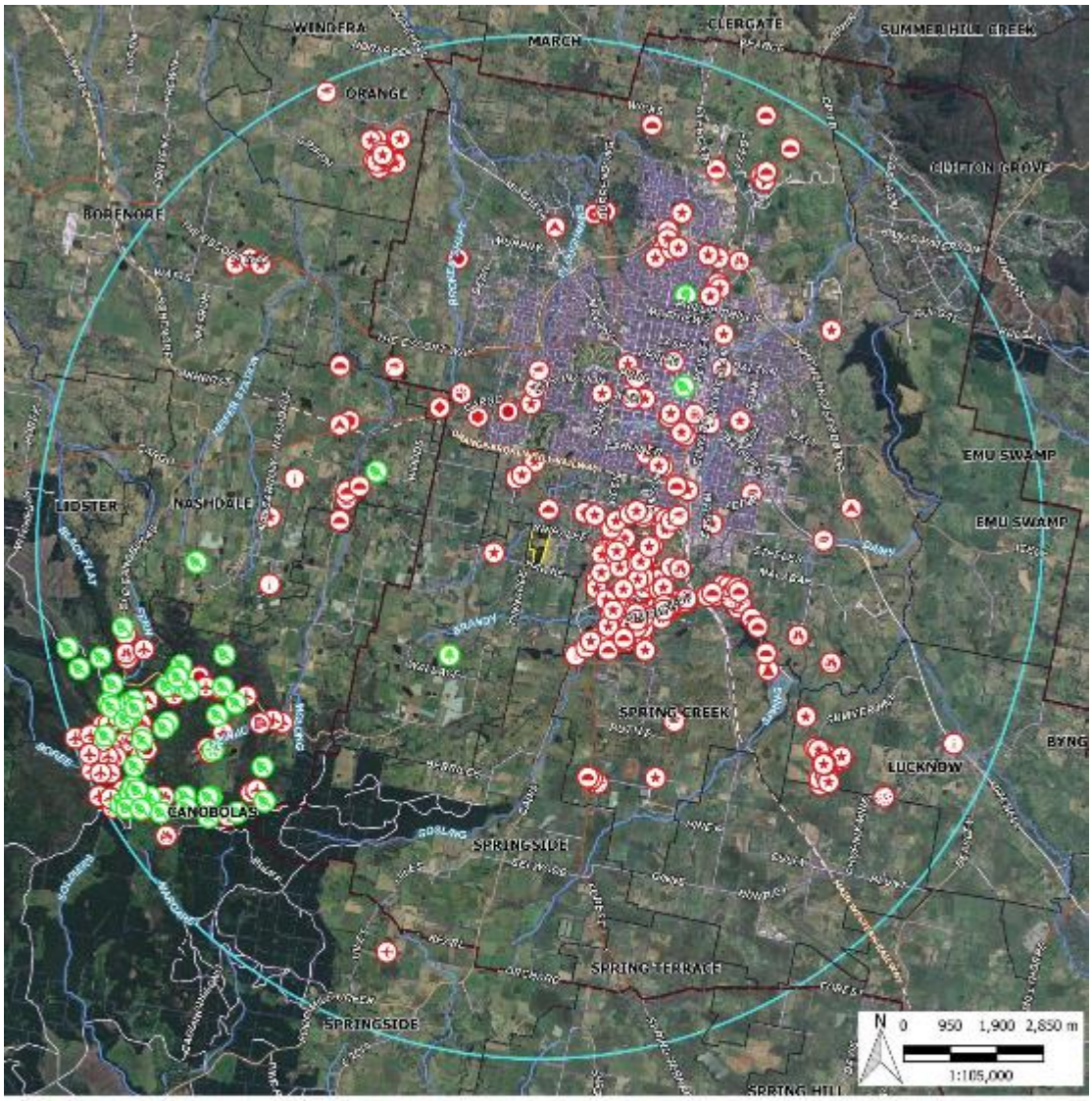
The Likelihood of Occurrence (Table 16) below includes migratory species not captured in the BAM. It is assumed that all other threatened species with the potential to occur on the site have been captured through the BAM process.

Table 14 Likelihood of Occurrence definitions

Likelihood of occurrence	Definition
Known	Species recorded in the Subject Land.
Likely	Species previously recorded within a 10 kilometre radius of the Subject Land and suitable habitat occurs within the Subject Land.
Possible	Species previously recorded within a 10 kilometre radius of the Subject Land but only marginal suitable habitat recorded, OR Species not previously recorded within a 10 kilometre radius of the subject site, but the Proposal footprint is within the species known distribution and suitable habitat occurs within the Subject Land.
Unlikely	Species previously recorded within a 10 kilometre radius of the Subject Land but no suitable habitat recorded.
Nil	Species not previously recorded within a 10 kilometre radius of the Subject Land and no suitable habitat present.

Table 15 Likelihood of impact definitions

Likelihood of impact	Definition
Nil	Species/ community will not be impacted by the Proposal.
Low	Species / community is unlikely to be impacted by the Proposal.
Moderate	Species / community is known or likely to occur within the Subject Land however the Proposal does not impact on important habitat resources.
High	Species / community is known or likely to occur within the Subject Land and the Proposal will impact on important habitat resources.



Oakstand, Shiralee Road Subdivision - Threatened Species within a 10km Radius of the Subject Land

Legend

- 10km Radius
- Subject Land
- LGA Boundary
- Suburb
- Lot boundary

Roads

- Arterial Road
- Local Road
- Primary Road
- Sub Arterial Road

Waterways

- Creek
- River

Threatened Species

- Barking Owl
- Black Gum
- Black-chinned Honeyeater (eastern subspecies)
- Blue-billed Duck
- Diamond Firetail
- Dusky Woodswallow
- Flame Robin
- Freckled Duck
- Greater Glider
- Grey-headed Flying-fox
- Koala
- Large Bent-winged Bat
- Large-eared Pied Bat
- Little Eagle
- Little Lorikeet
- Pied Honeyeater
- Powerful Owl
- Prostanthera gilesii
- Scarlet Robin
- Silky Swainson-pea
- Silver-Leaf Candlebark
- Speckled Warbler
- Squirrel Glider
- Superb Parrot
- Varied Sittella
- White-bellied Sea-Eagle
- Yellow-bellied Glider
- Yellow-bellied Sheathtail-bat

Figure 8 Threatened species recorded within 10km of the Subject Land

Table 16 Threatened species likelihood of occurrence table

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Amphibia							
Litoria booroolongensis	Booroolong Frog	E	E	The Booroolong Frog is restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range with recent records from the south-west slopes of NSW. It is now thought to be regionally extinct in all but the southern part of its range and an isolated population near Tamworth. It inhabits riffle habitat in pristine rivers and streams. Water quality is important for this species as it does not tolerate high turbidity and pollution levels. The frog lives along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. Adults occur on or near cobble banks and other rock structures within stream margins, and will shelter under rocks or amongst vegetation near the ground on the stream edge. Breeding occurs in spring and early summer and tadpoles metamorphose in late summer to early autumn. Eggs are laid in submerged rock crevices and tadpoles grow in slow-flowing connected or isolated pools.	PMST	Nil	Low - No impacts to this species potential habitat will occur as a result of the proposal.
Litoria raniformis	Southern Bell Frog	E	V	In NSW the Southern Bell Frog 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. Usually found in or around permanent or ephemeral Black	PMST	Nil	Low - No impacts to this species potential habitat will occur as a result of the proposal.

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				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. Breeding occurs during the warmer months and is triggered by flooding or a significant rise in water levels. Outside the breeding season animals disperse away from the water and take shelter beneath ground debris such as fallen timber and bark, rocks, grass clumps and in deep soil cracks. (Sourced from NSW Office of Environment - Threatended species profile 2022)			
Litoria castanea	Yellow-spotted Tree frog	CE	CE	The Yellow-spotted Tree Frog has similar habitat requirements to the other two Bell Frog species, including deep pools with fringing and emergent aquatic vegetation to breed and nearby refuge habitat to shelter. The species requires large permanent ponds or slow flowing 'chain-of-ponds' streams with abundant emergent vegetation such as bulrushes and aquatic vegetation. Eggs are laid amongst aquatic vegetation. Yellow-spotted Tree Frogs shelter during autumn and winter under fallen timber, rocks, other debris or thick vegetation.	PMST	Nil	Low - No impacts to this species potential habitat will occur as a result of the proposal.
Aves/Birds							
Botaurus poiciloptilus	Australasian Bittern	E	E	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. Preferred habitat is comprised of wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater	PMST	Possible - Although no recent records of this species exist within the Locality, it is likely that this	Low - No suitable habitat occurred within the Study Area and no records of this species exist

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				habitats, particularly those dominated by sedges, rushes and reeds (e.g. Phragmites, Cyperus, Eleocharis, Juncus, Typha, Baumea, Bolboschoenus) or cutting grass (Gahnia) growing over a muddy or peaty substrate.		species transiently utilises the Study Area for foraging.	within the Locality.
Rostratula australis	Australian Painted Snipe	E	E	The Australian Painted Snipe is restricted to Australia. Most records are from the south east, particularly the Murray Darling Basin. This species occupies wetland and swamp habitats, preferring the fringes of swamps and dams with a cover of grasses, reeds, scrub or woodland. Breeding occurs anytime during spring and summer when conditions are favourable. It nests on the ground amongst tall vegetation.	PMST	Possible - Although no recent records of this species exist within the Locality, it is likely that this species transiently utilises the Study Area for foraging.	Low - Suitable habitat occurs within the Study Area, however no records of this species exist within the Locality and the Study Area falls outside the known distribution area for the species.
Ninox connivens	Barking Owl	V	-	Found throughout continental Australia except for central arid regions. The Barking Owl requires large tree hollows in order to roost and breed. It occupies open forests and woodlands including partially cleared farmland. They often roost in densely formed Acacia and Casuarina species. Known to successfully breed along timbered watercourses in heavily cleared habitats, where a higher density of prey is found around fertile riparian soils. A large portion of its diet consists of arboreal mammals but can adapt to ground dwelling species where the habitat cannot	Bionet (1)	Possible - Records of this species exist within the Locality in the last 10 years and it is likely that this species may occasionally utilises the Study	Low - No habitat which would allow this species to persist and breed exists within the Study Area.

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				sustain preferred prey. Requires very large permanent territories in most habitats due to sparse prey densities.		Area for foraging.	
Melithreptus gularis gularis	Black-chinned Honeyeater	V	-	The Black-chinned Honeyeater is widespread throughout NSW, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is rarely recorded east of the Great Dividing Range, although regularly observed from the Richmond and Clarence River areas. The Black-chinned Honeyeater occupies open woodland habitats and open forests of smooth gums, stringybarks, ironbarks and Casuarinas and Melaleucas. They require large foraging territories of woodland patches at least 5 hectares large.	Bionet (1)	Possible - Records of this species exist within the Locality in the last 10 years and it is likely that this species may occasionally utilises the Study Area for foraging.	Low - No habitat which would allow this species to permanently reside and breed exists within the Study Area.
Oxyura australis	Blue-billed Duck	V	-	This species is a partly migratory bird that travels short distances between breeding swamps and over-wintering lakes. 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. It prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. Nesting occurs in Cumbungi over deep water between September and February, as well as in trampled vegetation of Lignum, sedges or Spikerushes, where a bowl-shaped nest is constructed. Young birds disperse in April-May from their breeding swamps in inland NSW to non-breeding areas on the Murray River system and coastal lakes. The species is completely	Bionet (16)	Likely - suitable habitat was recorded within the Subject Site during surveys and many historical records of this species exist in the broader Locality.	Low – potential habitat is present within the Subject Land, however this will not be directly impacted by the proposal.

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				aquatic, swimming low in the water along the edge of dense cover.			
Calidris ferruginea	Curlew Sandpiper	E	CE - Mi, C,J,R	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. Inland records are probably mainly of birds pausing for a few days during migration.	PMST	Possible - Records of this species exist within the Locality in the last 10 years and it is likely that this species may occasionally utilises the Study Area for foraging.	Low - no records of this species exist within the Locality and if present, the species would use the habitat within the Subject Land for transient foraging only.
Stagonopleura guttata	Diamond firetail	V	-	The Diamond Firetail tends to occur in proximity to watercourses building small dome nests in shrubs and dense foliage. It is found within Box-Gum Woodlands, Snow Gum Woodlands, open forests, mallee, Natural Temperate Grassland and in secondary grasslands derived from other communities. This species forages on grasses, forbs and insects along the ground. Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. (DPE 2022)	Bionet (2)	Likely - Records of this species exist within the Locality in the last 20 years and suitable foraging and breeding habitat occurs within the Subject Land.	Moderate - impacts to this species potential habitat will occur as a result of the proposal.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	Dry, open eucalypt forests and woodland are the preferred habitat. Mallee associations with a sparse understorey of eucalypt saplings, acacias and other shrubs and ground cover of	Bionet (31)	Likely - suitable habitat was recorded within	Moderate - impacts to this species potential

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				grasses or sedges and woody debris are also inhabited. Farmland, particularly forest or woodland edges are also inhabited and very occasionally, moist forest or rainforest.		the Subject Site during surveys and many historical records of this species exist in the broader Locality.	habitat will occur as a result of the proposal.
Numenius madagascariensis	Eastern Curlew	-	CE - Mi, C,J,R	The Eastern Curlew is found on intertidal mudflats and sandflats, often with beds of seagrass, on sheltered coasts, especially estuaries, mangrove swamps, bays, harbours, lagoons and occasionally on wooden oyster leases or other similar structures. It is rarely found inland. The Eastern Curlew occurs only in our flyway, and about 75 per cent of the world's curlews winter in Australia.	PMST	Unlikely – No records of this species exist within the locality and no suitable habitat was recorded within the Subject Site during surveys.	Low - no records of this species exist within the Locality.
Petroica phoenicea	Flame Robin	V	-	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes. 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). Nests are often near the ground and are built in sheltered sites, such as shallow cavities in trees, stumps or banks.	Bionet (2)	Possible - Records of this species exist within the Locality in the last 20 years and suitable foraging and breeding habitat occurs	Moderate - impacts to this species potential habitat will occur as a result of the proposal.

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
						within the Subject Land.	
Stictonetta naevosa	Freckled Duck	V	-	Found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. It breeds in large temporary swamps and prefers permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds. Nesting usually occurs between October and December with nests usually located in dense vegetation at or near water level.	Bionet (26)	Likely - suitable habitat was recorded within the Subject Site during surveys and many historical records of this species exist in the broader Locality.	Low – potential habitat is present within the Subject Land, however this will not be directly impacted by the proposal.
Callocephalon fimbriatum	Gang-gang Cockatoo	V	E	This species is nomadic, spending summer in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests and winter at lower altitudes in drier more open eucalypt forest and woodlands, particularly in coastal areas. This species nests in hollow-bearing trees close to water with breeding taking place between October and January. Favours old growth forest and woodland attributes with dense understoreys, for nesting and roosting. Nests are located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts.	PMST	Possible - No records of this species exist within the Locality, however the Subject Land is within the species' known distribution range and suitable foraging and breeding habitat occurs	Low - no records of this species exist within the Locality.

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
						within the Subject Land.	
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	V	This species predominantly nests in eucalypts and feeds on casuarinas. It nests in both living and dead trees. Glossy Black Cockatoos prefer to live in untouched, rugged country, especially that containing Brigalow scrub or rocky hilly country. Other habitat includes where she-oaks are common, coastal woodlands and drier forest areas as well as timbered watercourses. 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.	PMST	Unlikely – No recent records of the species within the Locality and no suitable habitat was recorded within the Subject Site during surveys.	Low - No habitat which would allow this species to permanently reside and breed exists within the Study Area, and no records of this species exist within the Locality.
Falco hypoleucos	Grey Falcon	E	-	Restricted to shrubland, grassland and wooded watercourses and sometimes near wetlands where surface water attracts prey. Occasionally found in open woodlands near the coast. Nests are constructed in high living eucalypts near a watercourse. Likely to be extinct in areas with higher than 500mm annual rainfall.	PMST	Unlikely - Likely to be extinct within the climate of the Locality.	Low - no records of this species exist within the Locality.
Hieraaetus morphnoides	Little Eagle	V	-	The Little Eagle occupies habitats rich in prey within open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used. For nest sites it requires a tall living tree within a remnant patch, where pairs build a large stick nest in winter and lay in early spring.	Bionet (11)	Possible - records of this species exist within the Locality in the last 10 years and suitable foraging habitat occurs	Low - No habitat which would allow this species to breed exists within the Study Area. Extensive other areas of foraging habitat are present

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
						within the Subject Land.	within the broader Locality. Preferred breeding habitat exists within within the broader Locality and therefore if present the species is likely to preferentially utilise other nearby areas for breeding.
Glossopsitta pusilla	Little Lorikeet	V	-	In NSW Little Lorikeets are distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri. They are considered nomadic responding to food availability and highly gregarious often foraging in mixed flocks. They occur in dry, open eucalypt forests and woodlands using roadside vegetation. They rely on nectar and pollen, particularly on profusely-flowering eucalypts, melaleucas and mistletoes. On the western slopes and tablelands White Box E. albens and Yellow Box E. melliodora are particularly important food sources for pollen and nectar respectively. They often return to the same nest hollow annually preferring smooth barked Eucalypts with small hollows (3 cm entrance diameter).	Bionet (2)	Possible - No records of this species exist within the Locality in the last 10 years. However, suitable breeding and foraging habitat does occur within the Subject Land.	Low - no records of this species exist within the Locality in the last 10 years.

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Leipoa ocellata	Malleefowl	E	V	Historically found widely throughout Australia, Malleefowl are now mostly limited to areas of inland semi-arid scrub. It requires light sandy loam soils with a diverse shrub and understory. They prefer a dry environment with low-growing eucalypt trees and shrubs, referred to as mallee country. Feeds mostly on ants and the seeds of wattle and senna plants.	PMST	Unlikely - No suitable habitat was recorded within the Subject Site during surveys.	Low - No suitable habitat was recorded within the Subject Site during surveys.
Grantiella picta	Painted Honeyeater	V	V	A nomadic species inhabiting Boree/ Weeping Myall (Acacia pendula), Brigalow (A. harpophylla) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema. Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	PMST	Possible - No records of this species exist within the Locality in the last 10 years.	Low - no records of this species exist within the Locality in the last 10 years.
Certhionyx variegatus	Pied Honeyeater	V	-	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.	Bionet (2)	Possible - records of this species exist within the Locality in the last 10 years and suitable habitat occurs within the Subject Land.	Low – very limited habitat resources for this species exist within the Subject Land.
Pycnoptilus floccosus	Pilotbird	-	V	The Pilotbird is found in wet forested areas and heathland in eastern Victoria and southeastern New South Wales. It forages on	PMST	Unlikely – no suitable habitat	Low – no suitable habitat present.

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				the ground, turning over leaf litter using strong legs. The globular nest is built with a side-entrance and hidden amongst the accumulated debris on the forest floor.		present within the Subject Land and no recent records of this species within the Locality.	
Anthochaera phrygia	Regent Honeyeater	CE	CE	The Regent Honeyeater is a migratory woodland bird moving across the landscape in response to climatic conditions and food availability. This species prefers Box-Ironbark woodland and riparian forests particularly habitats with mature trees, high canopy cover and abundance of mistletoes. Nonbreeding flocks occasionally seen in coastal areas foraging in flowering Spotted Gum and Swamp Mahogany forests, presumably in response to drought. The species breeds between July and January in Box-Ironbark and other temperate woodlands and riparian gallery forest dominated by River Sheoak. Regent Honeyeaters usually nest in horizontal branches or forks in tall mature eucalypts and Sheoaks. Also nest in mistletoe haustoria. An open cup-shaped nest is constructed of bark, grass, twigs and wool by the female.	PMST	Unlikely – no suitable habitat present within the Subject Land and no recent records of this species within the Locality.	Low – very limited habitat resources for this species exist within the Subject Land.
Petroica boodang	Scarlet Robin	V	-	In NSW, this species occupies open forests and woodlands from the coast to the inland slopes. It breeds in drier eucalypt forests and temperate woodlands, often on ridges and slopes, within an open understorey of shrubs and grasses and sometimes in open areas. Abundant logs and coarse woody debris are important structural components of its habitat. In autumn and winter it migrates to more open habitats such as grassy open woodland or paddocks with scattered trees.	Bionet (3)	Likely - suitable habitat was recorded within the Subject Site during surveys and records of this species exist in the broader Locality.	Moderate - impacts to this species potential habitat will occur as a result of the proposal.

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Chthonicola sagittata	Speckled Warbler	V	-	The Speckled Warbler occupies open Eucalypt woodlands with a grassy understory and often rocky outcrops. Relatively large undisturbed areas are required to sustain this species in an area. 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. The diet consists of seeds and insects, 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.	Bionet (1)	Possible - No records of this species exist within the Locality in the last 10 years. Marginal suitable habitat is present within the Subject Land.	Low – Only marginal suitable habitat present within the Subject Land. Extensive other areas of foraging habitat are present within the broader Locality. Preferred breeding habitat exists within within the broader Locality and therefore if present the species is likely to preferentially utilise other nearby areas for breeding.
Polytelis swainsonii	Superb Parrot	V	V	Found to forage in grassy box woodland up to 10km from the nesting site. They typically nest in colonies and return to the same location over generations. During the summer they return from wintering in northern NSW to breed, often in open box-woodland or isolated paddock trees requiring tree hollows to breed.	Bionet (174), PMST	Known - This species was recorded within the Study Area during surveys and has many	High - Known breeding and foraging habitat occurs within the proposal impact footprint. An AoS

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
						historical records in the broader Locality.	will be prepared for this species.
Lathamus discolor	Swift Parrot	E	CE	In NSW, the Swift Parrot mostly occurs mostly on the coast and south west slopes. It breeds in Tasmania and returns to the south-eastern mainland to forage over the cooler months (March – October). They move across the landscape to forage on lerp infestations or an abundance of eucalypt flowers. Preferred feed trees include Eucalyptus robusta, Corymbia maculata, C. gummifera, E. sideroxylon and E. albens.	PMST	Possible - No records of this species exist within the Locality in the last 10 years. Only marginal foraging habitat present within the Subject Land.	Low - No preferred habitat for this species was recorded during surveys. Given the highly mobile nature of this species it is unlikely this species would be impacted by the proposal.
Daphoenositta chrysoptera	Varied Sitella	V	-	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands, with a nearly continuous distribution in NSW from the coast to the far west.It prefers open Eucalypt and Acacia woodlands with Stringybark Eucalypts from which to glean insects. They are territorial preferring to use the same tree fork to construct nests for breeding.	Bionet (1)	Possible - No records of this species exist within the Locality in the last 10 years and limited suitable habitat was observed. Although no recent records exist, this species may	Low - No critical habitat for this species was recorded during surveys. Given the mobile nature of this species and the presence of other areas of more suitable habitat within the Locality, it is unlikely this

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
						transiently utilises the Study Area for foraging.	species would be impacted by the proposal.
Haliaeetus leucogaster	White-bellied Sea-eagle	V	-	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. Habitats are characterised by the presence of large areas of open water including larger rivers. Terrestrial habitats include grassland, heathland, woodland and forests. 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'. Typically lays two eggs between June and September with young birds remaining in the nest for 65-70 days. (Sourced from NSW Office of Environment - Threatended species profile - 2022)	Bionet (3)	Possible – no suitable breeding habitat present within the Subject Land. It is possible the species may transiently utilise the Study Area for foraging.	Low - This species would not permanently reside or breed within the Study Area therefore it is unlikely this species would be impacted by the proposal.
Hirundapus caudacutus	White-throated Needletail	-	V - Mi, C,J,R	In eastern Australia, the species is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Dividing Range and occasionally onto the adjacent inland plains. This species is mostly aerial. Although they occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings. This species forages aerially and opportunistically in many environments. The species has been recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows and it has been suggested that they also sometimes roost aerially.	PMST	Unlikely - no records of this species exist within the Locality.	Low - This species would not permanently reside or breed within the Study Area therefore it is unlikely this species would be impacted by the proposal.

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				The species breeds in Asia in wooded lowlands and sparsely vegetated hills, as well as mountains covered with coniferous forests. White-throated Needletails take refuge in a range of shelter types during extreme conditions including the potential to roost in tree hollows.			
Fish							
Macquaria australasica	Macquarie Perch	E	E	This species of freshwater fish inhabits river and lake habitats, especially the upper reaches of rivers and their tributaries. Spawning occurs in spring and summer in shallow upland streams or flowing sections of river systems. This species is found in the upper reaches of the Lachlan, Murrumbidgee and Murray Rivers, and in parts of the Hawkesbury and Shoalhaven catchment areas. The species requires clear water with deep, rocky holes with abundant cover (including aquatic vegetation, woody debris, large boulders and overhanging banks (DotE 2016c; DPI 2016b).	PMST	Unlikely - No suitable habitat was recorded within the Subject Site during surveys, and no records of this species exist within the Locality.	Low
Maccullochella peelii	Murray Cod	-	V	The Murray Cod occurs throughout the Murray-Darling Basin and utilises a diverse range of habitats from clear rocky streams, such as those found in the upper western slopes of NSW, and slow-flowing lowland rivers. Generally, they are found in waters up to 5 m deep and in sheltered areas with cover from rocks, timber or overhanging banks. The presence of wood debris has been shown to be the primary factor determining Murray cod presence.	PMST	Unlikely - No suitable habitat was recorded within the Subject Site during surveys, and no records of this species exist within the Locality.	Low

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Maccullochella macquariensis	Trout Cod	E	E	The Trout Cod is endemic to the Murray Darling River system. The closest record occurs from the Macquarie River dating from 2006. This species requires deep water habitat with plenty of cover and refuge including undercut banks, snags (large woody debris) and prefer waterways with relatively fast currents. They typically have small home ranges and remain in the same area.	PMST	Unlikely - No suitable habitat was recorded within the Subject Site during surveys, and no records of this species exist within the Locality.	Low
Flora							
Ammobium craspedioides	Yass Daisy	V	V	Found in moist or dry forest communities of Box-Gum Woodland and secondary grassland derived from clearing of these communities. Grows in association with a large range of eucalypts (Eucalyptus blakelyi, E. bridgesiana, E. dives, E. goniocalyx, E. macrorhyncha, E. mannifera, E. melliodora, E. polyanthemos, E. rubida). Known from near Crookwell on the Southern Tablelands to near Wagga Wagga on the South Western Slopes. Most populations are in the Yass region.Apparently unaffected by light grazing, as populations persist in some grazed sites.	PMST	Unlikely – Species not detected during surveys and habitat within the Subject Land is highly disturbed.	Low
Eucalyptus aggregata	Black Gum	V	V	This species grows in grassy woodlands on alluvial soils in moist sites along creeks on broad, cold and poorly-drained flats and hollows. It commonly occurs with Eucalyptus ovata, E. pauciflora, E. rubida, E. stellulata and E. viminalis with a grassy understorey of River Tussock. It occurs on the central and southern tablelands	Bionet (1), PMST	Unlikely – Species not detected during surveys and habitat within	Low

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				of NSW, and in a small disjunct population in Victoria. In NSW, it occurs predominantly in the South Eastern Highlands Bioregion, with the most eastern part of the distribution located just within the Sydney Basin Bioregion.		the Subject Land is highly disturbed.	
Eucalyptus canobolensis	Silver-leaf Candlebark	V	E	Known only from Mt Canobolas near Orange where the landform consists of undulating low to steep hills. Soils are shallow skeletal sands and loams on steep slopes. Vegetation is a sub-alpine woodland. Flowering period is listed as January to March. Seed is dispersed locally by wind, and there is no dormancy mechanism.	Bionet (2), PMST	Unlikely – Species not detected during surveys and no suitable habitat within the Subject Land.	Low
Eucalyptus pulverulenta	Silver-leafed Gum	V	V	The Silver-leafed Gum 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. dives), Silvertop Ash (E. sieberi) and Apple Box (E. bridgesiana). Sometimes planted as street trees or ornamental (in private gardens), this species is found in two quite separate areas, the Lithgow to Bathurst area and the Monaro (Bredbo to Bombala).	PMST	Unlikely – Species not detected during surveys and habitat within the Subject Land is highly disturbed.	Low
Eucalyptus robertsonii subsp. hemisphaerica	Robertson's Peppermint	V	V	Robertson's Peppermint is found in closed grassy woodland in locally sheltered sites (Johnson & Hill 1990). Associated species include Red Stringy Bark (Eucalyptus macrorhyncha), Scribbly Gum (E. rossii), Broad-leaved Peppermint (E. dives), Brittle Gum (E. mannifera) and Mountain Gum (E. dalrympleana).	PMST	Unlikely – Species not detected during surveys and habitat within the Subject Land is highly disturbed.	Low

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Euphrasia arguta	-	CE	CE	Euphrasia arguta is restricted to the Nundle State Forest but historically has been recorded along the plains and woodlands of Bathurst. Known populations occur in eucalypt forest with a mixed grass/shrub understorey, while previous records are described as occurring in open forest, grassy country and river meadows. Annual and dies back over winter. Dense stands observed in cleared firebreak areas, suggesting it may respond well to disturbance.	PMST	Unlikely – Species not detected during surveys and habitat within the Subject Land is highly disturbed.	Low
Lepidium hyssopifolium	Aromatic Peppercress	E	E	A population of Aromatic Peppercress is known to occur on private property within the Bathurst area. This species tends to germinate following disturbance when open areas of bare ground provide suitable access to light without the competition from other species. It has been found within grassy Eucalypt woodlands, low open Casuarina woodlands as well as weed infested areas with high degradation and soil disturbance i.e. road and rail corridors.	PMST	Unlikely – Species not detected during surveys and habitat within the Subject Land is highly disturbed.	Low
Leucochrysum albicans var. tricolor	Hoary Sunray	-	E	The Hoary Sunray occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils, often on roadsides. It requires bare ground and disturbance for germination. 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 localities know from beyond this region.	PMST	Unlikely – Species not detected during surveys.	Low
Prostanthera gilesii	-	CE	-	Known only from Mount Canobolas State Conservation Area, south-west of Orange in central western NSW. The largest population occurs on a protected slope above a creek in shrubby	PMST	Unlikely – Species not detected during	Low

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				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.		surveys and habitat within the Subject Land is highly disturbed.	
Swainsona recta	Mountain Swainsona Pea	E	E	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-Mudgee areas. Before European settlement Small Purple-pea occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum Eucalyptus blakelyi, Yellow Box E. melliodora, Candlebark Gum E. rubida and Long-leaf Box E. goniocalyx. Grows in association with understorey dominants that include Kangaroo Grass Themeda australis, poa tussocks Poa spp. and spear-grasses Austrostipa spp.	PMST	Unlikely – Species not detected during surveys and habitat within the Subject Land is highly disturbed.	Low
Swainsona sereicea	Silky Swainson-pea	V	-	Silky Swainson-pea has been recorded from the Northern Tablelands to the Southern Tablelands and further inland on the slopes and plains. There is one isolated record from the far north-west of NSW. Its stronghold is on the Monaro. Also found in South Australia, Victoria and Queensland. Occuring in Natural Temperate Grassland and Snow Gum Eucalyptus pauciflora Woodland on the Monaro and also in Box-Gum Woodland in the Southern Tablelands and South West Slopes. Sometimes found in association with cypress-pines Callitris spp.. Regenerates from seed after fire.	Bionet (1)	Unlikely – Species not detected during surveys and habitat within the Subject Land is highly disturbed.	Low
Thesium australe	Australe Toadflax	V	V	Austral Toad-flax is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to	PMST	Unlikely – Species not	Low

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				Southern Tablelands in grassland on coastal headlands or grassland and grassy woodland away from the coast. Australe Toadflax has been recorded from the Lithgow are to the east of Bathurst. This species does not tolerate high intensity grazing or dominant weeds such as Blackberry. It occurs along coastal headlands or grassy woodland habitats inland. It is a root parasite plant with a strong association with Kangaroo Grass (Themeda australis).		detected during surveys and no suitable habitat present within the Subject Land.	
Invertebrates							
Synemon plana	Golden Sun Moth	E	CE	The Golden Sun Moth is a medium-sized, diurnal moth, found in the area between Queanbeyan, Gunning, Young and Tumut. Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by wallaby grasses Austrodanthonia spp.	PMST	Unlikely - No suitable habitat was recorded within the Subject Site during surveys, and no records of this species exist within the Locality.	Low
Mammals							
Petauroides volans	Greater Glider	V	V	The Greater Glider has low mobility and a typically small home range (1 – 4ha). Found in tall eucalypt forests and woodlands this species is dependent on large tracts of undisturbed tall forest with suitably large nesting hollows. The species is solitary, with populations ranging from 0.6 to 2.8 individuals per hectare and are unlikely to disperse this patch. Modelling suggests at least 160	PMST	Unlikely – No records of this species within the Locality and no suitable habitat present	Low – no suitable habitat present within the Subject Land.

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				km2 of native forest patches is required to support a viable population.		within the Subject Land.	
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	This species roosts in camps generally located within 20 km of a regular food source and are commonly found in gullies, close to water and in vegetation with a dense canopy. This species is known to forage in areas supporting subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps on the nectar and pollen of native trees, in particular eucalypts, Melaleucas and Banksias. This species will also forage in urban gardens and cultivated fruit crops. Typically found on the coastal plain and eastern slopes of NSW, only making regular movements to the western slopes in northern NSW.	Bionet (8), PMST	Possible – no suitable breeding habitat present within the Subject Land but records of this species exist within the Locality. It is possible the species may transiently utilise the Study Area for foraging.	Low - This species would not permanently reside or breed within the Study Area therefore it is unlikely this species would be impacted by the proposal.
Phascolarctos cinereus	Koala	V	V	The Koala has a fragmented distribution throughout eastern Australia. It is limited to areas of preferred feed trees in eucalypt woodlands and forests. The size of their home range varies depending on the quality of habitat. Inhabit eucalypt woodlands and forests. The Koala feeds on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Inactive for most of the day, feeding and moving mostly at night. They spend most of their time in trees, but will descend and traverse open ground to move between trees. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.	Bionet (1), PMST	Unlikely - It is unlikely that this species would utilise the Study Area due to high levels of disturbance and lack of suitable habitat.	Low - Limited suitable habitat occurs within the Subject Land.

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				Generally solitary, but have complex social hierarchies based on a dominant male with a territory overlapping several females and sub-ordinate males on the periphery. Females breed at two years of age and produce one young per year.			
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	Caves are the primary roosting habitat for this species, but they may also use mines, stormwater outlets or tunnels and other man-made infrastructure. Eastern Bentwing-bats occur along the east and north-west coasts of Australia, hunting in forested areas, catching moths and other flying insects above the tree tops.	Bionet (1)	Unlikely – No suitable habitat present within the Subject Land.	Low – no suitable habitat present within the Subject Land.
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	The Large-eared Pied Bat is distributed between south-eastern QLD to NSW from the coast to the western slopes of the divide. This species primarily roosts beneath cliff overhangs, within disused mine shafts and may use tree hollows. Only two maternity roosts are known to occur within NSW. This species requires a combination of sandstone cliff for roosting habitat adjacent to Box-Gum Woodland or riparian corridors to provide appropriate foraging grounds.	PMST	Unlikely - No records of this species exist within the Locality and it is unlikely that this species would utilise the Study Area due to limited preferred habitat.	Low - Limited suitable habitat occurs within the Subject Land.
Dasyurus maculatus	Spotted-tailed Quoll	V	E	The Spotted Tailed Quoll inhabits a range of environments in NSW including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Den subject sites are in hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces. Females	PMST	Possible - No records of this species exist within the Locality and only marginal habitat	Low - No preferred habitat for this species was recorded during surveys.

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				occupy home ranges of up to 750 ha and males up to 3,500 ha, which are usually traversed along densely vegetated creek lines.		recorded within the Subject Land.	
Petaurus australis	Yellow-bellied Glider	V	-	The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. The species requires tall mature forests with an abundance of tree hollows to shelter and breed.	PMST	Unlikely – No records of this species within the Locality and no suitable habitat present within the Subject Land.	Low – no suitable habitat present within the Subject Land.
Reptiles							
Aprasia parapulchella	Pink-tailed Worm-lizard	V	V	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (Themeda australis). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites.	PMST	Possible - No records of this species exist within the Locality. The Subject Land falls within the 'predicted' rather than 'known' distribution for this species. Due to disturbance, limited suitable habitat exists	Low - No preferred habitat for this species was recorded during surveys.

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
						within the Subject Land.	
Delma impar	Striped Legless Lizard	V	V	Occurs in the Southern Tablelands, the South West Slopes and possibly on the Riverina. Populations are known in the Goulburn, Yass, Queanbeyan, Cooma and Tumut areas. Also occurs in the ACT, Victoria and south-eastern South Australia. Mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Sometimes found in modified grasslands with significant amounts of surface rocks.	PMST	Unlikely - No records of this species exist within the Locality.	Low
Threatened Ecological Communities							
Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion		CEEC	-	A woodland to low open woodland community characterised by sparse to very sparse tree layer dominated by Eucalyptus pauciflora, either as a single species or with Acacia melanoxylon, E. rubida, E. stellulata and/or E. viminalis as co-dominants. The community can also occur as secondary grassland where trees have been removed but the understorey composition remains largely intact. The composition can be difficult to separate from natural temperate grassland, with landscape cues such as the presence of snow gum in a similar landscape position used as a guide. Monaro Grassy Woodland (MGW) occurs in the Southern Tablelands of NSW, occupying broad valley floors and slopes and low rises of the moderately undulating tablelands on a wide variety of substrates including basalt, fine-grained sedimentary rocks, granite, acid volcanics and alluvium. Geographically, the community is located between Captains Flat	Bionet	Nil – Community not detected during surveys.	Nil

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				in the north and Bombala in the south. The eastern boundary corresponds approximately with the crest of the Great Dividing Range between Captains Flat and Nimmitabel, with western occurrences between the Adaminaby area in the north and Ingebyra in the south. Due to the extensive rain-shadow centred on the Monaro Tableland, the western distribution of the community is discontinuous with the distribution in the east, except for the areas of higher rainfall at the southern end of the Monaro plain between Bombala and Delegate. Examples can also be found north of the Monaro. (OEH 2020)			
Natural Temperate Grassland of the South Eastern Highlands		-	CE	The community can be found in a variety of topographies and substrates between 500 and 1200 m asl. Community is found on sweeping plains with poor drainage where frost forms. May also occur in a mosaic with several woodland communities. Confined to the Southern Tablelands bounded by the ACT, Yass, Abercrombie River, Goulburn, Great Eastern Escarpment, Victorian border and the eastern boundary of KNP.	PMST	Nil – Community not detected during surveys.	Nil
Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions		E	-	Tableland Basalt Forest occurs on plateaus and tablelands between 600 – 900 m asl with loam or clay soils derived primarily from basalt, but may also be derived from mudstones, granites, alluvium and other substrates. It is typically dominated by an open eucalypt canopy of variable composition. Eucalyptus viminalis, E. radiata, E. dalrympleana subsp. dalrympleana and E. pauciflora may occur in the community in pure stands or in varying combinations. The community typically has an open canopy of eucalypts with sparse mid-story shrubs.	Bionet	Nil – Community not detected during surveys.	Nil

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Werriwa Tablelands Cool Temperate Grassy Woodland in the South Eastern Highlands and South East Corner Bioregions		CEEC	-	This community ranges from woodlands to low open woodlands and is characterised by a sparse to very sparse (woodland to open woodland) tree layer dominated by Eucalyptus pauciflora (snowgum) either in single species stands or with E. rubida (candlebark) as a co-dominant. The community can also occur as secondary grassland where trees have been removed but the understorey composition remains largely intact. The composition can be difficult to separate from natural temperate grassland, with landscape cues such as the presence of snow gum in a similar landscape position used as a guide. This CEEC replaces the northern distribution of the formerly listed 'Tableland Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregion' Endangered Ecological Community, noting changes in the species assemblage. Werriwa Grassy Woodlands (WGW) occur in the Southern Tablelands of NSW, occupying broad valley floors and gentle slopes and low rises of the moderately undulating Southern Tablelands of NSW. It has been commonly recorded on a wide variety of substrates including basalt, fine-grained sedimentary rocks, granite, acid volcanics and alluvium but rarely on steep ridge lines on the tablelands. Geographically, it occurs on the eastern fall of the Great Dividing Range between Golspie in the north and Majors Creek in the south. The community has been recorded as far to the east as Marulan and as far west as Carwoola. .	Bionet	Nil – Community not detected during surveys.	Nil

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions		CE	-	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland can occur as either grassland or woodland is characterised by a species diverse understory of grasses, herbs and sparse shrubs. Dominant canopy species include Eucalyptus albens, E. melliodora and E. blakelyi. This ecological community occurs in areas where rainfall is between 400 and 1200 mm per annum, on moderate to highly fertile soils at altitudes of 170 metres to 1200 metres	Bionet	Nil – Community not detected during surveys.	Nil
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		CEEC	CEEC	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland can occur as either grassland or woodland is characterised by a species diverse understory of grasses, herbs and sparse shrubs. Dominant canopy species include Eucalyptus albens, E. melliodora and E. blakelyi. This ecological community occurs in areas where rainfall is between 400 and 1200 mm per annum, on moderate to highly fertile soils at altitudes of 170 metres to 1200 metres	Bionet, PMST	Nil – Community not detected during surveys.	Nil
Migratory Species							
Monarcha melanopsis	Black-faced Monarch	-	Mi	This species of bird usually inhabits dense gullies of rainforest, sclerophyll forests and eucalypt woodlands along the coastal regions from Victoria to Cape York and is migratory over much of its range.	PMST	Unlikely – No records of this species within the Locality and no suitable habitat present within the Subject Land.	Low

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Actitis hypoleucos	Common Sandpiper	-	Mi, C,J,R	In Australia, the Common Sandpiper is found in coastal or inland wetlands, both saline or fresh. It is found mainly on muddy edges or rocky shores. When in Australia, the population is concentrated in northern and western Australia .	PMST	Unlikely – No records of this species within the Locality.	Low
Calidris ferruginea	Curlew Sandpiper	E	CE - Mi, C,J,R	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. Inland records are probably mainly of birds pausing for a few days during migration.	PMST	Unlikely – No records of this species within the Locality.	Low
Numenius madagascariensis	Eastern Curlew	-	CE - Mi, C,J,R	The Eastern Curlew is found on intertidal mudflats and sandflats, often with beds of seagrass, on sheltered coasts, especially estuaries, mangrove swamps, bays, harbours, lagoons and occasionally on wooden oyster leases or other similar structures. It is rarely found inland. The Eastern Curlew occurs only in our flyway, and about 75 per cent of the world's curlews winter in Australia.	PMST	Unlikely – No records of this species within the Locality.	Low
Apus pacificus	Fork-tailed Swift	-	Mi, C,J,R	In Australia, the Fork-tailed Swift mostly occurs over dry or open habitats, including inland plains, riparian woodland and tea-tree swamps, low scrub, heathland, saltmarsh and sometimes above foothills or in coastal areas spending most of their time in the air, or roosting on cliffs or walls. They also occur over settled areas, including towns, urban areas and cities. They are also found at treeless grassland and sandplains covered with spinifex, open	PMST	Unlikely – No records of this species within the Locality.	Low

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
				farmland and inland and coastal sand-dunes. An aerial eater, flying anywhere from 1 m to 300 m above the ground to forage on insects including small bees, wasps, termites and moths. (DCCEEW 2022)			
Gallinago hardwickii	Latham's Snipe	-	Mi, J,R	Latham's Snipe are seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. They are found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. They also use crops and pasture (DCCEEW 2022).	PMST	Unlikely – No records of this species within the Locality.	Low
Calidris melanotos	Pectoral Sandpiper	-	Mi, J,R	These birds forage on grasslands and mudflats, picking up food by sight, sometimes by probing. They mainly eat arthropods and other invertebrates. Some Asian breeders winter in southern Australia and NZ.	PMST	Unlikely – No records of this species within the Locality.	Low
Rhipidura rufifrons	Rufous Fantail	-	Mi	Found along NSW coast and ranges. Inhabits rainforest, dense wet forests, swamp woodlands and mangroves. During migration, it may be found in more open habitats or urban areas.	PMST	Unlikely – No records of this species within the Locality.	Low
Myiagra cyanoleuca	Satin Flycatcher	-	Mi	In NSW widespread on and east of the Great Divide, sparsely scattered on the western slopes, very occasional records on the western plains. Inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, often near wetlands and watercourses. On migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests. Generally, not in rainforests.	PMST	Unlikely – No records of this species within the Locality.	Low

Scientific name	Common name	BC Act Listing	EPBC Act Listing	Habitat	Nature of record	Likelihood of occurrence	Likelihood of impact
Calidris acuminata	Sharp-tailed Sandpiper	-	Mi, C,J,R	The Sharp-tailed Sandpiper prefers the grassy edges of shallow inland freshwater wetlands. It is also found around sewage farms, flooded fields, mudflats, mangroves, rocky shores and beaches. Its breeding habitat in Siberia is the peat-hummock and lichen tundra of the high Arctic.	PMST	Unlikely – No records of this species within the Locality.	Low
Hirundapus caudacutus	White-throated Needletail	-	V - Mi, C,J,R	In eastern Australia, the species is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Dividing Range and occasionally onto the adjacent inland plains. This species is mostly aerial. Although they occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings.	PMST	Unlikely – No records of this species within the Locality.	Low
Motacilla flava	Yellow Wagtail	-	Mi, C,J,R	The Yellow Wagtail is an extremely rare visitor to Australia and may be recorded as a vagrant on occasion. It prefers a range of damp or wet habitats with low vegetation, including damp meadows, pastures near water, and can even be found occupying sewage farms and bogs. It breeds from April to August, although this varies with latitude. The nest is a grass cup lined with hair and placed on or close to the ground in a shallow scrape. It feeds on a wide variety of terrestrial and aquatic invertebrates as well as some plant material, particularly seeds.(Birdlife.org 2022)	PMST	Unlikely – No records of this species within the Locality.	Low

Appendix G – Assessments of Significance BC Act

ASSESSMENTS OF SIGNIFICANCE FOR STATE LISTED THREATENED BIOTA

Section 1.7 of the EP&A Act lists considerations that must be taken into account in the determination of the significance of potential impacts of a proposed Proposal on 'threatened species, populations or ecological communities (or their habitats)' listed under the BC Act. The Assessment of Significance is used to determine whether a Proposal is 'likely' to impose 'a significant effect' on threatened biota and thus whether a Species Impact Statement (SIS) is required. Should the Assessment of Significance conclude that there is likely to be a 'significant effect' on a listed species, population or endangered ecological community, an SIS must be prepared or participation in the Biodiversity Offset Scheme.

Biodiversity Conservation Act 2016 Part 7.3 sets out the following Assessment of significance considerations which must be addressed to determine whether a significant impact is likely to occur.

The species shown in Table 17 are listed under the EPBC Act are included in these assessments:

Table 17 Species listed under the BC Act requiring assessments of significance

Scientific Name	Common name	BC Act	Summary of AoS
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	No significant impact
Petroica boodang	Scarlet Robin	V	No significant impact
Petroica phoenicea	Flame Robin	V	No significant impact
Polytelis swainsonii	Superb Parrot	V	No significant impact
Stagonopleura guttata	Diamond firetail	V	No significant impact

Small Woodland Birds

- Dusky Woodswallow (*Artamus cyanopterus cyanopterus)* – Vulnerable
- Scarlet Robin (*Petroica boodang*) – Vulnerable
- Flame Robin (*Petroica phoenicea*) – Vulnerable
- Diamond Firetail (*Stagonopleura guttata*) – Vulnerable

These birds have been grouped together based on similar habitat requirements occupying eucalypt forests and woodlands and their requirement to breed, roost and feed within the study area.

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

Dusky Woodswallow, Scarlet Robin, Flame Robin and Diamond Firetail inhabit eucalypt woodlands and / grassy open forest, using these habitats for both foraging and nesting. Each species has specific requirements:

Dusky Woodswallow

- Dusky woodswallows primarily feed on invertebrates, which are captured whilst hovering or sallying above the canopy or over water. The species also frequently hovers, sallies and pounces under the canopy, primarily over leaf litter and dead timber, and may occasionally take nectar, fruit and seed. Nest sites vary greatly, but generally occur in shrubs or low trees, living or dead, horizontal or upright forks in branches, spouts, hollow stumps or logs, behind loose bark or in a hollow in the top of a wooden fence post. Nest sites may be exposed or well concealed by foliage.

Scarlet Robin

- Scarlet Robins are primarily resident within dry eucalypt forest and woodlands, preferring habitat with abundant logs and fallen timber. Throughout autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees. These birds forage from low perches, fence-posts or on the ground, from where they pounce on small insects and other invertebrates. They sometimes forage in the shrub or canopy layer. The nest of the Scarlet Robin is built in the fork of a tree, dead tree or shrub, usually more than 2 metres above the ground.

Flame Robin

- The Flame Robin breeds in upland tall moist eucalypt forests and woodlands, preferring clearings and areas with open understoreys. In winter, birds migrate to drier more open habitats below the ranges such as dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees. Birds forage from low perches, taking invertebrates from the ground, the air, or from tree trunks and logs. Nests are often near the ground and are built in sheltered sites, such as shallow cavities in trees, stumps or banks.

Diamond Firetail

- The Diamond Firetail inhabits eucalypt woodlands and derived grasslands, including lightly wooded farmland areas. The species feeds exclusively on the ground, eating grass and herb seeds, green leaves and insects. The species is communal, roosting together in dense shrubs or in smaller nests built especially for roosting. Nests for breeding are built either in the shrubby understorey, or higher up, commonly under hawk's or raven's nests.

An area (0.79 ha) of modified grassy woodland / open forest and native grassland derived from grassy woodland / open forest will be removed to make way for the Proposal, as well as an area of 0.14 ha of planted native vegetation, and an area of 15.29 ha of exotic vegetation including exotic trees and shrubs. This will cause a small reduction in the availability of foraging and breeding habitat for these bird species.

No definitive evidence of nesting by any of the above-listed species was observed during surveys within the Subject Land, however targeted surveys for these species were not undertaken and many small bird nests were observed within exotic shrubs throughout the Subject Land, any of which could potentially have been constructed by Dusky Woodswallow, Scarlet Robin, Flame Robin or Diamond

Firetail. These species are likely to occur in areas surrounding the Subject Land – suitable habitat occurs within the broader Assessment Area as well as throughout the locality.

It is recommended that any removal of vegetation within the Subject Land be undertaken outside the breeding season for these species (August-January) to avoid the risk of impact to nesting individuals.

It is considered unlikely the proposal would have an adverse effect on the life cycle of the species such that a viable local population of these species would be placed at risk of extinction.

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

i. **is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**
ii. **is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,**

Not applicable to these threatened species.

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

i. **the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and**
ii. **whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and**
iii. **the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,**

The vegetation to be impacted comprises of modified grassy woodland / open forest, native grassland derived from grassy woodland / open forest, planted native vegetation, exotic pasture and exotic trees and shrubs. A small number of mature hollow bearing remnant trees will be removed. A total of **16.22 ha** of vegetation may potentially be directly impacted, with a further **16.1 ha** subject to indirect impacts such as noise, dust during construction and increased human activity.

The habitat to be removed is likely to be used by the above-listed woodland birds for foraging and nesting resources. The area to be cleared will not create new fragmentation or isolation for these mobile species.

The habitat to be removed is not of high value to the long-term survival of the abovementioned species as it forms a small section of habitat within the wider locality and its position (within a modified agricultural landscape) is unlikely to be critical habitat required for these species to breed and survive within the locality.

Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The site does not support any declared registered areas of outstanding biodiversity.

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

The following listed Key threatening processes have the potential to occur or increase as a result of the proposal, if appropriate mitigation measures are not implemented:

- Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands
- Bushrock Removal
- Clearing of native vegetation
- Infection of frogs by amphibian chytrid causing the disease chytridiomycosis
- Invasion and establishment of exotic vines and scramblers
- Invasion of native plant communities by exotic perennial grasses
- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants
- Loss of Hollow-bearing Trees
- Removal of dead wood and dead trees

Conclusion
The proposed works are unlikely to significantly impact Dusky Woodswallow, Scarlet Robin, Flame Robin or Diamond Firetail, given the minor proportion of modified habitat to be removed within the Subject Land and the abundance of suitable foraging, roosting and nesting sites in the broader locality. It is recommended that any removal of vegetation within the Subject Land be undertaken outside the breeding season for these species (August-January) to avoid the risk of impact to nesting individuals.

Superb Parrot – Vulnerable

Polytelis swainsonii

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

Superb Parrot – This species was recorded within the Subject Land during surveys. There are also numerous recent records of the species using habitats within the surrounding Assessment Area (Bionet 2022). Superb Parrots require open woodland with tree hollows for nesting sites. Typically they nest in colonies and return to the same location over generations. During the summer they return from wintering in northern NSW to breed. 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, among others. Superb Parrots are found to forage in grassy box woodland up to 10km from the nesting site.

A number of remnant mature and hollow bearing trees will be removed to make way for the proposed works, which will cause a marginal reduction in the availability of nesting and foraging habitat for the Superb Parrot. It is unknown whether Superb Parrot is currently nesting within the Subject Land as targeted surveys were not undertaken. This species is also likely to occur in suitable habitat present both adjacent to and surrounding the Subject Land, as well as within the broader locality. Much of the Subject Land supports exotic vegetation and is not likely to be a key breeding area for these species.

Therefore, it is considered unlikely the proposal would have an adverse effect on the life cycle of the species such that a viable local population of these species would be placed at risk of extinction.

It is strongly recommended that to avoid the risk of impact to nesting individuals of Superb Parrot,

a) any removal of hollow bearing trees within the Subject Land be undertaken outside the breeding season for these species (September-January); and
b) pre-clearing surveys be undertaken by a qualified ecologist prior to commencement of works.

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

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

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

Not applicable to these threatened species.

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

iv. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

v. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

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

The vegetation to be impacted comprises of modified grassy woodland / open forest, native grassland derived from grassy woodland / open forest, planted native vegetation, exotic pasture and exotic trees and shrubs. A small number of mature hollow bearing remnant trees will be removed. A total of **14.39 ha** of vegetation may potentially be directly impacted, with a further **16.1 ha** being subject to indirect impacts such as noise, dust during construction and increased human activity.

The habitat to be removed is likely to be used by the Superb Parrot for foraging and nesting resources. The area to be cleared will not create new fragmentation or isolation for this mobile species.

The majority of habitat to be removed is not of high value to the long-term survival of the abovementioned species as it forms a small section of habitat within the wider locality and its position (within a modified agricultural landscape) is unlikely to be critical habitat required for these species to breed and survive within the locality.

The hollow-bearing trees to be removed do provide valuable nesting resources for Superb Parrot in a primarily cleared and modified agricultural landscape. It is strongly recommended that these trees be retained within a vegetation protection area. If this is not possible, it is recommended that artificial nesting boxes of suitable dimensions to support Superb Parrot be erected within vegetation elsewhere in the Subject Land, at a ratio of 2:1 to those hollows which have been removed.

Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The site does not support any declared registered areas of outstanding biodiversity.

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

The following listed Key threatening processes have the potential to occur or increase as a result of the proposal, if appropriate mitigation measures are not implemented:

- Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands
- Bushrock Removal
- Clearing of native vegetation
- Infection of frogs by amphibian chytrid causing the disease chytridiomycosis
- Invasion and establishment of exotic vines and scramblers
- Invasion of native plant communities by exotic perennial grasses
- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants
- Loss of Hollow-bearing Trees
- Removal of dead wood and dead trees

Conclusion

It is strongly recommended that any removal of hollow bearing trees within the Subject Land be undertaken outside the breeding season for Superb Parrot (September-January) to avoid the risk of impact to nesting individuals. In addition, pre-clearing surveys should be undertaken by a qualified ecologist prior to commencement of works.

In addition, it is recommended that artificial nesting boxes of suitable dimensions to support Superb Parrot be erected within vegetation elsewhere in the Subject Land, at a ratio of 2:1 to those hollows which have been removed.

The proposed works are unlikely to significantly impact Superb Parrot given the minor proportion of potential habitat to be removed within any given site, the preference by these species for roosting and nesting sites away from areas of high disturbance, and the abundance of suitable roosting and nesting sites in the broader locality.

Appendix H – EPBC Act Significant Impact Criteria Assessments

Significant Impact Criteria (SIC) Assessments (aka assessments of significance) have been provided for threatened biota of concern to provide an indication of the potential level of impact of the proposal based on past records and habitats present. The following assessments have relied on species habitat information and records available via OEH Saving Our Species, DCCEEW SPRAT profiles unless otherwise stated.

The species shown in Table 18 are listed under the EPBC Act are included in these assessments.

Table 18 EPBC Act listed species requiring SIC assessments

Name	EPBC Act	Summary of Assessment of Significance
Polytelis swainsonii	V	No significant impact

The Test of significance indicates that no significant impact to this species is anticipated as a result of the Proposal. Consequently, a Referral to the Minister is not required.

Superb Parrot (*Polytelis swainsonii)* – Vulnerable

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it would:

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

Many records for this species occur throughout the locality, however no important population is known to depend solely on habitat present within the study area. Given the limited impact to native vegetation (which has previously been modified), and indirect impacts occurring with mitigation measures in place, the proposal is not anticipated to impact significantly on an important population of this species.

Reduce the area of occupancy of an important population,

The vegetation to be impacted comprises of modified grassy woodland / open forest, native grassland derived from grassy woodland / open forest, planted native vegetation, exotic pasture and exotic trees and shrubs. A small number of mature hollow bearing remnant trees will be removed. In total, an area of **0.93 ha** of native vegetation will be removed. Given the availability of large tracts of similar / suitable habitat within the immediate study area and broader locality, it is deemed the Proposal is unlikely to reduce the area of occupancy of an important population of this species.

Fragment an existing population into two or more populations,

No known important populations occur within the Subject Site, however the species was recorded within the Subject Site during surveys. The Subject Land contains highly modified vegetation, and extensive areas of similar habitat are present throughout the broader locality. As a species, Superb Parrot is highly mobile and the proposal is deemed unlikely to fragment an existing population into two or more populations.

Adversely affect habitat critical to the survival of a species,

The Subject Site consists of modified agricultural and residential land, adjacent to existing roads and agricultural areas. Large tracts of similar habitat occur within the broader locality. Whilst potential breeding habitat occurs within the Subject Site in the form of a number of mature hollow-bearing trees, these are unlikely to be critical to the survival of the Superb Parrot as the species is known to breed over a large area. Therefore, the Proposal is unlikely to adversely affect habitat that is critical to the survival of this species.

Disrupt the breeding cycle of an important population,

This species nests in hollows (dead or alive trees), often in colonies with more than one nest in each tree. Breeding occurs between September and January. Large tracts of similar habitat occur within the broader locality. Whilst potential breeding habitat occurs within the Subject Site in the form of a number of mature hollow-bearing trees, these are unlikely to be critical to the survival of the Superb Parrot as the species is known to breed over a large area. No known important population of Superb Parrot is dependent on habitat present within the Subject Land. A limited number of potential nesting trees will be impacted by the proposed development. If works are timed outside of the breeding season (September-January), it is unlikely that the proposal will disrupt the breeding cycle of an important population.

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

The proposal will see direct impacts to approximately 0.93 ha of native vegetation, of which only approximately **0.48 ha** consists of suitable foraging and nesting habitat for the Superb Parrot. A small number of hollow-bearing trees will be impacted; these trees provide suitable breeding and feeding habitat for this species. Larger areas of suitable habitat are present within the broader locality. Vegetation within the Subject Land and adjacent areas may provide an important thoroughfare for these birds, however, it is deemed that the Proposal is unlikely to modify, destroy, isolate or decrease the availability of quality habitat such that it places this species into further decline.

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

The study area was observed to contain high weed levels during surveys. Areas of native vegetation to be impacted are relatively small remnants / plantings in a degraded state, and are subject to existing impacts from agricultural weeds and disturbance. Construction works and operational traffic have the potential to introduce/spread weeds. Environmental safeguards that form part of this Proposal will reduce any risk of these species becoming further established in the study area as a result of the proposed works, therefore reducing additional impacts to potential habitat for Superb Parrot.

Introduce disease that may cause the species to decline,

No evidence of existing disease was present within the study area during surveys. Earth moving equipment used for trenching has the potential to introduce disease into the study area, which could potentially impact on habitat resources used by Superb Parrot. Environmental safeguards that form part of this Proposal have been stated to reduce the possibility of disease being introduced to the study area are a result of the proposed works.

Interfere substantially with the recovery of the species.

Two individuals of Super Parrot were recorded within the Subject Site during surveys. No nesting activity was observed, however targeted surveys were not undertaken. This is a highly mobile species and only small areas of vegetation occurring within existing disturbed areas will be impacted. Large tracts of similar / suitable habitat occur within the broader locality. Therefore, the proposal is unlikely to substantially interfere with the recovery of this species.

Conclusion

Given the above, it is deemed unlikely that Superb Parrot will be significantly impacted by the proposed works.

It is strongly recommended that any removal of hollow bearing trees within the Subject Land be undertaken outside the breeding season for Superb Parrot (September-January) to avoid the risk of impact to nesting individuals. In addition, pre-clearing surveys should be undertaken by a qualified ecologist prior to commencement of works.

In addition, it is recommended that artificial nesting boxes of suitable dimensions to support Superb Parrot be erected within vegetation elsewhere in the Subject Land, at a ratio of 2:1 to those hollows which have been removed.

Appendix I – Climate Data

Orange, New South Wales
September 2022 Daily Weather Observations

Observations from Orange Airport.

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Th	3.2	14.4	0			N	35	12:59	10.2	91		NE	11	1025.2	13.2	60		NNW	22	1021.3
2	Fr	3.1	11.6	0			E	30	23:23	8.1	89		S	6	1023.3	11.0	61		SSE	6	1021.2
3	Sa	2.2	10.6	0			SE	48	15:10	6.2	81		ESE	17	1023.5	8.7	71		SE	30	1022.9
4	Su	2.2	12.7	0			SE	46	07:34	7.6	73		SE	31	1025.3	11.4	56		ESE	20	1023.5
5	Mo	-2.3	12.2	0			SSE	30	13:43	9.0	64		ESE	7	1023.9	11.3	51		SSE	19	1021.5
6	Tu	2.4	13.1	0			E	24	02:02	6.9	78		E	15	1024.7	12.0	47	8	E	7	1021.6
7	We	1.4	13.6	0			NNE	37	11:12	8.5	77	2	NE	13	1024.4	9.0	90	8	NNW	15	1020.6
8	Th	7.7	14.9	2.4			NNE	59	10:55	9.9	84	3	N	31	1018.4	12.4	72	8	NNE	26	1014.3
9	Fr	6.8	13.7	27.2			NW	50	23:54	8.4	99	8	NW	17	1013.4	10.8	78	8	NNW	24	1010.9
10	Sa	7.3	11.8	16.2			WSW	50	20:13	9.1	89	8	WNW	24	1011.4	10.2	86	8	W	24	1010.6
11	Su	3.1	10.2	10.0			WSW	48	00:19	5.9	86	8	SSW	19	1016.9	9.8	70		WSW	20	1015.5
12	Mo	-0.1	9.9	0			SW	37	11:09	5.8	71	6	SW	24	1019.4	9.8	68	7	SW	24	1018.5
13	Tu	1.4	10.6	0.8			WSW	24	00:37	5.8	72	4	SW	15	1025.4	9.9	54	1	SSE	13	1024.3
14	We	0.7	14.3	0			ENE	35	09:32	7.4	77		ENE	20	1026.6	13.1	47	3	NNE	19	1022.0
15	Th	6.1	11.0	7.4			N	50	21:34	7.1	99	8	NE	9	1017.1	9.2	99	8	N	22	1010.4
16	Fr	5.5	14.8	30.8			NW	50	13:52	10.9	66		WNW	17	1008.5	13.9	47	3	NW	31	1006.8
17	Sa	2.6	12.1	0			WNW	54	23:10	10.1	73	6	NW	22	1007.7	9.1	74	8	W	28	1007.2
18	Su	4.3	12.0	2.6			W	54	00:08	7.9	80	8	W	26	1014.3	10.3	62	8	NW	31	1012.8
19	Mo	3.3	12.1	0			WSW	48	10:38	9.1	80	3	WSW	24	1017.2	11.5	60		WSW	22	1016.4
20	Tu	-2.6	17.1	0.2			NE	24	08:41	9.1	61		ENE	17	1022.4	16.4	35		NE	15	1018.7
21	We	6.5	12.3	0			NE	41	17:23	10.7	85	2	NE	20	1018.4	10.0	99	8	NE	17	1015.0
22	Th	8.5	15.3	23.8			E	43	12:57	12.0	91	8	E	15	1016.8	14.8	81	4	ENE	22	1015.6
23	Fr	8.5	16.3	0.6			NE	28	01:45	11.8	84	4	NE	13	1017.8	13.6	87	6	SSE	9	1014.0
24	Sa	9.9	14.9	3.8			W	43	14:12	11.7	88	8	WSW	26	1013.2	12.1	78	7	WSW	28	1012.3
25	Su	1.7	14.3	0.2			SW	31	14:01	8.6	77		WSW	20	1017.7	13.4	61		SW	17	1016.0
26	Mo	1.2	15.5	0			NW	28	14:59	7.7	88	4		Calm	1018.0	14.6	55	7	NW	20	1015.8
27	Tu	7.6	16.9	4.4			WNW	46	06:56	11.1	95	7	N	9	1015.1	15.3	65	8	NNW	28	1011.3
28	We	2.0	12.0	15.8			SSW	37	13:58	8.9	74	1	NW	17	1012.5	7.9	86	8	SSW	19	1013.0
29	Th	3.6	16.1	0.4			SSE	46	17:05	11.4	82		SSE	28	1019.2	13.5	91	6	S	20	1019.3
30	Fr	5.6	15.6	0.8			SE	46	07:50	11.4	68		SE	33	1024.9	14.3	59	8	ESE	17	1023.4
Statistics for September 2022																					
Mean		3.8	13.4							8.9	80	5		18	1018.8	11.8	68	6		20	1016.6
Lowest		-2.6	9.9							5.8	61	1		Calm	1007.7	7.9	35	1	SSE	6	1006.8
Highest		9.9	17.1	30.8			NNE	59		12.0	99	8	SE	33	1026.6	16.4	99	8	NW	31	1024.3
Total				147.4																	

Observations were drawn from Orange Airport AWS {station 063303}
Some cloud observations are from automated equipment; these are somewhat different to those made by a human observer and may not appear every day.

Appendix J – DPI Fisheries Advice

Oakstand
Attn: Jon Hopkins
Level 9, 503-505 Kent Street
Sydney, NSW, 2000

The Environmental Factor
PO Box 268
Bathurst, NSW, 2795

September 27th, 2022

Dear Jon,

Re: Advice on requirements for Fisheries Permit for subdivision and residential development at 12 & 20 Shiralee Rd, Orange, NSW

Introduction

As requested, The Environmental Factor (TEF) completed a brief desktop assessment and consulted NSW Department of Primary Industries (DPI) Fisheries to confirm whether a Part 7 s201 Permit for 'Dredging and Reclamation' or 'Obstruction of Fish Passage' under the *Fisheries Management Act* 1994 (FM Act) is required for the proposed subdivision and residential development at 12 and 20 Shiralee Rd, Orange, NSW (Lot 1 DP630681 & Lot 1 DP381932).

Limitations and Disclaimer

The information, statements, recommendations, and commentary (together the "Information") contained in this letter are preliminary in nature and based on the information and advice received from Oakstand Pty Ltd via email (13/09/2022) and from consultation of available databases and maps, and advice received from NSW DPI - Fisheries. No onsite ecological assessment has been completed. Accordingly, whilst the information provided in this letter is given in good faith, TEF accepts no responsibility for any inaccuracies in the information given, or for any future costs incurred to the Client based on this preliminary advice.

***Fisheries Management Act 1994* (FM Act)**

The *Fisheries Management Act 1994* (FM Act) aims to conserve threatened species, populations and ecological communities of fish and marine vegetation native to NSW and to promote ecologically sustainable development, including the conservation of biological diversity. It also aims to reduce the threats faced by native fish and marine vegetation in NSW.

If proposed works are within or adjacent to a waterway that fits the definition of Key Fish Habitat and / or is mapped as Key Fish Habitat, a permit for dredging, reclamation, and / or obstruction of fish passage is required under the FM Act. A permit for dredging or reclamation work is required under s201 of Part 7 of the FM Act for any work that involves:

- Activities involving dredging and reclamation work (Part 7 permit)
- Activities temporarily or permanently obstructing fish passage (Part 7 permit)

- Using explosives, electrical devices or other dangerous substances in a waterway (Part 2 permit)

Permits are required for works within third order (or higher) streams (based on the Strahler system of stream order classification), and first and second order streams that are known or likely to be habitat for listed threatened species, populations or communities.

A Part 7 permit is required for works unless any planned dredging or reclamation work is:

- Carried out by Council and is carried out in accordance with the Code of Practice for Minor Works in NSW Waterways published on the Department's website: cl 263A *Fisheries Management (General) Regulation 2010*; or
- Authorised under the *Crown Lands Act 1989* (s 200(2)(a)); or
- Authorised by a relevant public authority (other than Council) (s 200(2)(b))

Execution of the proposal will need to be completed in accordance with any conditions dictated in the Part 7 permit, if required and issued to the developer by NSW DPI.

The Subject Site is directly adjacent to a first order, unnamed creek that flows into Blackmans Swamp Creek north of the site (Attachment 1). The creek is mapped as Key Fish Habitat (KFH) on the DPI KFH dataset of the Orange Local Government Area (LGA). As such, clarification was sought from DPI Fisheries to determine potential permit requirements. Advice received (Attachment 2) confirmed that the creek in question is not considered KFH and no permits are required under the FM Act for any works in or around the waterway.

It should be noted, however, that the advice contained in this letter pertains only to the FM Act. Any works on waterfront land, including within the bed and banks and riparian zone of a defined waterway (regardless of stream order or KFH classification) will require considerations under the NSW *Water Management Act 2000* (WM Act) and may require a Controlled Activity Approval from the Natural Resources Access Regulator (NRAR), including a Vegetation Management Plan (VMP).

We trust this report meets your requirements, however, if you have any questions or wish to discuss at all please don't hesitate to contact me via the detail listed below.

Best regards,

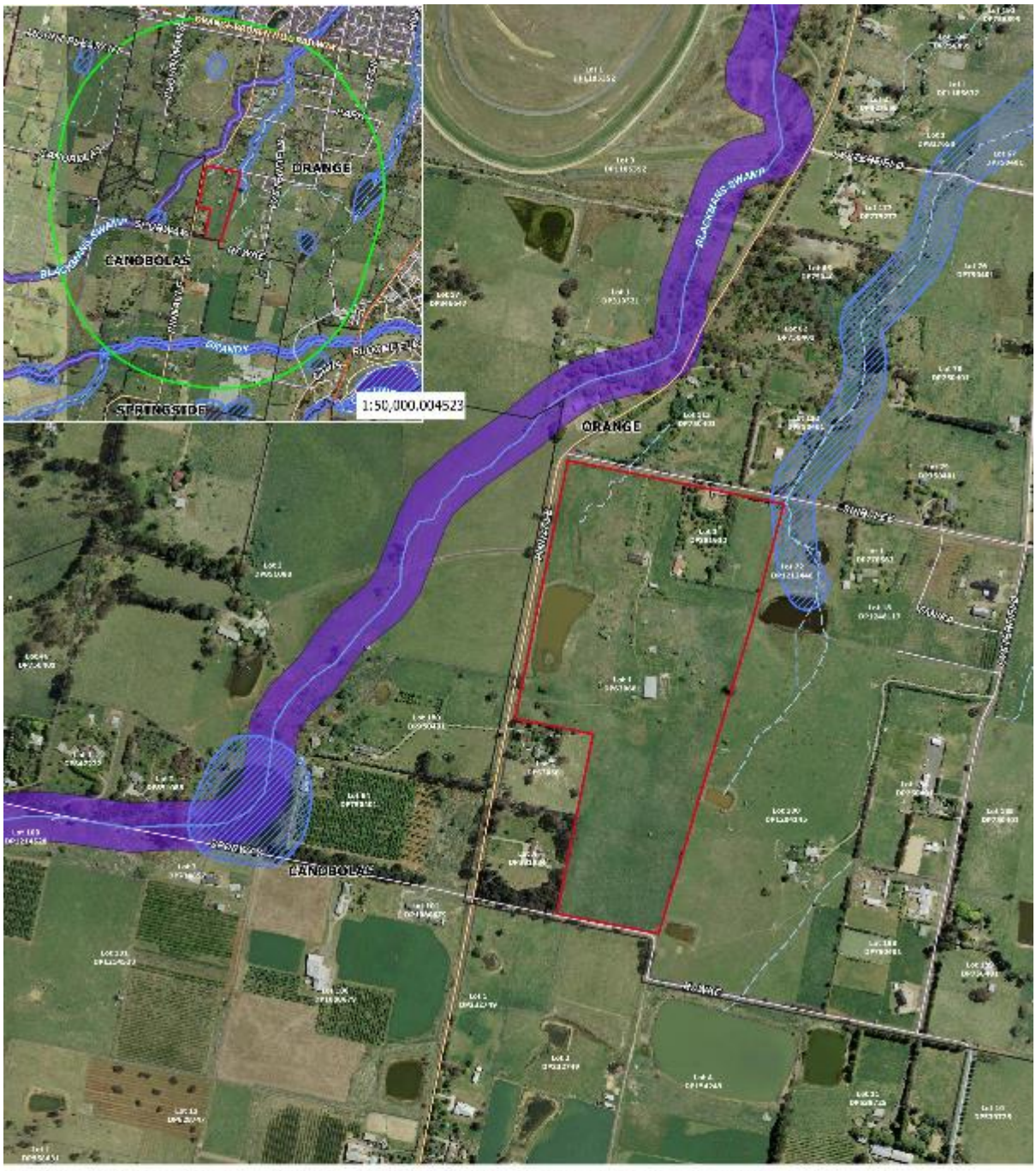
Graham Stirling
Project Manager and Environmental Consultant
0432 484 325
graham@envirofact.com.au

Attachments

Attachment 1 Key Fish habitat and waterways within 5km of proposal location

Attachment 2 – Email correspondence with DPI Fisheries

Attachment 1 Key Fish Habitat and waterways within 5km of proposal location



Oakstand Shiralee Subdivision - Surface Water within a 5km Radius of the Proposal Location

Legend

- 1.5km Radius
- Subject Land
- Local Government Area
- Suburb
- Lot boundary

Roads

- Local Road
- Sub Arterial Road

Waterways

- Creek
- 1st & 2nd order unnamed waterways
- Key Fish Habitat
- Riparian Lands Watercourses

N 0 80 160 240 m

1:8,000.01169

Attachment 2 – Email correspondence with DPI Fisheries

Graham Stirling

From: David Ward <david.ward@dpi.nsw.gov.au>
Sent: Monday, 26 September 2022 2:05 PM
To: Graham Stirling
Cc: Emily Cotterill
Subject: RE: Clarification request for a Fisheries Permit
Attachments: Shiralee.tif

Hi Graham,

Thank you for your enquiry. Well worth checking the KFH within the Orange LGA as there are lots of anomalies.

As you can see from our mapping, the waterway adjacent to the development is a first order stream and is therefore not considered to be KFH (Third order or larger). No permits are required from DPI Fisheries under the FM Act.

Cheers
Dave

David Ward
A/ Senior Fisheries Manager Murray Darling
Freshwater Environment
Department of Regional NSW
4 Marsden Park Road, Calala, 2340
T 02 6763 1255 **M** 04 2990 8856 **E** david.ward@dpi.nsw.gov.au

regional.nsw.gov.au

Department of Regional NSW

From: Graham Stirling <graham@envirofact.com.au>
Sent: Monday, 26 September 2022 1:33 PM
To: David Ward <david.ward@dpi.nsw.gov.au>
Cc: Emily Cotterill <emily@envirofact.com.au>
Subject: Clarification request for a Fisheries Permit

Afternoon David,

Hope you are well. I was hoping you could assist with clarifying whether a Part 7 Fisheries Permit is required for a property development on Shiralee Rd (see attached map showing site location and mapped KFH in the area). The subject land shows the two Lots that have been purchased by the developer. We're currently assisting the client with the required Biodiversity Assessment Report and (potentially) a Vegetation Management Plan for the Controlled Activity Approval with NRAR for works on the dam and stormwater outlet.

Council indicated to the developer that they would need to consider potential permits under the FM Act. We note from our mapping data that the KFH buffer is mapped in the eastern corner of the site.

Are you able to confirm if the waterway shown is indeed listed as KFH with DPI Fisheries and whether a Part 7 permit is potentially required for works in this location. We've noted on a couple recent projects that the data we have on KFH is different to that of Fisheries so always worth asking before advising our clients.

Let me know if you need any further information.

Thanks

Graham Stirling

Environmental Consultant & Project Manager | MSc EnvMgmt
The Environmental Factor
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