Lochinvar Ridge Stage 22 Biodiversity Assessment Report

Lochinvar Ridge Estate, Lochinvar

25003940.001A

2 May 2025

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Lochinvar Ridge Estate, Lochinvar

Kleinfelder Project: 25003940.001A

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1.0	Draft for client review	28 March 2025	Belinda Bortolin	Nigel Fisher	Fig Forest
2.0	Final	2 May 2025	Belinda Bortolin	Nigel Fisher	Fig Forest

EXECUTIVE SUMMARY

Urban Land Housing (ULH, the Proponent) proposes the continuation of residential development Lochinvar Ridge Estate, located off Station St Lochinvar NSW, consisting of Lot 1309 DP 1141533 (the subject site). Kleinfelder Australia (Kleinfelder) were engaged by ULH to conduct a preliminary biodiversity assessment report (BAR) of the proposal using field methodology as per the Biodiversity Assessment Method 2020 (BAM).

It is our understanding that this is a continuation of an existing development named the Lochinvar Ridge Estate. The purpose of the BAR is to identify the biodiversity values and condition of the site to indicate the likelihood of the proposed development having an impact on threatened species or ecological communities against requirements of the NSW Environmental Planning & Assessment Act 1979 (EP&A Act), NSW Local Land Services Act 2013 (LLS Act), NSW Biodiversity Conservation Act 2016 (BC Act) and Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

*The Subject Site is located in the Maitland City Council Local Government Area, in the Lower Hunter region of NSW. Stage 22 (the Proposal) will occupy up to approximately 7.7 hectares, effecting one lot (Lot 1309 DP 1141533) (**Figure 1**). This is a continuation of Stage 16 – 21 (Lot 2 DP 1306134).*

As per BAM methodology, three (3) full floristic/vegetation structural 20 x 20 metre quadrats, nested within 20 x 50 metre vegetation functional quadrats; each with five 1m² subplots for assessment of average litter cover, were performed across the site.

The field assessment identified one Plant Community Type (PCT) on the Subject Site: PCT 3431 Central Hunter Ironbark Grassy Woodland (Dry Sclerophyll Forest). This PCT is currently listed as an Endangered Ecological Community (EEC) in NSW under the BC Act and a Critically Endangered Ecological Community (CEEC) under the EPBC Act. PCT 3431 occurs outside of the proposed development and will not be impacted by the development. No trees occur within the proposed development area.

The draft native vegetation regulatory map (DNVRM) identifies no area of Category 1 Exempt Land within Lot 1309 DP 1141533. The majority of the land is 'excluded land', and the eastern portion of the Lot is Category 2 Regulated land, which is outside of the development area. The majority of the land is displayed on the map as land excluded from the Local Land Services Act 2013.

The preliminary BAM-C predicted 22 species to occur on site, with all ecosystem credit species assumed absent due to species constraints **(Table 6).** *The offset obligation is entirely associated with PCT 3431 where wooded vegetation occurs on the site that is being directly affected by the proposal. As the project will avoid all areas of PCT 3431 on the subject site, there is no offset obligation predicted to occur.*

The preliminary BAM-C generated *11 candidate flora species and 16 candidate fauna species to potentially occur on site, with 18 candidate species assumed absent due to species constraints* **(Table 7).** *Targeted surveys will be required to confirm presence of these species on site and finalise a credit obligation pending clearing of any associated habitat.*

Likelihood of occurrence assessment of species found from BioNet and Protected Matters searches found a moderate likelihood of Southern Myotis (Vulnerable – BC Act), Little Bent-winged Bat (“), Large Bent-winged Bat (“), Eastern Freetail-bat (“),Yellow-bellied Sheathtail-bat (“), Greater Broad-nosed Bat (“), Hunter Valley Delma (Endangered – BC Act / EPBC Act), and Grey-crowned Babbler (eastern subspecies) (Vulnerable- BC Act) to occur within the Development Area.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

Kleinfelder Australia Pty Ltd (Kleinfelder) was contracted by Urban Land Housing (ULH) to prepare a Biodiversity Assessment Report (BAR) for the proposed development for the site located off Station St Lochinvar consisting of Lot 1309 DP 1141533 (the subject site). It is our understanding that this is a continuation of an existing development named the Lochinvar Ridge Estate. The purpose of the BAR is to identify the biodiversity values and condition of the site to indicate the likelihood of the proposed development having an impact on threatened species or ecological communities against requirements of the NSW Environmental Planning & Assessment Act 1979 (EP&A Act), NSW Local Land Services Act 2013 (LLS Act), NSW Biodiversity Conservation Act 2016 (BC Act) and Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

The following terms are used to define areas throughout this BAR:

- **Subject Site:** Lot 1309 DP 1141533, Lochinvar NSW 2321.
- **Study Area:** Subject Site inclusive of 1500m buffer of land surrounding the Subject Site.
- **Development Area:** Areas of the subject site proposed for development, including access tracks and Asset Protection Zone (APZ).
- **Locality:** describes lands located within 10km of the Subject Land.

The proposed development may involve the clearing of vegetation, by way of Bushfire Asset Protection Zones, formation of roads, connection to infrastructure and ancillary services.

This BAR has been prepared to assess the proposal and determine if it is likely to significantly impact threatened species or ecological communities, or their habitats, with impacts arising from the construction and operation of the proposed development at Lochinvar Ridge Estate.

This report documents the results of this assessment, and details of the proponent's potential biodiversity offset requirements (ecosystem and species credits), pending avoidance of biodiversity impacts from the development of a final design.

1.2 PROPOSED SITE LOCATION AND DESCRIPTION

The proposed development for the site located off Station St Lochinvar consisting of Lot 1309 DP 1141533 (the subject site). This is a continuation of an existing development named the Lochinvar Ridge Estate.

Concept Design Plans (Urbis, Ref. 240913 Stage 16-21, dated 13/09/2024) were provided.

The footprint (Development Area) of the proposed works is as follows:

- The construction and operation of 70 Residential Lots within Lot 1309 DP 1141533.

The above listed locations (Subject Site and Development Area) are illustrated in **Figure 1** and **Figure 2**.

The subject site is located 1.3 kilometres south-west of Lochinvar within the Sydney Basin Interim Biogeographic Regionalisation for Australia (IBRA) region, Hunter IBRA Subregion (**Figure 1**).

1.3 REPORT OBJECTIVES

The report provides information to guide the principles of avoidance, minimisation and offsetting as prescribed by the objectives of the Biodiversity Assessment Method.

The purpose of the BAR is to identify the biodiversity values and condition of the site to indicate the likelihood of the proposed development having an impact on threatened species or ecological communities against requirements of the NSW Environmental Planning & Assessment Act 1979 (EP&A Act), NSW Local Land Services

Act 2013 (LLS Act), NSW Biodiversity Conservation Act 2016 (BC Act) and Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

The proposed development may involve the clearing of vegetation by way of Bushfire Asset Protection Zones, formation of roads, connection to infrastructure and ancillary services.

Preliminary field surveys as per the Biodiversity Assessment Methodology (BAM) have been undertaken to determine:

- Plant Community Types (PCT's) and Vegetation Zones. Survey to be undertaken using acceptable BAM Vegetation Integrity (VI) quadrats methodology.
- Threatened Ecological Communities. To be assessed for potential representation as State and/or Federally listed Threatened Ecological Communities.
- Potential habitat for native fauna.
- Any opportunistic findings or evidence of native and threatened fauna and flora on site.
- Groundwater Dependent Ecosystems.
- Occurrence of Category 1- Exempt Land.
- Preliminary desktop assessment for likelihood of occurrence and recommendations on targeted survey requirements for MNES with potential to occur or be directly or indirectly impacted by the Project.
- Provide mapping illustrating biodiversity values as observed during preliminary field surveys.
- Provide BAM-C outputs and potential threatened species survey requirements.

Where and if site conditions are appropriate the BAR will apply the following streamlined assessment modules:

- Streamlined assessment module – Scattered trees assessment and a justification of how the trees proposed to be cleared or impacted meet the definition of scattered trees
- Streamlined assessment module – Small areas
- If neither of these above triggers apply to the proposal and it is likely to significantly affect threatened species or ecological communities or their habitats, a report detailing the threatened species test of significance results may be attached to the BAR.

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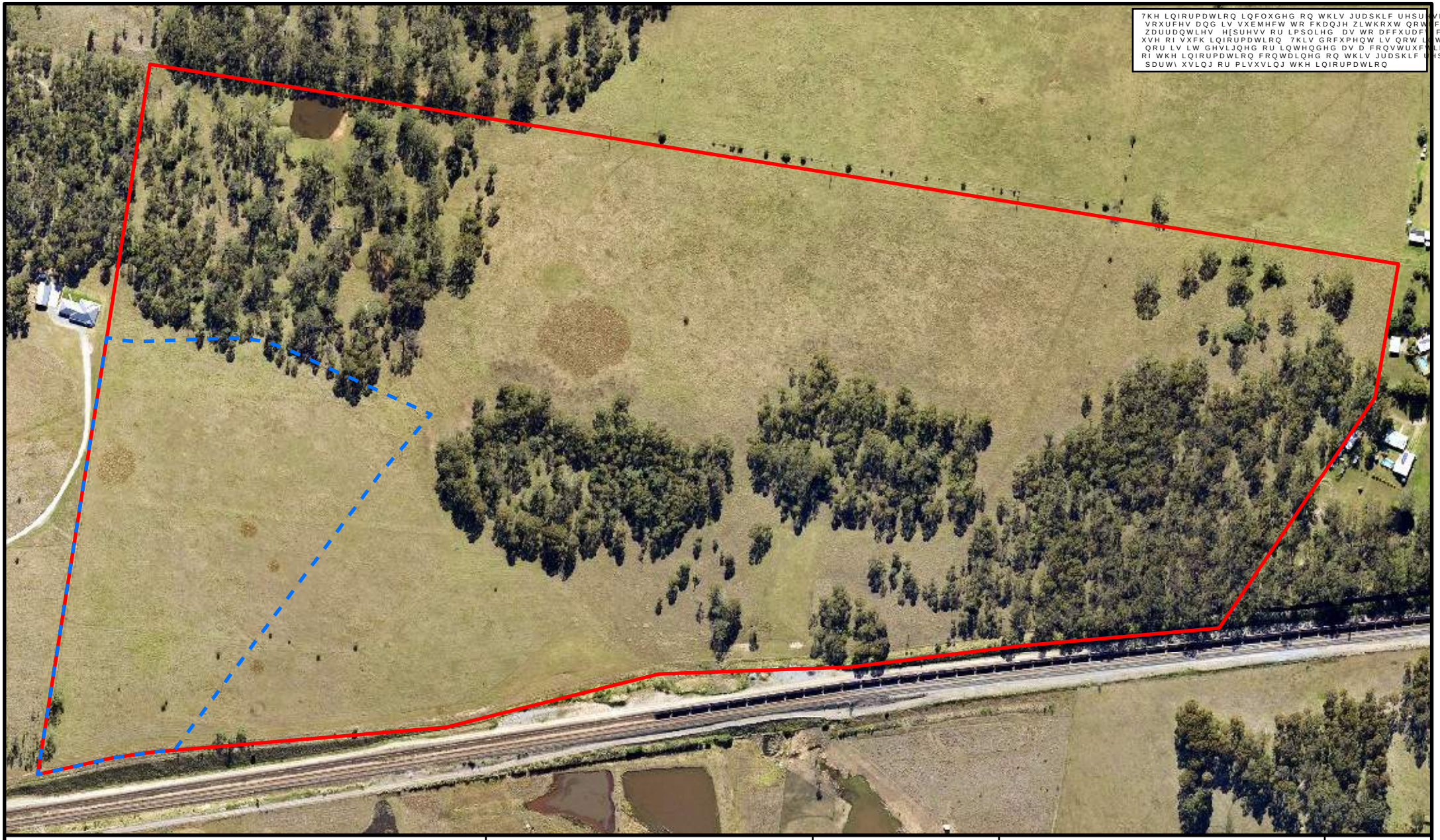

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2 STATUTORY CONTEXT

The following subsections discuss NSW and Commonwealth legislation within the context of this BAR and the proposed development.

2.1 KEY LEGISLATION

This BAR was developed in consideration of, and accordance with, the following legislation and planning instruments:

Commonwealth:

- *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act).

State:

- *Environmental Planning and Assessment Act 1979* (EP&A Act)
- *Biodiversity Conservation Act 2016* (BC Act)
- *Fisheries Management Act 1994* (*Fisheries Act)*
- *Coastal Management Act 2016* (CM Act)
- *Water Management Act 2000* (WM Act)
- *Biosecurity Act 2015* (Biosecurity Act)
- *National Parks and Wildlife Act 1974* (NP&W Act)
- *Local Land Services Act 2013* (LLS Act)
- *Land Management (Native Vegetation) Code 2018 under the Local Land Services Act 2013*
- *State Environmental Planning Policy (Biodiversity and Conservation)* 2021.

Local and regional planning instruments:

- Maitland Local Environmental Plan 2011 (MLEP 2011)

2.2 ASSESSABLE MATTERS AND TRIGGERS

Assessable matters relevant to the Proposal are defined as follows:

- Matters referred to in the BC Act where a development or an activity is “likely to significantly affect threatened species or an ecological community”.
- Impacts on matters identified by the BC Act and its regulation as constituting a “Serious and Irreversible Impact (SAII)”.
- Matters of National Environmental Significance (MNES) listed under Section 18 and 18A (threatened species and ecological communities) of the EPBC Act.

It is understood that the Proposal is to be assessed as development regulated under Part 4 of the EP&A Act. The first tier of assessment (i.e. thresholds tests) for ‘local development’ assessed under Part 4 of the EP&A Act initially focuses on ‘triggers’ that otherwise indicate a requirement, or not, for a second tier of assessment performed under Part 7 of the BC Act. Threshold tests are applied to determine if a development or activity is “likely to significantly affect threatened species” as listed below:

- Impacts exceed the Biodiversity Offsets Scheme thresholds (Section 7.2 of the BC Act); or
- Impacts are likely to significantly affect threatened species or ecological communities, or their habitats (Section 7.3 of the BC Act); or
- Impacts on a declared area of outstanding biodiversity value.

Exceedance or triggering any of the above results is a requirement for an impact assessment performed in accordance with the NSW Biodiversity Assessment Method (BAM) by an Accredited Person (Section 7.7 of the BC Act).

The Proposal is mapped to occur on Category 2 Bushfire Prone Land, as per local and state mapping. The Proposal is not mapped on Flood Prone Land, as per MCC Development Control Plan (DCP) 2011.

2.3 SERIOUS AND IRREVERSIBLE IMPACTS

It is important to be aware of matters classed as 'serious and irreversible impacts' (SAII) and the potential for associated approval issues generated by these matters (DPIE 2019). Where present, and impacted, the consent authority is unable to issue statutory approvals where a project will or is likely to impact an SAII. An impact avoidance outcome is required in these circumstances.

2.4 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The purpose of the Commonwealth EPBC Act is to ensure that actions likely to cause a significant impact on Matters of National Environmental Significance (MNES) undergo an adequate assessment. Under the EPBC Act, an action includes a proposal, undertaking, development or activity that may impact MNES. An action that '*has, will have or is likely to have a significant impact on a MNES*' is deemed to be a 'controlled action' and may not be undertaken without prior approval from the Commonwealth Minister.

MNES categories listed under the EPBC Act relevant to the Study Area include:

- Threatened species and ecological communities
- Migratory species

A self-assessment performed in accordance with the *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance* (DCCEEW 2013) is required to determine if there is likelihood for an action to have a significant impact on MNES. Where a significant impact is likely, a referral to the Commonwealth Minister must be undertaken.

2.5 AREAS OF OUTSTANDING BIODIVERSITY VALUE

Reference was made to the Areas of Outstanding Biodiversity Value register for declarations of in force areas. (https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/areas-of-outstanding-biodiversity-value/area-of-outstanding-biodiversity-value-register).

No areas of Areas of Outstanding Biodiversity Value were noted for the site.

3 METHODOLOGY

3.1 DESKTOP ANALYSIS

A review of relevant information on local biodiversity values pertaining to the Study Area, including relevant threatened biota was obtained via desktop analysis from:

- State Vegetation Type Mapping (DPHI 2024)
- The BioNet Atlas of NSW Wildlife (DPE 2024) – database search for previous records of threatened species, populations and ecological communities listed under the *Biodiversity Conservation Act 2016* (BC Act) within a 10 km radius of the site
- A PlantNet spatial search for all flora within a 25-kilometre radius of Lochinvar was undertaken (https://plantnet.rbgsyd.nsw.gov.au/search/spatial.htm)
- NSW Department of Planning and Environment Biodiversity Values Map and Threshold Tool
- The Department of Climate Change, Energy, the Environment and Water Protected Matters Search Tool – database search for matters of national environmental significance predicted to occur within a 10 km radius of the site
- Review of the LLS Act for consideration of exemptions pertaining to Category 1 lands
- Review of NSW Draft Native Vegetation Regulatory Map and Land Use Map (https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=DraftNVRMap)
- Relevant published literature on vegetation communities of relevance and threatened biota (see References).

The results of the database searches were used to compile a list of threatened species, populations and communities, as listed under the BC Act and EPBC Act that could potentially occur within the Study Area, and their likelihood of occurrence (**Appendix B**).

3.1.1 Vegetation Assessment

Existing State Vegetation Type Mapping (SVTM) was examined for the subject site (https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map). This dataset showed potential Plant Community Types (PCT) mapped. This was used to determine the extent and type of vegetation potentially present at the site. Vegetation types were assessed against identification criteria for State and Commonwealth listed threatened ecological communities (DCCEEW, 2025). Vegetation and habitats were compared with the BioNet Vegetation Classification descriptions to identify Plant Community Types (PCTs).

Additionally, a flora species list was compiled through a randomised walkover of the subject site.

Plant identification and nomenclature were based on species descriptions presented within *The Flora of New South Wales Volumes 1 to 4* (Harden, 1993) and with reference to taxonomic updates in *PlantNET - The Plant Information Network System* of Botanic Gardens Trust, Sydney, Australia (Botanic Gardens Trust, 2025). The locations of the floristic survey tracks are presented in **Figure 3.**

3.1.2 Land Categorisation

In determining whether a clearing or development proposal exceeds the Scheme's threshold (i.e. area clearing threshold and BVM threshold set out in clause 7.1 of the Biodiversity Conservation Regulation 2017 (BC Regulation)), any part of the proposal that involves the clearing of native vegetation on category 1-exempt land can be disregarded (Biodiversity Conservation Act 2016 (BC Act), section 7.4).

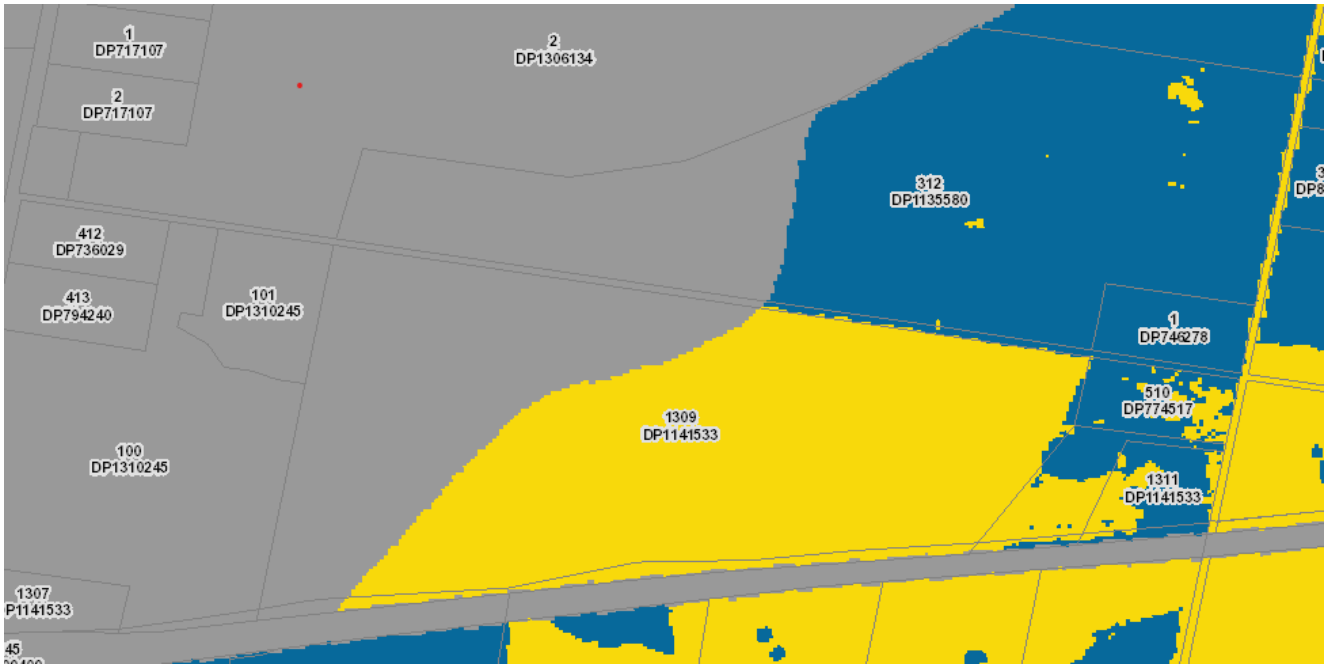
As per Part 5A of the LLS Act, Category 1 exemption applies to rural land (zoned RU1, RU2, or RU3) that was cleared of native vegetation as of 1 January 1990 or lawfully cleared of vegetation between 1 January 1990 and 25 August 2017. As the site is located on land zoned as R1 General Residential under the MLEP 2011, the land does not meet Category 1 exemption and is therefore required to be assessed under the BOS.

3.1.2.1 Native Vegetation Regulatory Mapping

The draft native vegetation regulatory map (DNVRM) identifies no area of Category 1 Exempt Land within Lot 1309 DP 1141533. The majority of the land is 'excluded land' (grey), and the eastern portion of the Lot is Category

2 Regulated land (yellow) which is outside of the development area. The majority of the land is displayed on the map as land excluded from the Local Land Services Act 2013, as per **Plate 1** below.

Plate 1: Draft Native Vegetation Regulatory Map



(*grey = excluded land, *yellow = category-2 regulated land)

3.1.3 Land Use

One land use type is mapped to occur within the subject site (NSW DCCEEW dataset, NSW Landuse 2017) including:

6.2.0 Reservoir/dam (approximately 0.1 ha – located within PCT 3431, outside of development area)

3.1.4 Climate

The nearest weather station is located at Maitland Airport (station 061428), which is approximately 3.6km from Lochinvar.

The area experiences hot summers, with the highest average maximum temperature of 45.6°C experienced in February. Temperatures in winter are cool to mild with the coldest temperatures being recorded in June with a mean minimum of 10.7°C. The average annual rainfall is 752.2mm.

3.1.5 Interim Bioregionalisation of Australia (IBRA)

The study area is located within the Greater Sydney Basin IBRA region and Hunter IBRA subregion (DCCEEW, 2025.

3.1.6 Biodiversity Values Map

The Biodiversity Values Map (BVM) identifies land with high biodiversity value, as defined by the *Biodiversity Conservation Regulation 2017*. The subject land does not contain land identified on the BVM.

3.1.7 Geology

The geology of the subject site is mapped as 'Lochinvar Formation' which is a mix of Basalt, siltstone, and sandstone (eSpade, DPIE 2025). No caves or rocky outcrops were identified on site.

Table 1: Geology of Subject Site (MinView, 2025)

Province	Sub-Province	Formation	Description	Dominant Lithology	Age range
Permo-Triassic Basins	Sydney Basin	Lochinvar Formation	Basalt, siltstone, sandstone.	Basalt	Permian (298.9 - 251.902 Ma)

3.1.8 Soils

The site occurs within the Branxton Soil Landscape (eSpade, DPIE 2025). This landscape covers undulating low hills and rises with many small creek flats, extending over a large area between Singleton and Cessnock. The main soils are Yellow Podzolic Soils (Dy5.41) on midslopes with Red Podzolic Soils (Dr3.21) on crests. Yellow Soloths (Dy4.41, Dy3.41) occur on lower slopes and in drainage lines. Alluvial Soils (sands – Uc1.22) occur in some creeks with Siliceous Sands (Uc4.22) on flats within large valleys. Some acid topsoil problems are encountered in the area.

Two Greater Soil Groups are mapped nearby the site; Non-calcic Brown Soil (GSG), Db1.12 (PPF) and Brown Podzolic Soil I (GSG), Db2.11 (PPF).

No acid sulfate soils are mapped within the subject site (NSW DCCEEW, 2025).

3.1.9 Groundwater Dependent Ecosystems

Groundwater plays an important ecological role in directly and indirectly supporting terrestrial and aquatic ecosystems. Groundwater sustains terrestrial and aquatic ecosystems by supporting vegetation and providing discharge to channels, lacustrine and palustrine wetlands, and both the estuarine and marine environment.

The degree of groundwater dependence of ecosystems can be categorised into three broad categories:

- Non-dependent ecosystems that occur mostly in recharge areas and have no connection with groundwater.
- Facultative GDEs that require groundwater in some locations but not in others, particularly where an alternative source of water can be accessed to maintain ecological function. Minor changes to the groundwater regime in facultative GDEs with proportional or opportunistic groundwater dependence may not have any adverse impacts but these ecosystems can be damaged or destroyed if a lack of access to groundwater is prolonged.
- Obligate GDEs that are restricted to locations of groundwater discharge and ecosystems located within aquifers (e.g. subterranean cave and stygofauna communities (Kuginis *et al*. 2012). Aquifer ecosystems are inherently groundwater dependent.

Groundwater dependent ecosystems have been classified into seven types under two broad categories as follows (Kuginis *et al*. 2012):

- Subsurface ecosystems – Underground ecosystems
- Karst systems and caves (limestone geology)
- Subsurface aquifer (phreatic) ecosystems
- Baseflow streams (hyporheic or subsurface component)
- Surface ecosystems – Above ground ecosystems
- Groundwater dependent wetlands
- Baseflow surface streams (surface/free-water component)
- Estuarine and near shore marine ecosystems
- Groundwater dependent terrestrial ecosystems; dependent on subsurface groundwater (phreatophytic).

The Bureau of Meteorology Atlas of GDEs identifies high, moderate, and low potential GDEs on the Subject Site. Within the Subject Site low and moderate potential terrestrial GDEs are mapped (*Parramatta Red Gum/Narrow-leaved Apple/Prickly-leaved Paperbark shrubby woodland in the Cessnock-Kurri Kurri area*). These areas of low-moderate potential terrestrial GDE's are mapped in PCT 3431 in the northern section of the subject site (excluded

from the development area). No aquatic GDEs are predicted within the subject site. The GDE's mapped to occur on site do not align with areas of vegetation on site (*Parramatta Red Gum/Narrow-leaved Apple/Prickly-leaved Paperbark shrubby woodland)*.

3.1.10 Connectivity

The landscape surrounding the subject land has been heavily cleared for agricultural development and other infrastructure, including a railway line directly to the south of the subject site and New England Highway 2 km to the north. Habitat connectivity is highly fragmented from these past disturbance activities. Some partial connectivity is apparent in the north of the subject site with areas of woodland vegetation (PCT 3431) outside of the development area and the adjoining Lot 312 DP 1135580. These vegetated areas are zoned C3 Environmental Management as per the MLEP 2011.

3.2 Field Survey

3.2.1 Vegetation Surveys

An assessment of vegetation and PCTs present was conducted during site inspections and quadrats-based surveys undertaken on the 18th of February 2025. Twenty hours were spent on random meander and quadrat-based surveys applied according to the BAM. The "Grasslands and other Groundcover Assessment Method" was not utilised, as the vegetation has been disrupted within six months prior to the assessment (cattle grazing).

Three full floristic/vegetation structural 20 x 20 metre quadrats, nested within 20 x 50 metre vegetation functional quadrats; each with five 1m² subplots for assessment of average litter cover, were performed across the site **(Figure 2).**

Quadrats were chosen by walking randomly into a vegetated area and establishing the quadrat centreline on a random bearing. Floristic quadrats recorded all species present within the quadrat along with their cover expressed as percentage and their numerical abundance based upon visual estimations. These were recorded to data sheets and later transferred to Excel spreadsheet. A handheld Android smartphone with FieldMaps was used to record locations of all quadrats, with accuracy being generally <10 metres. Digital photography was made from the mid-line bearing (50m transect) of each quadrat. All locations were recorded in Geodetic Datum of Australia Map Grid Zone 55.

All flora species encountered with suitable flowering or vegetative material were collected and later identified using various Flora identification keys (NSW PlantNet Flora Online; Brooker and Kleinig 1999; Harden 1990, 1992, 1993, 2000 & 2002; Jacobs et al 2023). Specimens, where necessary to identify to genera or species level, were examined with an Olympus SZ61 Stereozoom Microscope with 10-inch HDMI LCD monitor. Manageable and risk weighted High Threat Weeds (HTW) according to the BAM were noted. A listing of all species identified is shown at **Appendix A.**

3.2.2 Fauna Habitat Assessment

Daytime opportunistic and incidental observations of fauna species were photographed or viewed with binoculars during field surveys. These included opportunistic observation of fauna activity such as scats, tracks, burrows or other traces.

Searches for potential habitat features included stick nests, microbat roosting habitat, terrestrial nests/burrows, hollow-bearing trees including fissures within the bark, branches and trunk, "Gilgai" and waterbodies. These were photographed with a handheld Android smartphone with Google Earth geolocation enabled.

A listing of all vertebrate and invertebrates noted is shown at **Appendix A.**

3.2.3 Prescribed Biodiversity Impacts

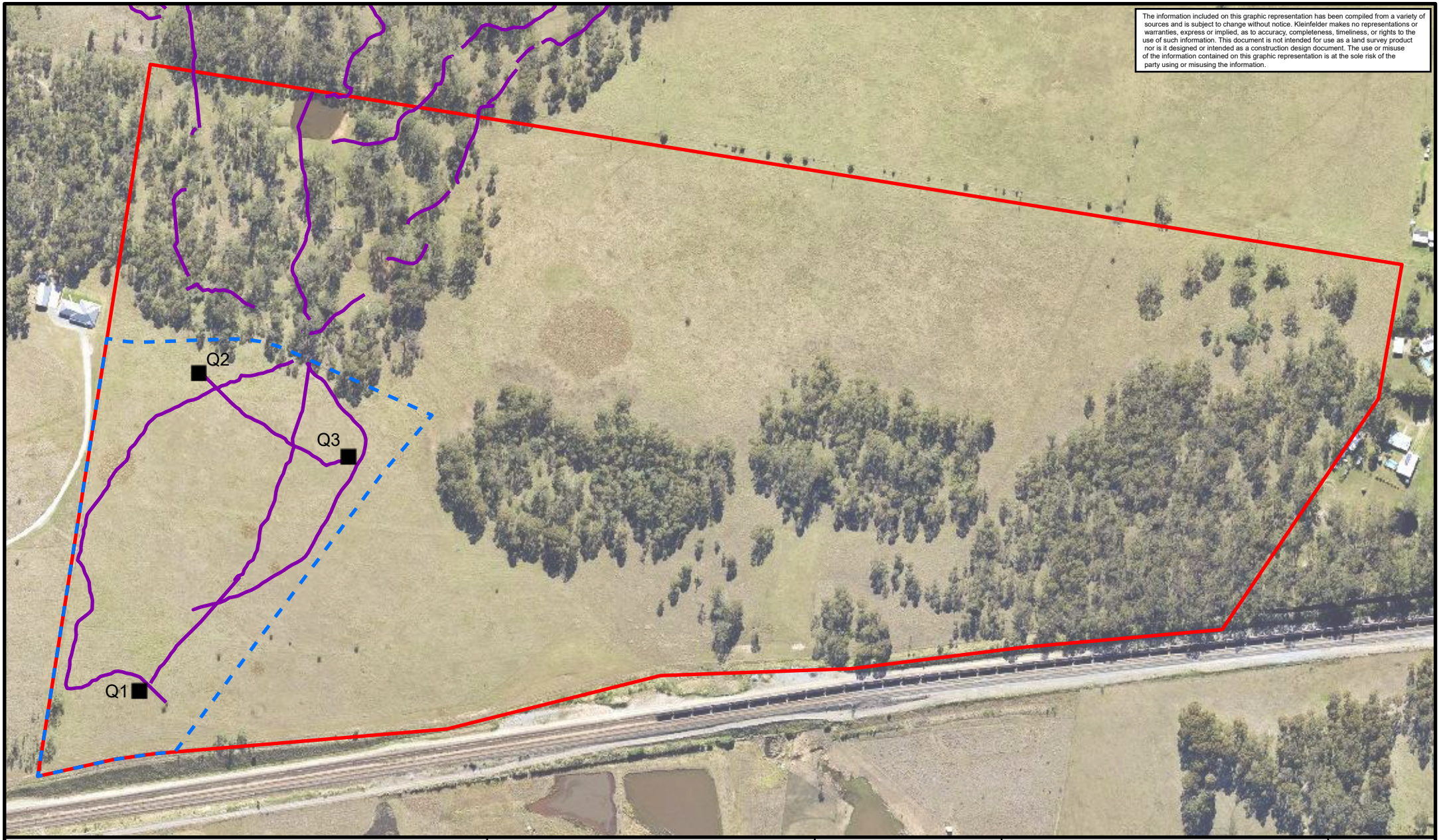
Identifying additional prescribed impacts on the habitat of threatened entities included a visual assessment of site for the following:

- Karst, caves, crevices, cliffs, rocks and other geological features of significance.
- Human-made structures.
- Non-native vegetation.

- Areas connecting threatened species habitat, such as movement corridors.
- Effect on water quality, water bodies and hydrological processes that sustain threatened entities.
- Threatened and protected animals impacts from turbine strikes of a wind farm (not considered as scope of development does not include wind farm).
- Threatened fauna or native animals that are part of a TEC impacted by potential vehicle strikes.

3.2.3.1 Survey Limitations

Field surveys were undertaken during a single seasonal site visit. Whilst a diversity of native and exotic flora species was recorded, additional surveys across various seasonal conditions would result in the detection of a greater diversity of species. Flora species searches were conducted during site and meander surveys, however, targeted flora surveys in accordance with The NSW Guide to Surveying Threatened Plants (DPIE 2020) or relevant threatened species profiles were not conducted. Further habitat assessments and targeted threatened flora and fauna surveys may be required to inform a Development Application.



Legend
- Subject Site
- Development Area
- Meander Search Line
- Flora Quadrat

0 20 40 80 120 160 200
Scale @ A4 1:4,000 Metres
N
GDA2020 MGA Zone 56

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PROJECT REFERENCE:	25003940
DATE DRAWN:	19/03/2025 Version 1
DRAWN BY:	RHourigan
DATA SOURCE:	Metromap - 2025

SURVEY EFFORT

URBAN LAND & HOUSING GROUP PTY LTD
LOCHINVAR RIDGE BAR STAGE 22
LOCHINVAR, NSW

FIGURE:
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4 RESULTS

4.1 VEGETATION ASSESSMENT

4.1.1 Native Vegetation Assessment

A native vegetation assessment within the development area was used to assess if the area clearing threshold would exceed the BOS threshold, as per Section 7.2 of the BC Act.

As per the BOS threshold scheme, "calculations for partially exotic ground cover vegetation may be adjusted where the mid-shrub layer or tree layer is primarily absent" (*Reviewing area clearing threshold results from the BMAT tool,* DCCEEW, 2024). Native vegetation was calculated as a percentage across all three quadrats (15-75% native) and was given an average score and multiplied by the total area to be cleared i.e. 7.6 ha. The area of native vegetation within the development area was calculated as 1.63 ha, as per **Table 2** below.

Table 2: Native Vegetation Assessment for the Subject Site

Quadrats	Native vegetation assessment
1	18.3% native coverage
2	21.8% native coverage
3	24.6% native coverage
Average Native Vegetation Cover %	21.5
Area of Total Native Cover	1.63 ha

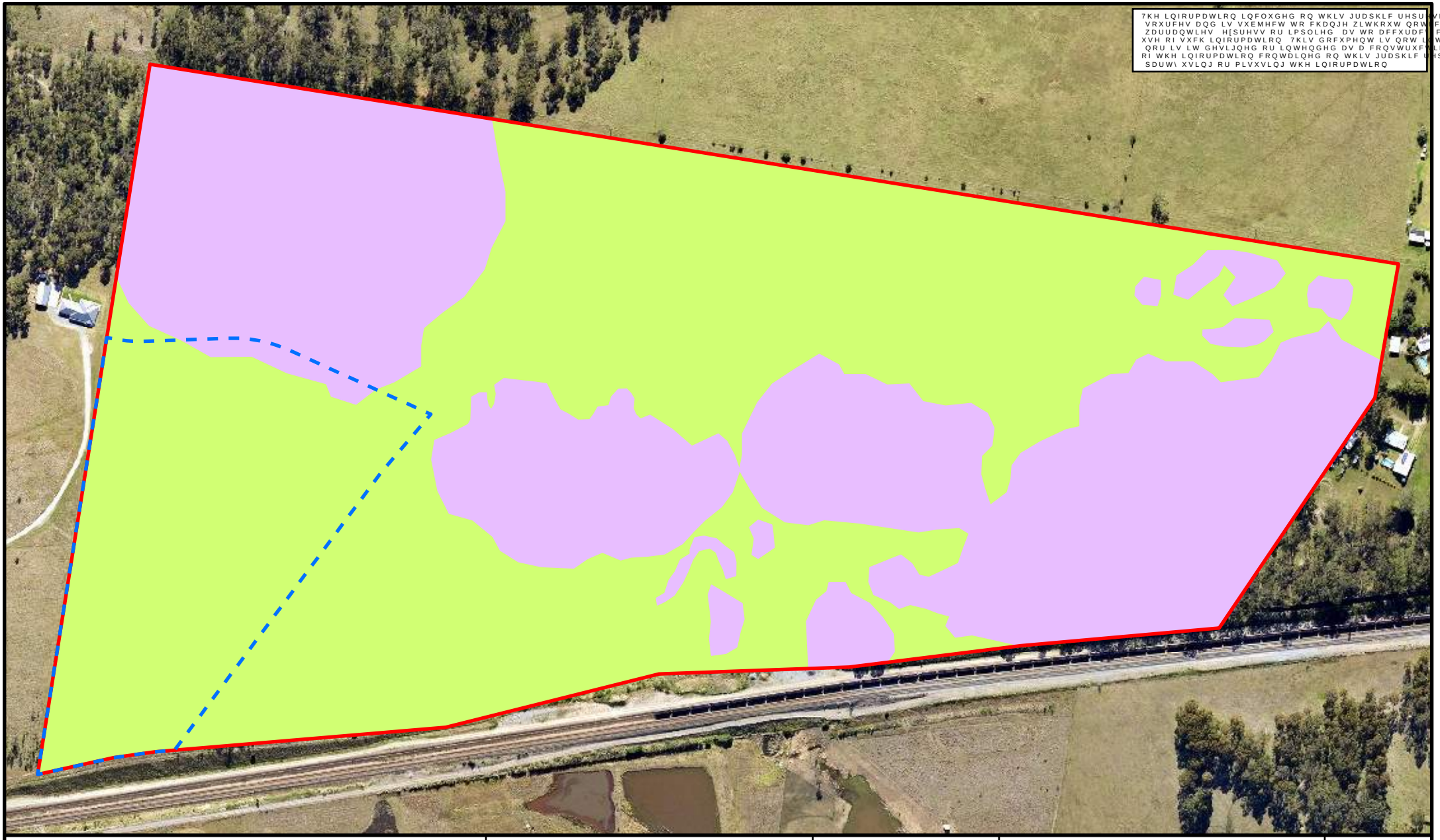
The minimum lot size associated with the subject site is less than 1 ha (450m^2), therefore, the clearing threshold is 0.25 ha or more. As the native clearing threshold is exceeded (1.63 ha), it is anticipated that a Biodiversity Development Assessment Report (BDAR) will be required to be submitted with the Development Application.

4.1.2 Native Vegetation Cover

Native vegetation cover (woody vegetation, including regrowth and plantations comprised of plants native to NSW and non-woody vegetation with no signs of cultivation) were assessed within the subject site. Percent native vegetation cover refers to the amount of native vegetation (woody and non-woody) that is estimated to remain in the landscape proximal to the assessment area (BAM 2020, DPIE). A summary of vegetation cover is provided in **Table 3**, and for the purpose of the BAM a native cover class has been determined as >10-30%.

Table 3: Native Vegetation Cover within the Study Area

Vegetation Cover Type	Description	Cover within Study Area (ha)	Total area of Study Area (ha)	Native Cover Class within Study Area (%)
Native Vegetation	Remnant woodland and both natural and derived grassland	123	1,094	10-30



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4.1.3 State Vegetation Mapped Plant Community Types

The following plant community types are mapped to occur within the Subject Site, as per NSW State Vegetation Type Mapping (SVTM, DCCEEW) -

Dry Sclerophyll Forests (Shrub/grass sub-formation); Hunter-Macleay Dry Sclerophyll Forests;

- PCT 3442 Lower Hunter Lowland Ironbark-Paperbark Forest; and
- PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest

4.1.4 Site Verified Plant Community Types

Random meander surveys undertaken within the subject site (outside of exotic grassland quadrats), as well as visual observation with remnant canopy trees and native regeneration to the north of the site, determined the likelihood that none of the above mapped PCT's occur.

Based upon quadrat data from previous Kleinfelder BAR for Lochinvar Stage 16-21, Lot 2 DP 1306134 (*Lochinvar Ridge Estate Preliminary BAR, Project No. 25002897.001A, © Kleinfelder 24/2/2025*), observations of vegetation present during traverses and a review of literature, the author is of the opinion that the following classes (Keith 2004) and ecological associations are present on the site:

Dry Sclerophyll Forests (Shrub/grass sub-formation); Hunter-Macleay Dry Sclerophyll Forests;

- PCT 3431 Central Hunter Ironbark Grassy Woodland

Justification for this PCT selection over the State Vegetation Type Mapping (SVTM) are provided in the quadrat assessment of Kleinfelder (2025) BAR for Lochinvar Stage 16-21, Lot 2 DP 1306134. This PCT is entirely associated with the wooded area within the northern section of the subject site and is excluded from the development area.

4.1.5 Threatened Ecological Communities

There are associated Threatened Ecological Communities under the BC Act and EPBC Act for patches of PCT 3431 on the subject site (BC Act listed *Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions* and EPBC Act listed *Central Hunter Valley eucalypt forest and woodland*). PCT 3431 will not be impacted by the development as it is confined to the northern section of the subject site outside the development footprint. An assessment of significance to address the potential impacts on the listed TEC's have been undertaken in **Appendix C** and **Appendix D**.

4.1.6 High Threat Weeds and Weeds of National Significance

Four (4) Weeds of National Significance (WoNS) were identified within the subject site, as detailed in **Table 4**. *Senecio madagascariensis* was the only WoNS located within the development footprint and was identified throughout all exotic grassland in high abundance. *Briza subaristata* and *Paspalum dilatatum* are listed 'High Threat Weeds' (HTW) under the BAM 2020 and were also identified in high abundance within the development footprint.

Lycium ferocissimum (African Boxthorn), *Opuntia aurantiaca* (Tiger Pear) and *Olea europaea subsp. cuspidata* (African Olive) were occurrent within PCT 3431 in the northern section of the subject site (outside of the development footprint). These species have a 'Risk Weighting' under the BAM 2020 as they are not considered plausible for eradication, as opposed to 'Manageable High Threat Weeds'.

Table 4: High Threat Weeds (HTW) and Weeds of Significance (WoNS)

Species	HTW Risk Weighted *(BC Act 2016)*	Manageable HTW *(BC Act 2016)*	Weed of National Significance *(DPIE)*	Priority Weed (*as per Hunter Regional Strategic Weed Management Plan 2023-2027*)
Paspalum dilatatum	✓			
Cyperus eragrostis	✓			
Cotoneaster glaucophyllus	✓			✓ (Asset Protection)
Briza subaristata	✓			

Species	HTW Risk Weighted *(BC Act 2016)*	Manageable HTW *(BC Act 2016)*	Weed of National Significance (*DPIE*)	Priority Weed (*as per Hunter Regional Strategic Weed Management Plan 2023-2027*)
Sporobolus fertilis Giant Parramatta Grass	✓			✓ (Asset Protection)
Olea europaea subsp. cuspidata African Olive		✓		✓ (Containment)
Lycium ferocissimum African Boxthorn		✓	✓	✓ (Containment)
Senecio madagascariensis	✓		✓	✓ (Containment and/or Asset Protection)
Opuntia aurantiaca Tiger Pear	✓		✓	✓ (Containment and/or Asset Protection)
Opuntia stricta Common Pear	✓		✓	✓ (Asset Protection)

4.1.7 Threatened Flora

A search of the BioNet Atlas of NSW Wildlife returned 16 records of threatened plant species within a 10 km radius of the subject site. An EPBC Protected Matters Search returned 12 species that may occur through species or species habitat modelling.

A likelihood of occurrence assessment determined that no threatened flora species had a moderate or high likelihood of occurrence on the Subject Site. A complete list of the likelihood of threatened flora occurring within the subject site is presented at **Appendix B**. No threatened flora species were identified during the site assessment.

4.1.8 Plant Diversity

A total of 52 flora species were identified during the assessment, these were comprised of 29 native species and 23 exotic species. These species are divided into the growth forms identified in **Table 5**. A complete list of flora species is listed in **Appendix A**.

Table 5: Lochinvar Ridge Estate (Stage 22) Flora Diversity (BAM Growth Form)

Form	Number of species
Trees (T)	0
Shrubs (SG)	2
Grass and grasslike (GG)	9
Forbs (FG)	16
Ferns and allies	0
Aquatic	0
Vines	2
Exotics (High Threat Exotic)	12
Other Exotics	11

4.2 Fauna Habitat Assessment

Fauna and habitat were assessed during random meander surveys.

4.2.1 Incidental Fauna

16 species of birds and one (1) species of mammal were identified opportunistically during the site assessment **(Appendix A).** No targeted fauna surveys were performed.

4.2.2 Threatened Fauna

A search of the BioNet Atlas of NSW Wildlife returned a list of 26 threatened fauna species that have previously been recorded within 10 km of the subject site. An EPBC Protected Matters Search returned a list of 25 threatened fauna species known or predicted to occur (potential habitat) within the locality of the subject site.

A likelihood of occurrence assessment (**Appendix B)** determined a moderate or high likelihood of occurrence for eight (8) fauna species within the subject site based on the occurrence of (broadly) suitable habitat and recent records within 10km of the subject site.

These species are:

- Hunter Valley Delma (*Delma vescolineata)*
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris)*
- Greater Broad-nosed Bat (*Scoteanax rueppellii)*
- Eastern Freetail-bat (*Micronomus norfolkensis)*
- Large Bent-winged Bat (*Miniopterus orianae oceanensis)*
- Little Bent-winged Bat (*Miniopterus australis)*
- Southern Myotis (*Myotis macropus)*
- Grey-crowned Babbler *(Pomatostomus temporalis temporalis)*

An assessment of significance has been undertaken in **Appendix C** and **Appendix D** to identify any potential impacts on these threatened species with the likelihood to occur on the subject site.

No threatened fauna was recorded during the site inspection.

4.2.3 Fauna Habitat

Two dams and numerous hollow-bearing trees are present within the subject site, all of which occur to the northern section (PCT 3431) and are located outside of the development area. These water features alongside woodland vegetation offer foraging and potential breeding habitat for a variety of fauna.

Other habitat features included hollow logs dispersed throughout PCT 3431 which are likely providing microhabitat for reptiles and other ground-dwelling fauna.

Native groundcover was in better condition in areas not being grazed by cattle i.e. within the C3 conservation area outside of the development footprint, allowing foraging potential for bird species. Areas with higher native groundcover species were in the northern section (PCT 3431), zoned C3 Conservation (MLEP 2011). Typical native groundcover species in this area include *Aristida ramosa* (Purple Wiregrass)*, Cymbopogon refractus* (Barbed Wire Grass)*, Eragrostis leptostachya* (Paddock Lovegrass)*,* and *Microlaena stipoides* (Weeping Grass).

Within the development area, fauna habitat is limited to low quality foraging habitat within exotic grassland for bird species, and potential habitat for reptiles (groundcover vegetation, cow pats). See **Plate 2** below.

Plate 2: Exotic grassland (development area) with PCT 3431 in the background (north)

4.2.3.1 Koala Habitat

The Maitland LGA is listed under Schedule 2 of the *SEPP (Biodiversity and Conservation)* 2021 categorised under the Central Coast Koala management area, therefore, Chapters 3 and 4 of the *SEPP (Biodiversity and Conservation)* 2021 apply to this proposal. As per Chapter 4 of the SEPP, ***core koala habitat*** means—

- *(a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or*
- *(b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.*

No koala tree species listed under Schedule 1 of the SEPP are present within the development area, therefore, it has been determined that the site does not contain core koala habitat and does not require further assessment.

4.3 Prescribed Biodiversity Impacts

Identifying additional prescribed impacts on the habitat of threatened entities included a visual assessment of site for the following:

- Karst, caves, crevices, cliffs, rocks and other geological features of significance.
- Human-made structures.
- Non-native vegetation.
- Areas connecting threatened species habitat, such as movement corridors.
- Effect on water quality, water bodies and hydrological processes that sustain threatened entities.
- Threatened and protected animals impacts from turbine strikes of a wind farm (not considered as scope of development does not include wind farm).
- Threatened fauna or native animals that are part of a TEC impacted by potential vehicle strikes.

No karst, caves, crevices, cliffs, rocks or other geologically significant features were noted during surveys.

Two waterbodies (dams) and numerous hollow-bearing trees are present within the subject site; however, they are excluded from the development area and will not be impacted.

Habitat connectivity is highly fragmented from past clearing activities. Some partial connectivity is apparent to the north of the subject site with areas of vegetation on adjoining Lot 312 DP 1135580. This vegetated area is zoned C3 Environmental Management and is excluded from development.

The development is not a wind farm so will not affect any flight path, migration route, resident threatened Aves including raptors and nomadic or migratory species.

The proposal is likely to result in additional vehicle strikes on threatened fauna or animals that are part of a TEC.

4.3.1 Water Features

Two waterbodies are present within the subject site, both are excluded from the development area.

One large dam is located within the wooded vegetation (PCT 3431) to the north-east of the subject site (**Plate 3**). Vegetation surrounding the dam consists of species *Juncus usitatus, Typha orientalis, Cyperus brevifolius,* and *Nymphaea sp.* The dam may provide suitable habitat for threatened amphibians (breeding), Microchiroptera (foraging), and aves (foraging).

Plate 3: Large dam within north-east section of subject site (outside of development footprint)

A second small dam is located close to the large dam (PCT 3431), with evidence of recent cattle grazing surrounding the dam. Vegetation surrounding the dam consists of native and exotic species *Ludwigia peploides*, *Juncus usitatus, Typha orientalis, Cyperus brevifolius,* and *Nymphaea sp.* The dam may provide suitable habitat for threatened amphibians being heavily vegetated (**Plate 4**).

Plate 4: Small dam within north-east section of subject site (outside of development footprint)

Two mapped first order streams occur at the northern boundary of the subject site, which taper off and are outside of the development area. At the time of field inspection, they were not inundated. These first-order streams are considered semi-permanent and only likely to be inundated following heavy rainfall events.

Whilst the site is not mapped as flood prone, stormwater from rainfall events likely meanders across the site in drainage lines and may remain standing for extended periods of time.

4.4 Preliminary BAM-C Outputs

Data derived from the quadrats conducted during the site assessment were entered into the BAM-C to determine potential offset cost associated with each PCT. The BAM-C provides two credit classes including ecosystem credits and candidate species credits.

4.4.1 Ecosystem Credits

These account for the direct impacts to PCTs and habitat for threatened species that can be reliably predicted to occur within each PCT. Ecosystem credit species cannot be ruled out by targeted surveys, however credits can be reduced by reducing the impact to PCTs from the development.

The preliminary BAM-C predicted 22 species to occur on site, with all ecosystem credit species assumed absent due to species constraints **(Table 6).** The offset obligation is entirely associated with PCT 3431 where wooded vegetation occurs on the site that is being directly affected by the proposal. As the project will avoid all areas of PCT 3431 on the subject site, there is no offset obligation predicted to occur.

Table 6: Ecosystem Credit Species Predicted to Occur and Nature of Presence/Absence on Project Site

Species	Vegetation Association	
	Development Area	**Subject Site (outside of impact area)**
Regent Honeyeater (Foraging), *Anthochaera phrygia*	None	PCT 3431

Species	Vegetation Association	
	Development Area	Subject Site (outside of impact area)
Dusky Woodswallow, *Artamus cyanopterus cyanopterus*	None	PCT 3431
South-eastern Glossy Black-Cockatoo (Foraging), *Calyptorhynchus lathami lathami*	None	PCT 3431
Speckled Warbler, *Chthonicola sagittata*	None	PCT 3431
Brown Treecreeper (eastern subspecies), *Climacteris picumnus victoriae*	None	PCT 3431
Spotted-tailed Quoll, *Dasyurus maculatus*	None	PCT 3431
Black-necked Stork, *Ephippiorhynchus asiaticus*	None	PCT 3431
Black Falcon, *Falco subniger*	None	PCT 3431
Little Lorikeet, *Glossopsitta pusilla*	None	PCT 3431
White-bellied Sea-Eagle (Foraging), *Haliaeetus leucogaster*	None	PCT 3431
White-throated Needletail, *Hirundapus caudacutus*	None	PCT 3431
Swift Parrot (Foraging), *Lathamus discolor*	None	PCT 3431
Broad-billed Sandpiper (Foraging), *Limicola falcinellus*	None	PCT 3431
Eastern Coastal Free-tailed Bat, *Micronomus norfolkensis*	None	PCT 3431
Little Bent-winged Bat (Foraging), *Miniopterus australis*	None	PCT 3431
Large Bent-winged Bat (Foraging), *Miniopterus orianae oceanensis*	None	PCT 3431
Eastern Osprey (Foraging), *Pandion cristatus*	None	PCT 3431
Scarlet Robin, *Petroica boodang*	None	PCT 3431
Flame Robin, *Petroica phoenicea*	None	PCT 3431
Grey-crowned Babbler (eastern subspecies), *Pomatostomus temporalis temporalis*	None	PCT 3431
Grey-headed Flying-fox (Foraging), *Pteropus poliocephalus*	None	PCT 3431
Diamond Firetail, *Stagonopleura guttata*	None	PCT 3431

4.4.2 Candidate Species Credits

These credits account for species whose likelihood of occurrence cannot be predicted by vegetation surrogates and/or landscape features and can only be reliably detected during surveys. Targeted surveys or expert reports can be used to confirm the presence/absence of these species as part of the BDAR.

The preliminary BAM-C generated 11 candidate flora and 16 candidate fauna species to potentially occur on site, with 18 candidate species assumed absent due to species constraints **(Table 7)**. Targeted surveys will be

required to confirm presence of these species on site and finalise a credit obligation pending clearing of any associated habitat.

Table 7: Candidate Species Credit Species Survey Period

Candidate Species	Recommended Survey Period	Serious and Irreversible Impacts	Comment
Threatened Flora			
Acacia pendula – endangered population	All year	Yes	Geographic limitations: The site is located within Hunter River Catchment **Not Identified on site**
Cymbidium canaliculatum – endangered population	All year	No	Habitat constraints: The site does not contain Epiphytes; Fallen/standing dead timber including logs; Cut stumps or logs on ground Geographic limitations: The site is located within the Hunter catchment **No targeted surveys required**
Pine Donkey Orchid, *Diuris tricolor*	Sept – Oct	No	**Targeted surveys required**
Diuris tricolor – endangered population	Sept - Oct	No	Geographic limitations: Muswellbrook LGA **No targeted surveys required**
Slaty Red Gum, *Eucalyptus glaucina*	All year	No	**Not Identified on site**
Ozothamnus tesselatus	All Year	No	**Not Identified on site**
North Rothbury Persoonia, *Persoonia pauciflora*	All year	Yes	Geographic limitations: The site is located within 10km of North Rothbury **Not Identified on site**
Scant Pomaderris, *Pomaderris queenslandica*	All year	No	**Not Identified on site**
Tarengo Leek Orchid, *Prasophyllum petilum*	Sept - Dec	No	**Targeted surveys required**
Prasophyllum sp. Wybong	Sept - Oct	No	**Targeted surveys required**
Pterostylis chaetophora	Sep - Nov	No	**Targeted surveys required**
Threatened Aves			
Regent Honeyeater (Breeding), *Anthochaera phrygia*	N/A	Yes	**Habitat constraints:** Not mapped on Important Habitat map **No targeted surveys required**
South-eastern Glossy Black-Cockatoo, *Calyptorhynchus lathami lathami*	Apr - Aug	No	**Habitat constraints**: Subject site contains hollow bearing trees (hollows greater than 15cm diameter and higher than 8m above ground), however, they are not located within the development area. **No targeted surveys required**

Candidate Species	Recommended Survey Period	Serious and Irreversible Impacts	Comment
White-bellied Sea-Eagle (Breeding), *Haliaeetus leucogaster*	July - Dec	No	**Habitat constraints**: Living or dead mature trees within suitable vegetation within 1km of rivers, lakes, large dams or creeks, wetlands and coastlines **No targeted surveys required**
Swift Parrot (Breeding), *Lathamus discolor*	N/A	Yes	**Habitat constraints:** Site not mapped on Important Habitat map **No targeted surveys required**
Broad-billed Sandpiper (Breeding), *Limicola falcinellus*	N/A	No	**Habitat constraints**: Site not mapped on Important Habitat map **No targeted surveys required**
Eastern Osprey (Breeding), *Pandion cristatus*	Apr - Nov	No	**Habitat constraints:** The development area does not contain any trees suitable for nesting. **No targeted surveys required**
Threatened Mammals			
Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area, *Dromaius novaehollandiae - endangered population*	All year	No	**Geographic limitations:** The subject site is not located within the Port Stephens LGA. **No targeted surveys required**
Little Bent-winged Bat (Breeding), *Miniopterus australis*	Dec - Feb	Yes	**Habitat constraints:** There are no **c**aves, tunnels, mines, culverts or other structure known or suspected to be used for breeding within the subject site. **No targeted surveys required**
Large Bent-winged Bat (Breeding), *Miniopterus orianae oceanensis*	Dec - Feb	Yes	**Habitat constraints:** There are no Caves, tunnels, mines, culverts or other structure known or suspected to be used for breeding within the subject site. **No targeted surveys required**
Southern Myotis, *Myotis macropus*	Oct - Mar	No	**Habitat constraints:** There are waterbodies with permanent pools/stretches 3m or wider, including dams and other waterbodies, on or within 200m of the site are present. Waterbodies are located within 200m of the Development Area,. **Targeted surveys required**
Squirrel Glider, *Petaurus norfolcensis*	All year	No	**Habitat constraints:** The development area does not contain any trees suitable for nesting. **No targeted surveys required**
Brush-tailed Phascogale, *Phascogale tapoatafa*	Dec - Jun	No	The Development Area contains exotic grassland which has no suitable habitat for this species. **No targeted surveys required**

Candidate Species	Recommended Survey Period	Serious and Irreversible Impacts	Comment
Koala, *Phascolarctos cinereus*	All year	No	**Habitat constraints:** No koala use trees present within the development area. **No targeted surveys required**
Grey-headed Flying-fox (Breeding), *Pteropus poliocephalus*	Oct - Dec	No	**Habitat constraints:** No breeding camps are identified within the subject site. **No targeted surveys required**
Threatened Amphibians			
Green and Golden Bell Frog, *Litoria aurea*	Nov - Mar	No	**Habitat constraints**: Semi-permanent/ephemeral wet areas / waterbodies are located outside of the Development Area. **No targeted surveys required**
Threatened Reptiles			
Hunter Valley Delma, *Delma vescolineata*	Sept - Dec	No	**Targeted surveys required** – species has a known population between the Maitland and Muswellbrook region

4.4.3 Potential SAII

No species generated through the preliminary BAM calculator were considered as having the potential to occur on the site that are at risk of potential Serious and Irreversible Impacts (SAII).

4.5 Matters of National Environmental Significance (MNES)

A search of the EPBC PMST (conducted 27/03/2025) returned a list of MNES predicted to occur within a 10km radius of the subject site (**Appendix E**). This list included one (1) Wetlands of International Importance (WoII), seven (7) threatened ecological communities, thirty-six (36) threatened species and nine (9) migratory species. Pelagic and marine species have been excluded from assessment due to a lack of suitable habitat within the subject site. **Appendix C** contains an assessment of the likelihood of occurrence for EPBC Act (alongside BC Act) listed species at the subject site, while **Appendix D** contains an assessment of significance regarding potential impacts to BC listed flora and fauna. The assessment of significance was undertaken in accordance with the EPBC Act *Matters of National Environmental Significance Significant impact guidelines 1.1* (Department of the Environment, 2013).

The Hunter estuary wetlands, a WoII (Ramsar Wetland), is located outside of the subject site (approximately 20 – 30km upstream); as such, a federal referral to the minister is not required.

No EPBC Act listed threatened or migratory species were opportunistically identified within the subject site during the site assessment, however it should be noted that targeted surveys were not performed. It is noted that the Hunter Valley Delma *Delma vescolineata*, is a listed species under the MNES as has the potential to occur within the subject site. A further assessment of the potential impacts to this species has been undertaken in **Appendix C** and **Appendix D**.

5 DISCUSSION

5.1 IMPACT ASSESSMENT

5.1.1 Impacts to Threatened Ecological Communities

The field assessment identified one Plant Community Type (PCT) on the subject site (in areas that were not classified as exotic grassland):

- **PCT 3431** Central Hunter Ironbark Grassy Woodland (associated with BC Act listed TEC *Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregion*s and EPBC Act listed TEC *Central Hunter Valley eucalypt forest and woodland).*

This PCT is currently associated with a Threatened Ecological Community in NSW under the BC and EPBC Act. However, PCT 3431 is located within the northern wooded section of the subject site and will not be impacted by the development as it is outside of the development area. An assessment of significance to address the potential impacts on the listed TEC's have been undertaken in **Appendix C** and **Appendix D**.

5.1.2 Impacts to Threatened Species Habitat

No threatened species were identified within the proposed development footprint during preparation of this BAR. The vegetation within the proposed development footprint primarily contains a mixture of exotic and native grass species with no overstorey. Vegetation parcels occurring onsite are in a low condition and are generally unsuitable for occupation by most threatened species known to occur within the locality.

In accordance with Section 7.3 of the BC Act, an 'Assessment of Significance' was completed for all threatened species considered to have at least a moderate likelihood of occurring on the site. The development area (7.6 ha) contains 7.6 ha of suitable habitat for the Endangered (BC and EPBC Act) Hunter Valley Delma (*Delma vescolineata).* The assessment of significance determined that the proposed development has the possibility to have a significant impact on the Hunter Valley Delma, however, this remains inconclusive without targeted surveys to determine if the species is present within the subject site (see **Appendix C** and **Appendix D**).

The preliminary BAM-C generated 11 candidate flora and 16 candidate fauna species to potentially occur on site with 18 candidate species assumed absent due to species constraints **(Table 7)**. Targeted surveys supporting a Biodiversity Development Assessment Report (BDAR) may be required to confirm presence of these species on site and finalise a credit obligation pending clearing of any associated habitat for the following flora species:

- Pine Donkey Orchid, *Diuris tricolor*
- Tarengo Leek Orchid, *Prasophyllum petilum*
- *Prasophyllum sp. WybongPterostylis chaetophora*

5.1.2.1 Direct Impacts

Direct impacts of the proposed development on fauna habitat include the following:

- The disturbance of soil and removal of understorey vegetation during construction potentially displacing ground-dwelling fauna such as amphibians and reptiles.

5.1.2.2 Indirect Impacts

Potential indirect impacts of the proposed development on resident fauna populations include the following:

- Noise and lighting during the construction phase may result in minor disturbance to resident fauna within the locality and disrupt their natural behaviour.
- Ground disturbance by machinery during the construction phase may create dust and facilitate the movement of sediment.

Management measures are presented in **Section 5.2** to reduce the potential for these impacts.

5.1.3 Impacts to Native Vegetation

The proposed development will involve impacts to approximately 1.63 ha of native vegetation within the subject site (grassland with an assemblage of native and exotic species, as per Section **4.1.1**). This exceeds the BOS clearing threshold for the subject site (0.25 ha) and as such a BDAR will be required to support the Development Application.

5.2 Impact Mitigation

5.2.1 Avoidance Measures

Concept Design Plans (Urbis, Ref. 240913 Stage 16-21, dated 13/09/2024) avoid areas containing native vegetation and / or large native trees within the subject site. While the development does not involve removal of canopy vegetation and entirely avoids all of PCT 3431 within the subject site, ongoing impacts post-construction are likely to occur (human trafficking, rubbish dumping, domestic animal entry) on the area of PCT 3431 as it occurs immediately north of the development footprint boundary (see **Figure 4**). It is therefore recommended that fencing be installed as a part of the final design plans, in order to mitigate these impacts on the C3 conservation area (PCT 3431).

Furthermore, clearing activities at the site should be avoided between November to February where possible to minimise disruption of the breeding cycle for *Delma vescolineata*. Based upon the closely related species, *Delma impar*, the breeding cycle is noted as November to December for mating, December to January egg laying and January to February hatching (TSSC, 2024).

5.2.1.1 Vegetation & Fauna Protection

The following controls are to be implemented during vegetation clearing and construction of the proposed development:

- Effort should be taken to identify and mark the boundaries of the proposed development to avoid the potential clearing of non-target vegetation.
- No clearing should occur within the subject site in the early morning / evening.
- Clearing should be carried out in a manner that allows fauna species residing within the development footprint to relocate without human intervention.
- Vegetation and soil removed from the subject site during the construction phase is likely to contain a partially exotic seed bank. Topsoil removed during this period should be stored and disposed of appropriately.
- If fauna is detected within the construction footprint during any works involving machinery, works are to stop immediately. The animal is to be allowed to self-relocate. Alternatively, a local wildlife rescue service or other suitably qualified/experienced person is to be contacted to facilitate the safe removal of the animal from the worksite.

5.2.1.2 Erosion Control

Mitigation measures to reduce soil erosion and pollutant run-off during construction activities should include:

- Installation and management of erosion and sediment controls is to occur in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004).
- Installation and management of erosion and sediment controls are to take note of possible stormwater inlets and are to be installed to prevent uncontrolled run-off from the subject site entering adjoining properties.
- The Construction Contractor will conduct regular inspection of erosion and sediment control measures, particularly following rainfall events, to ensure their ongoing functionality.
- Excavated material that is not be reused onsite will be removed to a licenced waste facility as soon as practicable.
- Undertake maintenance of silt fences and other mitigation measures to isolate run-off.

5.2.1.3 Dust Control

Specific measures to minimise the generation of dust and associated impacts on adjacent natural environments should include:

- Vehicles travelling on unsealed surfaces should not exceed 10km/h (unless this threshold is superseded by an Air Quality Assessment and / or Management Plan).

- Use of a water tanker to spray unpaved access tracks during the construction phase where required and where the use of water does not result in increased erosion and / or sedimentation risk.
- Application of dust suppressants or covers on soil stockpiles such as geofabric material or polymer binder (free of seed).

5.2.1.4 Chemical Spills

Uncontrolled and / or substantial spills have potential to contaminate surface soils, surface water and / groundwater and may be classed as presenting 'material harm' as defined under the NSW *Protection of the Environment Operations Act 1997.* Specific measures to minimise the potential for chemical spills and associated impacts on adjacent natural environments should include the following:

- All chemicals must be kept in clearly marked bunded areas.
- All chemicals are to be stored and managed as per their labels and / or safety data sheet (SDS).
- Regularly inspect vehicles and mechanical plant for leakage of fuel or oil, with repairs taken where required to prevent leaks.
- No re-fuelling, washing or maintenance of vehicles and plant to be undertaken within 20 m of identified drainage lines.

5.2.1.5 Management of Weeds

A moderate diversity of exotic plant species was recorded within the subject site, including the WoNS *Senecio madagascariensis*. Weed management should be implemented within the proposed development footprint and surrounding area of the subject site prior to and after construction to minimise weed incursions into the surrounding environment. This should include:

- Carrying out weed control within the subject site prior to the construction phase of the development. This will reduce the capacity of exotic plant species to spread into the locality. Organic matter and soil removed during this process should be disposed of via transport to a facility licenced to accept the material.
- Follow-up exotic plant removal after the completion of the construction phase of the proposed development.
- All vehicles and machinery should be verified as being free from external seed, plant material or loose soil to prevent the spread of weeds and fungal pathogens.

A list of control methods for exotic species listed in NSW can be found on the NSW WeedWise website (DPI, 2021).

5.3 CONCLUSION

The preliminary BAM-C predicted 22 species to occur on site, with all ecosystem credit species assumed absent due to species constraints **(Table 6).** The offset obligation is entirely associated with PCT 3431 where wooded vegetation occurs on the site that is being directly affected by the proposal. As the project will avoid all areas of PCT 3431 on the subject site, there is no offset obligation predicted to occur.

The preliminary BAM-C generated 11 candidate flora and 16 candidate fauna species to potentially occur on site with 18 candidate species assumed absent due to species constraints **(Table 7)**. Targeted surveys supporting a Biodiversity Development Assessment Report (BDAR) may be required to confirm presence of these species on site and finalise a credit obligation pending clearing of any associated habitat for the following flora species:

- Pine Donkey Orchid, *Diuris tricolor*
- Tarengo Leek Orchid, *Prasophyllum petilum*
- *Prasophyllum sp. Wybong*
- *Pterostylis chaetophora*

The proposed development will require clearing of approximately 1.63 ha of native vegetation which has been evaluated as predominantly exotic grassland and is not representative of a native PCT. No trees are being removed by the proposed development.

The field assessment identified one Plant Community Type (PCT) on the subject site (in areas that were not classified as exotic grassland):

- **PCT 3431** Central Hunter Ironbark Grassy Woodland (associated with BC Act listed TEC *Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregion*s and EPBC Act listed TEC *Central Hunter Valley eucalypt forest and woodland).*

This PCT is currently associated with a Threatened Ecological Community in NSW under the BC and EPBC Act. However, PCT 3431 is located within the northern wooded section of the subject site and will not be impacted by the development as it is outside of the development area. An assessment of significance to address the potential impacts on the listed TEC's have been undertaken in **Appendix C** and **Appendix D**.

Indirect impacts to the threatened ecological community (PCT 3431) occurring north of the development footprint should be managed and mitigated as outlined in **Section 5.2.**

An 'Assessment of Significance' (AoS) was completed for all threatened species considered to have at least a moderate likelihood of occurring on the site. The development area (7.6 ha) contains 7.6 ha of suitable habitat for the Endangered (BC and EPBC Act) Hunter Valley Delma (*Delma vescolineata).* The AoS determined that the proposed development has the possibility to have a significant impact on the Hunter Valley Delma, however, this remains inconclusive without targeted surveys to determine if the species is present within the subject site (**Appendix C** and **Appendix D**).

No EPBC listed species, migratory species or important habitat for such entities were identified within the Subject Site or broader Subject site, except for the Hunter Valley Delma *(Delma vescolineata).* If targeted surveys determine the presence of this species within the subject site, an EPBC referral to the Commonwealth Minister for the Environment may be required for the proposed development.

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APPENDIX A SPECIES LIST

Table 1: Fauna species observed on site

	Species	Common name
Aves		
1.	*Alisterus scapularis*	King Parrot
2.	*Cacatua galerita*	Sulphur-crested Cockatoo
3.	*Cacatua sp.*	Corella
4.	*Cracticus nigrogularis*	Pied Butcherbird
5.	*Dacelo novaeguineae*	Laughing Kookaburra
6.	*Entomyzon cyanotis*	Blue-faced Honeyeater
7.	*Eolophus roseicapilla*	Galah
8.	*Gymnorhina tibicen*	Australian Magpie
9.	*Manorina melanocephala*	Noisy Miner
10.	*Philemon corniculatus*	Noisy Friarbird
11.	*Rhipidura albiscapa*	Grey Fantail
12.	*Sericornis frontalis*	White-browed Scrubwren
13.	*Threskiornis molucca*	Australian white Ibis
14.	*Trichoglossus moluccanus*	Rainbow Lorikeet
15.	*Vanellus miles*	Masked Lapwing
16.	*Zanda funerea*	Yellow-tailed Black-Cockatoo
Mammals		
17.	*Macropus giganteus*	Eastern Grey Kangaroo

Table 2: Native Flora list

Native species				
No.	**Growth Form**	**Family**	**Binomial**	**Name**
1.	Forb (FG)	Lamiaceae	*Ajuga australis*	Austral Bugle
2.	Grass & grasslike (GG)	Poaceae	*Aristida ramosa*	Purple Wiregrass
3.	GG	Poaceae	*Bothriochloa decipiens*	Pitted Bluegrass
4.	GG	Poaceae	*Bothriochloa macra*	Red Grass
5.	FG	Asteraceae	*Brachyscome multifida*	
6.	FG	Apiaceae	*Centella asiatica*	Indian Pennywort
7.	GG	Poaceae	*Cymbopogon refractus*	Barbed Wire Grass
8.	GG	Poaceae	*Cynodon dactylon*	Common Couch
9.	Vine	Fabaceae (Faboideae)	*Grona varians*	Slender Tick-trefoil

Native species				
10.	FG	Convolvulaceae	*Dichondra repens*	Kidney Weed
11.	FG	Asteraceae	*Euchiton sphaericus*	Star Cudweed
12.	GG	Cyperaceae	*Fimbristylis dichotoma*	Common Fringe-sedge
13.	FG	Rubiaceae	*Galium propinquum*	Macri Bedstraw
14.	FG	Geraniaceae	*Geranium solanderi*	Native Geranium
15.	Vine	Fabaceae (Faboideae)	*Glycine clandestina*	
16.	FG	Faboideae	*Lespedeza juncea subsp. sericea*	
17.	FG	Campanulaceae	*Lobelia purpurascens*	Whiteroot
18.	FG	Lamiaceae	*Mentha diemenica*	Slender Mint
19.	GG	Poaceae	*Microlaena stipoides*	Weeping Grass
20.	FG	Oxalidaceae	*Oxalis exilis*	
21.	GG	Poaceae	*Panicum effusum*	Hairy Panic
22.	FG	Phyllanthaceae	*Phyllanthus virgatus*	
23.	Shrub (SG)	Thymelaeaceae	*Pimelea glauca*	Smooth Rice-flower
24.	Shrub	Thymelaeaceae	*Pimelea linifolia*	Slender Rice Flower
25.	FG	Ranunculaceae	*Ranunculus lappaceus*	Common Buttercup
26.	FG	Polygonaceae	*Rumex brownii*	Swamp Dock
27.	GG	Poaceae	*Rytidosperma fulvum*	Wallaby Grass
28.	FG	Anthericaceae	*Tricoryne elatior*	Yellow Autumn-lily
29.	FG	Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell

Table 3: Exotic Flora list

Exotic species			
No.	**Family**	**Binomial**	**Name**
1.	Asteraceae	*Ambrosia tenuifolia*	Lacy Ragweed
2.	Poaceae	*Briza subaristata*	
3.	Gentianaceae	*Centaurium erythraea*	Common Centaury
4.	Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane
5.	Roseaceae	*Cotoneaster glaucophyllus*	Cotoneaster
6.	Apiaceae	*Cyclospermum leptophyllum*	Slender Celery
7.	Cyperaceae	*Cyperus eragrostis*	Umbrella Sedge
8.	Apocynaceae	*Gomphocarpus fruticosus*	Narrow-leaved Cotton Bush
9.	Asteraceae	*Hypochaeris glabra*	Smooth Catsear

Exotic species			
10.	Asteraceae	*Hypochaeris radicata*	Catsear
11.	Linaceae	*Linum trigynum*	French Flax
12.	Oleaceae	*Olea europaea subsp. cuspidata*	Common Olive
13.	Asteraceae	*Onopordum acanthium*	Scotch Thistle
14.	Poaceae	*Paspalum dilatatum*	Paspalum
15.	Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues
16.	Asteraceae	*Senecio madagascariensis*	Fireweed
17.	Malvaceae	*Sida spinosa*	
18.	Poaceae	*Sporobolus africanus*	Parramatta Grass
19.	Poaceae	*Sporobolus fertilis*	Giant Parramatta Grass
20.	Asteraceae	*Taraxacum officinale*	Dandelion
21.	Fabaceae (Faboideae)	*Trifolium repens*	White Clover
22.	Verbenaceae	*Verbena bonariensis*	Purpletop
23.	Verbenaceae	*Verbena rigida*	Veined Verbena

Table 4: Percentage cover and abundance from 3 floristic 20 x 20 metre quadrats

Growth Form	Weed Species	Family	Binomial	Name	Q1 Coordinates: -32.718732, 151.456339		Q2 Coordinates: -32.716448, 151.456892		Q3 Coordinates: -32.717062, 151.458163	
					Cover	Abun.	Cover	Abun.	Cover	Abun.
H		Lamiaceae	*Ajuga australis*	Austral Bugle	0.1	20				
H	*	Asteraceae	*Ambrosia tenuifolia*	Lacy Ragweed			0.1	20		
G		Poaceae	*Aristida ramosa*	Purple Wiregrass	10	1000	10	1000	10	500
G		Poaceae	*Bothriochloa decipiens*	Pitted Bluegrass					0.1	10
G		Poaceae	*Bothriochloa macra*	Red Grass	1	100	5	500	2	100
H		Asteraceae	*Brachyscome multifida*		0.1	10	0.1	5		
G	*	Poaceae	*Briza subaristata*		5	500	1	1000	10	1000
H	*	Gentianaceae	*Centaurium erythraea*	Common Centaury	0.5	50	0.1	100	0.5	50
H		Apiaceae	*Centella asiatica*	Indian Pennywort	0.1	10				
H	*	Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	0.1	10			0.1	10
S	*	Roseaceae	*Cotoneaster glaucophyllus*						0.1	1
H	*	Apiaceae	*Cyclospermum leptophyllum*	Slender Celery	0.5	50	0.2	50		
G		Poaceae	*Cymbopogon refractus*	Barbed Wire Grass	10	1000	5	500	2	100
G		Poaceae	*Cynodon dactylon*	Common Couch	0.5	100	0.1	100	2	50
H	*	Cyperaceae	*Cyperus eragrostis*	Umbrella Sedge	0.1	20	0.1	5	0.1	10
H		Convolvulaceae	*Dichondra repens*	Kidney Weed	0.1	100	0.5	500	0.5	100
H		Asteraceae	*Euchiton sphaericus*	Star Cudweed	0.1	1				
H		Cyperaceae	*Fimbristylis dichotoma*	Common Fringe-sedge	0.1	1			0.1	10
H		Rubiaceae	*Galium propinquum*	Macri Bedstraw	0.1	50			0.1	100
H		Geraniaceae	*Geranium solanderi*	Native Geranium			0.1	20	0.1	20
V		Fabaceae (Faboideae)	*Glycine clandestina*		0.2	10	0.1	10	0.1	10
H	*	Apocynaceae	*Gomphocarpus fruticosus*	Narrow-leaved Cotton Bush	0.1	5	0.1	10		

Growth Form	Weed Species	Family	Binomial	Name	Q1 Coordinates: -32.718732, 151.456339		Q2 Coordinates: -32.716448, 151.456892		Q3 Coordinates: -32.717062, 151.458163	
					Cover	Abun.	Cover	Abun.	Cover	Abun.
H		Faboideae	*Grona varians*	Slender Tick-trefoil	0.1	10			0.1	5
H	*	Asteraceae	*Hypochaeris glabra*	Smooth Catsear						
H	*	Asteraceae	*Hypochaeris radicata*	Catsear	0.5	500	0.1	10	0.5	100
S		Faboideae	*Lespedeza juncea*				0.1	10		
H	*	Linaceae	*Linum trigynum*	French Flax	0.1	10				
H		Campanulaceae	*Lobelia purpurascens*	Whiteroot	0.1	10				
H		Lamiaceae	*Mentha diemenica*	Slender Mint			0.2	20		
G		Poaceae	*Microlaena stipoides*	Weeping Grass	0.1	10				
T	*	Oleaceae	*Olea europaea subsp. cuspidata*	Common Olive	0.1	1				
H	*	Asteraceae	*Onopordum acanthium*	Scotch Thistle	0.1	10				
H		Oxalidaceae	*Oxalis exilis*		0.1	10				
G		Poaceae	*Panicum effusum*	Hairy Panic	1	100			0.5	20
G	*	Poaceae	*Paspalum dilatatum*	Paspalum	50	5000	65	6500	50	5000
H		Phyllanthaceae	*Phyllanthus virgatus*		0.1	5	0.1	5		
S		Thymelaeaceae	*Pimelea glauca*	Smooth Rice-flower						
S		Thymelaeaceae	*Pimelea linifolia*	Slender Rice Flower					0.5	10
H	*	Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	1	100	0.2	50	1	100
H		Ranunculaceae	*Ranunculus lappaceus*	Common Buttercup	0.1	10	0.1	5	0.1	5
H		Polygonaceae	*Rumex brownii*	Swamp Dock			0.1	1		
G		Poaceae	*Rytidosperma fulvum*	Wallaby Grass	0.5	50				
H	*	Asteraceae	*Senecio madagascariensis*	Fireweed	0.1	10	0.1	5	0.2	500
S	*	Malvaceae	*Sida spinosa*		0.5	10				
G	*	Poaceae	*Sporobolus africanus*	Parramatta Grass	0.1	10	0.1	5	0.2	20
G	*	Poaceae	*Sporobolus fertilis*	Giant Parramatta Grass			0.1	5		
H	*	Asteraceae	*Taraxacum officinale*	Dandelion			0.1	10	0.5	500

Growth Form	Weed Species	Family	Binomial	Name	Q1 Coordinates: -32.718732, 151.456339		Q2 Coordinates: -32.716448, 151.456892		Q3 Coordinates: -32.717062, 151.458163	
					Cover	Abun.	Cover	Abun.	Cover	Abun.
H		Anthericaceae	*Tricoryne elatior*	Yellow Autumn-lily	0.1	10				
H	*	Fabaceae (Faboideae)	*Trifolium repens*	White Clover	0.2	10	0.1	10	0.1	5
H	*	Verbenaceae	*Verbena bonariensis*	Purpletop	2	200	1	100	3	100
H	*	Verbenaceae	*Verbena rigida*	Veined Verbena	1	100	0.5	50	2	1000
H		Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell			0.1	1	0.1	10

APPENDIX B THREATENED SPECIES LIKELIHOOD OF OCCURRENCE

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Acacia bynoeana Bynoe's Wattle	E	V	1	BioNet Atlas, PMST	Occurs in heath or dry sclerophyll forest on sandy soils. Seems to prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple. Potentially suitable habitat present within the Subject Site due to site disturbance. Only 1 database record within the locality from 2016.	Low	No
Callistemon linearifolius Netted Bottle Brush	V	-	1	BioNet Atlas	Grows in dry sclerophyll forest on the coast and adjacent ranges. No habitat present within the site as the site consists of heavily disturbed grassland. Only 1 database record within the locality from 2016.	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Cymbidium canaliculatum Cymbidium canaliculatum population in the Hunter Catchment	E	-	1	BioNet Atlas	Typically grows in the hollows, fissures, trunks and forks of trees in dry sclerophyll forest or woodland, where its host trees typically occur on Permian Sediments of the Hunter Valley floor. It usually occurs singly or as a single clump, which can form large colonies on trees, between two and six metres from the ground. Within the Hunter Catchment, Cymbidium canaliculatum is most commonly found in Eucalyptus albens (White Box) dominated woodlands (including those dominated by the intergrade E. albens-moluccana), much of which may constitute the endangered ecological community (EEC) 'White Box Yellow Box Blakely's Red Gum Woodland'. It has been found, less commonly, to grow on E. dawsonii (Slaty Box), E. crebra (Narrow-leaved Ironbark), E. moluccana (Grey Box), Angophora floribunda (Rough-barked Apple), Acacia salicina (Cooba) and on some other species, including dead stags. It is also known to use man-made structures, such as fence posts and wooden bridges as its host. No habitat present within the site as the site consists of heavily disturbed grassland. One record within the locality to the far east of the subject site.	Low	No
Cynanchum elegans White-flowered Wax Plant	E	E	-	PMST	The White-flowered Wax Plant usually occurs on the edge of dry rainforest vegetation. Other associated vegetation types include littoral rainforest; Coastal Tea-tree *Leptospermum laevigatum* – Coastal Banksia *Banksia integrifolia subsp. integrifolia* coastal scrub; Forest Red Gum *Eucalyptus tereticornis* aligned open forest and woodland; Spotted Gum *Corymbia maculata* aligned open forest and woodland; and Bracelet Honey myrtle *Melaleuca armillaris* scrub to open scrub. No habitat present within the site as the site consists of heavily disturbed grassland. No records within the locality.	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Eucalyptus camaldulensis Eucalyptus camaldulensis population in the Hunter catchment	E	-	1	BioNet Atlas	May occur with *Eucalyptus tereticornis, Eucalyptus melliodora, Casuarina cunninghamiana subsp. cunninghamiana and Angophora floribunda.* Most of the occurrences are on private land and there are no known occurrences in conservation reserves. Suitable habitat available within the locality, however, only 1 database record from 2016 which is outside of the subject site.	Low	No
Eucalyptus glaucina Slaty Red Gum	V	V	10	BioNet Atlas, PMST	Grows in grassy woodland and dry eucalypt forest. Grows on deep, moderately fertile and well-watered soils. No species identified during site assessment. Few records within the locality from 2017 located within 500m of the subject site.	Low	No
Eucalyptus parramattensis subsp. decadens Earp's Gum	V	V	1	BioNet Atlas, PMST	Occurs in low-lying, often swampy areas and in woodlands with associates such as *Eucalyptus racemosa, E. globoidea* and *Angophora bakeri.* In the regional vegetation classification of the National Parks and Wildlife Service Earp's Gum occurs in two vegetation communities: Tomago Sand Swamp and the Kurri Sands Swamp (Bell 2006) communities, both of which occur on poor sandy soils from either Pleistocene sands or Permian sediments. No habitat present within the site as the site consists of heavily disturbed grassland. Low database records within the locality (1 record from 2017 <500m to the west of subject site).	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Euphrasia arguta	CE	CE	-	PMST	Could be found in grassy areas near rivers at elevations up to 700 m above sea level, with an annual rainfall of 600 mm. Plants from the Nundle area have been reported from eucalypt forest with a mixed grass and shrub understorey; here, plants were most dense in an open disturbed area and along the roadside, indicating the species had regenerated following disturbance. Potentially suitable habitat within the Subject Site due to disturbance along the roadside. However, this species is quite restricted in range. No database records within the locality.	Low	No
Grevillea parviflora subsp. Parviflora Small-flower Grevillea	V	V	1	BioNet Atlas, PMST	Grows in sandy or light clay soils usually over thin shales, often with lateritic ironstone gravels and nodules. Sydney region occurrences are usually on Tertiary sands and alluvium, and soils derived from the Mittagong Formation. Soil landscapes include Lucas Heights or Berkshire Park. Occurs in a range of vegetation types from heath and shrubby woodland to open forest. In Sydney it has been recorded from Shale Sandstone Transition Forest and in the Hunter in Kurri Sand Swamp Woodland. however, other communities occupied include *Corymbia maculata - Angophora costata* open forest in the Dooralong area, in Sydney Sandstone Ridgetop Woodland at Wedderburn and in Cooks River / Castlereagh Ironbark Forest at Kemps Creek. Potentially suitable habitat within the subject site. Low number of database records (1 record from 2016 <500m west of subject site).	Low	No
Prasophyllum sp. Wybong A leek-orchid	-	CE	-	PMST	Endemic to NSW, it is known from near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell, Tenterfield, Currabubula and the Pilliga area. Known from open eucalypt woodland and grassland. A perennial orchid, appearing as a single leaf over winter and spring. Potentially suitable habitat within the Study Area. No known database records.	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Pterostylis gibbosa Illawarra Greenhood	E	E	1	BioNet Atlas, PMST	All known populations grow in open forest or woodland, on flat or gently sloping land with poor drainage. In the Hunter region, the species grows in open woodland dominated by Narrow-leaved Ironbark *E. crebra*, Forest Red Gum and Black Cypress Pine *Callitris endlicheri*. No suitable habitat present within the site as the site consists of heavily disturbed grassland. Low records within the locality (only 1 record outside of the subject site from 2016).	Low	No
Rhizanthella slateri Eastern Underground Orchid	V	E	-	PMST	Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest. Highly cryptic given that it grows almost completely below the soil surface, with flowers being the only part of the plant that can occur above ground. Therefore usually located only when the soil is disturbed. No suitable habitat present within the site as the site consists of heavily disturbed grassland. No records within the locality.	Low	No
Rhodamnia rubescens Scrub Turpentine	CE	CE	-	PMST	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. No suitable habitat present within the site as the site consists of heavily disturbed grassland. No records within the locality.	Nil	No
Rutidosis heterogama Heath Wrinklewort	V	V	1	BioNet Atlas, PMST	Grows in heath on sandy soils and moist areas in open forest and has been recorded along disturbed roadsides. No suitable habitat within the site and only 1 record within the locality from 2016.	Low	No
Syzygium paniculatum Magenta Lilly Pilly	E	V	1	BioNet Atlas, PMST	On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities. No suitable habitat in Study Area. Only 1 database record outside of the subject site (west).	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Thesium australe Austral Toadflax	V	V	-	PMST	Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (*Themeda australis*). Suitable habitat within the Subject Site. No known database records.	Low	No
Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions	E		-	BioNet Atlas	Occurs within the Subject Site	-	-
Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions	E		-	BioNet Atlas	Does not occur within the Subject Site	-	-
Central Hunter Valley eucalypt forest and woodland	-	CE	-	PMST	Does not occur within the Subject Site	-	-
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	-	E	-	PMST	Does not occur within the Subject Site	-	-

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	-	E	-	PMST	Does not occur within the Subject Site	-	-
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion	V	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Hunter Valley Weeping Myall (Acacia pendula) Woodland		CE	-	PMST	Does not occur within the Subject Site	-	-
Hunter Valley Vine Thicket in the NSW North Coast and Sydney Basin Bioregions	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion	E	E	-	PMST	Does not occur within the Subject Site	-	-
Kurri sand swamp woodland of the Sydney Basin bioregion	E	E	-	PMST	Does not occur within the Subject Site	-	-
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions	V	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Lowland Rainforest of Subtropical Australia		CE	-	PMST	Does not occur within the Subject Site	-	-
Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Quorrobolong Scribbly Gum Woodland in the Sydney Basin Bioregion	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	-	CE	-	PMST	Does not occur within the Subject Site	-	-
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	-	E	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Sydney Freshwater Wetlands in the Sydney Basin Bioregion	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregio	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
Warkworth Sands Woodland in the Sydney Basin Bioregion	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-
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	E	-	-	BioNet Atlas	Does not occur within the Subject Site	-	-

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	-	CE	-	PMST	Does not occur within the Subject Site	-	-
Litoria aurea Green and Golden Bell Frog	E	V	2	BioNet Atlas	Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (*Typha spp.*) or spikerushes (*Eleocharis spp.*). Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and diurnal sheltering sites available. No suitable habitat present within the site. Low number of database records from within the locality.	Low	No
Anthochaera phrygia Regent Honeyeater	E	CE	2	BioNet Atlas, PMST	Mostly recorded in box-ironbark eucalypt associations. At times of food shortage, the species also uses other woodland types and wet lowland coastal forest dominated by *Eucalyptus robusta* (Swamp Mahogany) or *E. maculata* (Spotted Gum). No suitable habitat present within the site as the site consists of heavily disturbed grassland. Site is not mapped as Important Habitat for this species. Low records within the locality.	Low	No
Botaurus poiciloptilus Australasian Bittern	E	E	-	PMST	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha spp.*) and spikerushes (*Eleocharis spp.*). No suitable habitat within the Subject Site. No database records.	Nil	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Callocephalon fimbriatum Gang-gang Cockatoo	E	E	-	PMST	In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. May also occur in sub-alpine Snow Gum (Eucalyptus pauciflora) woodland and occasionally in temperate rainforests. Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 7 cm in diameter or larger in eucalypts and 3 metres or more above the ground. No suitable habitat present within the site as the site consists of heavily disturbed grassland. No records within the locality.	Low	No
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo	V	V	1	BioNet Atlas, PMST	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of she-oak occur. Black She-oak (*Allocasuarina littoralis*) and Forest She-oak (*A. torulosa*) are important foods. Feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species). Dependent on large hollow-bearing eucalypts for nest sites. No suitable breeding habitat due to absence of hollows. Low number of database records within the locality (1 record from 2023).	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Chthonicola sagittata Speckled Warbler	V	-	3	BioNet Atlas	The Speckled Warbler lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area. The 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. No suitable habitat present within the site as the site consists of heavily disturbed grassland. Low number of database records within the vicinity.	Low	No
Circus assimilis Spotted Harrier	V	-	1	BioNet Atlas	Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Marginal suitable habitat within the Subject Site. One database record close to site from 1983.	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Climacteris picumnus victoriae Brown Treecreeper	V	V	-	PMST	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. Hollows in standing dead or live trees and tree stumps are essential for nesting. No suitable habitat present within the site as the site consists of heavily disturbed grassland. No records within the locality.	Low	No
Daphoenositta chrysoptera Varied Sittella	V	-	1	BioNet Atlas	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years. No suitable habitat present within the site as the site consists of heavily disturbed grassland. Low number of database records within the locality.	Low	No
Ephippiorhynchus asiaticus Black-necked Stork	E	-	1	BioNet Atlas	Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries. No suitable habitat present within the site as the site consists of heavily disturbed grassland. Only one record within the vicinity from 1987.	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Erythrotriorchis radiatus Red Goshawk	E	E	-	PMST	Red Goshawks inhabit open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water, and are often found in riparian habitats along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus forest of coastal rivers. No suitable habitat present within the site as the site consists of heavily disturbed grassland. No known records within the locality.	Low	No
Falco hypoleucos Grey Falcon	V	V	-	PMST	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey. Preys primarily on birds, especially parrots and pigeons, using high-speed chases and stoops; reptiles and mammals are also taken. No suitable habitat present within the site as the site consists of heavily disturbed grassland. No database records within the locality.	Low	No
Falsistrellus tasmaniensis Eastern False Pipistrelle	V	-	4	BioNet Atlas	Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. No suitable habitat available within the Subject Site. Few records within the locality.	Low	No
Glossopsitta pusilla Little Lorikeet	V	-	4	BioNet Atlas	Forages primarily in the canopy of open *Eucalyptus* forest and woodland, yet also finds food in *Angophora*, *Melaleuca* and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. No suitable habitat present within the site as the site consists of heavily disturbed grassland. Low database records within the locality.	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Grantiella picta Painted Honeyeater	V	V	-	PMST	Inhabits 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. No suitable foraging habitat present within the Subject Site. No database records within the locality.	Low	No
Haliaeetus leucogaster White-bellied Sea-Eagle	V	-	1	BioNet Atlas	Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass. No suitable breeding habitat within the Subject Site. Low number of database records (1 record from 2002).	Low	No
Lathamus discolor Swift Parrot	E	CE	-	PMST	This migratory species has been recorded on the mainland from a variety of habitat types including dry and wet sclerophyll forest, forested wetlands, coastal swamp forests and heathlands. Known to use *E. pilularis*. This species breeds in Tasmania. Does not breed within the locality. No records within the locality. No foraging habitat available within the Subject Site and site not mapped as Important Habitat for this species.	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Lophoictinia isura	V	-	1	BioNet Atlas	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland. No suitable habitat present within the site as the site consists of heavily disturbed grassland. One recent record within the locality.	Low	No
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern)	E	E	-	PMST	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. No suitable habitat due to lack of structurally diverse habitats required within the Subject Site. No records within the locality.	Nil	No
Myotis macropus Southern Myotis	V	-	4	BioNet Atlas	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, wharves, bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface. Marginal foraging habitat (small dam <500m to the northern boundary of subject site). Few records within the locality.	Moderate	Yes

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Neophema chrysostoma Blue-winged Parrot	V	V	-	PMST	Blue-winged parrots inhabit a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. They tend to favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones (Higgins 1999; Holdsworth et al. 2021). The species can also be seen in altered environments such as airfields, golf-courses and paddocks. Pairs or small parties of blue-winged parrots forage mainly near or on the ground for seeds of a wide range of native and introduced grasses, herbs and shrubs (Higgins 1999). Marginal foraging habitat available due to disturbed paddock within the subject site. No records within the locality.	Low	No
Pomatostomus temporalis temporalis Grey-crowned Babbler	V	-	20	BioNet Atlas	Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions. Nests are usually located in shrubs or sapling eucalypts, although they may be built in the outermost leaves of low branches of large eucalypts. No suitable habitat present within the site as the site consists of heavily disturbed grassland. Species may pass over site. One recent record (2023) <500m from subject site.	Moderate	Yes
Rostratula australis Australian Painted Snipe	E	E	-	PMST	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. Breeding requirements include shallow wetlands with bare mud. It has also been noted to breed in grazing land. Forages under clumps of tea-trees. No suitable habitat present within the site as the site consists of heavily disturbed grassland. No records within the locality.	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Stagonopleura guttata Diamond Firetail	V	V	-	PMST	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus pauciflora Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland. Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season). Marginal foraging habitat available (grassland) within the Subject Site. No records within the locality.	Low	No
Tyto novaehollandiae Masked Owl	V	-	2	BioNet Atlas	Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting. No suitable foraging or breeding habitat within the Subject Site. Few records within the locality.	Low	No
Chalinolobus dwyeri Large-eared Pied Bat	E	E	1	BioNet Atlas, PMST	Found in well-timbered areas containing gullies. Prefers dry forest close to sandstone ridgelines. Roosts in caves, crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Petrochelidon ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features. No suitable foraging or breeding habitat within the Subject Site. Only one database record within the locality from 2021.	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Dasyurus maculatus Spotted-tailed Quoll	V	E	2	BioNet Atlas	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. Hunts gliders, possums and roosting birds. No suitable habitat present within the site as the site consists of heavily disturbed grassland. Few database records within the locality.	Low	No
Miniopterus australis Little Bent-winged Bat	V	-	8	BioNet Atlas	Occupies moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, *Melaleuca* swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings. No potential roosting or foraging habitat available. Few records within the locality.	Moderate	No
Miniopterus orianae oceanensis Large Bent-winged Bat	V	-	13	BioNet Atlas	Forages in forested habitats. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. No potential roosting or foraging habitat available. Some database records within the vicinity from 2017 close to site.	Moderate	No
Micronomus norfolkensis Eastern Freetail-bat	V	-	7	BioNet Atlas	Tall open forest, *Melaleuca*, dry sclerophyll forest, River Red Gum and Yellow Box woodlands and riparian open forest. Roost mainly in tree hollows but will also roost under bark or in man-made structures. No potential roosting habitat available. Few database records within the locality.	Moderate	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Petauroides volans Greater Glider	E	E	-	PMST	Largely restricted to eucalypt forests and woodlands. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. During the day it shelters in tree hollows, with a particular selection for large hollows in large, old trees. No suitable habitat present within the site as the site consists of heavily disturbed grassland. No records within the locality.	Low	No
Petaurus australis Yellow-bellied Glider	V	V	-	PMST	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. No suitable habitat present within the site as the site consists of heavily disturbed grassland. No records within the locality.	Low	No
Petaurus norfolcensis Squirrel Glider	V	-	7	BioNet Atlas	Inhabits mature or old growth Box, Box-Ironbark woodlands and *Eucalyptus tereticornis* (River Red Gum) forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Require abundant tree hollows for refuge and nest sites. No suitable foraging or nesting habitat available within the site. Low records occur within the locality.	Low	No
Petrogale penicillata Brush-tailed Rock-wallaby	E	V	-	PMST	In NSW they occur from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees. No suitable habitat present within the Subject Site (rocky escarpments, outcrops and cliffs). No records within the locality.	Nil	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Phascogale tapoatafa Brush-tailed Phascogale	V	-	8	BioNet Atlas	Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest. Agile climber foraging preferentially in rough barked trees of 25 cm DBH or greater. Feeds mostly on arthropods but will also eat other invertebrates, nectar and sometimes small vertebrates. Nest and shelter in tree hollows with entrances 2.5 - 4 cm wide and use many different hollows over a short time span. No suitable habitat present within the site as the site consists of heavily disturbed grassland. Several database records within the locality from 2017.	Low	No
Phascolarctos cinereus Koala	E	E	-	PMST	In New South Wales, Koala populations are found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range. Inhabit eucalypt woodlands and forests. 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. No suitable habitat present within site as site consists of heavily disturbed grassland and no trees. No records within the locality.	Low	No
Potorous tridactylus tridactylus Long-nosed Potoroo (northern)	V	V	-	PMST	Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature. No suitable habitat present within the Subject Site and lack of complexity in vegetation structure required for this species. No records within the locality.	Nil	No
Pseudomys novaehollandiae New Holland Mouse	-	V	-	PMST	Known from coastal dune, heaths and heathy woodlands. No suitable habitat present within Study Area. No records within the locality.	Nil	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Pteropus poliocephalus Grey-headed Flying-fox	V	V	124	BioNet Atlas, PMST	Occurs across a wide range of habitat types along the eastern seaboard of Australia, depending on food availability. Fruit from myrtaceous trees and rainforest trees form the major components of their diet. No suitable habitat present within site as site consists of heavily disturbed grassland. The closest Grey-headed Flying-fox camps are located in Maitland which are not within the locality.	Low	No
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	V	-	3	BioNet Atlas	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. No suitable habitat present within site as site consists of heavily disturbed grassland. Two records from 2017 <1km north of the subject site.	Moderate	Yes
Scoteanax rueppellii Greater Broad-nosed Bat	V	-	8	BioNet Atlas	This species occurs in a variety of habitats including rainforest, dry and wet sclerophyll forest and eucalypt woodland. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species. Roosts in tree hollows and occasionally buildings. No suitable habitat present as site consists of heavily disturbed grassland. Three database records from 2017 <1km north of the subject site.	Moderate	No
Vespadelus troughtoni Eastern Cave Bat	V	-	1	BioNet Atlas	A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings. Occasionally found along cliff-lines in wet eucalypt forest and rainforest. No suitable roosting habitat due to absence of caves, cliffs or rocky overhangs within the Subject Site. Low database records within the locality.	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Calidris acuminata Sharp-tailed Sandpiper	V	-	-	PMST	The species utilises fresh and hypersaline environments, feeding along the edge of water on mudflats, coastal and inland wetlands, and sewage ponds. After rainfall events, the species may also feed on areas of agricultural pasture (Higgins and Davies 1996; Weller et al. 2020). No suitable habitat within the Subject Site. No records within the locality.	Low	No
Calidris ferruginea Curlew sandpiper	CE	CE	-	PMST	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. This species does not breed in Australia. No suitable habitat present within the site as the site consists of heavily disturbed grassland. No records within the locality.	Nil	No
Gallinago hardwickii Latham's Snipe	V	V	-	PMST	Latham's snipe feed in soft mudflats or shallow water typically at night, early morning, or evening (BirdLife Australia 2021). Latham's snipe can roost singly and in aggregations. They shelter during the day in small wetlands including urban water bodies, saltmarshes, as well as creek edges, where there is adequate shallow flooded or inundated substrate. They also use crops and pasture. They mostly are found among dense cover comprising sedges, grasses, lignum, reeds, and rushes. No suitable habitat present within the site as the site consists of heavily disturbed grassland and species does not breed in the locality. No records within the locality.	Nil	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Hirundapus caudacutus White-throated Needletail	V	V	1	BioNet Atlas, PMST	In Australia, White-throated Needletails almost always forage aerially, at heights up to 'cloud level'. The species has been recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows. The species breeds in wooded lowlands and sparsely vegetated hills, as well as mountains covered with coniferous forests. No suitable habitat present within site as site consists of heavily disturbed grassland Species may forage aerially above the Subject Site.	Low	No
Aprasia parapulchella Pink-tailed Worm-lizard	V	V	-	PMST	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. No suitable habitat present within the site as the site consists of disturbed grassland dominated by exotics. No database records within the locality.	Low	No

Species	Legal Status*		Number of records (10 km)	Source#	Habitat Preferences	Likelihood of occurrence	Assessment Required?
	BC Act	EPBC Act					
Delma vescolineata Hunter Valley Delma	E	E	-	PMST	The Hunter Valley Delma occurs in secondary native grassland remaining after the removal or dieback of previous woody canopy vegetation (Benson 1996) in association with sparse boxgum or ironbark woodland (Mahony et al. 2022). The primary canopy species consists of *Eucalyptus melliodora* (yellow-box gum) and *E. crebra* (narrow-leaved ironbark), with a diverse ground cover layer containing multiple grasses including *Austrostipa spp*. (speargrass), *Bothriochloa spp.* (beardgrass), and *Chloris spp*. (finger grass) (Mahony et al. 2022). It has been found sheltering under rocks and discarded rubbish, including building rubble, metal and organic waste. The Hunter Valley Delma has also been detected under dried cow pats in agricultural land that is heavily disturbed by livestock and contain no natural surface refugia (Mahony et al. 2022). Suitable habitat present within the subject site (agricultural land heavily disturbed by livestock). No database records within the locality.	Moderate	Yes

APPENDIX C EPBC ASSESSMENT OF SIGNIFICANCE

Species Assessed under the EPBC Act Significant Impact Guidelines

The following pertains to Assessments of Significance for direct or indirect impacts to EBPC Act listed threatened species, populations and communities in association with the BAR at Lochinvar Ridge Estate.

- Hunter Valley Delma (*Delma vescolineata)*

The Hunter Valley Delma *(Delma vescolineata)* is listed as Endangered under the EPBC Act. This species was gazetted in October 2024 and has therefore not been surveyed for in recent years.

The Hunter Valley Delma is known almost entirely from a 25 km wide corridor in the Hunter Valley NSW between Maitland and Muswellbrook (Mahony et al. 2022). A further specimen has been identified from just north of Parraweena on the Liverpool plains, approximately 80 km north-west of Muswellbrook. It is possible that the Hunter Valley Delma is more widespread in this region. There is no evidence of the Hunter Valley Delma co-occurring with the striped legless lizard (Mahony et al. 2022). The sites where the species has been detected include rehabilitated mine sites and pastoral land used for cattle grazing (Mahony et al. 2022, Mahony 2022 pers comm 17 May).

The Hunter Valley Delma occurs in secondary native grassland remaining after the removal or dieback of previous woody canopy vegetation (Benson 1996) in association with sparse boxgum or ironbark woodland (Mahony et al. 2022). The primary canopy species consists of Eucalyptus melliodora (yellow-box gum) and E. crebra (narrow-leaved ironbark) with a diverse ground cover layer containing multiple grasses including Austrostipa spp. (speargrass), Bothriochloa spp. (beardgrass), and Chloris spp. (finger grass) (Mahony et al. 2022). It has been found sheltering under rocks and discarded rubbish, including building rubble, metal and organic waste. The Hunter Valley Delma has also been detected under dried cow pats in agricultural land that is heavily disturbed by livestock and contain no natural surface refugia (Mahony et al. 2022).

C.1 Critically Endangered and Endangered Species – EPBC Act Assessment of Significance

The EPBC Act Significant Impact Guidelines (DCCEEW, 2013) state:

An action is likely to have a significant impact on a Critically Endangered and Endangered species if there is a real chance or possibility that it will:

- *lead to a long-term decrease in the size of a population*
- *reduce the area of occupancy of the species*
- *fragment an existing population into two or more populations*
- *adversely affect habitat critical to the survival of a species*
- *disrupt the breeding cycle of a population*
- *modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline*
- *result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat*
- *introduce disease that may cause the species to decline, or*
- *interfere with the recovery of the species.*

A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:

- *a geographically distinct regional population, or collection of local populations, or*
- *a population, or collection of local populations, that occurs within a particular bioregion.*

Appendix C, Table 1: Endangered Species – Hunter Valley Delma (*Delma vescolineata)*

Will the action -	Endangered Species (Hunter Valley Delma)
- lead to a long-term decrease in the size of a population	As previously mentioned, the Hunter Valley Delma occurs in "secondary native grassland remaining after the removal or dieback of previous woody canopy vegetation" (TSSC, 2024). The Development Area is comprised of exotic grassland; however, a variety of groundcover species is present (native and non-native). There are no *E. melliodora* present on the site. This species may shelter under "cow pats in agricultural land heavily disturbed by livestock" (Mahony et al. 2022) which are present throughout the site, therefore, suitable habitat is present. The species has no Bionet records associated within a 10km radius of the site. No targeted surveys have been undertaken for this species since it was gazetted in October 2024. This species was not detected during site assessment; however, targeted surveys are noted as an important step for determining the presence of the Hunter Valley Delma on a site (TSCC, 2024). Important populations are known to occur in the following areas: Muswellbrook, Jerrys Plains, Ravensworth, and Parraweena. The subject site is located in Lochinvar, where an important population is not known to occur. However, there are records existing between the Maitland and Muswellbrook LGA and there is currently no data available on the population size of the Hunter Valley Delma. It is considered that the removal of approximately 6.29 ha of potential habitat for the Hunter Valley Delma is inconclusive without targeted surveys and the proposed development has the possibility of leading to a long-term decrease in the size of a population.
- reduce the area of occupancy of the species - fragment an existing population into two or more populations	As the distribution of the species in the surrounding area is unknown, long-term impacts on the local population are uncertain. The Conservation Advice also mentions targeted field surveys as an important step for determining the presence of the Hunter Valley Delma on a particular site; therefore, long-term impacts on the local population are uncertain. Within the subject site and the surrounding vegetation large areas of similar habitat occur with more native species in the understorey, if occupied the long-term impacts on the species may be significant following impacts of the proposed development. The development area comprises of a patch of grassland with a significant amount of connectivity to surrounding habitat, or patches at the extremities of larger patches. Therefore, the loss of potential habitat for these species within the subject site may isolate remaining habitat from other patches and it is possible that the proposal may fragment an existing population into two or more populations. Targeted surveys are required to affirm if the species is occupying the subject site, which would determine whether significant impacts are likely to occur as a result of the proposal.
- adversely affect habitat critical to the survival of a species - modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Habitat critical to the survival of the Hunter Valley Delma is not well understood, but is likely to include sites that possess more than one of the following characteristics (from Conservation Advice): ▪ The habitat critical to the survival of the Hunter Valley Delma is not well understood but likely includes the secondary native grassland of the Hunter Valley between Maitland and Muswellbrook where the species is known to occur. The Hunter Valley Delma relies on a diverse grass ground cover layer, as this habitat provides the species with refuge from predators, and habitat for foraging and breeding. The site does not meet the majority of the above criteria as it is predominantly exotic grassland; however, breeding habitat cannot be ruled out. The subject site is also located between Maitland and Muswellbrook, where the species is known to occur. There are grassed areas which contain a higher density of native groundcovers and increased sheltering opportunities for the species outside of the development footprint.

Will the action -	Endangered Species (Hunter Valley Delma)
	Due to the habitat being assessed as optimal for the species it is likely that the development area contains habitat critical to the survival of the species. Targeted surveys are required to affirm if the species is occupying the subject site.
- disrupt the breeding cycle of a population	Based upon the closely related species, *Delma impar*, the breeding cycle is noted as November to December for mating, December to January egg laying and January to February hatching (TSSC, 2024). Clearing activities at the site will be avoided between November to February where possible to minimise disruption of the breeding cycle for *Delma vescolineata*.
- result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat - introduce disease that may cause the species to decline	The existing weed and feral animal threat levels are likely to change significantly as the development will increase human trafficking, domestic animal entry, and rubbish impeding within areas of the C3 conservation area in the north. It is therefore recommended that fencing be installed surrounding the C3 conservation area along the northern boundary of the site as a part of the design plan, in order to reduce these impacts from occurring in areas containing fauna habitat and the CEEC. A site-specific CEMP will be prepared and implemented prior to the commencement of any clearing or construction works to ensure that impacts are minimised. The proposal would not include activities that are likely to introduce any disease, fungus or virus to the local populations of the species.
- interfere with the recovery of the species.	As an approved, updated, and detailed Conservation Advice for the species would provide sufficient direction to implement priority conservation actions, mitigate key threats, enable recovery and provide foundation for further planning, a national Recovery Plan is not required at this time. Consequently, the Threatened Species Scientific Committee has not recommended that a recovery plan be required (TSSC, 2024). The proposal has the potential to interfere substantially with the recovery of the species given habitat resources for these species are located within the development footprint.
Conclusion	Approximately 6.29 ha of suitable habitat for this species occurs within the subject site and is proposed to be removed as part of the development. No records occur within the locality (DCCEEW, 2025), however, this species is known to occur between Maitland and Muswellbrook. Due to the uncertainty around the status of the population within the Study Area (size, importance, breeding potential), the potential for the proposal to have a significant impact on the species is uncertain. Targeted surveys are necessary to ascertain if Delma vescolineata occurs within the development area. If the species is determined by surveys to occur upon the site, the proposal would have the potential to significantly impact on the species in the locality.

C.2 Critically Endangered and Endangered Ecological Communities – EPBC Act Assessment of Significance

The following Critically Endangered Ecological Communities (CEEC) have been assessed under the EPBC Act Significant Impact Guidelines:

- Central Hunter Valley eucalypt forest and woodland

The EPBC Act Significant Impact Guidelines (DOE, 2013) state:

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- reduce the extent of an ecological community
- fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines
- adversely affect habitat critical to the survival of an ecological community

- modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns
- cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting
- cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:
    - *assisting invasive species, that are harmful to the listed ecological community, to become established, or*
    - *causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or*
- interfere with the recovery of an ecological community.

Appendix C, Table 2: Critically Endangered Ecological Communities – Central Hunter Valley eucalypt forest and woodland

Will the action -	Vulnerable Species
- reduce the extent of an ecological community	The proposed development entirely avoids all of PCT 3431, which has been identified as a CEEC in the northern section of the subject site, therefore it will not reduce the extent of the CEEC. The area containing 0.5 ha of CEEC Central Hunter Valley eucalypt forest and woodland is partially disturbed with the threat of introduced weeds and is fragmented due to historical vegetation clearing for agriculture directly surrounding this PCT.
- fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	As above.
- adversely affect habitat critical to the survival of an ecological community	No habitat critical to the survival of the CEEC will be affected by the proposed development.
- modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	Mitigation measures will address potential indirect impacts during construction phase; following this, it is not anticipated that the CEEC will be modified or disturbed. Installation of a Tree Protection Fence surrounding the CEEC will prevent vehicles entering the TPZ, which will consequently prevent edge effects from occurring within the CEEC. The existing weed and feral animal threat levels are likely to change significantly as the development will increase human trafficking, domestic animal entry, and rubbish impeding within areas of the C3 conservation area in the north. It is therefore recommended that fencing be installed surrounding the C3 conservation area along the northern boundary of the site as a part of the design plan, in order to reduce these impacts from occurring in areas containing fauna habitat and the CEEC.

Will the action -	Vulnerable Species
cause a substantial change in the species composition of an occurrence of an ecological community, including cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: – assisting invasive species, that are harmful to the listed ecological community, to become established, or – causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or - interfere with the recovery of an ecological community	Mitigation measures which will be outlined in **Section 5.2 of this BAR** addresses preventative measures for invasive species (flora and fauna) becoming further established in the area, noting that the subject site is heavily modified and already host to invasive species. Mitigation measures include recommendation for fencing surrounding the C3 conservation area along the northern boundary of the site as a part of the design plan, in order to reduce future impacts from occurring in areas containing the CEEC. A site-specific CEMP will be prepared and implemented prior to the commencement of any clearing or construction works to ensure that impacts are minimised. Management measures outlined in **Section 5.2.1** of this BAR addresses preventative measures for construction activities introducing or spreading new or existing environmental and noxious weeds or plant and animal pathogens. The development will not interfere with the recovery of this community, given preventative measures are undertaken during and after construction that will mitigate any indirect impacts. Additionally, it is recommended that fencing be installed surrounding the development to minimise dumping of rubbish, trampling, domestic animal entry or other disturbances occurring within the CEEC. Furthermore, the CEEC is located within the C3 conservation area and will not be affected by the proposal.
Conclusion	The proposed development will not impact any of the CEEC located within the subject site. Potential indirect impacts caused by edge effects during the construction phase should be mitigated with the installation of tree protection fencing surrounding the CEEC, as designated vehicle ‘no-go zones’ to prevent entry into the TPZ. A site-specific CEMP will be prepared and implemented prior to the commencement of any clearing or construction works to ensure that impacts are minimised. It is not anticipated that the proposal will cause any fragmentation of the CEEC, given that the entire CEEC is outside of the construction footprint.

APPENDIX D ASSESSMENT OF SIGNIFICANCE (NSW BC ACT 2016)

D.1 Factors of Assessment - Biodiversity Conservation Act 2016

The five factors considered in the test of significance under s.7.3 of the BC Act are shown in the table below. The tests of significance for all threatened species, populations and ecological communities considered likely to occur within the subject site are provided in the proceeding sub-sections.

Appendix D, Table 1: Factors addressed in the assessment of significance

Factor	Species	Population	Ecological Community
(a) in the case of a **threatened species**, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	**X**	**-**	-
(b) in the case of an **endangered ecological community or critically endangered ecological community**, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	-	-	
(c) in relation to the **habitat of a threatened species, population or ecological community**: (i) the extent to which habitat is likely to be removed or modified as a result of the 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, population or ecological community in the locality	**X**	**-**	
(d) whether the proposed development or activity is likely to have an adverse effect any declared **area of outstanding biodiversity value** (either directly or indirectly).	-	-	-

Factor	Species	Population	Ecological Community
(e) whether the proposed development or activity is or is part of a **key threatening process** or is likely to increase the impact of, a key threatening process.	**X**	-	

D.2 Threatened Species Assessment

D2.1 Aves

The threatened species assessment for the fauna class *Aves* considers the following species:

- Grey-crowned Babbler *Pomatostomus temporalis temporalis* (Vulnerable)

Appendix D, Table 2: Threatened aves assessment under Section 7.3 of BC Act

Factor	Assessment
(a) Effect on life cycle of **threatened species**.	The proposed development will impact upon exotic grassland which is not critical habitat for this species. No trees, shrubs or fallen timber are identified as requiring removal, limiting potential nesting locations. The subject site is unlikely to represent core breeding and nesting habitat for this species. No known records occur within the subject site for this species.
(b) (i) Effect on the extent of **EEC** or **CEEC**.	Not Applicable
(b) (ii) Effect on composition of **EEC** or **CEEC**.	Not Applicable
(c) (i) Extent of habitat removal or modification for **threatened species**, **population** or **ecological community**	The proposed development does not require the removal of trees, shrubs or fallen timber potentially utilised by this species. Habitat to be impacted contains a high proportion of exotic grassland occurring in a disturbed environment and lacks midstorey vegetation and canopy trees.
(c) (ii) Extent of fragmentation or isolation of habitat for **threatened species**, **population** or **ecological community.**	No fragmentation of habitat for this species is likely to occur as the woodland to the north of the development area is being retained and no foraging habitat is being removed.
(c) (iii) The importance of habitat to **threatened species**, **populations** or **ecological community**.	As above.
***(d)* Area of Outstanding Biodiversity Value**	Not Applicable
***(e)* Key Threatening Processes**	Key Threatening Processes (KTPs) relevant to the proposed development: • Clearing of native vegetation. • Infection of native plants by Phytophthora cinnamomic. • Invasion and establishment of exotic vines and scramblers. The proposed development may facilitate the above-listed KTPs to a minor extent. This is in consideration of the disturbed nature of the site, and the small impact area, resulting in minor clearing of native vegetation.

Factor	Assessment
Conclusion	The proposed development occurs within a grazed paddock with no overstorey or fallen logs for refugia for this species. No significant impacts to the Grey-crowned Babbler are anticipated.

D2.2 Mammals

The threatened species assessment for the fauna class *Mammals* considers the following species:

- Yellow-bellied Sheathtail-bat *(Saccolaimus flaviventris)* – Vulnerable
- Greater Broad-nosed Bat (*Scoteanax rueppellii)* – Vulnerable
- Eastern Freetail-bat (*Micronomus norfolkensis)* – Vulnerable
- Large Bent-winged Bat (*Miniopterus orianae oceanensis)* – Vulnerable
- Little Bent-winged Bat (*Miniopterus australis)* – Vulnerable
- Southern Myotis *(Myotis macropus)* - Vulnerable

Appendix D, Table 4: Threatened mammals assessment under Section 7.3 of BC Act

Factor	Assessment
(a) Effect on life cycle of **threatened species**.	The proposed development will impact upon managed grassland which does not contain any foraging or roosting habitat for threatened bats. The subject site is unlikely to represent core habitat for threatened microbats. No records occur for these species within the subject site and a small number of records occur within a 10km radius.
(b) (i) Effect on the extent of **EEC** or **CEEC**.	Not Applicable
(b) (ii) Effect on composition of **EEC** or **CEEC**.	Not Applicable
(c) (i) Extent of habitat removal or modification for **threatened species**, **population** or **ecological community**	The proposed development does not require the removal of hollow-bearing trees or waterbodies potentially utilised by these species. Habitat to be impacted contains a high proportion of exotic flora occurring in a disturbed environment and lacks midstorey vegetation. Impacts upon potentially roosting bat species would not occur as roosting habitat lies outside of the development footprint. There is more suitable foraging habitat available for these species in the wider locality.
(c) (ii) Extent of fragmentation or isolation of habitat for **threatened species**, **population** or **ecological community.**	The habitat to be impacted is in areas that have been modified and managed (past clearing and grassland heavily grazed by livestock).
(c) (iii) The importance of habitat to **threatened species**, **populations** or **ecological community**.	The habitat to be impacted is in areas that have been modified and managed and represent an area of marginal foraging habitat and no roosting habitat. The area of habitat to be impacted is unlikely to be considered as important habitat.
***(d)* Area of Outstanding Biodiversity Value**	Not Applicable

Factor	Assessment
(e) **Key Threatening Processes**	Key Threatening Processes (KTPs) relevant to the proposed development: • Clearing of native vegetation. • Infection of native plants by Phytophthora cinnamomi. • Invasion and establishment of exotic vines and scramblers. The proposed development may facilitate the above-listed KTPs to a minor extent. This is in consideration of the disturbed nature of the site, and the small impact area, resulting in minor clearing of native vegetation (limited to some native grasses).
Conclusion	The proposed development occurs within a regularly managed area consisting of heavily grazed grassland. No hollow-bearing trees for roosting or waterbodies for foraging are being removed as a part of this development. No significant impacts to threatened microbats are anticipated.

D2.4 Reptiles

The threatened species assessment for the fauna class *Reptilia* considers the following species:

- Hunter Valley Delma *Delma vescolineata* – Endangered

Appendix D, Table 4: Threatened reptiles assessment under Section 7.3 of BC Act

Factor	Assessment
(c) Effect on life cycle of **threatened species**.	The species has no Bionet records associated within a 10km radius of the site. No targeted surveys have been undertaken for this species since it was gazetted in October 2024. This species was not detected during site assessment; however, targeted surveys are noted as an important step for determining the presence of the Hunter Valley Delma on a site (TSCC, 2024). Based upon the closely related species, Delma impar, the breeding cycle is noted as November to December for mating, December to January egg laying and January to February hatching (TSSC, 2024). Clearing activities at the site will be avoided between November to February where possible to minimise disruption of the breeding cycle for *Delma vescolineata.*
(d) (i) Effect on the extent of **EEC** or **CEEC**.	Not Applicable
(d) (ii) Effect on composition of **EEC** or **CEEC**.	Not Applicable
(e) (i) Extent of habitat removal or modification for **threatened species**, **population** or **ecological community**	Approximately 6.29 ha of suitable habitat for this species occurs within the subject site and is proposed to be removed as part of the development. No records occur within the locality (DCCEEW, 2025). The Hunter Valley Delma occurs in "secondary native grassland remaining after the removal or dieback of previous woody canopy vegetation" (TSSC, 2024). The Development Area is comprised of mostly exotic grassland; however, a variety of groundcover species is present (native and non-native). This species may shelter under "cow pats in agricultural land heavily disturbed by livestock" (Mahony et al. 2022) which are present throughout the site, therefore, suitable habitat is present. Habitat critical to the survival of the Hunter Valley Delma is not well understood, but is likely to include sites that possess more than one of the following characteristics (from Conservation Advice): ▪ The habitat critical to the survival of the Hunter Valley Delma is not well understood but likely includes the secondary native grassland of the Hunter Valley between Maitland and Muswellbrook where the species is known to occur. The Hunter Valley Delma relies on a diverse grass ground cover layer, as this habitat provides the species with refuge from predators, and habitat for foraging and breeding. The majority of the site does not meet all of the above criteria as it is predominantly exotic grassland; however, breeding habitat cannot be ruled out. There are grassed areas which contain a higher density of native groundcovers and increased sheltering opportunities for the species outside of the development footprint.

Factor	Assessment
(d) (ii) Extent of fragmentation or isolation of habitat for **threatened species**, **population** or **ecological community.**	Approximately 6.29 ha of suitable habitat for this species occurs within the subject site and is proposed to be removed as part of the development. No records occur within the locality (DCCEEW, 2025). The Hunter Valley Delma occurs in "secondary native grassland remaining after the removal or dieback of previous woody canopy vegetation" (TSSC, 2024). The Development Area is comprised of exotic grassland; however, a variety of groundcover species is present (native and non-native). There are no *E. melliodora* present on the site. This species may shelter under "cow pats in agricultural land heavily disturbed by livestock" (Mahony et al. 2022) which are present throughout the site, therefore, suitable habitat is present. Habitat critical to the survival of the Hunter Valley Delma is not well understood, but is likely to include sites that possess more than one of the following characteristics (from Conservation Advice): ▪ The habitat critical to the survival of the Hunter Valley Delma is not well understood but likely includes the secondary native grassland of the Hunter Valley between Maitland and Muswellbrook where the species is known to occur. The Hunter Valley Delma relies on a diverse grass ground cover layer, as this habitat provides the species with refuge from predators, and habitat for foraging and breeding. The site does not meet the majority of the above criteria as it is predominantly exotic grassland; however, breeding habitat cannot be ruled out. The subject site is also located between Maitland and Muswellbrook, where the species is known to occur. There are grassed areas which contain a higher density of native groundcovers and increased sheltering opportunities for the species outside of the development footprint.
(f) (iii) The importance of habitat to **threatened species**, **populations** or **ecological community**.	As above. Due to the habitat being assessed as optimal for the species it is likely that the development area contains habitat critical to the survival of the species. Targeted surveys are required to affirm if the species is occupying the subject site.
***(g)* Area of Outstanding Biodiversity Value**	Not Applicable
***(h)* Key Threatening Processes**	Key Threatening Processes (KTPs) relevant to the proposed development: • Clearing of native vegetation. • Infection of native plants by Phytophthora cinnamomic. • Invasion and establishment of exotic vines and scramblers. The proposed development may facilitate the above-listed KTPs to a minor extent. This is in consideration of the disturbed nature of the site, and the small impact area, resulting in minor clearing of native vegetation.

Factor	Assessment
Conclusion	Approximately 6.29 ha of suitable habitat for this species occurs within the subject site and is proposed to be removed as part of the development. No records occur within the locality (DCCEEW, 2025); however, this species is known to occur between Maitland and Muswellbrook. Due to the uncertainty around the status of the population within the Study Area (size, importance, breeding potential), the potential for the proposal to have a significant impact on the species is uncertain. Targeted surveys are necessary to ascertain if Delma vescolineata occurs within the development area. If the species is determined by surveys to occur upon the site, the proposal would have the potential to significantly impact on the species in the locality.

D.3 Threatened Ecological Communities Assessment

D3.1 *Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregion*s (EEC)

Appendix D, Table 4: Threatened Ecological Communities assessment under Section 7.3 of BC Act

Factor	Assessment
(a) Effect on life cycle of **threatened species**.	Not Applicable
(b) (i) Effect on the extent of **EEC** or **CEEC**.	The proposed development entirely avoids all of PCT 3431, which has been identified as an EEC in the northern section of the subject site, therefore it will not reduce the extent of the EEC. The area containing >5 ha the EEC is partially disturbed with the threat of introduced weeds and is fragmented due to historical vegetation clearing for agriculture directly surrounding this PCT.
(b) (ii) Effect on composition of **EEC** or **CEEC**.	As above.
(c) (i) Extent of habitat removal or modification for **threatened species**, **population** or **ecological community**	The proposed development will remove primarily exotic grassland with and entirely avoids all of PCT 3431 to the north, therefore habitat removal will not occur.
(c) (ii) Extent of fragmentation or isolation of habitat for **threatened species**, **population** or **ecological community.**	As outlined above, no fragmentation is expected to occur to the EEC as it is outside of the construction footprint.
(c) (iii) The importance of habitat to **threatened species**, **populations** or **ecological community**.	The area of habitat to be impacted is unlikely to be considered as important habitat as it is frequently grazed grassland and is not considered a part of the EEC.
***(d)* Area of Outstanding Biodiversity Value**	Not Applicable

Factor	Assessment
(e) **Key Threatening Processes**	Key Threatening Processes (KTPs) relevant to the proposed development: • Clearing of native vegetation. • Invasion of native plant communities by exotic perennial grasses. • Infection of native plants by Phytophthora cinnamomic. • Invasion and establishment of exotic vines and scramblers. The proposed development may facilitate the above-listed KTPs to a minor extent. This is in consideration of the disturbed nature of the site, and the small impact area, resulting in minor clearing of native vegetation.
Conclusion	The proposed development entirely avoids all PCT 3431 therefore, no direct impacts on the EEC are anticipated. The proposed development includes possible indirect impacts (edge effects) during the construction phase to the EEC in the north as well as ongoing impacts following construction. Mitigation measures will be in place during pre-construction and construction phase to reduce the likelihood of any impact on the EEC. As such, a significant impact upon the *Cumberland Plain Woodland in the Sydney Basin Bioregion* is considered unlikely.

APPENDIX E PROTECTED MATTERS SEARCH TOOL (PMST)

EPBC Act Protected Matters Report

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

Report created: 27-Mar-2025

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	7
Listed Threatened Species:	36
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	20
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	2
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

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

Ramsar Site Name	Proximity
Hunter estuary wetlands	20 - 30km upstream from Ramsar site

Listed Threatened Ecological Communities [Resource Information]

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

Community Name	Threatened Category	Presence Text
Central Hunter Valley eucalypt forest and woodland	Critically Endangered	Community may occur within area
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area
Hunter Valley Weeping Myall (Acacia pendula) Woodland	Critically Endangered	Community may occur within area
Kurri sand swamp woodland of the Sydney Basin bioregion	Endangered	Community may occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

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

Scientific Name	Threatened Category	Presence Text
BIRD		

Scientific Name	Threatened Category	Presence Text
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat may occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor		
Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Melanodryas cucullata cucullata		
South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area
Neophema chrysostoma		
Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Stagonopleura guttata		
Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area
MAMMAL		
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Petauroides volans		
Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area
Petaurus australis australis		
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
[Pseudomys novaehollandiae](#) New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
[Pteropus poliocephalus](#) Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
PLANT		
[Acacia bynoeana](#) Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area
[Cynanchum elegans](#) White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
[Eucalyptus glaucina](#) Slaty Red Gum [5670]	Vulnerable	Species or species habitat known to occur within area
[Euphrasia arguta](#) [4325]	Critically Endangered	Species or species habitat may occur within area
[Prasophyllum sp. Wybong (C.Phelps ORG 5269)](#) a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area
[Pterostylis gibbosa](#) Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat known to occur within area
[Rhodamnia rubescens](#) Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat may occur within area
[Rutidosis heterogama](#) Heath Wrinklewort [13132]	Vulnerable	Species or species habitat may occur within area
[Syzygium paniculatum](#) Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
REPTILE		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area
Delma vescolineata Hunter Valley Delma [92599]	Endangered	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis		
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Chalcites osculans as Chrysococcyx osculans		
Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Lathamus discolor		
Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis		
Black-faced Monarch [609]		Species or species habitat likely to occur within area overfly marine area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Neophema chrysostoma		
Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area
Pterodroma cervicalis		
White-necked Petrel [59642]		Species or species habitat may occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato)		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
Symposiachrus trivirgatus as Monarcha trivirgatus		
Spectacled Monarch [83946]		Species or species habitat may occur within area overfly marine area

Extra Information

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
North East NSW RFA	New South Wales

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Hunter Natural Gas Pipeline	2004/1902	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed

Bioregional Assessments

[Resource Information]

SubRegion	BioRegion	Website
Hunter	Northern Sydney Basin	BA website

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

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

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APPENDIX F BIODIVERSITY VALUES MAP AND THRESHOLD TOOL REPORT

Department of Planning and Environment

Biodiversity Values Map and Threshold Report

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

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

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

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

Biodiversity Values Map and Threshold Report

Date of Report Generation		03/02/2025 3:05 PM
1. Biodiversity Values (BV) Map - Results Summary (Biodiversity Conservation Regulation Section 7.3)		
1.1	**Does the development Footprint intersect with BV mapping?**	no
1.2	Was ALL BV Mapping within the development footprinted added in the last 90 days? (dark purple mapping only, no light purple mapping present)	no
1.3	**Date of expiry of dark purple 90 day mapping**	N/A
1.4	**Is the Biodiversity Values Map threshold exceeded?**	no
2. Area Clearing Threshold - Results Summary (Biodiversity Conservation Regulation Section 7.2)		
2.1	**Size of the development or clearing footprint**	67,404.0 sqm
2.2	**Native Vegetation Area Clearing Estimate (NVACE)** (within development/clearing footprint)	67,404.0 sqm
2.3	**Method for determining Minimum Lot Size**	LEP
2.4	**Minimum Lot Size** (10,000sqm = 1ha)	450 sqm
2.5	**Area Clearing Threshold** (10,000sqm = 1ha)	2,500 sqm
2.6	**Does the estimate exceed the Area Clearing Threshold?** (NVACE results are an estimate and can be reviewed using the Guidance)	yes

REPORT RESULT: Is the Biodiversity Offset Scheme (BOS) Threshold exceeded for the proposed development footprint area? (Your local council will determine if a BDAR is required)	**yes**

What do I do with this report?

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

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

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

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

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

Review Options:

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

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

Acknowledgement

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

Signature: _____ Date:_____

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

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Biodiversity Values Map and Threshold Tool

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

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

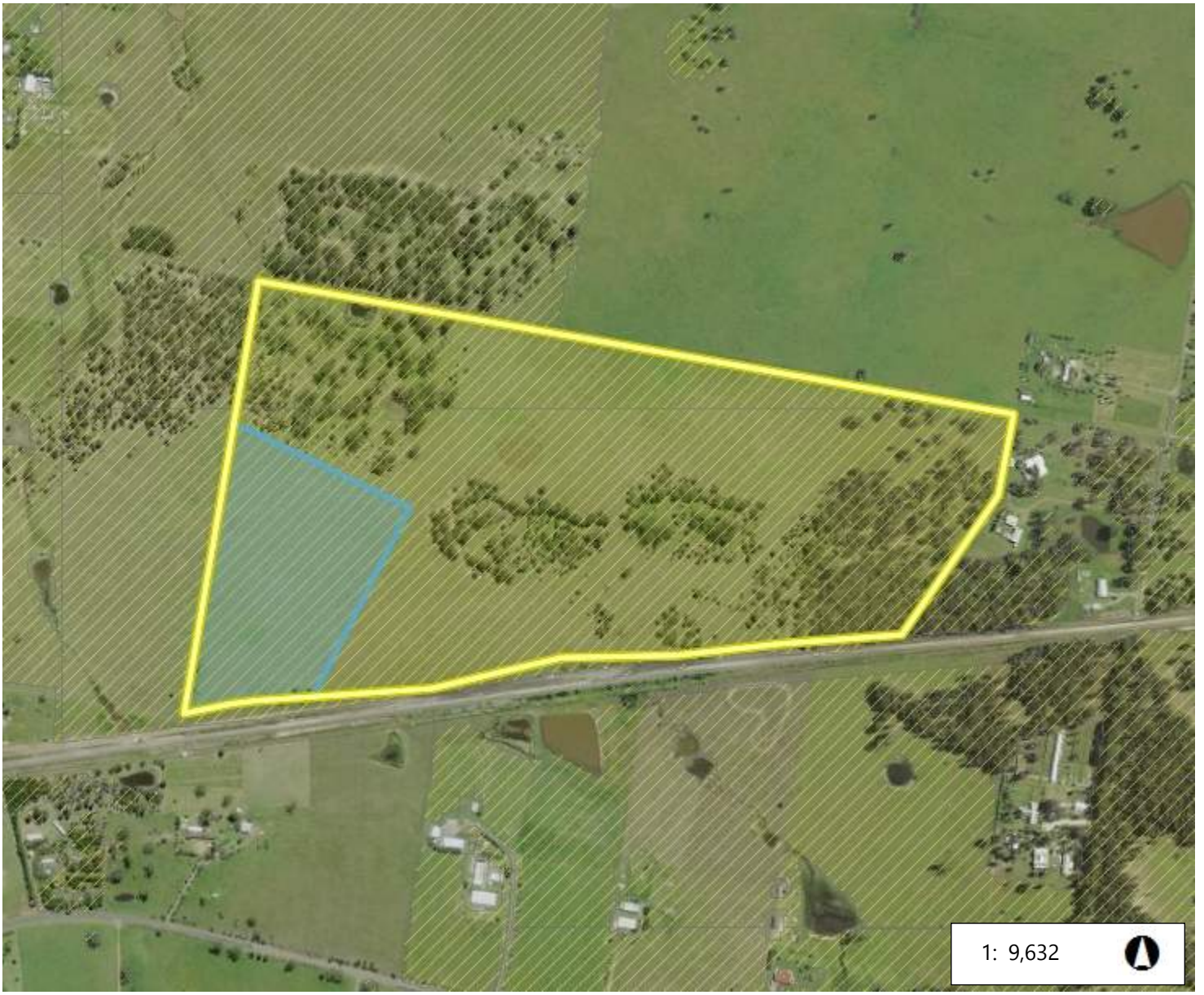
This report may be used as evidence for development applications submitted to councils. You may also use this report when considering native vegetation clearing under the State Environmental Planning Policy (Biodiversity and Conservation) 2021 - Chapter 2 vegetation in non-rural areas.

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

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

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

Biodiversity Values Map



489.3 0 244.66 489.3 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

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

Legend

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

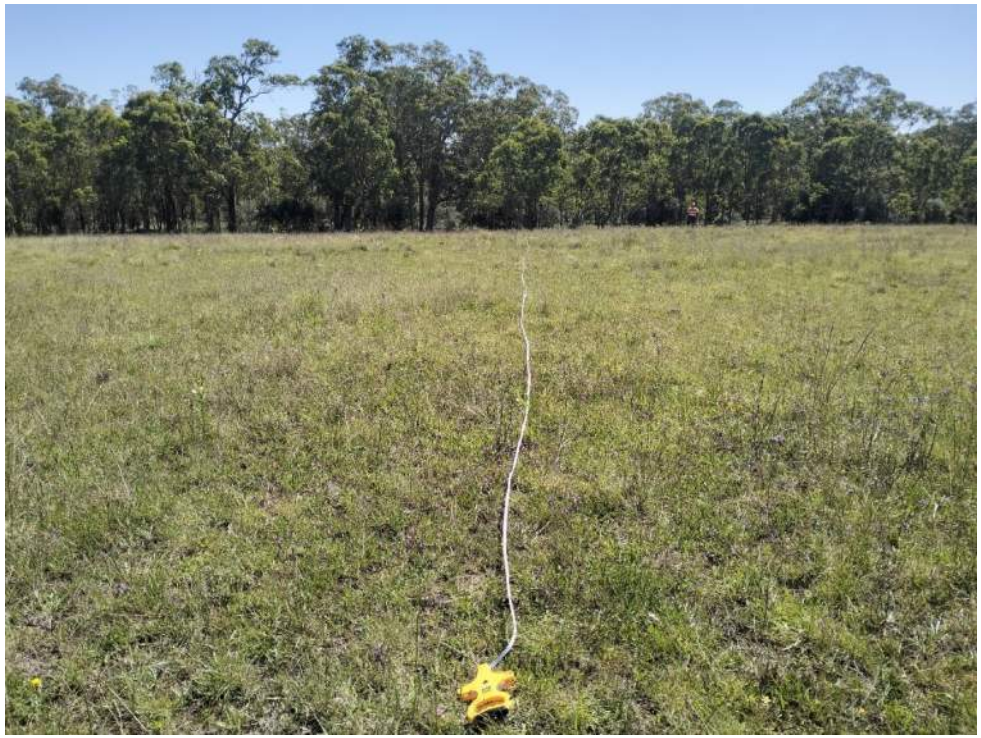
03/02/2025 03:05 PM

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

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

APPENDIX G QUADRAT PHOTOS

Quadrat 1 – Start (left), Finish (right)



Quadrat 2 – Start (left), Finish (right)

Quadrat 3 – Start (left), Finish (right)