ecoplanning
ecology | planning | offsets

Flora and Fauna Assessment

39 Redground Road, Crookwell, NSW

Prepared for: Jeffrey Bulfin

18 February 2025 Version: 1.0 – Final

PROJECT NUMBER	2025-014			
PROJECT NAME	Flora and Fauna Assessment			
PROJECT ADDRESS	39 Redground Road, Crookwell, NSW			
PREPARED FOR	Jeffrey Bulfin			
AUTHOR/S	Jai Brien-Cooper			
REVIEW	**Technical**	**QA**	**Version**	**Date to client**
	Lucas McKinnon		Final – 1.0	18/2/2025
	Lucas McKinnon		Draft – 0.1	17/2/2025
ACKNOWLEDGEMENTS	Unless referenced, all data presented in this report was collected and analysed by Ecoplanning			
LICENCES	**Scientific Licence**		SL101557	
	Bionet Sensitive Species Data Licence		1115	
	Animal Research Authority Ethics Licence		Fauna Surveys and Monitoring (16/346)	
	Scientific Collection - Aquatic		P19/0009-1.0 & OUT19/2602	

This report should be cited as: 'Ecoplanning (2025). Flora and Fauna Assessment– 39 Redground Road, Crookwell, NSW (v Final 1.0). Prepared for Jeffrey Bulfin.'

ECOPLANNING PTY LTD | 428 PRINCES HIGHWAY WOONONA NSW 2517 | P: (02) 4244 2736

Contents

Appendices

Figures

Tables

Glossary and abbreviations

Acronym	Description
*	Denoted a non-native species
AOO	Area Of Occupancy
BC Act	NSW *Biodiversity Conservation Act 2016*
BC Reg	NSW Biodiversity Conservation Regulation 2017
BoM	Bureau of Meteorology
BOS	NSW Biodiversity Offsets Scheme
CEEC	Critically Endangered ecological Community
CEMP	Construction Environmental Management Plan
Cth. TSSC	Commonwealth Threatened Species Scientific Committee
DSEWPaC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities
DPE	NSW Department of Planning and Environment (now separated into NSW DCCEEW and
DPIE	NSW Department of Planning, Industry, and Environment
EEC	Endangered Ecological Community
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FFA	Flora and Fauna Assessment (referring to this report)
LGA	Local Government Area
MNES	Matters of National Environmental Significance
NRAR	NSW Natural Resources Access Regulator
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment, and Water

Acronym	Description
NSW DPHI	NSW Department of Planning, Housing, and Infrastructure
PCT	Plant Community Type
PMST	Protected Matters Search Tool
Potential koala habitat	*Areas of native vegetation where trees of the types listed in Schedule 1 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component* (as per Section 3.2 of the SEPP-BC Act)
Proposed development	The proposed rezoning and subdivision of the study area.
RFI	Review for Further Information
SEPP-BC	State Environmental Planning Policy (Biodiversity and Conservation) 2021
SEPP-BC	NSW State Environmental Planning Policy (Biodiversity and Conservation) 2010
SPRAT	Species Profile and Threat Database
Study area	39 Redground Road, Crookwell (Lot 1/-/DP1064795), NSW in its entirety
SVTM	State Vegetation Type Map
Threatened entity	Any threatened species, population, migratory species, or ecological communities listed as threatened under either the BC Act or EPBC Act
ULLEP	Upper Lachlan Local Environmental Plan 2010
VZ	Vegetation Zone

1 Introduction

This Flora and Fauna Assessment (FFA) has been prepared to identify and assess the likely impacts of future development of 39 Redground Road (Lot 1/-/DP1064795), Crookwell, NSW (the "Study Area"; **Figure** 1.1). It has been prepared to address the queries relating to Biodiversity Values as outlined in a request for further information (RFI) from NSW Department of Planning and Environment (DPE) (now part of NSW Department of Climate Change, Energy, the Environment, and Water [DCCEEW]) (NSW Department of Planning and the Environment (DPE) 2023), which requested these values be assessed by either an FFA or application of Stage 1 of the NSW Biodiversity Assessment Method (BAM; NSW Department of Planning, Industry, and Environment [DPIE 2020]).

Expected impacts to biodiversity resulting from a proposed development must be documented under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Under Part 4 of the EP&A Act, potential impacts can either be assessed via an FFA or a Biodiversity Development Assessment Report (BDAR) depending on if entry into the NSW Biodiversity Offset Scheme (BOS; as established by the *NSW Biodiversity Conservation Act 2016* [BC Act]) is triggered. Entry requirements of the BOS are listed in section 7.3 of the NSW *Biodiversity Regulation 2017* (BC Reg). If a BDAR is required, then impacts on biodiversity values from the proposed development must be offset, and entry into the NSW BOS is required. If entry into the BOS is not required, then impacts to biodiversity do not exceed these entry requirements, then impacts can be accessed via an FFA.

The potential impacts of the proposed development have been tested against the BOS entry thresholds (**Section 4.4.3**) and will not exceed any threshold.

This report aims to address the legislative context provided in **Table** 1.1. The findings of this report will inform the future proposed development within the study area.

Table 1.1: Legal framework addressed within this report.

Instrument	Relevant section
Commonwealth	
Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Part 3, Division 1 – Requirements relating to matters of national environmental significance
NSW State	
Biodiversity Conservation Act 2016 (BC Act)	Section 7.3 – Test of Significance for threatened species, communities, and their habitats
Environmental Planning and Assessment Act 1979 (EP&A Act)	Part 4 – Development assessment and consent
State Environmental Planning Policy (Biodiversity Conservation) 2021 (SEPP-BC)	Chapter 3 – Koala Habitat Protection 2020
Upper Lachlan Local Environmental Plan 2010 (ULLEP)	Section 6.2 – Biodiversity

1.1 Proposal background

1.1.1 The study area

The study area is approximately 2 hectares (ha) in area, is located within the Upper Lachlan Local Government Area (LGA), and is zoned as RU1 – Primary Production under the Upper Lachlan Local Environmental Plan 2010 (ULLEP) (**Figure** 1.2), as per the Land Zoning Map number 5C (ULLEP 2010a).

The study area is dominated by exotic grasses (viz. *Phalaris aquatica**) and approximately five sheds. No waterways have been mapped within the study area, nor have any areas of the subject land been mapped as containing areas of biodiversity value on the NSW Biodiversity Values (BV) map (**Figure** 1.3).

1.2 Proposed development

The proposed development of the study area aims rezone it from RU1 - Primary Production to R2 – Low Density Residential. It is expected that the future subdivision of the study area will result in the creation of 21 new lots, each being approximately 800 square metres (m^2), and allocation of an access road. Proposed plans of the subdivision are shown in **Figure** 1.4 (received 13 February 2025). It has been assumed that total clearance of all vegetation within the study area will be required for the future subdivision and development.

For the purposes of this report, the proposed rezoning and subdivision of the study area will be termed the proposed development.

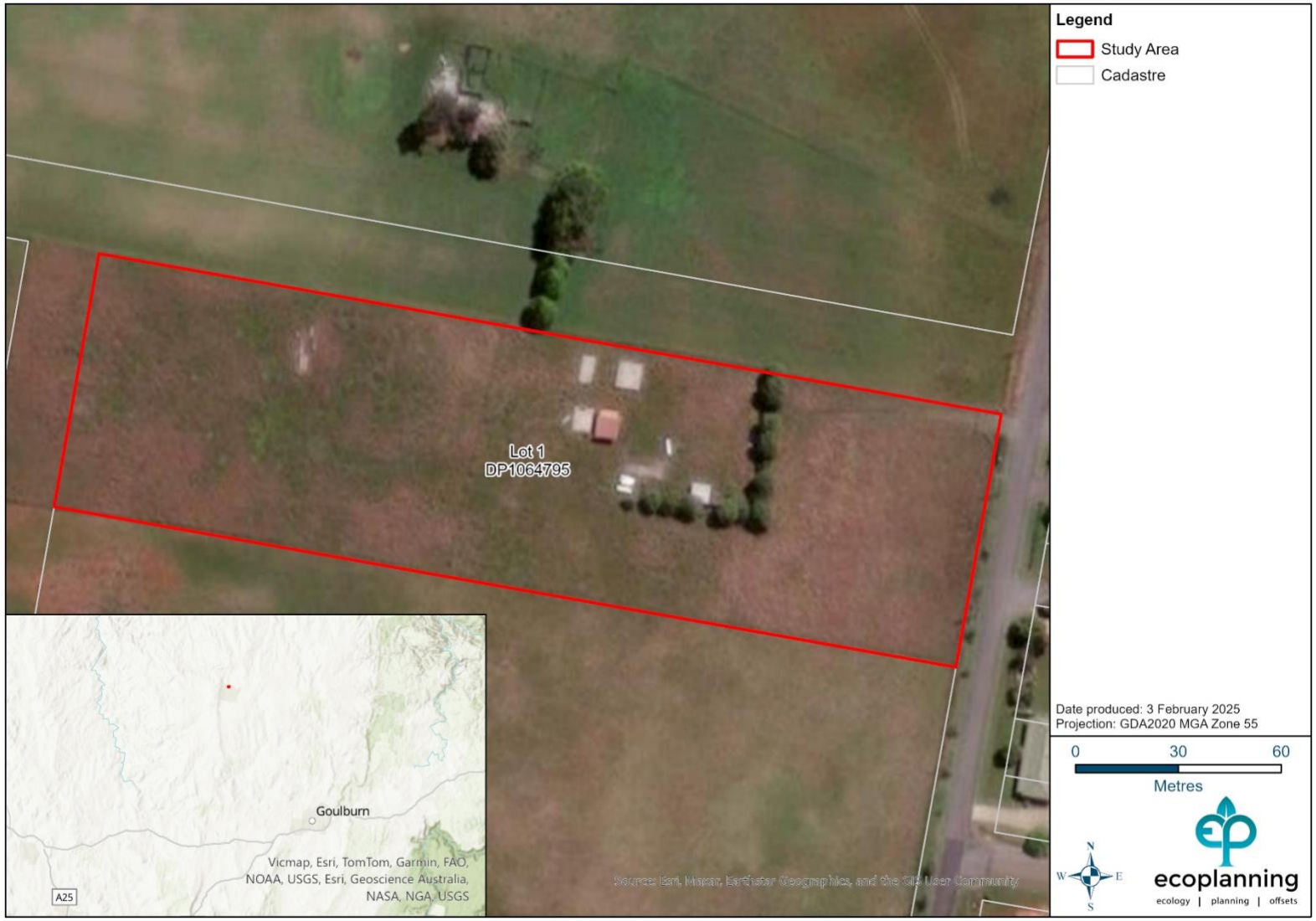

Figure 1.1: Location of the study area.

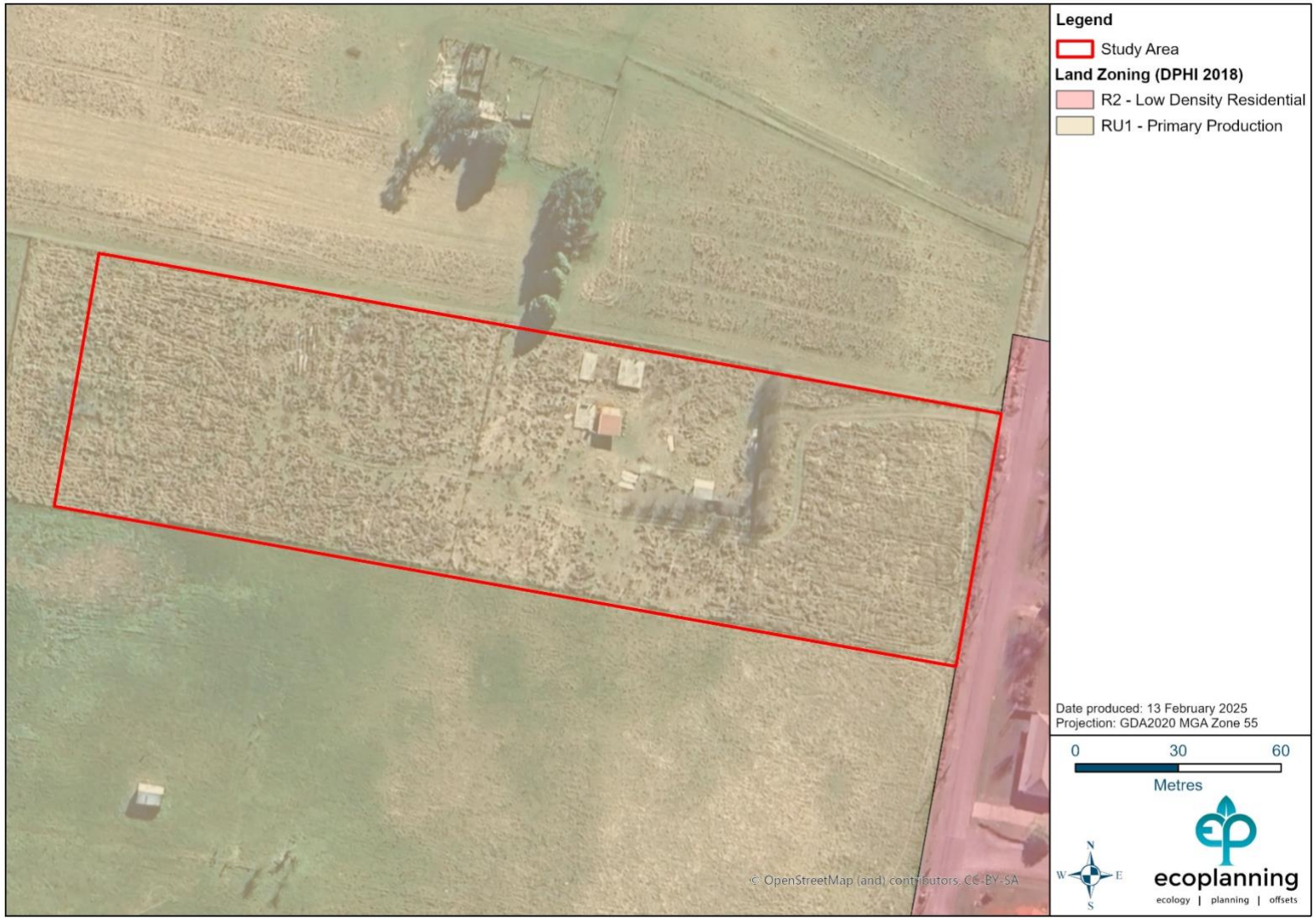

Figure 1.2: Land zoning of the study area, as per Land Zoning Map 5C (ULLEP 2010a).

Figure 1.3: Areas mapped on the NSW Biodiversity Values Map (version 17.4; NSW DCCEEW 2024c) and mapped waterways (DCS 2018) in relation to the study area.

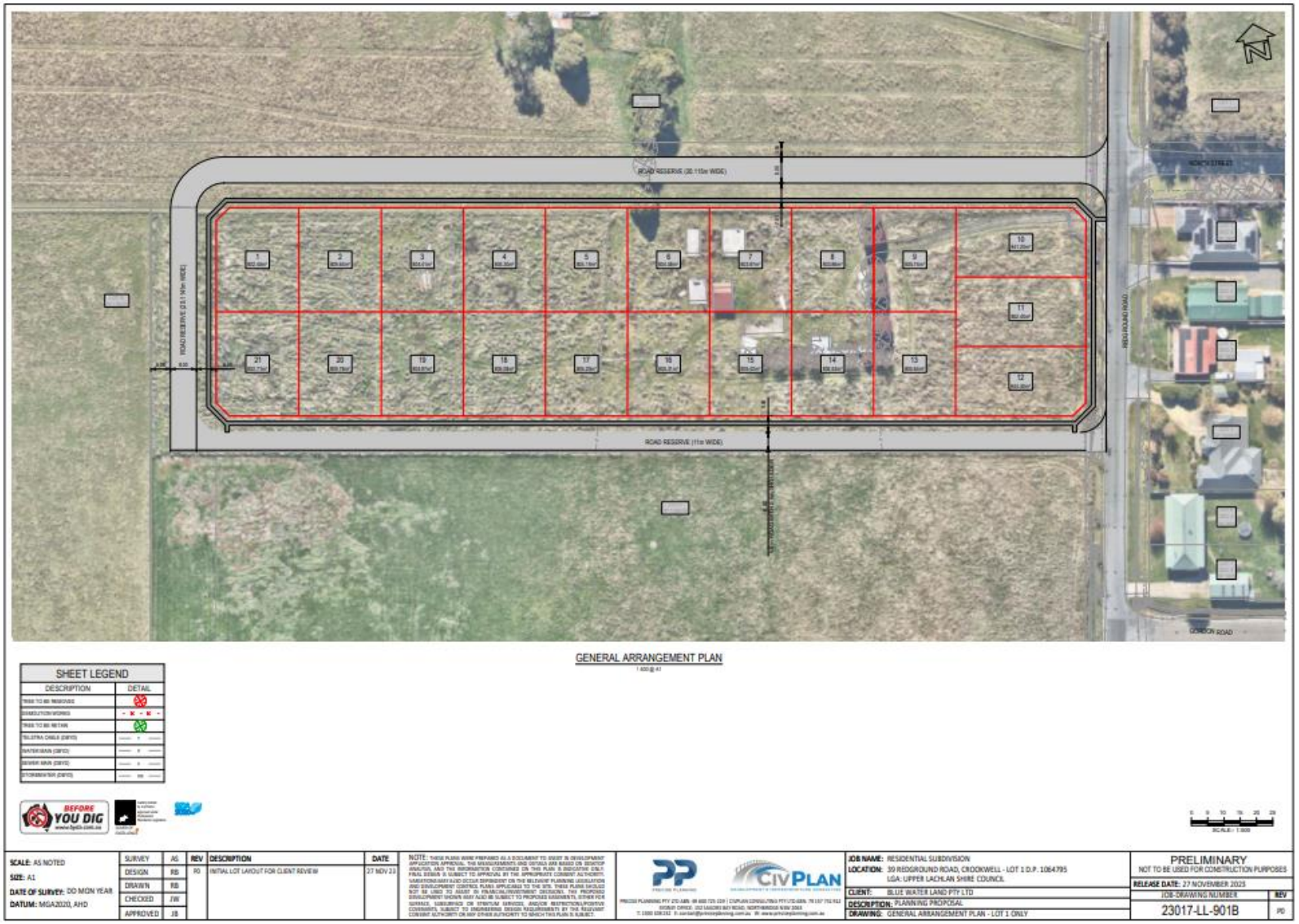

Figure 1.4: Proposed layout for the subdivision of the study area (received 13 February 2025).

2 Methods

2.1 Literature review

A site-specific literature and database review were undertaken for this report. This included desktop analysis of aerial photography and review of regional scale information from the following sources:

- ePlanning Spatial Viewer (DPHI 2025)
- BioNet Atlas (NSW DCCEEW 2025a)
- Protected Matters Search Tool (Comm. DCCEEW 2025)
- SIX Maps (LPI 2025a)
- NSW State Vegetation Type Map (SVTM; NSW DCCEEW 2025b)
- Pre-clearings SVTM (NSW DCCEEW 2024c)
- Historic Image Viewer (LPI 2025b)
- Historic Aerial Photography Viewer (Geoscience Australia 2025)

2.1.1 Threatened species likelihood of occurrence

Threatened species, populations and migratory species recorded within 5 km of the study area in a search of the BioNet Atlas (NSW DCCEEW 2025a) are typically considered appropriate for this assessment, however, a review of the available information indicated there was a relatively low number of threatened species records within 5 km if the study area. In this situation, it was considered necessary to increase the assessment area from 5 km to 10 km. Additionally, only recent (<20 years old) BioNet records were considered relevant for the current assessment.

A species likelihood of occurrence was assessed by:

- “Recent record” = species has been recorded in the study area within the past 5 years
- “High” = species has previously been recorded in the study area (<5 years ago) or in proximity (for mobile species), and/or habitat is present that is likely to be used by a local population.
- “Moderate” = suitable habitat for a species is present onsite but no evidence of a species detected and relatively high number of recent records (5-20 years) in the local area or species is highly mobile.
- “Low” = suitable habitat for a species is present onsite but limited or highly degraded, no evidence of a species detected and relatively low number of recent records in the local area.
- “Not present” = suitable habitat for the species is not present onsite or adequate survey has determined species does not occur in the study area.

2.1.2 Historic aerial imagery

Historic aerial imagery from the NSW Historic Image Viewer (LPI 2025b) and the Historical Aerial Photography Viewer (Geoscience Australia 2025) were reviewed to ascertain what the history of the study area may have been. This assessment was completed to help inform the likelihood of occurrence for threatened species which may be present within the study area.

2.2 Field survey

A field survey was undertaken on 13 September 2023 by Jai Brien-Cooper (Consultant Ecologist) and Zahra Spitznagel-Reeves (Field Ecologist). This survey consisted of a meander through the study area to determine the distribution of vegetation patches and to identify habitat which may be utilised by native wildlife.

2.2.1 Vegetation communities and flora

Field survey involved traversing the study area, whilst recording visible flora species and identifying potential habitat for threatened flora species. Areas of intact, resilient vegetation were surveyed more extensively than cleared/degraded areas of the site. Nomenclature follows the Flora of NSW (Harden 1990-2000), and updates from PlantNet (2025).

Field survey was undertaken to validate regional vegetation mapping from the SVTM (NSW DCCEEW 2024b). Validated vegetation communities were then checked against the descriptions of threatened ecological communities listed under the BC Act and/or EPBC Act.

2.2.2 Flora and fauna habitat

Opportunistic fauna survey was undertaken for birds, amphibians, reptiles, and mammals, which included recording signs of direct and indirect occupancy (i.e., scats, owl pellets, fur, bones, tracks, bark scratches, foliage chew marks).

Fauna habitat searches were conducted for potential foraging, roosting, breeding or nesting habitat of nocturnal and diurnal species. This includes inspection for the presence of tree hollows, stags, bird nests, possum dreys, decorticating bark, rock shelters, rock outcrops/crevices, mature/old growth trees, food trees (*Banksia* spp., *Allocasuarina* spp., and winter-flowering eucalypts), culverts, dens, dams, riparian areas, and refuge habitats of man-made structures.

Plant community types

In NSW, vegetation communities have been compartmentalised into vegetative units known as plant community types (PCTs). PCTs are defined by a range of characteristics, not only the assemblages of plant species, but also its position in the landscape, soils type, etc. The definitions of PCTs are compiled on the NSW BioNet Vegetation Classification (NSW DCCEEW 2025b), with each PCT having a ‘common name’, ‘scientific name’ and PCT ID or number. To assess the number of potential PCTs that may be present in the study area, mapped PCTs within 1,500 m of the study area were considered.

The most recent vegetation mapping for eastern NSW is ‘A revised classification of Plant Community Types for eastern New South Wales (Connolly et al. in prep.). All PCTs under the most recent version are identified ID numbers >3000 (e.g., PCT 3415). Many PCTs from previous versions have been amalgamated or divided into the new version, while others have been directly transferred (with the addition of more detailed diagnostic information). These new PCTs have been in effect since late 2023 and the current PCT identification scheme (PCT IDs >3000) will be utilised in this report.

2.2.3 Survey limitations

The field survey aimed to record as many flora species as possible. However, a definitive list of the flora within the study area cannot be gathered without systematic traverses and survey across several seasons. The techniques used in this investigation are considered adequate to gather the data necessary to validate the vegetation communities and vegetation condition within the study area and assess the likelihood of occurrence of any threatened flora species.

All species recorded were identified to species and sub-species level where possible, however, for some species, such as several grasses and forbs, identification remained conservatively at the genus level when reproductive or other diagnostic material required for full identification was lacking at the time of survey.

A full threatened fauna survey following the most recent BAM guidelines (frogs DPIE [2020b], plants [DPIE 2020c], koala [DPE 2022], reptiles [DPE 2022b], bats [OEH 2018]) or identified on BioNet (NSW DCCEEW 2025a) were not undertaken as sufficient detail to determine the likelihood of occurrence of threatened and migratory species for the purpose of this report was achieved through a habitat assessment during the field survey.

All mapping has been completed with the assumption of an accuracy of ±5 m.

3 Results

3.1 Literature review

3.1.1 Threatened species and populations, and migratory species

A search of the BioNet Atlas – completed on 03/02/2025 – found 31 recent records of nine threatened species within 10 km of the study area: three birds, two mammals, and one plant (**Figure** 3.1). No recent records of threatened species or populations, or migratory species have been made within the study area. No threatened species had a likelihood of occurrence greater than 'Low'. **Appendix A** presents the likelihood of occurrence analysis results for all threatened species records considered relevant.

3.1.2 Plant communities

A review of plant communities mapped on the SVTM within 1.5 km of the study area identified six PCTs. No native vegetation was mapped by the SVTM within the study area. The nearest patch of native vegetation to the study area was 15 m to the north of the study area and was mapped as "Crookwell-Taralga Basalt Grassy Forest" (PCT 3295). **Table** 3.1 summarises all PCTs mapped within 1.5 km of the study area.

Table 3.1: Plant Community Types (PCTs) and their associated threatened ecological communities, mapped within 1.5 km of the study area, including the area of each PCTs within 1.5 km of the study area and the proximity of the nearest patch.

Plant Community Type	Area mapped within 1.5 km (ha)	Proximity of nearest patch (m)
PCT 3295 - Crookwell-Taralga Basalt Grassy Forest	0.35	15
PCT 3347 - Southern Tableland Creekflat Ribbon Gum Forest	0.77	1141
PCT 3366 - Central Tableland Clay Apple Box Grassy Forest	0.01	38
PCT 3369 - Central Tableland Ranges Peppermint-Gum Grassy Forest	1.38	1220
PCT 3370 - Central Tableland Red Stringybark Grassy Forest	0.04	1175
PCT 3374 - Goulburn Tableland Peppermint Grassy Forest	1.16	288
Total area	**3.71**	

Threatened ecological communities

No threatened ecological communities (TECs) were identified within the study area, as no native vegetation was mapped within the study area. The nearest potential TEC mapped to the study area was "Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions" associated with PCT 3295, which is listed as an endangered ecological community (EEC) under the BC Act. **Table** 3.2 identifies the most likely TEC for PCTs mapped within 1.5 km of the study area.

Table 3.2: Threatened ecological communities mapped, on the State Vegetation Type Map, within 1.5 km of the study area

PCT	BC Act TEC*	EPBC Act TEC*
PCT 3295	EEC - Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	-
PCT 3347	-	-
PCT 3366	EEC - Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	-
PCT 3369	-	-
PCT 3370	EEC - Mt Canobolas Xanthoparmelia Lichen Community	-
PCT 3374	-	-
PCT 3295	EEC - Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	-

*EEC – Endangered Ecological Community; CEEC – Critically Endangered ecological Community

Pre-clearing vegetation mapping

The pre-clearing SVTM (shown in **Figure** 3.3) identified the same PCTs as the post-clearing SVTM, just with larger areas. PCT 3366 and 3295 accounted for the largest proportion of the area within 1.5 km of the study area (42.5% and 40.2%, respectively; **Table** 3.3) and were predicted to be present within the study area (**Figure** 3.3).

Table 3.3: Predicted areas of PCT predicted to be present within 1.5 km of the study area, as modelled by the pre-clearing SVTM.

Plant Community Type	Area mapped within 1.5 km (ha)
PCT 3295 - Crookwell-Taralga Basalt Grassy Forest	326
PCT 3347 - Southern Tableland Creekflat Ribbon Gum Forest	9
PCT 3366 - Central Tableland Clay Apple Box Grassy Forest	344
PCT 3369 - Central Tableland Ranges Peppermint-Gum Grassy Forest	10
PCT 3370 - Central Tableland Red Stringybark Grassy Forest	1
PCT 3374 - Goulburn Tableland Peppermint Grassy Forest	120
Total area	**810**

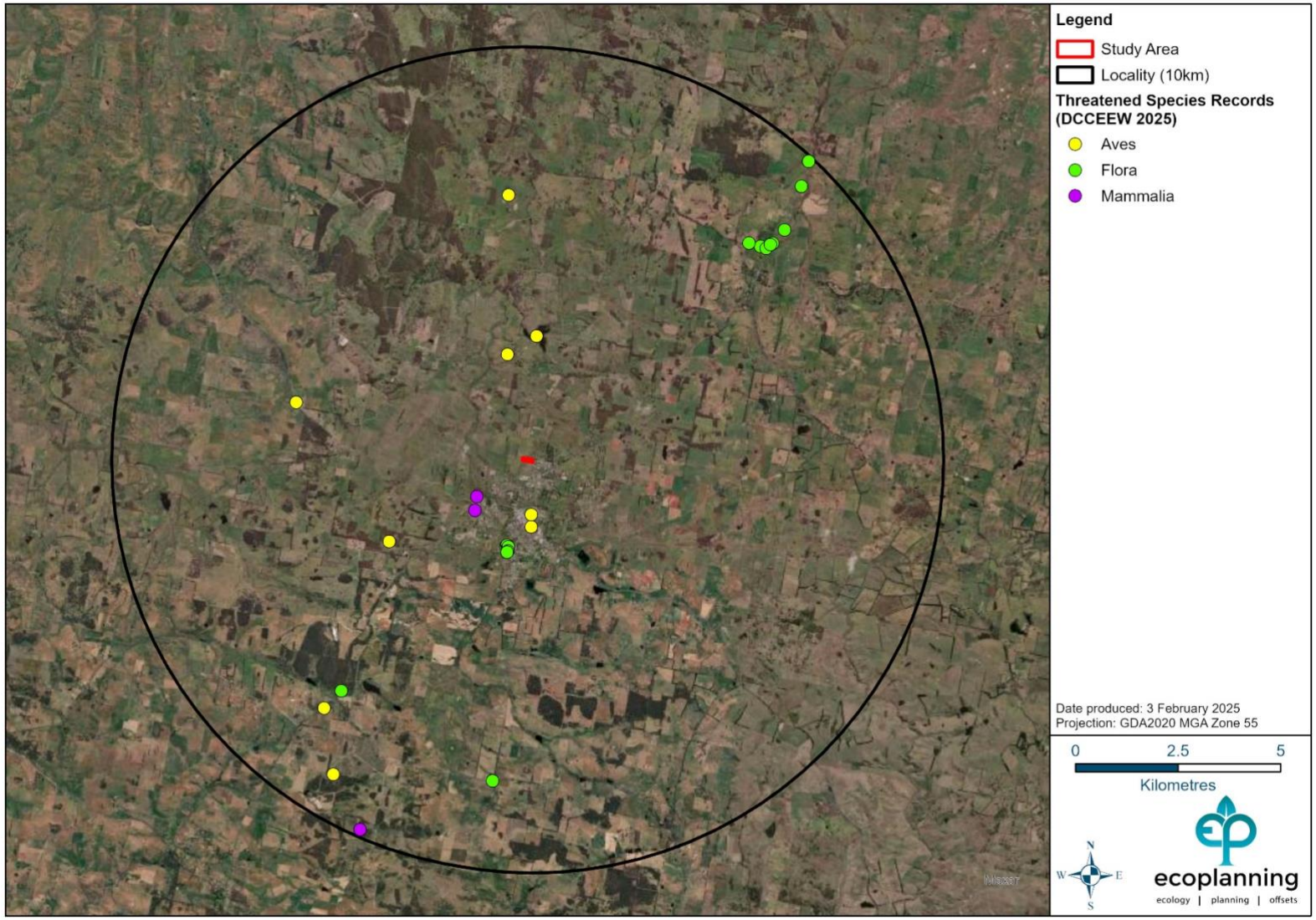

Figure 3.1: Recent (<20 years old) records of threatnened species (organised by Class) within in 10 km of the study area (NSW DCCEEW 2025a).

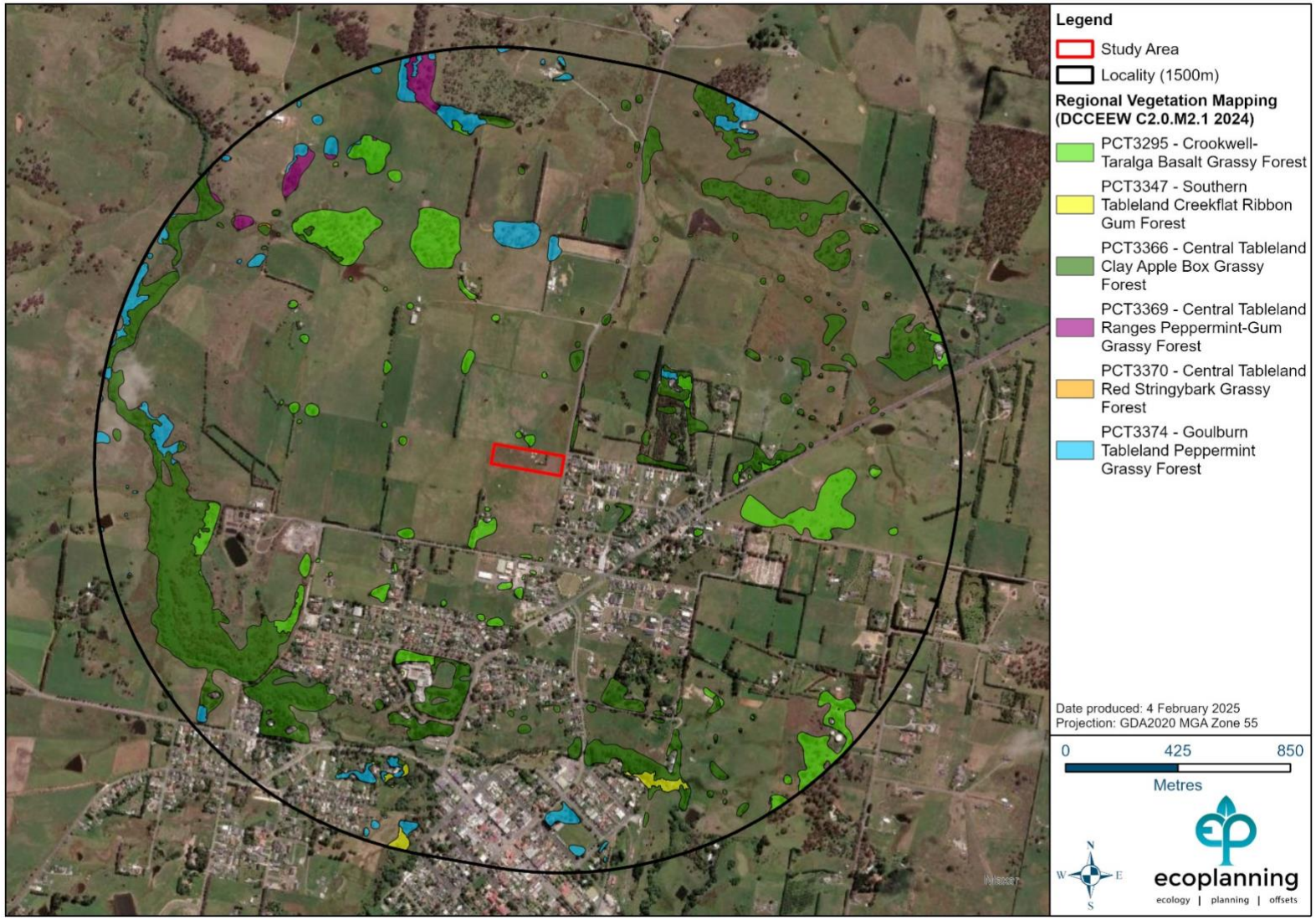

Figure 3.2: Plant Community Types (PCTs) mapped within 1.5 km of the study area.

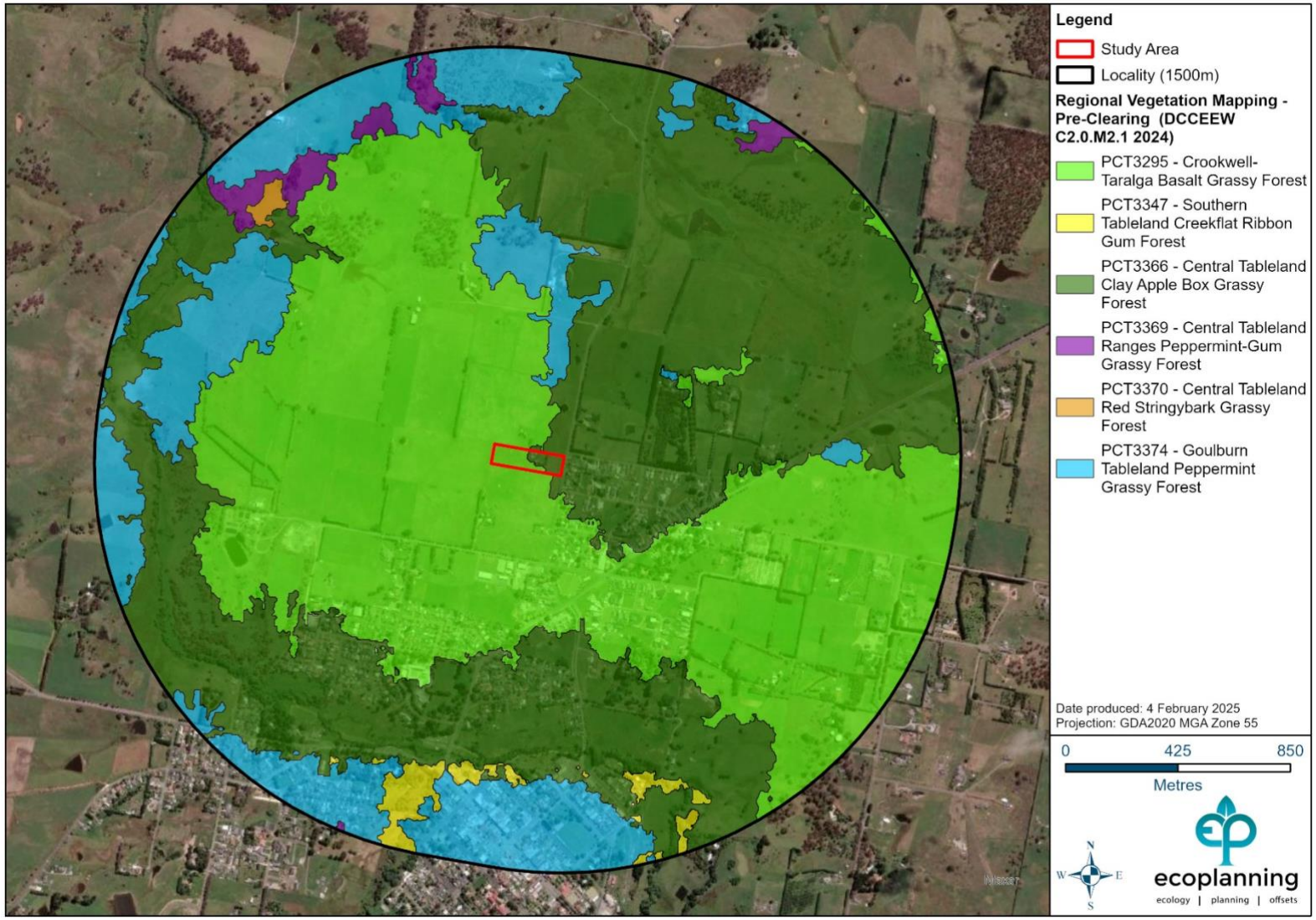

Figure 3.3: Predicted vegetation mapping from the pre-1750 State Vegetation Type Map (NSW DCCEEW 2024c).

3.1.3 Historic aerial imagery

A review of historic aerial imagery shows that the study area has been subject to a range of disturbances, mainly due to agricultural practices. The date when the original native vegetation was cleared cannot be derived from aerial imagery, however, it was at least >72 years ago, as the oldest aerial image available is from 1953 (**Figure** 3.4), and shows no wooded vegetation in the study area (based on **Section 3.1.2**, the pre-clearing native vegetation is expected to be a wooded community). **Figure** 3.5 shows more recent evidence of agricultural practices between 1968 and 1988. Some properties neighbouring to the study area may have undergone historic ploughing, for pasture improvement or cropping, as indicated by feint parallel lines. It is also likely that the study area has undergone some level of ploughing, although this cannot be confirmed based on aerial imagery.

Based on a review of more recent aerial imagery, it is likely that the *P. aquatica** infestation is a recent feature of the study area, as **Figure** 3.6 shows the progression of the *P. aquatica** over the course of five years (August 2018 to March 2023) within the study area.

Figure 3.4: Oldest available aerial image (image number 1168_10_116), dated 31 December 1962.

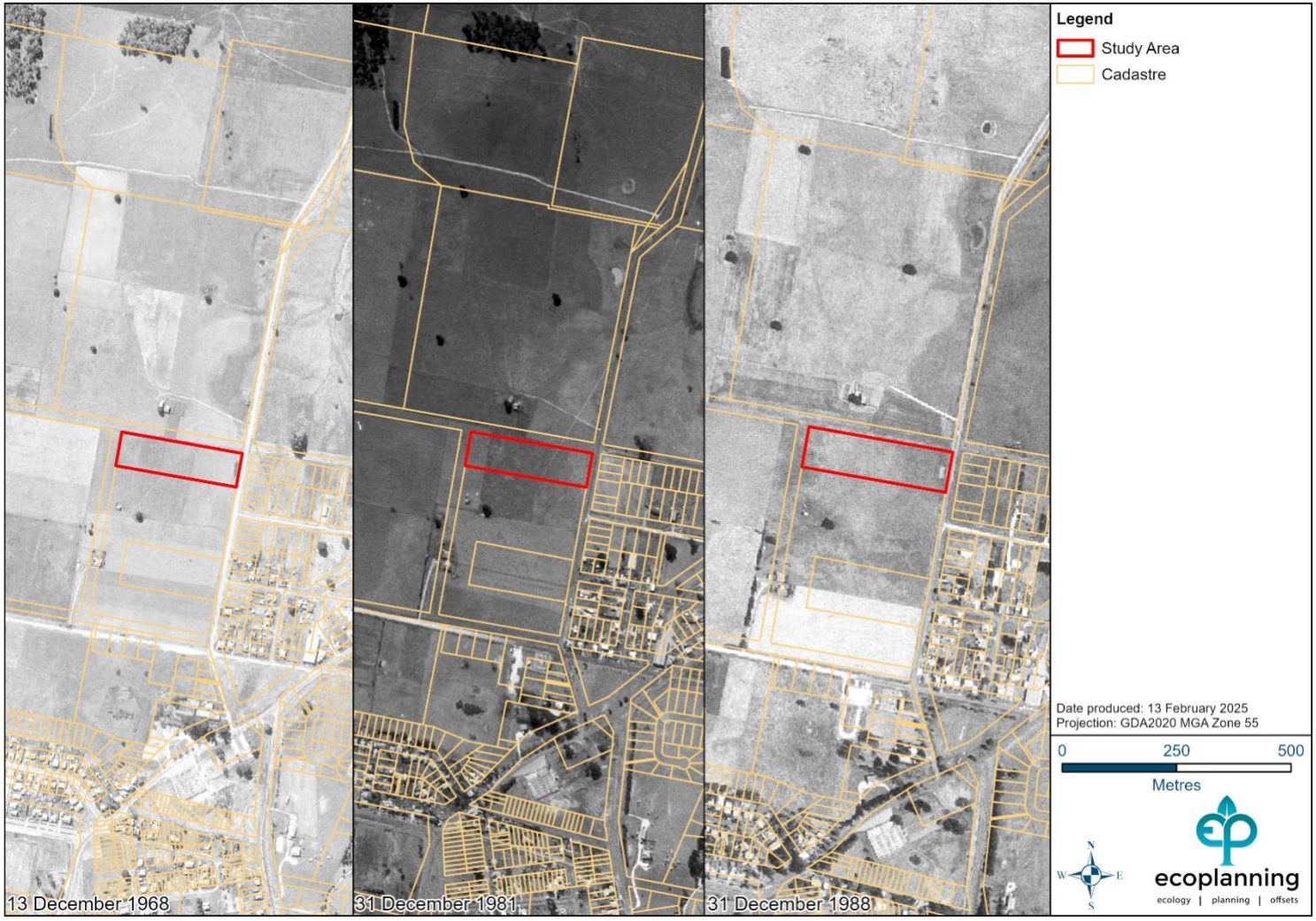

Figure 3.5: Aerial image of the study area and surrounding land indicating historic ploughing has occurred within the study area (LPI 2025b): Left – image number 1633-10-21 (dated 13/12/1968); Middle – Image number 3257-08-026 (dated 31/12/1981); Right – Image number 3709-06-025 (dated 31/12/1988).

Figure 3.6: **Three aerial images of the study area :**
Top – dated 22 August 2018, showing the majority of the study area free of the *P. aquatica infestation.**
Middle – dated 27 April 2021, showing a moderate infestation of *P. aquatica at the rear of the study area.**
Bottom – dated 8 March 2023 (close to the time of survey), showing infestation of *P. aquatica within the study area.**

3.2 Field survey

3.2.1 Vegetation validation

Within the study area, no areas could be allocated a most likely PCT as little native vegetation was present. Instead, the study area was divided into two broad vegetation zones (VZ): exotic grassland (VZ1) which accounted for 1.97 ha and structures (VZ2) accounting for 0.03 ha (**Table** 3.4 and **Figure** 3.7). A full list of flora and fauna recorded in the study area is presented in **Appendix B**.

Table 3.4: Vegetation zones mapped within the study area.

Vegetation zone	Area (ha)
Exotic grassland	1.97
Sheds	0.03
Total area	**2.00**

Vegetation zone 1 – Exotic grassland

This vegetation zone had a low cover of native species and was instead dominated by the exotic grass *Phalaris aquatica** (Harding Grass) (**Plate** 3.1). Small patches of the study area had other weeds, including *Cenchrus clandestina** (Kikuyu Grass), *Trifolium repens** (White Clover), and *Medicago* spp.* (Medics). The main native species identified within this vegetation zone was *Microlaena stipoides* (Weeping Meadow Grass), although, its cover was <1% of the vegetation zone.

Vegetation zone 2 – Sheds and other structures

This vegetation zone was characterised by several small structures, including a shipping container and sheds, located on the centre of the northern boundary of the study area (**Plate** 3.2 and **Figure** 3.7).

Threatened ecological communities

No threatened ecological communities were present within the study area.

Plate 3.1: Example of Phalaris aquatica within the study area.

Plate 3.2: Example of a small shed in Vegetation Zone 2.

Figure 3.7: Validated vegetation within the study area.

3.2.2 Threatened species and populations, and migratory species

No threatened species were observed within the study area. Following the threatened species habitat data collected during the field survey were used to inform a post-survey likelihood of occurrence assessment for threatened species and populations, and migratory species.

Although no recent BioNet records for Striped Legless Lizard (*Delma impar*) have been made within 10 km of the study area, potential habitat for this species was identified in the study area. Ideal habitat for Striped Legless Lizard is typically described as native grasslands and derived native grasslands (OEH 2025), although, recent research (Howland et al. 2016) has shown that this species can inhabit grasslands with a high cover of exotic grasses, viz. *P. aquatica** (**Plate** 3.1).

However, although potential habitat for the species is present within the study area, three factors indicated that this species is unlikely to occur, and the likelihood of occurrence of the species is 'Low'. Firstly, the nearest records of Striped Legless Lizard are from Pejar Dam (approximately 18 km to the southeast of the study area). Secondly, historic aerial imagery shows that agriculture has been present in the study area, and areas surrounding the study area for at least 70 years (Section 3.1.3). Agricultural practices that would have likely occurred through this >70 year history may have included repeated ploughing (for pasture improvement and cropping) and intense grazing, both of which are a detriment to Striped Legless Lizard presence. Lastly, the *P. aquatica** infestation (associated with the potential habitat for Striped Legless Lizard) is a recent feature of the study area, as shown by aerial imagery between 2018 and 2023.

Regardless, a Test of Significance – in accordance with section 7.3 of the BC Act – was completed for the Striped Legless Lizard. This assessment is presented in **Appendix C** and is discussed further in **Section 4.4.2**.

4 Impact assessments

This section outlines the anticipated direct and indirect impacts of the proposed works within the study area. Avoidance and mitigation measures are also proposed in this section.

4.1 Direct impacts

As discussed in **Section 1.2**, total clearance of the study are has been assumed based on the proposed subdivision plans (**Figure** 1.4). This would result in a direct impact to the small areas of native vegetation present (small patches of *M. stipoides* that accounted for <1% of the study area) and any native fauna which may use the study area for habitat or foraging. Areas of potential habitat for native fauna, including the vulnerable, Striped Legless Lizard, as monocultures of *P. aquatica** (VZ1) have been noted as potential habitat for this vulnerable species. Other potential habitat features in the study area are the sheds, which may be used by microbats as roosting habitat.

As no local population of Striped Legless Lizard has been verified by survey, impacts to Striped Legless Lizard are based on there being an assumed (which is unlikely), as there is no known nearby population of Striped Legless Lizard (the nearest being approximately 18 km to the southeast of the study area). Potential for direct impacts to Striped Legless Lizard have been assessed via a Test of Significance (following section 7.3 of the BC Act) and conclude there will be no significant impacts, even if there is an assumed local population of Striped Legless Lizard (**Appendix C**).

4.2 Indirect impacts

It is difficult to quantify the indirect impacts of the proposed development, but these may include impacts such as noise, light spill, erosion, weed spread, stormwater runoff, and edge effects associated with the removal of vegetation and construction. These impacts can be either avoided or mitigated through development of a Construction Environmental Management Plan (CEMP).

4.3 Avoidance and mitigation

4.3.1 Areas of native vegetation

As there is little native vegetation within the study area (<1% of the study area was native vegetation), no attempts of avoidance have been made at this preliminary stage of planning.

4.3.2 Areas of non-native vegetation

As the majority of the study area has been mapped as non-native vegetation (viz. *P. aquatica**) impacts to non-native vegetation are the primary impact expected to arise due to any proposed development within the study area.

4.3.3 Threatened species habitat

Are noted previously, the areas dominated by *P. aquatica** are considered as potential habitat for Striped Legless Lizard. No targeted surveys for Striped Legless Lizard have been completed for this FFA and no records for the species are available on BioNet (**Figure** 3.1),

therefore, a local population of the species can only be assumed (although, its presence is unlikely). Following the BC Act Test of Significance (**Appendix C**), there is not expected to be any significant impacts that would arise from the proposed development. However, at this preliminary stage of planning, there has been no attempts of avoid of avoid or minimise made with regards to the potential habitat for this species.

4.4 Legislative context

4.4.1 Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*

Part 3, Division 1 – Matters of National Environmental Significance

If an activity may have a significant impact on protected matters (defined as entities that are protected under the EPBC Act) a Significant Impact Assessment must be completed. These assessments are to follow *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* (DoE 2013).

To determine if an EPBC Act threatened entity may be impacted by the proposed activity, a search on the Protected Matters Search Tool (PMST; Cth. DCCEEW [2025]) should be completed. A PMST for the study area was completed on 7 February 2025 and found 57 protected matters to be within 5 km of the study area and is summarised in **Table** 4.1.

To determine if any of the protected matters which were found in the PMST search were likely to occur within the study area, and analysis of potential habitat within the study area was completed suing the results of the 2023 survey (**Section 2.2**). The results of this analysis are summarised in **Table** 4.1.

Table 4.1: Results of the Protected Matters Search Tool search completed 7 February 2025.

Protected Matters	Number within the buffer	Likelihood of occurrence assessment result using results from field survey
World Heritage Properties	0	N/A
National Heritage Places	0	N/A
"Wetlands of International Importance (RAMSAR Wetlands)"	4	All were >600 km upstream of the wetland, and no impacts are expected.
Great Barrier Reef Marine Park	0	N/A
Commonwealth Marine Area	0	N/A
Listed Threatened Ecological Communities	2	No native vegetation communities were present within the study area.
Listed Threatened Species	43	Only one species (Striped Legless Lizard) had potential habitat within the study area.
Listed Migratory Species	8	No species had potential habitat within the study area.

Of the 57 Protected Matters within 5 km of the study area, only one (Striped Legless Lizard) had the potential of occurring within the study area based on the presence of potential habitat.

A Significant Impact Assessment for Striped Legless Lizard has been completed with respect to the proposed development within the study area, and is presented in **Appendix D**. The result of the Striped Legless Lizard Significant Impact Assessment found the proposed development to have a non-significant impact on Striped Legless Lizard for the following reasons:

- No known population of the species is known from the study area (the nearest records being approximately 18 km to the southeast).
- Total clearance of the study area is estimated to clear <0.01% of potential habitat for the species in the local area.
- Historical land clearing, grazing, and cropping within the subject site and adjacent properties limiting potential persistence within the study area.
- The proposed development will not fragment any patches of potential habitat for the species.

4.4.2 NSW *Biodiversity Conservation Act 2016*

Section 7.3 – Tests of Significance for threatened species, communities, and their habitats.

No threatened entities – including threatened species, populations, migratory species, and TECs – listed under the BC Act, were identified during field surveys of the study area. Additionally, the likelihood of occurrence assessment found no BC Act threatened species, population, or migratory species to have a Moderate or greater probability of occurring within the study area.

However, based on potential habitat observed within the study area, the Striped Legless Lizard was found to have a Moderate likelihood of occurrence of occurring within the study area. As such, a Test of Significance – following section 7.3 of the BC Act – was completed (presented in **Appendix C**). The results of this Test of Significance found total clearance of the study area was not likely to have a significant impact on Striped Legless Lizard or its habitat for the following reasons:

- The small amount of potential habitat (<2 ha) proposed to be removed.
- Amount of potential habitat in the local area, especially neighbouring properties.
- A prolonged history (>50 years) of agricultural disturbance degrading historic potential habitat.
- No nearby recent records.

4.4.3 NSW *Environmental Planning and Assessment Act 1979*

Part 4 assessments

Typically, a proposed development is assessed under Part 4 of the EP&A Act. Under Part 4 of the EP&A Act impacts to biodiversity values can be assessed via a BDAR or FFA, depending on if impacts exceed one of three thresholds, outlined in section 7.3 of the BC Reg:

- Area of native vegetation clearing,
- Significant impacts to threatened entities, or
- Impacts to areas on the NSW Biodiversity Values (BV) map (NSW DCCEEW 2024a).

The potential biodiversity impacts of the proposed development, with respect to the land clearing thresholds, have been assessed in **Table** 4.2. If any of the thresholds – listed in Part 4 of the BC Reg – are exceeded, then the impacts of a proposed activity must enter the NSW Biodiversity Offsets Scheme (BOS) and be assessed via the BAM.

Based on the assessment completed in **Table** 4.2, the proposed activity within the study area is not expected to exceed any threshold listed in Part 4 of the BC Reg.

Table 4.2: Land clearing thresholds, as listed in Part 4 of the BC Reg, and assessment of the proposed activity against the relevant threshold levels.

Part 4 threshold	Threshold study area and result
Clearing threshold – clearing native vegetation greater than the ratio of minimum lot size to area of clearing (section 7.2 of BC Reg).	Based on the minimum lot size of the study area (100 ha*) <1.00 ha of native vegetation clearing would be allowable under the EP&A Act. No native vegetation zones are mapped within the study area. Small patches *Microlaena stipoides* were identified within the study area but accounted for < **Result** – The proposed development will not exceed the native vegetation clearing threshold.
Significant impacts - whether the proposed development will have significant impacts on threatnened entities listed under the BC Act.	Total clearing of the study area is expected to not have a significant impact on any threatened entities listed under the BC Act, based on the significant impact assessments presented in **Appendix C**. **Result** – total clearing of the study area is unlikely to have a significant impact on any threatened entities, including Striped Legless Lizard.
Biodiversity Values Map - if any part of the proposed development will directly impact area identified on the NSW BV map	A review of the BV map was completed on 4 February 2025 (**Figure** 1.3; v17.4 NSW DCCEEW 2024c). **Result** – No areas of the study area have been mapped on the BV map.

*Minimum lot size for the study area is found on map LZS_005C of the ULLEP (2010).

4.4.4 NSW State Environmental Planning Policy (Biodiversity and Conservation) 2021

Chapter 3 – Koala Habitat Protection 2020

Chapter 3 of the NSW State Environmental Planning Policy (Biodiversity Conservation) 2021 (SEPP-BC) aims to "…*encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range*…" (Section 3.1 of the SEPP-BC). The SEPP-BC applies to all land in NSW that is >1 ha and zoned 'RU1 – Primary Production' (Section 3.3.1a of the SEPP-BC) unless the LGA exempt following Schedule 2 of the SEPP-BC. Under the ULLEP, the study area is zoned as "RU1 – Primary Production" and the study area is 2.0 ha, which is greater than the exempt size threshold. Therefore, chapter 3 of the SEPP-BC must be applied, and the study area must be assessed under Section 3.2 of the SEPP-BC.

Firstly, Section 3.6 of the SEPP-BC Act requires the consent authority (Upper Lachlan Shire Council) must be satisfied that the proposed development is not occurring on potential koala habitat. Section 3.2 of the SEPP-BC described potential koala habitat to be "…*areas of native vegetation where trees of the types listed in Schedule 1 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.*" No native trees were identified within the study area, so no parts of the study area can be considered potential koala habitat.

4.4.5 Upper Lachlan Local Environmental Plan 2010

Section 6.2 – Biodiversity

This section of the ULLEP aims to: *"… protect native fauna and flora, and … protecting the ecological processes necessary for their continued existence, and … encouraging the recovery of native fauna and flora, and their habitats."* (Section 6.2.1; ULLEP) and applied to land that has been mapped as "Sensitive" on the *Natural Resources Sensitivity– Biodiversity Map* (Section 6.2.2; ULLEP). Before a development application can be approved by the consent authority (Upper Lachlan Shire Council) must consider if any adverse impacts to entities listed in Section 6.2.3 of the ULLEP will result from the proposed development and satisfied that appropriate measures (as listed in Section 6.2.4 of the ULLEP) have been taken.

The study area, in its entirety, is mapped as "Sensitive" land on the Biodiversity Map (map number NRB_005; ULLEP [2010b]). As such, any proposed development of the study area must be assessed against Section 6.2.3 and 6.2.4 of the ULLEP. This assessment relating to the current proposed activity in the study area is shown in **Table** 4.3.

Table 4.3: Assessment of the proposed development in the study area against Section 6.2.3 and 6.2.4 of the ULLEP.

(3) Before determining a development application for land to which this clause applies, the consent authority must consider any adverse impact from the proposed development on— ***(a) a native ecological community, and***
No native vegetation communities are present in the study area.
(b) the habitat of any threatened species, populations or ecological community, and ***(c)a regionally significant species of fauna and flora or habitat, and***
No threatened species, populations, or ecological communities (listed under the BC Act) were identified within the study area. However, potential habitat for the Striped Legless Lizard – listed as vulnerable under the BC Act – was identified within the study area. The potential habitat for Striped Legless Lizard within the study area was VZ1, areas dominated by *P. aquatica**. As noted elsewhere in this report (viz. **Appendix C**), primary habitat for Striped Legless Lizard is noted as native grasslands, and secondary habitat can include grasslands that have a high structural complexity, this is regardless of whether the dominant grasses present are native or exotic (Howland et al. 2016). Neighbouring properties to the study area also include this high density of *P. aquatica* tussocks, indicating that potential Striped Legless Lizard habitat extends well beyond the study area. No surveys for Striped Legless Lizard have been completed as part of the FFA, so a local population of Striped Legless Lizard can only be assumed (although, its presence is unlikely). The nearest known population of Striped Legless Lizard is from Pejar Dam, approximately 18 km to the southeast of the study area, suggesting that a local population of Striped Legless Lizard is unlikely. Additionally, the long history of agricultural practices in the local area – as indicated in aerial imagery reviewed in **Section 3.1.3** – may have reduced the likelihood of a resident population of Striped Legless Lizard. Furthermore, the *P. aquatica** infestation is only a recent feature of the study area, as indicated in **Figure** 3.6.

However, if the study area is to undergo total clearance as part of a future development, there is unlikely to be an adverse impact to any local population of Striped Legless Lizard, given the small size of the potential habitat within the study area (<2 ha).
(d) a habitat element providing connectivity.
The study area does not provide any elements of connectivity within the local landscape.
(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that— ***(a) the development is designed, sited and will be managed to avoid any adverse environmental impact, or*** ***(b) if that impact cannot be avoided—the development is designed, sited and will be managed to minimise that impact, or*** ***(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.***
No environmental impacts (with respect to biodiversity) are expected to arise due to the proposed development within the study area, and no attempts of avoid or minimise have been made.

5 Conclusions and recommendations

Ecoplanning have prepared this FFA for a development application to rezone and subdivide 39 Redground Road, Crookwell, (Lot 1/-/DP1064795) NSW (the study area). The aim of this report was to investigate the potential impacts which may arise due to future development (associated with the current development application) for the study area. This FFA was considered adequate, given that an assumed total clearance to the 2.00 ha study area is not expected to exceed the land clearing thresholds of for entry into the NSW Biodiversity Offsets Scheme (Section 7.3 of the NWS *Biodiversity Conservation Regulation 2017*), the site is not on the NSW Biodiversity Values Map, and no significant impacts are likely when assessed in accordance with the 5-part test.

No native vegetation communities were identified during surveys conducted by Ecoplanning in September 2023. Instead, the study area was dominated by the exotic grass *Phalaris aquatica** (Harding Grass). A review of historic arial imagery indicated that the study area, and neighbouring properties, have been subject to a range of agricultural practices potentially including grazing, pasture improvement, and cropping. It is highly unlikely that the Striped Legless Lizard would persist in the study area following this prolonged period of modification and agricultural management, and its isolation from the nearest extant populations (>18 km from the site).

No threatened species or ecological communities – listed under the BC Act – were identified on site, however, potential habitat for the Striped Legless Lizard (listed a vulnerable under the BC Act) was identified, associated with the areas where *P. aquatica** had formed dense monocultures which was identified as potential habitat. A Test of Significance (following section 7.3 of the BC Act) found that total clearance of the study area was unlikely to have a significant impact on a presumed local population of Striped Legless Lizard.

6 References

Bachman S., Moat J., Hill A., De La Torre J. & Scott B. (2011) Supporting Red List threat assessments with GeoCAT: geospatial conservation assessment tool. *ZooKeys* doi: 10.3897/zookeys.150.2109.

Commonwealth Department of Climate Change, Energy, the Environment, and Water (Commonwealth DCCEEW) (2025) Protected Matters Search Tool. *Prot. Matters Search Tool*. [online]. Available from: https://www.awe.gov.au/environment/epbc/protected-matters-search-tool.

Commonwealth Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2011) *Environment Protection and Biodiversity Conservation Act 1999 referral guidelines for the vulnerable striped legless lizard, Delma impar*. Canberra ACT. [online]. Available from: https://www.dcceew.gov.au/environment/epbc/publications/epbc-act-referral-guidelines-vulnerable-striped-legless-lizard-delma-impar.

Commonwealth Department of the Environment (DoE) (2013) *Matters of National Environmental Significance - Significant impact guidelines 1.1*. Department of the Environment, Canberra, ACT.

Commonwealth Department of the Environment (DoE) (2025) Delma impar in Species Profile and Threats Database. [online]. Available from: https://www.environment.gov.au/sprat [Accessed February 15, 2025].

Commonwealth Threatened Species Scientific Committee (Comm. TSSC) (2016) *Conservation Advice - Delma impar (Striped Legless Lizard)*. Canberra: Department of the Environment and Energy. [online]. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1649.

Connolly D., Binns D., Turner K., Hager T., Lyons M. & Magarey E. (in prep.) *A revised classification of Plant Community Types for eastern New South Wales*. NSW Department of Planning and the Environment, Parramatta.

Dorrough J. & Ash J. E, (1999) Using past and present habitat to predict the current distribution and abundance of a rare cryptic lizard, Delma impar (Pygopodidae). *Aust. J. Ecol.* , 614–624.

Geoscience Australia (2025) Historical Areal Photography Viewer. [online]. Available from: https://experience.arcgis.com/experience/9a0ecbafe94f49829712b46fc69186ff/page/Page/ [Accessed February 7, 2025].

Harden G. (1990) *Flora of New South Wales*. New Southy Wales University Press, Sydney, NSW.

Howland B., Stojanovic D., Gordon I. J., Manning A. D., Fletcher D. & Lindenmayer D. B. (2014) Eaten Out of House and Home: Impacts of Grazing on Ground-Dwelling Reptiles in Australian Grasslands and Grassy Woodlands (ed R. Slotow). *PLoS ONE* **9** , e105966.

Howland B. W. A., Stojanovic D., Gordon I. J. *et al.* (2016) Habitat preference of the striped legless lizard: Implications of grazing by native herbivores and livestock for conservation of grassland biota. *Austral Ecol.* **41** , 455–464.

Huttner-Koros B. (2016) *Where is the love? Experimental translocation of the threatened striped legless lizard (Delma impar) and an investigation of the habitat suitability of the invasive African lovegrass (Eragrostis curvula)*. Honours Thesis. Fenner School of Environment and Society, Australian National Univeristy, Canberra, ACT.

Mahony S. V., Cutajar T. & Rowley J. J. L. (2022) A new species of Delma Gray 1831 (Squamata: Pygopodidae) from the Hunter Valley and Liverpool Plains of New South Wales. *Zootaxa* **5162** , 541–556.

Maldonado S. P., Melville J., Peterson G. N. L. & Sumner J. (2012) Human-induced versus historical habitat shifts: identifying the processes that shaped the genetic structure of the threatened grassland legless lizard, Delma impar. *Conserv. Genet.* **13** , 1329–1342.

NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) (2024a) NSW Biodiversity Values Map. *NSW Biodivers. Values Map*. [online]. Available from: https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/about-the-biodiversity-offsets-scheme/when-does-bos-apply/biodiversity-values-map.

NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) (2024b) NSW State Vegetation Type Map. [online]. Available from: https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map.

NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) (2024c) NSW State Vegetation Type Map (pre-clearing). [online]. Available from: https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map-pre-clearing.

NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) (2024d) BioNet Atlas of NSW Wildlife. *BioNet Atlas NSW Wildl.* [online]. Available from: https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet.

NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) (2025a) BioNet Atlas of NSW Wildlife. *BioNet Atlas NSW Wildl.* [online]. Available from: https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet.

NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) (2025b) Vegetation Infomation Service classification. *NSW Veg. Classif.* [online]. Available from: https://www.environment.nsw.gov.au/research/Visclassification.htm.

NSW Department of Planning and Environemnt (DPE) (2022a) *Koala (Phascolartos cinereus) Biodiversity Assessment Method Survey Guide*. Environment and Heritage Group, Parramatta, NSW.

NSW Department of Planning and Environemnt (DPE) (2022b) *Threatened Reptiles - Biodiversity Assessment Method survey guide*. Parramatta, NSW. [online]. Available from: https://www.environment.nsw.gov.au/research-and-publications/publications-search/threatened-reptiles-biodiversity-assessment-method-survey-guide.

NSW Department of Planning and the Environment (DPE) (2023) Response to Pre-Gateway Scoping Proposal for 39 Redground Road Crookwell (DOC23/588448), Saxon M.

NSW Department of Planning, Housing, and Infrastructure (DPHI) (2025) ePlanning Spatial Viewer. *EPlanning Portal Viewer*. [online]. Available from: https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/lot.

NSW Department of Planning, Industry, and Environment (DPIE) (2020a) *Biodiversity Assessment Method*. Department of Planning, Industry, and Environment, Sydney, NSW.

NSW Department of Planning, Industry, and Environment (DPIE) (2020b) *NSW Survey Guide for Threatened Frogs - A guide for the survey of threatened frogs and their habitats for the Biodiveristy Assessment Method*. Department of Planning, Industry, and Environment, Sydney, NSW.

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

NSW Office of Environment and Heritage (OEH) (2018) *'Species credit' threatened bats and their habitats*. Office of Environment and Heritage, Sydney, NSW.

NSW Property Information (LPI) (2025a) SIX Maps NSW. [online]. Available from: https://maps.six.nsw.gov.au/.

NSW Property Information (LPI) (2025b) Historical Imagery Viewer. [online]. Available from: https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f7c215b873864d44bccddda8075238cb.

Office of Environment and Heritage (OEH) (2025) Threatened species profile: Striped Legless Lizard. [online]. Available from: https://atlaseditor.bionet.nsw.gov.au/UI_Modules/TSM_/ProfileEdit.aspx?pId=10211&pType=SpeciesCode [Accessed February 6, 2025].

PlantNET (The NSW Plant Information Network System) (2025) Royal Botanic Gardens and Domain Trust, Sydney. [online]. Available from: https://plantnet.rbgsyd.nsw.gov.au/.

Robertson P. & Smith W. (2010) *National Recovery Plan for the Striped Legless Lizard, Delma impar*. Department of Sustainability and Environment, Melbourne. [online]. Available from: http://www.environment.sa.gov.au/managing-natural-resources/Plants_Animals/Threatened_species_ecological_communities/Recovery_planning/Plans_for_threatened_animals_in_SA/Reptiles.

Upper Lachlan Shire Council (ULLEP) (2010a) Sheet number - LSZ_005C. [online]. Available from: https://eplanningdlprod.blob.core.windows.net/pdfmaps/7640_COM_LSZ_005C_020_20100615.pdf [Accessed February 7, 2025].

Upper Lachlan Shire Council (ULLEP) (2010b) Sheet number - NRB_005. [online]. Available from: https://eplanningdlprod.blob.core.windows.net/pdfmaps/7640_COM_NRB_005_160_20100227.pdf [Accessed February 7, 2025].

Appendix A Threatened species likelihood of occurrence analysis results

Scientific name/ Common name	Legal status*	Number of records	Closest records and date	Most recent record and proximity	Likelihood of occurrence	
					Prior to field assessment	Post field assessment
KINGDOM: Animalia, CLASS: AVES						
Artamus cyanopterus cyanopterus (Dusky Woodswallow)	BC Act = V,P EPBC Act = N/A	1	6.4 km (28/02/2010)	6.4 km (28/02/2010)	Low	Low
Callocephalon fimbriatum (Gang-gang Cockatoo)	BC Act = E1,P,3 EPBC Act = E	2	1.3 km (13/06/2005)	1.6 km (05/03/2010)	Low	Low
Circus assimilis (Spotted Harrier)	BC Act = V,P EPBC Act = N/A	1	6.4 km (28/02/2010)	6.4 km (28/02/2010)	Low	Low
Daphoenositta chrysoptera (Varied Sittella)	BC Act = V,P EPBC Act = N/A	2	3.8 km (25/11/2007)	8.9 km (06/12/2016)	Low	Low
Hieraaetus morphnoides (Little Eagle)	BC Act = V,P EPBC Act = N/A	4	2.5 km (20/10/2007)	7.7 km (30/10/2020)	Low	Low
Petroica phoenicea (Flame Robin)	BC Act = V,P EPBC Act = N/A	1	8.9 km (09/10/2016)	8.9 km (09/10/2016)	Low	Low
KINGDOM: Animalia, CLASS: MAMMALIA						
Falsistrellus tasmaniensis (Eastern False Pipistrelle)	BC Act = V,P EPBC Act = N/A	1	9.8 km (20/03/2016)	9.8 km (20/03/2016)	Low	Low
Pteropus poliocephalus (Grey-headed Flying-fox)	BC Act = V,P EPBC Act = V	3	1.4 km (17/03/2018)	1.7 km (22/03/2018)	Low	Low
KINGDOM: Plantae						
Eucalyptus aggregata (Black Gum)	BC Act = V EPBC Act = V	16	2.1 km (26/05/2012)	7.8 km (24/11/2019)	Low	Low

*BC Act Status – V – Vulnerable, E1 – Endangered, E4A – Critically Endangered, P – Protected, 2 – Category 2 sensitive species, 3 – Category 3 sensitive species
EPBC Act Status – CE – Critically Endangered, E – Endangered, V – Vulnerable
BioNet – BioNet Atlas (DPE 2023), PMS – EPBC Protected Matters Search Tool (DCCEEW 2023)

Appendix B Flora and Fauna recorded within the study area

Table B.1: Flora recorded within the study area.

Family	Species name	Common name	Native/Exotic
Fabaceae	*Medicago* spp.	Medic	Exotic
	Trifolium repens	White Clover	Exotic
Poaceae	*Cenchrus clandestina*	Kikuyu Grass	Exotic
	Microlaena stipoides	Weeping Meadow-grass	Native
	Phalaris aquatica	Phalaris	Exotic

Appendix C Striped Legless Lizard Test of Significance

A brief review on the relevant ecology of Striped Legless Lizard is presented below to support a Test of Significance – following section 7.3 of the BC Act – which is presented in **Table C.1** below.

REVIEW OF STRIPED LEGLESS LIZARD ECOLOGY

The Striped Legless Lizard (*Delma impar*) is listed as a vulnerable species under the BC Act due to fragmentation of habitat, degradation of existing habitat due to agricultural practices and invasion of exotic grasses, and a projected decline in population sizes (NSW DCCEEW 2024d).

Striped Legless Lizard occurs in the Southern Tablelands, South-West Slopes, Upper Hunter, and possibly Riverina. Striped Legless Lizard populations of the Upper Hunter Valley underwent a recent taxonomic review that found the population from this region to be sufficiently genetically distinct to be considered a separate species (*Delma vescolineata*; Mahony et al. 2022), however, this change has not yet formally recognised.

Since European colonisation, extensive clearing of Striped Legless Lizard habitat has restricted it to a patchy occurrence, with strongholds around the Goulburn, Yass, Queanbeyan, Cooma, Muswellbrook, and Tumut areas (NSW DCCEEW 2024d). Although land clearing and land use change has been mostly detrimental to the existence of the Striped Legless Lizard, some land use practices have conversely facilitated its presence, indicating that this species has a complex relationship with current and historic land use.

Primary habitat for Striped Legless Lizard is known to be areas of native grassland and derived native grassland (NSW DCCEEW 2024d). Secondary habitat is that in grassy woodlands which are in the immediate proximity to areas of native grasslands, as this species occupancy has been shown to decrease with an increase with canopy cover (NSW DCCEEW 2024d; Howland et al. 2014). Further research has shown that grassland structural complexity is the most influential factor in determining probability of occurrence for Striped Legless Lizard, rather than if the dominant grasses present are exotic or native (Howland et al. 2016).

The microhabitat requirements of the Striped Legless Lizard are grasslands, particularly those which include areas with a high structural complexity of tussock grasses, being the most significant factor in the likelihood of Striped Legless Lizard occurrence (Dorrough and Ash 1999; Howland et al. 2016). Native tussock grasses which facilitated this structural complexity included species such as *Austrostipa* spp., *Poa* spp., *Eragrostis* spp., *Themeda triandra*, and to a lesser extent *Rytidosperma* spp. Historically, Striped Legless Lizard would have been found in grasslands, and woodlands on the periphery of occupied grasslands, within its extent of occurrence.

However, since colonisation, land clearing and agricultural practices have drastically reduced its area of occupancy, with Striped Legless Lizard now having a patchy distribution within its extent of occupancy (Maldonado et al. 2012). The agricultural practice of ploughing in successive years has been noted to be detrimental to the occurrence of the Striped Legless Lizard (Dorrough and Ash 1999). Essentially, ploughing removes the structural complexity required by Striped Legless Lizard for foraging. Similarly, high intensity grazing has been shown to decrease the habitat quality for Striped Legless Lizard, as Howland et al. (2014) has

shown that Striped Legless Lizard were most likely to be found in areas of intermediate grazing intensity, and lowest in areas of low and high grazing intensity. Although, it should be noted that probability of occurrence for Striped Legless Lizard was low (<0.05%), regardless of grazing pressures (Howland et al. 2014).

Invasion of weeds is also noted as being detrimental to the presence of Striped Legless Lizard, as it can change the structural complexity of ground cover. However, some exotic grasses, viz. *Phalaris aquatica**, *Eragrostis curvula*,* and *Nassella neesiana**, replicate the structural complexity required by the Striped Legless Lizard and can for preferable habitat (DPE 2024d; Huttner-Koros 2016; Howland et al. 2014, 2016).

No surveys for the Striped Legless Lizard have been completed as part of this FFA, so its presence in the subject site is not known. However, based on the results of the likelihood of occurrence, the potential habitat within the subject site indicate that the Striped Legless Lizard has a moderate likelihood of occurrence in the study area, and the Test of Significance, presented in **Table C.**1, will give an indication to how the proposed subdivision of study area will impact the Striped Legless Lizard, if it were to be present. Taken into consideration is the information discussed above, as well as the proximity and timing of any recent records, and the quality of habitat in the subject site.

TEST OF SIGNIFICANCE

The Test of Significance for Striped Legless Lizard – following section 7.3 of the BC Act – is presented in **Table C.**1. Based on the brief review of the relevant ecology of Striped Legless Lizard and potential habitat identified within the study area, the result of this Test of Significance (**Table C.**1) found that the proposed development was not likely to have a significant impact on Striped Legless Lizard for the following reasons:

- A historic population in the local area being unlikely.
- A prolonged history (>50 years) of agricultural disturbance degrading historic potential habitat.
- A small amount of potential habitat (<2 ha) proposed to be removed.
- The amount of potential habitat in the local area, especially neighbouring properties.
- No nearby recent records.

Table C.1: Test of Significance for Striped Legless Lizard, following section 7.3 of the BC Act.

(1) The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats— ***(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,***
No known population of Striped Legless Lizard is present within the study area. For the following reasons, a historic population of Striped Legless Lizard is unlikely. Firstly, the nearest known population of Striped Legless Lizard is approximately 18 km to the southeast of the study area, at Pejar Dam (NSW DCCEEW 2025a). This population of Striped Legless Lizard was last recorded in November 2023. Additionally, a review of pre-clearing vegetation mapping, indicated that the original vegetation community of the study area was a forest (**Figure** 3.3), and would have a canopy cover too dense for Striped Legless Lizard. Further, historic aerial imagery shows a prolonged history of disturbance due to local agricultural practices. These agricultural practices may have included ploughing, which is a detriment to the presence of Striped Legless Lizard. And lastly, the infestation of *P. aquatica** in the study area is only recent (aerial photography indicates infestation began in 2018; **Figure** 3.6), suggesting the potential habitat for Striped Legless Lizard within the study area is only a recent feature. For the reasons listed above, it is unlikely that there was a historic population of Striped Legless Lizard within the study area. Modern vegetation mapping (**Figure** 3.2 and **Figure** 3.7) shows that the study area and surrounding properties is dominated by an agricultural landscape with areas of exotic grassland. Neighbouring properties have a proportion of exotic grasses, including *P. aquatica**, indicating that potential habitat for Striped Legless Lizard is present. Based on the amount of potential habitat for Striped Legless Lizard in the local area (all neighbouring properties have similar infestations of dense *P. aquatica**), the size of the potential habitat to be modified as part of the current development application (approximately 1.97 ha), and that modification of that potential habitat is unlikely to cause fragmentation of the presumed local population of Striped Legless Lizard, it is unlikely that any adverse impacts to the life cycle of this local population will arise so that this presumed local population will become at risk of extinction.
(1b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity—
No threatened ecological communities are present within the study area.
(1c) in relation to the habitat of a threatened species or ecological community— ***(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and***
A total of 1.97 ha of potential Striped Legless Lizard habitat will be cleared for the proposed development.
(1cii) 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
As the study area is surrounded by areas of potential habitat, especially all neighbouring properties, the removal of the 1.97 ha of potential habitat within the study area is unlikely to fragment the local habitat for Striped Legless Lizard.

(1ciii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,
As discussed previously, potential habitat for the includes both native and exotic grasslands, with Striped Legless Lizard occurrences having a positive correlation with increasing grassland structure (Howland et al. 2016). Previous land uses can also impact the habitat quality for Striped Legless Lizard, with recent ploughing and high intensity grazing decreasing the habitat quality for the species. As discussed in **Section 3.1.3**, the study area has likely been subject to a range of historic agricultural processes, including grazing and pasture improvement (including ploughing). It is likely that these practices have been consistent in the history of the study area and surrounding properties in the local area. This consistent disturbance from a long history of agriculture in the local area (dating back to at least 1953, 72 years) has likely been a detriment to a Striped Legless Lizard population persisting in the local area. Additionally, we need to consider that the infestation of *P. aquatica** is only as recent as 2018, as is suggested by aerial images (**Figure** 3.6).
(1d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),
The study area does not include any declared areas of outstanding biodiversity value, either directly or indirectly.
(1e) 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.
Assuming that the study area will be cleared in its entirety under the proposed development application, the following Key Threatening Processes (listed under the BC Act) may result: • **Anthropogenic climate change** – unless any proposed activities within the study area are either "carbon neutral" or have a net reduction in greenhouse gas emissions, there will be a minor addition to anthropogenic climate change. • **Invasion of weeds** – accounting for all Key Threatening Processes that involve the introduction and establishment of weeds, unless proper biosecurity protocols are put in place (e.g. wash down areas of new vehicles and site plants) there is the potential for weeds, which have not yet been introduced to the local area, to become introduced and established. • **Predation by feral cats** – Feral cats are a likely predator to Striped Legless Lizard, as feral cats predate on most Australian herpetofauna. Although a local population of feral cats is likely to be present in the local area – associated with the township of Crookwell – there is the potential for this feral cat population to slightly increase if any house cats which may be kept as pets in any new development in the study area are not housed with sufficient protection measures (e.g. being kept indoors or cat runs at all times). Although there is the potential for the three Key Threatening Processes listed above to negatively impact the presumed local population of Striped Legless Lizard, these impacts are likely to be minor for the reason listed.

Appendix D EPBC Act Significant Impact Assessment for Striped Legless Lizard

This Significant Impact Assessment for Striped Legless Lizard (*Delma impar*) follows the guidelines set out in the *Significant Impact Assessment Guidelines 1.1 – Matters of National Environmental Significance* as published by the Commonwealth Department of the Environment (DoE; 2013) – using the vulnerable assessment criteria – and the *EPBC Act referral guidelines for the vulnerable striped legless lizard,* Delma impar (Referral Guidelines), as published by the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC 2011).

The Significant Impact Assessment for Striped Legless Lizard is presented in **Table D.**1 and is informed by the review on the ecology of Striped Legless Lizard presented in **Appendix C**, and the Striped Legless Lizard entry in the Species Profile and Threat Database (SPRAT; DoE 2025) . The results of this assessment found the proposed development within the study area to a non-significant impact on Striped Legless Lizard for the following reasons:

- No known population of the species is known from the study area (the nearest records being approximately 18 km to the southeast).
- Total clearance of the study area is estimated to clear <0.01% of potential habitat for the species in the local area.
- Historical land clearing, grazing, and cropping within the subject site and adjacent properties limiting potential persistence within the study area.
- The proposed development will not fragment any patches of potential habitat for the species.

Table D.1: Significant Impact Assessment for Striped Legless Lizard, following the Significant Impact Assessment Guidelines (DoE 2013).

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will…lead to a long-term decrease in the size of an important population of a species
An 'Important Population' of a species is described as either (DoE 2013): • '*key source populations either for breeding or dispersal,* • *populations that are necessary for maintaining genetic diversity, and/or* • *populations that are near the limit of the species range*'. 'Important Populations' for Striped Legless Lizard are listed in the EPBC Act Conservation Advice for Striped Legless Lizard, as published by the Commonwealth Threatened Species Scientific Committee (Conservation Advice; Cth. TSSC; 2016), with the nearest 'Important Population' being south of Goulburn, approximately 54 km to the south of the study area. There is no population is known from the study area, and there is unlikely to be a local population in the area surrounding the study area as the nearest known population is at Pejar Dam (approximately 18 km to the southeast of the study area). As such, there is no known 'Important Population' of Striped Legless Lizard within the study area. However, Figure 1 of the Referral Guidelines states that a 'Important Population' of Striped Legless Lizard must be assumed if no targeted surveys have been completed. The Referral Guidelines also state that the following must be considered when determining if a Striped Legless Lizard population can be considered an 'Important Population': • Sites that are <0.5 ha, • Small isolated areas of habitat which are currently under pressure, or are likely to experience long-term pressures, and • Sites that are small which support marginal or low quality habitat. Although the study area is >0.5 ha and contains potential habitat for the species, it is a small area which has had a prolonged history of agricultural pressure (potentially including ploughing; **Section 3.1.3**). These pressures persist due to land use zoning of the study area as 'RU1 – Primary Production', under the ULLEP. As such, it is unlikely that the study area contains a 'Important Population' of Striped Legless Lizard. Additionally, the study area is isolated, by approximately 18 km, from the nearest known population of Striped Legless Lizard. As such, the total clearance of the study area for the proposed development will not have a significant impact on any local population of Striped Legless Lizard.
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will…reduce the area of occupancy of an important population.
<2.00 ha of porential habitat for the Striped Legless Lizard will be cleared as part of the proposed development. The Conservation Advice does not identify an area of occupancy (AOO) for Striped Legless Lizard nationally, nor the AOO for the nearest 'Important population' to the study area, located a Goulburn, NSW. As above, the site does not retain an important population, and therefore there will be no reduction in the AAO for this species.
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will…fragment an existing important population into two or more populations.
As the study area is not found within an area occupied by an important population of Striped Legless Lizard, it will not fragment any known populations of Striped Legless Lizard.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will…adversely affect habitat critical to the survival of a species.
The Conservation Advice identifies habitat critical to the survival of the species as providing breeding habitat, foraging habitat, refuge from disturbance events, long-term protection from development events, and has connectivity value and contributes to the evolutionary potential of the species in the wild across its natural geographical range. Further, when it is uncertain if an area is critical habitat, then the Referral Advice lists the following considerations: occurring at the edge of the species known and likely modelled distribution, represents a newly discovered range extension, has not been subject to adverse practices in the last 10 years such as ploughing, cropping, cultivation, fertiliser use or intense farming, or contains a high density of lizards found through surveys on the site. The study area may represent 'habitat critical to the survival of the species' based on the definition in the Conservation Advice, as the infestation of *P. aquatica** could potentially provide foraging habitat for Striped Legless Lizard. However, the prolonged history of agricultural practices (potentially including ploughing and/or intense farming) within the study area and the isolation of the study area from known records of the species are considered, the quality of habitat within the study area does not conform to habitat critical to the survival of Striped Legless Lizard.
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will…disrupt the breeding cycle of an important population.
Breeding habitat for Striped Legless Lizard has been described as using surface stones, Wolf spider burrows, soil cracks, thick ground cover, and grass tussocks as breeding habitat (Robertson and Smith 2010), and it is likely that the species breeds within these habitat features. As such, the study area in its current form does represent potential breeding habitat for Striped Legless Lizard (as represented by the *P. aquatica** tussocks). However, as an important population of the species is not present in the study area, so there will be no impacts to the breeding cycle of an important population.
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will… modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
The proposed development will remove approximately <2.00 ha of potential, but highly modified and isolated, Striped Legless Lizard habitat, which represents <0.01% of the 81,870,000 ha extent of occurrence (DoE 2025). As such, the proposed development will not '*modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that*' the Striped Legless Lizard is likely to decline.
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will… result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat… or …introduce disease that may cause the species to decline.
As discussed, it is highly unlikely that Striped Legless Lizard would persist in this isolated and highly modified location, with threatening processes such as grazing, cropping and land clearance prevalent and ongoing in the adjacent properties and within the subject site. Give that the action proposed is to subdivide the land for housing, no invasive species that are harmful to a vulnerable species are likely to become established. Adequate biosecurity protocols are recommended during the construction phase (e.g. vehicle washdown bays) to limit the possibility of the introduction of invasive species.