

Jeffrey Bulfin  
Principal Planner  
Precise Planning  
152 Sailors Bay Road  
Northbridge NSW 1560  
*Supplied by email*

21 March 2024

**Re: Likelihood of occurrence for Striped Legless Lizard, 39 Redground Road (Lot 1/-/DP1064795), Crookwell, NSW**

Dear Jeffrey,

It is understood that a planning proposal has been previously submitted to the Upper Lachlan Council for the property 39 Redground Road (Lot 1/-/DP1064795), Crookwell, NSW (referred to herein as the 'study area'; **Figure 1**), which was accompanied by a desktop review of biodiversity values of the property. Department of Planning and Environment subsequently requested further assessment for the likelihood of occurrence for Striped Legless Lizard (*Delma impar*) within the study area. Striped Legless Lizard is a threatened species listed as Vulnerable under the NSW *Biodiversity Conservation Act 2016* (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This letter is to document the desktop review, habitat assessment, and subsequent likelihood of occurrence analysis for Striped Legless Lizard within the study area.

## **REVIEW OF STRIPED LEGLESS LIZARD HABITAT CONSTRAINTS**

The extent of occurrence of Striped Legless Lizard includes the regions of Southern Tablelands, South-West Slopes, Upper Hunter, and possibly Riverina. Striped Legless Lizard 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 is not yet legally recognised. Primary habitat for Striped Legless Lizard is known to be areas of native grassland (DPE 2023a), particularly those that conform to Natural Temperate Grassland, a Threatened Ecological Community (TEC) under the EPBC Act (DAWE 2011). Secondary habitat is that in grassy woodlands which are in the immediate proximity to areas of native grasslands (DPE 2023a).

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 (DPE 2023a). 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.

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). Tussock grasses which facilitated this structural complexity included species such as *Austrostipa* spp., *Poa* spp., *Eragrostis* spp., *Themeda australis*, and to a lesser extent *Rytidosperma* spp.. Historically, Striped Legless Lizard would have been found in grasslands, and woodlands surrounding 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). An agricultural practice, which has been noted to be detrimental to the occurrence of the Striped Legless Lizard, particularly ploughing in successive years, can have a detrimental impact on the presence of the Striped Legless Lizard (Dorrough and Ash 1999). Essentially, ploughing removes the structural complexity required by Striped Legless Lizard for foraging. 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* and *Eragrostis curvula*, replicate the required structural complexity required by the Striped Legless Lizard (DPE 2023a; Huttner-Koros 2016).

## METHODS

The study area was surveyed by Jai Brien-Cooper (Ecologist) and Zahra Spitznagel-Reeves (Ecologist) on 13 September 2023. A random meander of the study area was undertaken to get an overview of potential Striped Legless Lizard habitat within the study area (**Figure 1**).

A spatial data review of the following sources was undertaken:

- NSW State Vegetation Type Map (SVTM; DPE 2023b) – plant community types (PCTs) within 500 m of the study area were considered.
- BioNet records (DPE 2023a) – only records made within 10 km of the study area, in the previous 20 years (from 1 January 2003).
- Historic aerial imagery (DSS 2022) and Google Earth satellite imagery

Data recorded during the site survey and acquired from the desktop review was compared against the known habitat constraints of Striped Legless Lizard; it's BioNet profile (DPE 2023a), Commonwealth conservation advice (Comm. TSSC 2016), and available published literature.

The likelihood of occurrence analysis incorporated findings from the site survey and desktop review, and classified the likelihood of occurrence as:

- '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.

## RESULTS

Review of threatened species records found no records of Striped Legless Lizard within 10 km of the study area. Nine threatened species have been observed within 10 km of the study area in the previous 20 years, all species had a low likelihood of occurrence (**Table 1**; **Figure 2**).

**Table 1: Threatened species observed, and likelihood of occurrence, within 10 km of the study area in the previous 20 years (after 1 January 2003).**

(Phylum) Family	Name	Number of records	Nearest record	Most recent record	Likelihood of occurrence
(Animalia) Artamidae	<i>Artamus cyanopterus cyanopterus</i> (Dusky Woodswallow)	1	6.4 km (28/02/2010)	6.4 km (28/02/2010)	Low
(Animalia) Cacatuidae	<i>Callocephalon fimbriatum</i> (Gang-gang Cockatoo)	2	1.3 km (13/06/2005)	1.6 km (05/03/2010)	Moderate
(Animalia) Accipitridae	<i>Circus assimilis</i> (Spotted Harrier)	1	6.4 km (28/02/2010)	6.4 km (28/02/2010)	Low
(Animalia) Neosittidae	<i>Daphoenositta chrysoptera</i> (Varied Sittella)	2	3.8 km (25/11/2007)	8.9 km (06/12/2016)	Low
(Animalia) Accipitridae	<i>Hieraaetus morphnoides</i> (Little Eagle)	4	2.5 km (20/10/2007)	7.7 km (30/10/2020)	Low
(Animalia) Petroicidae	<i>Petroica phoenicea</i> (Flame Robin)	1	8.9 km (09/10/2016)	8.9 km (09/10/2016)	Low
(Animalia) Vespertilionidae	<i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle)	1	9.8 km (20/03/2016)	9.8 km (20/03/2016)	Low

(Phylum) Family	Name	Number of records	Nearest record	Most recent record	Likelihood of occurrence
(Animalia) Pteropodidae	<i>Pteropus poliocephalus</i> (Grey-headed Flying- fox)	3	1.4 km (17/03/2018)	1.7 km (22/03/2018)	Low
(Magnoliophyta) Myrtaceae	<i>Eucalyptus aggregata</i> (Black Gum)	16	2.1 km (26/05/2012)	7.8 km (24/11/2019)	Low

The SVTM identified no plant community types within the study area, however two were present within 500 m of the study area (**Figure 3**):

- Central Tableland Clay Apple Box Grassy Forest
- Crookwell-Taralga Basalt Grassy Forest

The tracks of the random meander are shown in **Figure 1**. The study area was predominantly covered by exotic grass *Phalaris aquatica* (Phalaris) (shown in **Figure 4**). Small patches of other exotic ground covers, *Cenchrus clandestina* (Kikuyu Grass), *Trifolium repens* (White Clover) and *Medicago* spp. (Medic) were also present. There was low cover of native ground cover species, the most notable being *Microlaena stipoides* (Weeping Meadow-grass). In the centre of the study area there was a small, abandoned dwelling (**Figure 5**), a shipping container and piles of sheet metal and other building refuse. Surrounding the study area was exotic pasture.

A review of publicly available historic aerial imagery indicated that the study area has been highly disturbed (an example shown in **Figure 6**).

## CONCLUSION

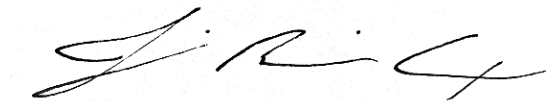
Review of Striped Legless Lizard BioNet records and SVTM indicated that there was a moderate likelihood of occurrence for Striped Legless Lizard within the study area. The site survey found a dominance of *Phalaris aquatica*. Although an exotic species, areas dominated by exotic grasses (including *Phalaris aquatica*) have been identified as potential habitat for Striped Legless Lizard by creating similar structural complexity to area of native tussock grassland (DPE 2023a; Huttner-Koros 2016). Based on the historic native vegetation (i.e. grassy woodlands) and the dominance of *Phalaris aquatica*, the likelihood of occurrence for Striped Legless Lizard was considered 'Moderate'. However, as noted in the Commonwealth conservation advice for the Striped Legless Lizard (Comm. TSSC 2016), historic land clearing and land use (particularly land clearing and ploughing) is detrimental to the presence of the Striped Legless Lizard. Therefore, given that review of historic aerial imagery indicated that the study area had been historically disturbed, the likelihood of occurrence for the Striped Legless Lizard within the study area was downgraded to **low**. If targeted surveys for Striped Legless Lizard are to be undertaken to confirm the presence or absence of the species, they would need to comply with guidelines set out by the NSW Department of Planning and the



Environment (DPE 2022) and the Commonwealth Department for Sustainability, Environment, Water, Population, and Communities (DSEWPC 2011).

If you have any questions regarding the findings of this survey, feel free to contact me.

Yours sincerely



Jai Brien-Cooper

**Field Ecologist**

**BConsBio**

**M:** 0429 116 589

**E:** [jai.brien-cooper@ecoplanning.com.au](mailto:jai.brien-cooper@ecoplanning.com.au)



## REFERENCES

Commonwealth Department of Agriculture, Water, and the Environment (DAWE) (2011) *Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory in Community and Species Profile and Threats Database*. Commonwealth Department of Agriculture, Water, and the Environment (DAWE), Canberra, Australia. [online]. Available from: <http://www.environment.gov.au/sprat>.

Commonwealth Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) (2011) *Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the EPBC Act*. Canberra, ACT.

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](http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1649).

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.

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 University, 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 Planning and Environment (DPE) (2022) *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 Environment (DPE) (2023a) 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 Planning and Environment (DPE) (2023b) *NSW State Vegetation Type Map*. Parramatta, NSW. [online]. Available from: <https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map>.

NSW Department of Spatial Services (DSS) (2022) Historical, Aerial, and Satellite Imagery. *Hist. Aer. Satell. Imag.* [online]. Available from: [https://www.spatial.nsw.gov.au/products\\_and\\_services/aerial\\_and\\_historical\\_imagery](https://www.spatial.nsw.gov.au/products_and_services/aerial_and_historical_imagery).





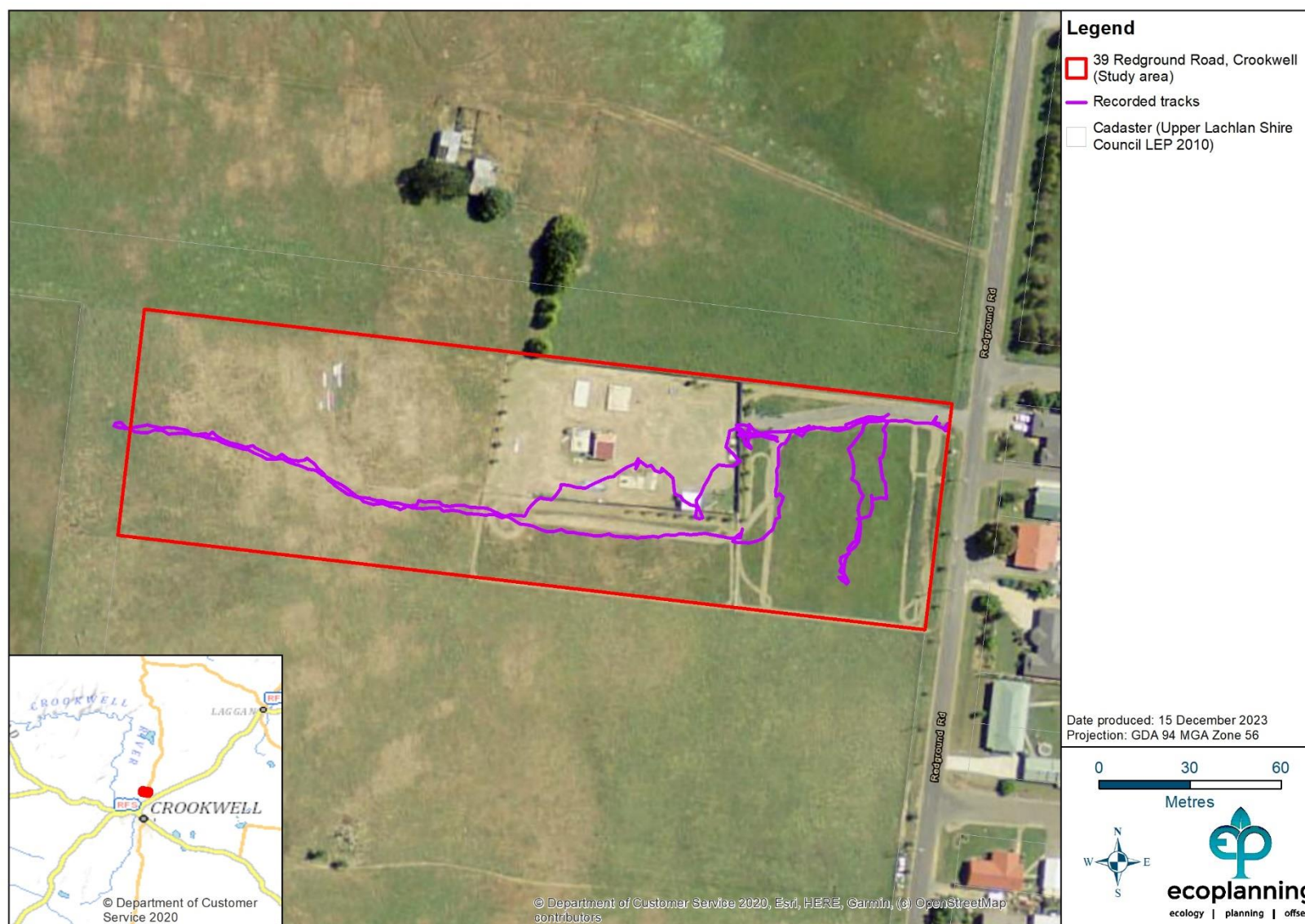


Figure 1: Location of the study area and tracks recorded on 13 September 2023.



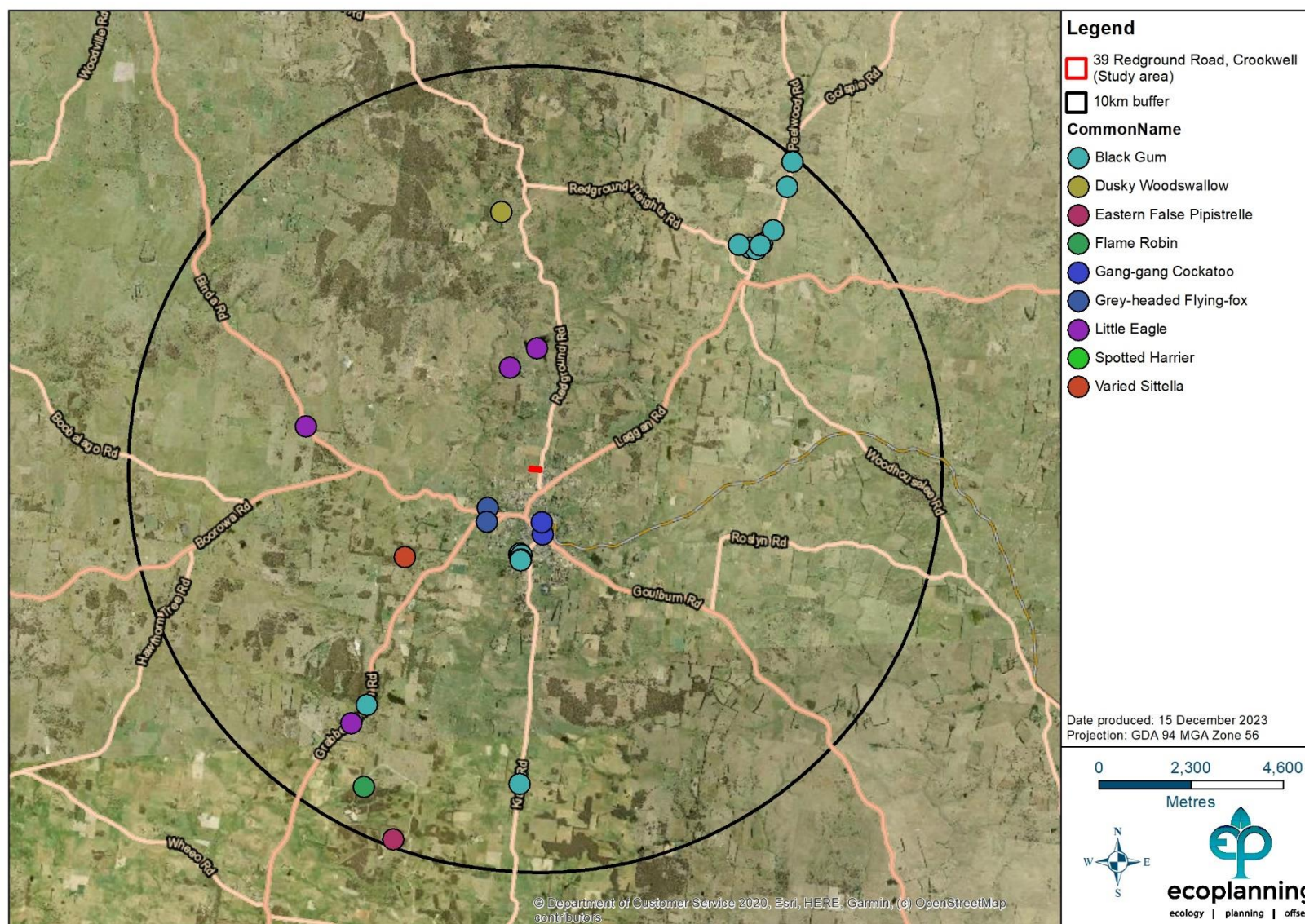


Figure 2: Threatened species observations made within 10 km of the study area, in the previous 20 years (DPE 2023a).



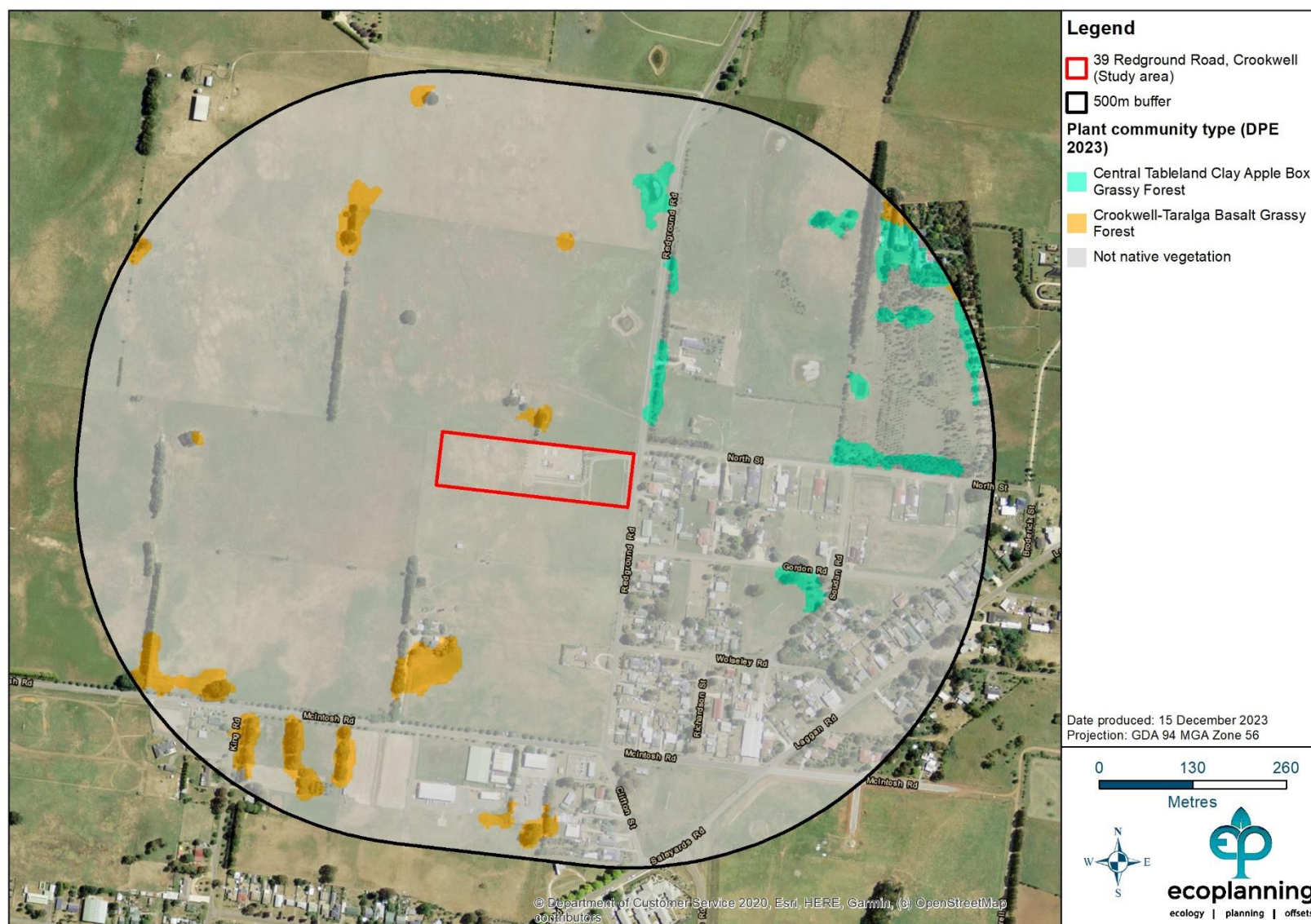


Figure 3: Plant community types within 500 m of the study area (DPE 2023b).





Figure 4: Example of the dominance of *Phalaris aquatica*\* within the study area.



Figure 5: Image of abandoned dwelling present within the study area.





Figure 6: Google Earth satellite imagery (NSW Department of Customer service 2020) of the study area