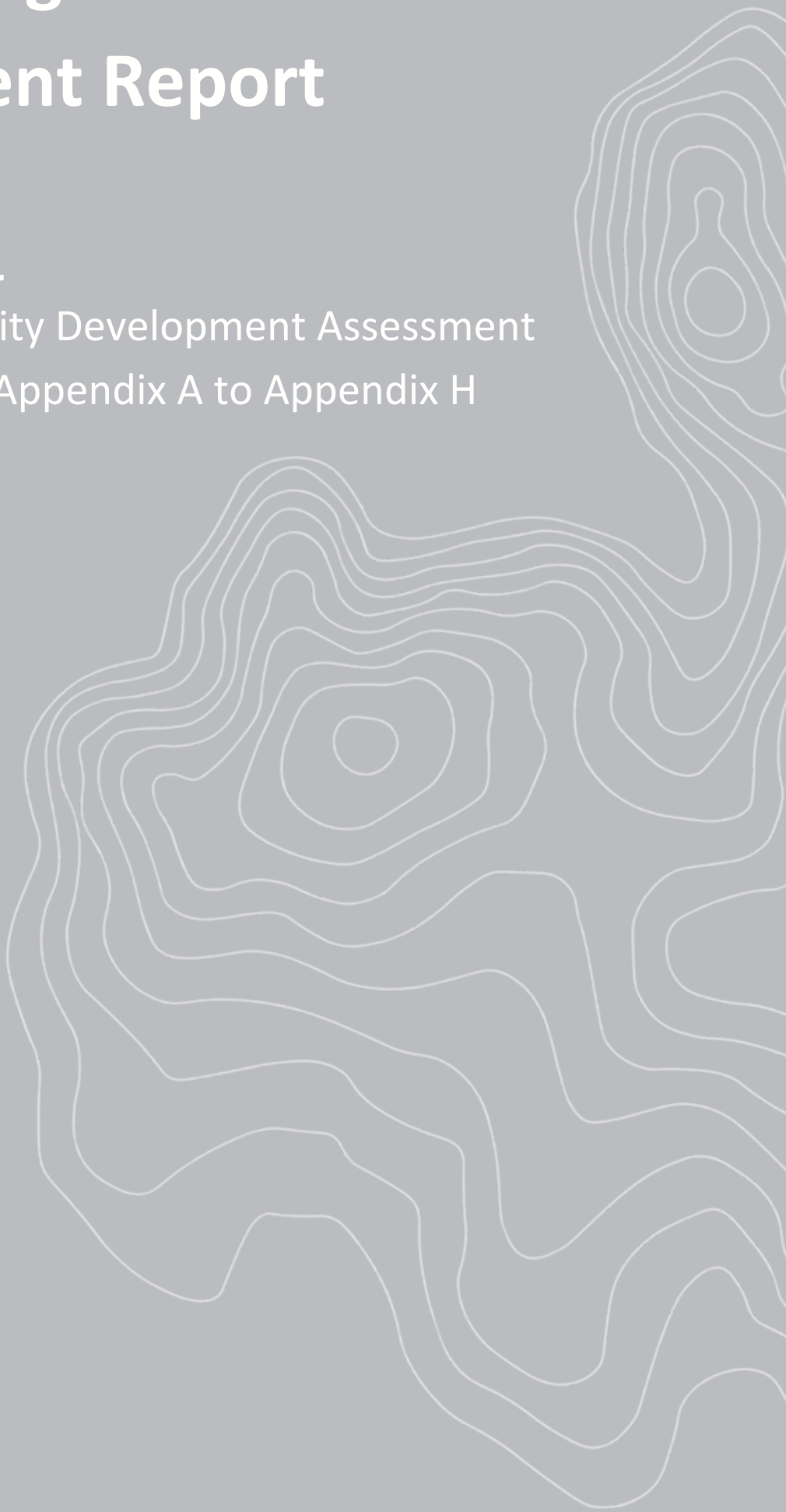
Burrendong Wind Farm Amendment Report

APPENDIX F.1

Revised Biodiversity Development Assessment Report - BDAR & Appendix A to Appendix H



Burrendong Wind Farm – Biodiversity Development Assessment Report

Burrendong Wind Farm Pty Ltd

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Template 2.8.1

Executive Summary

Burrendong Wind Farm Pty Ltd (Ark Energy Pty Ltd; the Proponent) proposes to develop a wind farm on ridge lines between Yarrabin and Burrendong, near Wellington within the Central West Renewable Energy Zone (REZ). The Burrendong Wind Farm (the Project) consists of up to 70 wind turbine generators (WTG) and associated infrastructure to be developed over an area of 730.73 ha (the Development Footprint, including transmission lines and external transportation route upgrades). The Project is classified as 'State Significant Development' (SSD - 8950984) and will be assessed under Part 4 of *the Environmental Planning and Assessment Act 1979* (EP&A Act).

This updated Biodiversity Development Assessment Report (BDAR) has been prepared on behalf of the Proponent to assess the potential ecological impacts of the Project in accordance with the NSW Biodiversity Assessment Methodology (BAM) 2020 under the *Biodiversity Conservation Act 2016* (BC Act). The development application and environmental impact statement (EIS) were submitted to the NSW Department of Planning and Environment (DPE, now Department of Planning, Housing and Infrastructure; DPHI) and publicly exhibited during November 2023.

Following the public exhibition of the EIS, the Biodiversity Conservation and Science Directorate (BCS; now Conservation Programs, Heritage and Regulation; CPHR) of the New South Wales (NSW) Department of Climate Change, Energy, the Environment and Water (DCCEEW) provided eight (8) key recommendations on the BDAR. Amendments to the survey and additional information provided have been developed in consultation with the BCS/CPHR between February 2024 and July 2025. Additional survey and information have also been provided to reflect DPHI comments regarding the proposed access route to the Project Site. The impact of these changes has been assessed in this amended BDAR.

In response to matters raised in submissions and outcomes of ongoing engagement with CPHR, the Proponent has included the following considerations:

1. Incorporating a Development Corridor (approximately 1,322 ha) where surveys have been completed to provide flexibility in micro-siting whilst ensuring all potential impacts to biodiversity have been considered and assessed where appropriate. In areas where surveys were incomplete, species have been assumed to be present thus ensuring that the maximum upper limit of offset credit liability has been considered.
2. Commitment to undertaking additional bird and bat utilisation surveys (BBUS) across the Project Site. Nineteen sites (10 impact sites and nine (9) control sites) were established in autumn 2023 to obtain a greater coverage of the Project Site. In September 2024, three (3) ultrasonic bat detectors were placed at 100 m, 50 m and at 2 m at two (2) Met Masts located within the Project Site. Data has been collected across all seasons to gauge activity levels at the three (3) heights and across the Project Site (see Section 6). Data gathered from the Project Site will be incorporated into a Bird and Bat Adaptive Management Plan (BBAMP) (see Section 7.2) to be developed prior to construction for the Project.
3. Based on the information from the BBUS, all Wind Turbine Generators (WTGs) have been allocated a risk rating and collision risk modelling for at-risk species has been updated. This is further detailed in Section 6.7.

4. Impacts to Serious and Irreversible Impact (SAII) entities and Matters of National Environmental Significance (MNES) have been re-evaluated and further assessments have been conducted. Impacts to SAII have been considered in Section 9 and MNES have been updated in Section 11.1 of this BDAR. Additional mitigation measures for these SAIIs have been considered in consultation with CPHR and are provided Section 9.1.1. An assessment of significance for each MNES has been updated and included in Appendix O.
5. Additional targeted flora and fauna surveys and expert reports to ensure the upper limit of credits have been completed. Targeted flora surveys were conducted during 24-28 February 2025, 28 October 2025 and 10 November 2025 using both the 40 m grid and transect methods as outlined in the '*Surveying threatened plants and their habitats. NSW Guide for the Biodiversity Assessment Method* (DPIE 2020c). Expert reports have been completed for *Aprasia parapulchella* (Pink-Tailed Legless Lizard) and *Keyacris scurra* (Key's Matchstick Grasshopper). These are included in Section 4 of this BDAR with reports attached to Appendix R. Targeted Key's Matchstick Grasshopper surveys were undertaken in November 2025 within areas of suitable grassland habitat identified from the Expert Report (approximately 30 ha). Targeted Key's Matchstick Grasshopper survey methods were based on guidance from the BOS Helpdesk (dated 30/07/2024) which recommends meandering slowly through preferred habitat, observing the preferred flora species and disturbing the vegetation slightly to enhance detectability of the species if present by encouraging movement. Waving vegetation with a dowel or something similar may also be of use.
6. Vegetation stratification, classification and mapping have been updated, and areas re-evaluated in the Biodiversity Assessment Method (BAM) Calculator (BAM-C) amalgamating impacts in one Parent Case and two (2) Child Cases. See Appendix G.
7. Additional information on the ancillary infrastructure, including asset protection zones (APZs) and road upgrades is presented in Section 2.1.2. A Temporary Workers Accommodation Facility (TWAF) has been included within the amended Development corridor and has been assessed as part of this BDAR.
8. The Proponent is seeking formal concurrence from the decision-maker to defer targeted surveys for a select number of threatened species until post-approval, as detailed in Section 4.7, Table 4-22 and Table 4-23. These species were identified as having a low to moderate likelihood of occurrence; however, due to seasonal constraints and land access limitations, surveys could not be completed within the appropriate survey windows. As a result, these species have been assumed present in accordance with the Biodiversity Assessment Method (BAM) 2020, and their potential habitat has been included in the calculation of species credits. In addition, partial surveys were completed for the species listed in Table 4-23. Although no individuals were recorded, several of these species were assessed as having a low to moderate (except Powerful Owls) likelihood of occurrence in portions of the Project Site that were either inaccessible or not adequately surveyed. These species have also been assumed present, and the assessment of impacts and offset requirements has been completed accordingly. In late 2025, Masked Owls and Powerful Owl records were updated on BioNet. These records have been included and an 800 m buffer applied to these locations. These areas did not intersect with the Development Corridor.

E1: Development Description

The Project involves the construction, operation and decommissioning of up to 70 WTGs with a maximum tip height of 250 m (to blade tip) and ancillary infrastructure including access tracks, road upgrades, underground and overhead electricity cabling, substations, transmission lines and grid connections to the TransGrid 330 kV transmission network located on the western side of Lake Burrendong. Approximately 400-500 megawatts (MW) of renewable energy would be generated and supplied directly to the national electricity grid. The proposed number of WTGs was reduced from 105 at the time of the initial assessment and the Development Footprint modified and updated during the assessment process in consultation with project ecologists and the Proponent.

The Project Site is approximately 29,000 ha with most infrastructure located within predominately cleared land along ridgelines that are used for farming and grazing operations. The Development Corridor is wider than the Development Footprint varying in width from 0 m to 100 m outside the Development Footprint. The Development Corridor is required to support flexibility in the design and final placement (micro siting) of the above components. Flexibility is sought in the Development Consent to allow the Proponent to determine the optimal project layout within the limits of the impact assessment and Development Consent, generally in accordance with this EIS, post-Development Consent. The Proponent requests flexibility within pending consent conditions that the timing of determining final offset requirements and offsets is cognisant of the detailed design process. The Development Corridor comprises of approximately 1,322 ha with a proposed Development Footprint of 730.73 ha (including road upgrades and connection corridors). For the purposes of assessing the impacts to biodiversity, the Development Corridor has been assessed covering the overall project infrastructure, including wind farm infrastructure, internal roads, transmission line, access tracks and transport haul road.

E2: Measures to avoid and minimise

Throughout the development of the Project, alternate alignments and expanded investigation corridors were explored to identify an optimal layout. These alternative layouts were developed in response to ongoing environmental and engineering investigations and consultation with landowners.

Alongside the Wind Farm layout and siting of WTGs, biodiversity assessments were conducted on two potential access routes for transporting workers and Over Size Over Mass (OSOM) vehicles delivering plant and WTG components, as well as two transmission line options. The goal was to select routes with the lowest ecological impact (Appendix M).

The initial northern transmission line option assessed in the EIS intersected high-quality Grey Box Grassy Woodland Threatened Ecological Community (TEC) and potential habitat for *Crinia sloanei* (Sloane's Froglet). This area also contained aboriginal artefacts. Given these environmental and cultural sensitivities, this route was removed from the Development Footprint (see Appendix M). Similarly, an eastern access route option was eliminated due to significant Box Gum Woodland TEC and the presence of *Acacia ausfeldii* (Ausfeld's Wattle) within the road reserve. The chosen northern access route is largely cleared, impacted by weeds, and contains lower-quality roadside Box Gum Woodland compared to the eastern alternative.

WTG placement was also refined, with turbines removed from the southern area of the Project layout which contained high quality Box Gum Woodland and relocated to a highly degraded ridgeline in the

east which has been pasture improved for stock grazing. Additionally, WTG 49 and its access track were micro-sited to avoid impacts on *Xanthorrhoea glauca* (Grass Tree). Although not a threatened species, Grass Trees hold a significant cultural heritage value.

These refinements led to a significant reduction in the Development Footprint and minimised impacts to native vegetation. Initial impacts projected in 2020 totalled up to 1,432 ha, reduced to 1,077 ha in 2021 to avoid higher quality vegetation, particularly on the eastern road. Further reductions were made in 2023 reducing the impact area down to 750 ha when the original BDAR was submitted. This reduction was achieved by removing the northern and central transmission easements and realigning internal tracks to avoid Box Gum Woodland. Ongoing refinements particularly to avoid patches of Box Gum Woodland, have further reduced the impact areas to 730.73 ha. These changes are summarised in Table E0-1 below.

Table E0-1: Summary of changes in impacts during Project development

Year	Impact Area (ha)	Summary
2020	1,432	Initial projected impacts
2021	1,077	Revised to avoid higher quality vegetation, especially on the eastern road
2023	750	Further reduction due to the removal of the northern and central transmission easements and realignment of tracks
2024	743	Additional reductions achieved by further refinement to avoid Box-Gum Woodland
2025	730.73	Reductions due to placement refinement of WTG 49 and access road upgrade works

Overall, the current layout is the preferred option due to a combination of construction costs, topography, access, and avoidance of threatened ecological communities as far as practical. However, some impacts to biodiversity remain unavoidable. Offset credit liability for these residual impacts have been calculated, based on the Development Footprint, as detailed in Appendix G.

E3: Native Vegetation and threatened species

Biodiversity impacts have been assessed through survey, mapping and assessment completed in accordance with the BAM 2020. The assessment reveals that the Development Corridor contains the following features and biodiversity values:

- 12 Plant Community Types (PCTs)
- Two (2) TECs.
    - White Box- Yellow box- Blakely's Red Gum Grassy Woodland listed as Critically Endangered (CE) under both the NSW BC Act and Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
    - Grey Box Grassy Woodlands listed as Endangered (E) under both BC Act and EPBC ACT
- Candidate species including three (3) species of threatened bats, one (1) mammal and five (5) species of birds (one (1) migratory species) were detected during field surveys:
    - *Chalinolobus dwyeri* (Large-eared Pied Bat)
    - *Miniopterus orianae oceanensis* (Large Bent-winged Bat)

- *Miniopterus australis* (Little Bent-winged Bat)
- *Vespadelus troughtoni* (Eastern Cave Bat)
- *Phascolarctos cinereus* (Koala)
- *Calyptorhynchus lathami lathami* (Glossy Black Cockatoo)
- *Haliaeetus leucogaster* (White-bellied Sea Eagle)
- *Hieraaetus morphnoides* (Little Eagle)
- *Hirundapus caudacutus* (White-throated Needletail) Migratory
- *Ninox strenua* (Powerful Owl).

- An additional three species of mammals (*Cercartetus nanus* Eastern Pygmy Possum, *Petaurus norfolcensis* Squirrel Glider, and *Phascogale tapoatafa* Brush-tailed Phascogale), one reptile (*Aprasia parapulchella* Pink-tailed Legless Lizard), one insect (*Keyacris scurra* Keys Matchstick Grasshopper), and three species of birds (*Burhinus grallarius* Bush Stone-curlew, *Ninox connivens* Barking Owl, *Tyto novaehollandi*ae Masked Owl) were considered to have the potential to occur within the Project Site.
- Floristic transect surveys were completed in October and November 2025 along Yarrabin Road access route and along the transmission line on the Wellington side of the Development Corridor. Four species of plants were presumed present within all areas of associated PCTs that were not surveyed within the survey timing requirements (*Diuris tricolor* Pine Donkey Orchid, *Prasophyllum petilum* Tarengo Leek Orchid, *Swainsona recta* Small Purple-pea and *S. sericea* Silky Swainson-pea). An additional three species were assumed present in areas that were not adequately surveyed (*Grevillea divaricata, Persoonia marginata, and Tylophora linearis*). Offset credits have been calculated for these species.
- Non threatened raptors were confirmed to be present within the Project Site, being the *Aquila audax* (Wedge-tailed Eagle), *Falco cenchroides* (Nankeen Kestrel), *Haliastur sphenurus* (Whistling Kite), *Accipiter fasciatus* (Brown Goshawk), *Falco peregrinus* (Peregrine Falcon), *Falco longipennis* (Australian Hobby) and *Accipiter cirrocephalus* (Collared Sparrowhawk).

An assessment of the impacts of the Project on MNES within the Project Site was undertaken to determine whether referral of the Project to the Commonwealth Minister for the Environment was required. Assessments of significance (Appendix O) were completed for two TECs, 14 threatened fauna species, two migratory bird species and six threatened flora species. The Project was referred to the Commonwealth Department of Climate Change, Environment, Energy and Water (DCCEEW) and was determined to be a Controlled Action on 2 June 2021 (2021/8916). The Project will be assessed under the bilateral agreement with NSW. Additional information is provided in Section 11.1 of this BDAR.

E4: Impacts and Offset Requirements

The Project will impact 730.73 ha, consisting of:

- Overhead Reticulation – 3.95 ha
- Transmission line – 34.02 ha
- Road upgrades – 63.35 ha
- Internal track upgrades – 17.90 ha
- Substation – 4.30 ha
- Windfarm – 586.68 ha

- Access to Windfarm (Option A)[1] – 9.56 ha
- Access to Windfarm (Option B)[1] – 10.97 ha.

There will be a direct loss of 681.96 ha of native vegetation which requires offsetting under the Biodiversity Offset Scheme (BOS). There will be a direct loss of TECs consisting of:

- Box Gum Woodland (CE) – 74.51 ha (32.02 ha is EPBC Act listed Box Gum Woodland) of which 67.72 ha is in a Derived Native Grassland (DNG) form
- Grey Box Woodland (E) – 0.84 ha (0.84 ha is EPBC Act Grey Box Woodland), of which 0.78 ha is in the DNG form mainly along the roadside on Yarrabin Road.

The Project has been refined to avoid impacts as much as possible to Box Gum Woodland. A hierarchy was followed to minimise impacts by firstly avoiding this community, then avoiding those areas that were in woodland condition, followed by those areas with a diverse ground layer in the DNG areas, especially areas that conformed to the EPBC Act listed community; through to degraded grasslands with a priority of locating impacts within poor quality areas. DNG refers to areas that result from historical clearing and current agricultural land use. Of the 74.51 ha of Box Gum Woodland within the Development Footprint, 90% is DNG. Unmitigated impacts to Box Gum Woodland could potentially be determined SAII. Additional and appropriate measures have been discussed with CPHR which will be implemented to further reduce impacts to Box Gum Woodland. These are outlined Section 9.1.1.

Cave-dwelling bats are a SAII entity. Impacts to breeding and roosting habitat is a SAII. However, there is no breeding habitat within the Development Corridor, nor within the required 2 km to generate credits, although there is the potential of the WTG to impact the bats directly due to blade strike or barotrauma. This quantum of possible impacts is currently unknown. In September 2024, ultrasonic detectors were permanently mounted to the two met masts within the Project Site at 0 m, 50 m and 100 m to determine whether the bats fly within the rotor swept area and if so what percentage of bat activity may be within the impact area (Section 6). To understand potential impacts to birds flying within rotor swept area, additional bird surveys have been undertaken and will continue for a minimum of 2 years across the site across all seasons to indicate seasonal flight patterns. Based on data collected to date, curtailment strategies have been proposed (see Section 7.1.1).

Maximum residual impacts to plant communities and the associated TECs are shown in Table E0-2 below.

Table E0-2: Maximum Impacts to plants communities and maximum offset credits required.

Vegetation Zone	PCT Name	Condition Class	TEC Association	Impact Area (ha)	Ecosystem Credits
South Western Slopes Bioregion					
1	76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW	DNG	Inland Grey Box Woodland in the	0.77	23

[1] An alternative access to the Project may be required to facilitate movement of infrastructure and light vehicle assess rather than using the current road (option A) through the Reflections Cudgegong River Holiday Park.

Vegetation Zone	PCT Name	Condition Class	TEC Association	Impact Area (ha)	Ecosystem Credits
	South Western Slopes and Riverina Bioregions		Riverina, NSW South Western Slopes		
2	84 – River Oak – Rough barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Good		1.21	30
3	84 – River Oak – Rough barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	DNG		1.90	23
4	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	3.57	100
5	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	23.79	495
6	272 – White box – black cypress pine – red gum +/- Mugga Ironbark shrubby woodland in the hills of the NSW central western slopes	Good		173.19	7,184
7	272 – White box – black cypress pine – red gum +/- Mugga Ironbark shrubby woodland in the hills of the NSW central western slopes	DNG		64.92	1,333
8	274 – White Box -Rough barked apple alluvial woodland of the NSW central western slopes including in the Mudgee region	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.07	2
9	277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	1.92	69
10	277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	13.25	448

Vegetation Zone	PCT Name	Condition Class	TEC Association	Impact Area (ha)	Ecosystem Credits
11	281 – Rough Barked Apple – red gum – yellow box woodland on alluvial clay to loam soils on the valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	4.24	98
12	331 – Red Stringybark woodland on hillslopes northern NSW South Western Slopes Bioregion	DNG		0.48	5
13	331 – Red Stringybark woodland on hillslopes northern NSW South Western Slopes Bioregion	Good		1.07	24
14	461 – Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion	DNG		0.57	25
15	76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Good	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes	0.06	1
16	281 – Rough Barked Apple – red gum – yellow box woodland on alluvial clay to loam soils on the valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.34	15
17	274 – White Box -Rough barked apple alluvial woodland of the NSW central western slopes including in the Mudgee region	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.83	28
Total South Western Slopes Bioregion				**292.18**	**9,903**
South Eastern Highlands Bioregion					
1	84 – River Oak – Rough barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Good		0.32	8
2	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	5.09	166

Vegetation Zone	PCT Name	Condition Class	TEC Association	Impact Area (ha)	Ecosystem Credits
3	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Low	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	19.26	308
4	270 – White Box Tumbledown Red Gum – Long-leaved Box shrub/grass woodland on fine grained sediments of the upper Macquarie River	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.15	6
5	272 – White box – black cypress pine – red gum +/- Mugga Ironbark shrubby woodland in the hills of the NSW central western slopes	Good		56.62	2,157
6	272 – White box – black cypress pine – red gum +/- Mugga Ironbark shrubby woodland in the hills of the NSW central western slopes	DNG		41.39	894
7	277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	1.26	47
8	287 – Long-leaved Box – Red Box – Red stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	DNG		102.07	975
9	287 – Long-leaved Box – Red Box – Red stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	Good		111.55	2,790
10	331 – Red Stringybark woodland on hillslopes northern NSW South Western Slopes Bioregion	Good		37.21	823
11	331 – Red Stringybark woodland on hillslopes northern NSW South Western Slopes Bioregion	DNG		14.12	145
12	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.74	46
Total South Eastern Highlands Bioregion				**389.78**	**8,365**
TOTAL				**681.96**	**18,268**

There will be a direct loss of habitat for candidate species. Candidate species presence within the Development Corridor has been determined through extensive surveys confirming species presence or absence. However, assumptions of presence have been made under the following conditions:

Areas with Incomplete Surveys:

- **Inaccessible Areas**: Portions of the Development Corridor that were physically inaccessible due to difficult terrain. This covers approximately 32 ha of which 7 ha is within the Development Footprint (see Figure 3-3).
- **Survey Timing Limitations**: Areas where surveys were conducted outside the required season or temporal windows.

These assumptions ensure that potential impacts to candidate species are fully considered despite limitations in survey coverage. Impacts to Candidate species are shown in Table E0-3.

Tympanocryptis mccartneyi (Bathurst Earless Dragon) was a recent addition to the BAM Calculator (BAM-C), added August 2025. This species was added after all additional surveys were completed and therefore has not been included in the assessment within this BDAR.

Table E0-3: Candidate species potentially requiring offsets

Scientific Name	Common Name	BC Act listing	EPBC Act listing	Loss of area (ha)	Biodiversity Risk weighting	Number of species credits
South Western Slopes Bioregion						
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V	51.40	2	1,687
Cercartetus nanus	Eastern Pygmy Possum	V	NL	50.03	2	1,666
Diuris tricolor	Pine Donkey Orchid	V	NL	0.50	1.5	11
Keyacris scurra	Key's Matchstick grasshopper	E	E	5.67	2	99
Ninox connivens	Barking Owl	V	NL	45.22	2	1,229
Ninox strenua	Powerful Owl	V	NL	1.58	2	49
Petaurus norfolcensis	Squirrel Glider	V	NL	45.22	2	1,229
Phascogale tapoatafa	Brush-tailed Phascogale	V	NL	80.76	2	2,271
Phascolarctos cinereus	Koala	E	E	255.80	2	9,927
Prasophyllum petilum	Tarengo Leek Orchid	E	E	6.08	2	218
Swainsona recta	Small Purple-pea	E	E	15.58	2	340
Swainsona sericea	Silky Swainson-pea	V	NL	19.14	2	442
Tylophora linearis		V	NL	0.57	2	29

Scientific Name	Common Name	BC Act listing	EPBC Act listing	Loss of area (ha)	Biodiversity Risk weighting	Number of species credits
Tyto novaehollandiae	Masked Owl	V	NL	45.22	2	1,229
TOTAL						**20,426**
South Eastern Highlands						
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V	13.42	2	428
Burhinus grallarius	Bush Stone-curlew	E	NL	18.78	2	616
Cercartetus nanus	Eastern Pygmy Possum	V	NL	8.00	2	260
Grevillea divaricata		E	NL	5.54	3	245
Keyacris scurra	Key's Matchstick Grasshopper	E	E	5.83	2	167
Ninox connivens	Barking Owl	V	NL	8.92	2	295
Ninox strenua	Powerful Owl	V	NL	1.60	2	22
Persoonia marginata	Clandulla Geebung	V	V	47.51	2	1,062
Petaurus norfolcensis	Squirrel Glider	V	NL	8.92	2	295
Phascogale tapoatafa	Brush-tailed Phascogale	V	NL	7.32	2	273
Phascolarctos cinereus	Koala	E	E	389.79	2	9,549
Swainsona recta	Small Purple-pea	E	E	26.50	2	458
Swainsona sericea	Silky Swainson-pea	E	E	77.69	2	1,744
Tyto novaehollandiae	Masked Owl	V	NL	8.92	2	295
Total						**15,709**
TOTAL						**36,133**

E5: Mitigation Measures

The potential impacts to biodiversity as a result of the project have been avoided and minimised as much as practicable, through design refinements. The Proponent is committed to continuing progress design optimisation in a detailed design process which is expected to reduce impacts from that presented in this amended BDAR. Further mitigation measures are outlined in Section 7 and proposed to be adopted to manage the extent and severity of the remaining impacts during construction and operational phases and include provisions of biodiversity offsets, management measures, monitoring and adaptive management measures. These measures include low wind speed curtailment, turbine feathering and smart curtailment trials to minimise turbine strike risk for bird and bat species.

The Development Footprint will continue to be refined within the Development Corridor and once finalised the final residual impacts associated with the project will be calculated. This will be less than what is presented in this BDAR. The retirement of these credits will be carried out in accordance with the NSW BOS.

In May 2025, Ark engaged an environmental consultant to investigate the most appropriate biodiversity offset strategy for the wind farm. This process includes consideration of both land-based offsets through a Biodiversity Stewardship Site within the locality of the wind farm and Strategic Biodiversity Offset Delivery Agreements, as provided under the *Biodiversity Conservation Act 2016* (as amended in 2025).

While the offset strategy is yet to be finalised, Ark is committed to delivering an approach that appropriately compensates for the unavoidable loss of biodiversity values and residual project impacts. The final strategy will be developed post-approval in consultation with the Department of Planning, Housing and Infrastructure (DPHI) and will be consistent with the mechanisms available under the *BC Act* and *BC Act Regulations*.

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Abbreviations

Abbreviation	Description
AAM	Additional and Appropriate Measures
AG DCCEEW	Australian Government Department of Climate Change, Energy, Environment and Water
AOBV	Areas of Outstanding Biodiversity Value
AOO	Area of occupancy
BAM	Biodiversity Assessment Method 2020
BAM-C	Biodiversity Assessment Method Credit Calculator
BBAMP	Bird and Bat Adaptive Management Plan
BBUS	Bird and Bat Utilisation Survey
BC Act	NSW *Biodiversity Conservation Act 2016*
BCD	Biodiversity Conservation Division
BCS	Biodiversity Conservation and Science (now CPHR previously OEH, and BCD)
BDAR	Biodiversity Development Assessment Report
BM	Benchmark
BMP	Biodiversity Management Plan
BOS	Biodiversity Offset Strategy
BUS	Bird Utilisation Survey
BV	Biodiversity Values
CEEC	Critically Endangered Ecological Community
CPHR	Conservation Programs Heritage and Regulation
CRM	Collision Risk Model
CWO REZ	Central West Orana Renewable Energy Zone
DAWE	Department of Agricultural, Water and Environment
DNG	Derived Native Grassland
DPE	NSW Department of Planning, Industry and Environment
DPHI	NSW Department of Planning, Housing and Industry
DPI	Department of Primary Industries
DRC	Dubbo Regional Council
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EL	Exploration Licence
ELA	Eco Logical Australia Pty Ltd
EMS	Environmental Management Strategy
EOO	Extent of occurrence

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Abbreviation	Description
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FM Act	NSW *Fisheries Management Act 1994*
GIS	Geographic Information System
HBT	Hollow Bearing Tree
HTW	High Threat Weed
IBRA	Interim Biogeographic Regionalisation for Australia
IPC	Independent Planning Commission
KFH	Key Fish Habitat
LEP	Local Environmental Plan
LGA	Local Government Area
LLS	Local Land Service
LWD	Large Woody Debris
MNES	Matters of National Environmental Significance
MWRC	Mid-western Regional Council
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change Energy Environment and Water
OSOM	Over Size Over Mass
PCT	Plant Community Type
PMST	Protected Matters Search Tool
RSA	Rotor Swept Area
SAII	Serious and Irreversible Impact
SEARs	Secretary's Environmental Assessment Requirements
SEED	Sharing and Enabling Environmental Data
SEH	South Eastern Highlands
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSI	State Significant Infrastructure
SWS	South Western Slopes
TARP	Trigger Action Response Plan
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
the Project	Burrendong Wind Farm
the Proponent	Burrendong Wind Farm Pty Ltd
TSSC	Threatened Species Scientific Committee

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Abbreviation	Description
TWAF	Temporary Workers Accommodation Facility
VI	Vegetation Integrity
VIS	Vegetation Information System
WM Act	NSW *Water Management Act 2000*
WTG	Wind Turbine Generator

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Certification under Section 6.15 *Biodiversity Conservation Act 2016*

I, Cheryl O'Dwyer (BAAS18153) certify that this Biodiversity Development Assessment Report and the accompanying finalised credit reports have been prepared based on the requirements of, and information provided under the Biodiversity Assessment Method 2020 and clause 6.15 of the *Biodiversity* Conservation *Act 2016*.

I declare that all EPBC listed species and communities that have the potential to occur within the Subject Land have been identified in this BDAR including those that are ecosystem credit species.



Date: 31 March 2026

BAM Assessor Accreditation no: BAAS18153

Details and Experience of Authors and Contributors

Name	BAM Assessor Accreditation	Position / Role	Task Performed	Relevant Qualifications
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***No longer employed at ELA**

CONFLICT OF INTEREST

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest. This declaration has been made in the interests of full disclosure to the decision-maker. Full disclosure has also been provided to the client.



Date: 31 March 2026

BAM Assessor Accreditation no: BAAS18153

Stage 1 Biodiversity Assessment

1. Introduction

1.1. Proposed Development

The proposed Burrendong Wind Farm (the Project) is classified as State Significant Development (SSD – 8950984) under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The Planning Secretary's Environmental Assessment Requirements (SEARs) for the Project were issued on 30 September 2022 and require the preparation of a Biodiversity Development Assessment Report (BDAR) to assess biodiversity impacts.

The original BDAR was prepared and submitted with the Environmental Impact Statement (EIS) for the Project to address the SEARs in relation to biodiversity. The development application and EIS were submitted to the NSW Department of Planning and Environment (DPE; now Department of Planning, Housing and Infrastructure; DPHI) and publicly exhibited during November 2023. This amended BDAR has been prepared as part of the submission phase to address amendments to the Project and consider agency feedback. Following the public exhibition of the EIS, the Biodiversity Conservation and Science Directorate (BCS; referred to now as Conservation Programs, Heritage and Regulation; CPHR) of the New South Wales (NSW) Department of Climate Change, Energy, the Environment and Water (DCCEEW) provided eight (8) key recommendations on the BDAR. Amendments to the survey and additional information provided have been developed in consultation with the BCS / CPHR between February 2024 and June 2025. Additional survey and information have also been provided to reflect DPHI comments regarding the proposed access route to the Project Site. The impact of these changes has been assessed in this amended BDAR. A table detailing how this report has addressed comments received by BCS is provided in Appendix P.

In response to matters raised in submissions and outcomes of ongoing engagement with CPHR, the Proponent has amended the Project as follows:

1. Incorporating a Development Corridor (approximately 1,322 ha) where surveys have been completed to provide flexibility in micro-siting whilst ensuring all potential impacts to biodiversity have been considered and assessed where appropriate. In areas where surveys were incomplete, species have been assumed to be present thus ensuring that the maximum upper limit of offset credit liability has been considered.
2. Commitment to undertaking additional bird and bat utilisation surveys (BBUS) across the Project Site. Nineteen sites (10 impact sites and nine (9) control sites) were established in autumn 2023 to obtain a greater coverage of the Project Site. In September 2024, three (3) ultrasonic bat detectors were placed at 100 m, 50 m and at 2 m at two (2) Met Masts located within the Project Site. Data has been collected across all seasons to gauge activity levels at the three (3) heights and across the Project Site. Data gathered from the Project Site will be incorporated into a Bird and Bat Adaptive Management Plan (BBAMP see Section 7.2) to be developed prior to construction for the Project. Additional details have been provided in Section 6 of this BDAR.

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3. Based on the information from the BBUS, all Wind Turbine Generators (WTG) have been allocated a risk rating and collision risk modelling has been updated. This is further detailed in Section 6 of this BDAR.
4. Impacts to Serious and Irreversible Impact (SAII) entities and Matters of National Environmental Significance (MNES) have been re-evaluated and further assessments have been conducted. Impacts to SAII have been considered in Section 9 and MNES have been updated in Section 11.1 of this BDAR. Additional mitigation measures for these SAIIs have been considered in consultation with CPHR and are provided Section 9.1.1. An assessment of significance for each MNES has been updated and included in Appendix O.
5. Additional targeted flora and fauna surveys and expert reports to ensure the upper limit of credits have been completed. Targeted flora surveys were conducted during 24-28 February 2025, 28 October 2025 and 10 November 2025 using both the 40 m grid and transect methods as outlined in the '*Surveying threatened plants and their habitats. NSW Guide for the Biodiversity Assessment Method* (DPIE 2020c). Expert reports have been completed for *Aprasia parapulchella* (Pink-Tailed Legless Lizard) and *Keyacris scurra* (Key's Matchstick Grasshopper). These are included in Section 4.6.6 of this BDAR with reports attached to Appendix R. Targeted Key's Matchstick Grasshopper surveys were undertaken in November 2025 within areas of suitable grassland habitat identified from the Expert Report (approximately 30 ha). Targeted Key's Matchstick Grasshopper survey methods were based on guidance from the BOS Helpdesk (dated 30/07/2024) which recommends meandering slowly through preferred habitat, observing the preferred flora species and disturbing the vegetation slightly to enhance detectability of the species if present by encouraging movement. Waving vegetation with a dowel or something similar may also be of use.
6. Vegetation stratification, classification and mapping have been updated and areas re-evaluated in the Biodiversity Assessment Method (BAM) Calculator (BAM-C) amalgamating impacts in one Parent Case and two (2) Child Cases. See Appendix G.
7. Additional information on the ancillary infrastructure, including asset protection zones (APZ) and road upgrades is presented in Section 1.4. A Temporary Workers Accommodation Facility (TWAF) has been included within the amended Development corridor and has been assessed as part of this BDAR.
8. The Proponent is seeking formal concurrence from the Minister for the Environment under Section 7.14 of the *Biodiversity Conservation Amendment (Biodiversity Offsets Scheme) Act 2024* to micro-site the Development Footprint within the assessed Development Corridor following further detailed design, and to defer targeted surveys for a select number of threatened species until post-approval, as detailed in Section 4.7 and Table 4-22. These species were identified as having a low to moderate likelihood of occurrence; however, due to seasonal constraints and land access limitations, surveys could not be completed within the appropriate survey windows. As a result, these species have been assumed present in accordance with the BAM 2020, and their potential habitat has been included in the calculation of species credits. In addition, partial surveys were completed for the species listed in Table 4-23. Although no individuals were recorded, several of these species were assessed as having a moderate to high likelihood of occurrence in portions of the Project Site that were either inaccessible or not adequately surveyed. These species have also been assumed present, and the assessment of impacts and offset requirements has been completed accordingly. In late 2025, Masked Owls and Powerful Owl records were updated on BioNet. These

records have been included and an 800 m buffer applied to these locations. These areas did not intersect with the Development Corridor.

This BDAR provides an assessment of the avoid, minimise and offset framework and assesses the residual impacts of the Project in accordance with the NSW BAM 2020. The BAM is a repeatable method for assessing biodiversity impacts. Under the BAM, impacts to biodiversity are quantified through two credit types:

- Ecosystem Credits – which includes impacts to vegetation (and some predicted threatened fauna species that are easily predicted by vegetation surrogates)
- Species Credits – which includes all threatened flora and some fauna species.

The number of ecosystem credits and species credits required by a development is directly related to the condition and extent of vegetation (and habitats) impacted and is measured using the BAM-C. The BAM-C utilises vegetation integrity collected in the field, as well as native vegetation extent data within the study area, to estimate the number of ecosystem credits that will be required. The BAM-C also provides a list of candidate threatened species that must be considered during the biodiversity assessment.

The Project also requires approval under the *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). The BAM has been endorsed as the assessment method for MNES under the Bilateral Agreement made under the EPBC Act. This BDAR has also assessed impacts on MNES (Appendix O).

Eco Logical Australia (ELA) has prepared this report on behalf of the Proponent, Burrendong Wind Farm Pty Ltd (the Proponent) to meet the requirements of the BAM 2020 established under Section 6.7 of the NSW *Biodiversity Conservation Act 2016* (BC Act) by Dr. Cheryl O'Dwyer, who is an accredited BAM assessor (BAA18153) as required by the SEARs. Two (2) BAM-C cases were used under the Parent Case 00024561; 00024562 (South Eastern Highlands; SEH) and 00024650 (South Western Slopes; SWS). For ease of readability, data is presented on common figures with detailed maps provided as an appendix to this report.

The SEARs identified that the EIS must address the specific biodiversity issues summarised in Table 1-1 below.

Table 1-1: SEARs requirements

SEARs Requirement	Addressed
Assess biodiversity values and the likely biodiversity impacts of the project, including impacts associated with transport route road upgrades, and indirect impacts on Lake Burrendong State Park in accordance with the BC Act and documented in a Biodiversity Development Assessment Report (BDAR), including a detailed description of the proposed regime for avoiding, minimising, managing and reporting on the biodiversity impacts (including on grasslands) of the development over time, and a strategy to offset any residual impacts of the development in accordance with the BC Act.	Addressed throughout this document
The BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect, uncertain and prescribed impacts in accordance with the BAM 2020.	Section 6 and 7
The BDAR must include details of the measures proposed to address the offset obligation as follows:	
• a. The total number and classes of biodiversity credits required to be retired for the development/project;	Section 8 and Appendix G

SEARs Requirement	Addressed
• b. The number and classes of like-for-like biodiversity credits proposed to be retired; • c. The number and classes of biodiversity credits proposed to be retired in accordance with the variation rules;	
The BDAR must be submitted with all spatial data associated with the survey and assessments as per Appendix 11 of the BAM.	All data will be provided upon submission
An assessment of the likely impacts on listed aquatic threatened species, populations, or ecological communities, scheduled under the *Fisheries Management Act 1994*, and a description of the measures to minimise and rehabilitate impacts, including impacts to Burrendong Dam, Lake Burrendong, Macquarie River, Cudgegong River, Meroo River and others.	Section 4.1.3 and 4.1.4
Assess the likely impacts on koalas and their habitat.	Section 4
Assess the impact of the project on birds and bats from blade strikes, low air pressure zones at the blade tips (barotrauma), and alteration to movement patterns resulting from the turbines and considering cumulative effects of other wind farms in the vicinity.	Section 6
If an offset is required, include details of the measures proposed to address the offset obligation.	Land-based offsets Section 10.2

1.1.1. Location

The Project Site is located approximately 30 km southeast of Wellington within both the Dubbo Regional Council (DRC) (formally Wellington and Dubbo Shire Councils) and Mid-Western Regional Council (MWRC) Local Government Areas (LGA) and to the east of Lake Burrendong (Figure 1-1) within the Central West region of NSW. The nearest rural community to the Project Site is Hargraves, with several localities also in proximity, including Biara, Maitland Bar, Moorkerawa, Yarrabin and Yarragal. The Project Site is made up of several properties zoned as RU1 – Primary Production (under Wellington Local Environmental Plan (LEP) 2012 and MWRC LEP 2012) which are currently used primarily for livestock grazing and farming operations. Sections of the Project Site are also zoned as E3 – Environmental Management with a minor SP2 zoning to the north which corresponds with a tourist park. Burrendong Dam is located adjacent to the Project Site, which is managed by WaterNSW under the Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source 2016 and the NSW Government, who manages licenced water for the environment. The Project Development Corridor is located across multiple land holdings, including 16 private landowners (containing 57 freehold lots), 6 lots owned by the State of NSW, and 33 lots owned by Water NSW.

The Project Site includes hills and ridgelines, undulating slopes and flats associated with Lake Burrendong with elevations varying from approximately 250 m to 1,100 m. Large patches of woodland are present. The landform of the Project Site is typically sloping to undulating topography with local rises. The Project Site is presented in Figure 1-3.

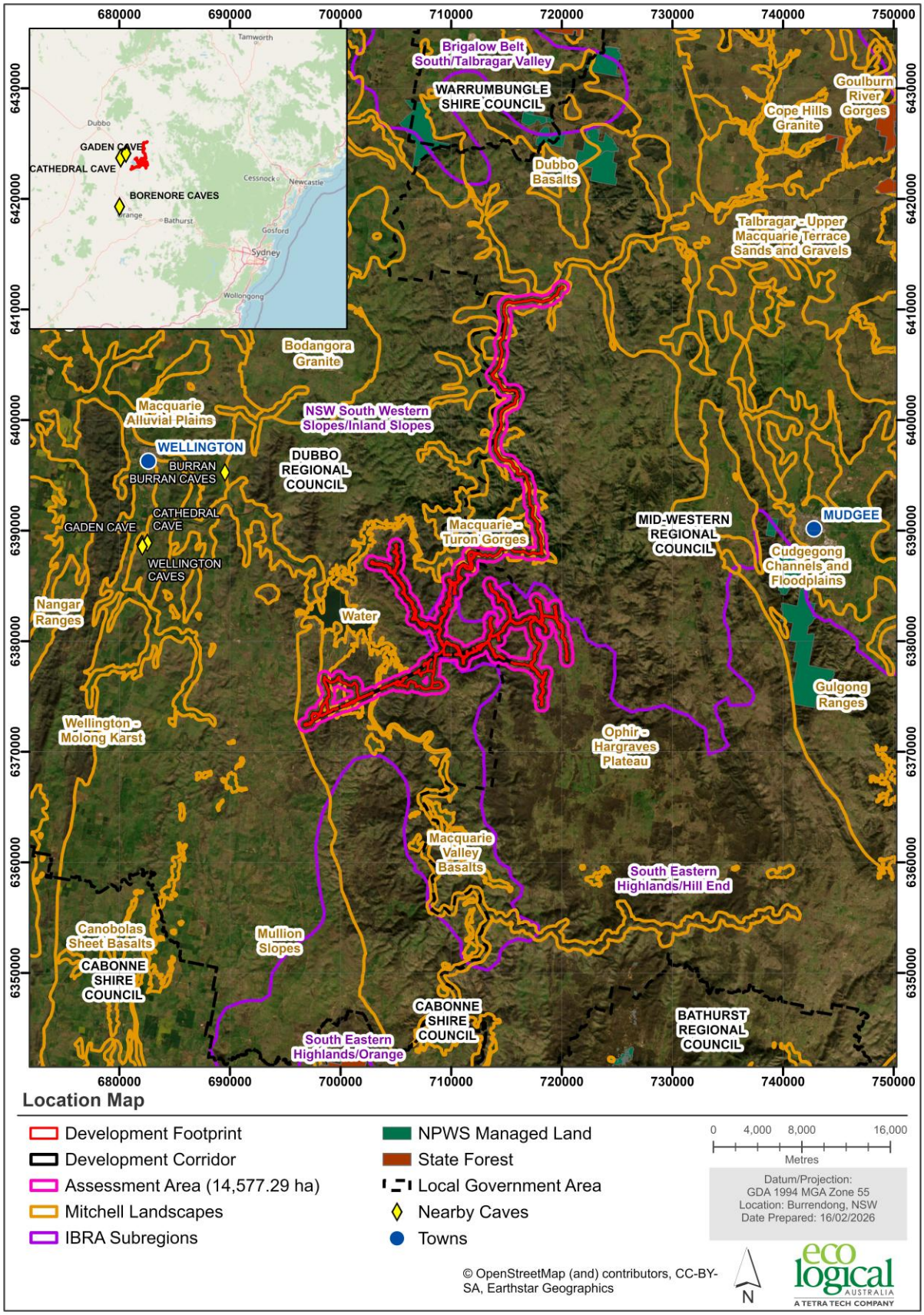


Figure 1-1: Location Map

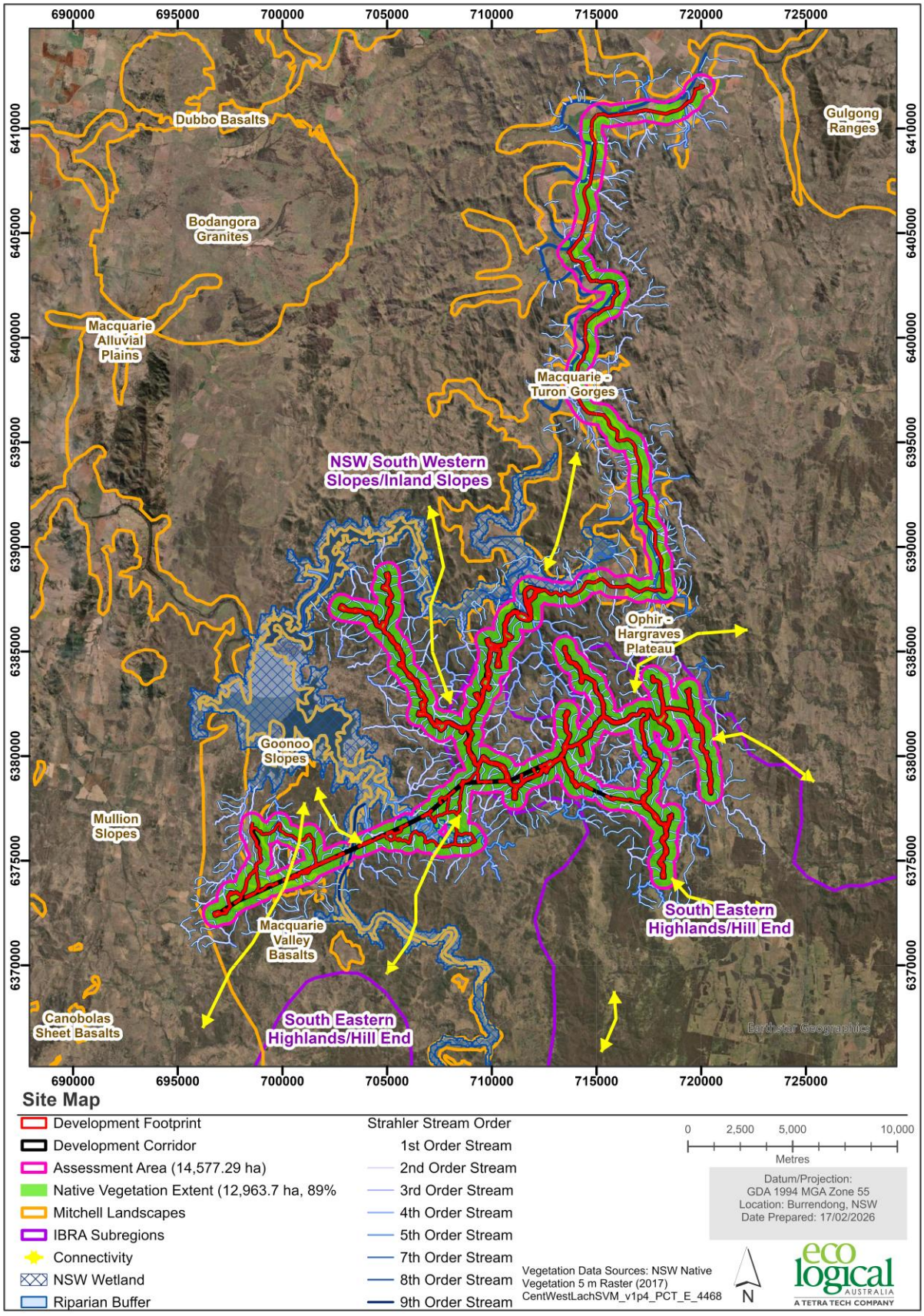


Figure 1-2: Site map

1.2. Terminology

The following terminology (Table 1-2) has been used throughout this BDAR for the purposes of describing the impacts of the proposal in the context of a biodiversity assessment in accordance with the NSW BAM (DPIE 2020).

Table 1-2: Terminology

Terminology	Description
The Project	The construction and operation of the Burrendong Wind Farm, including all components required for the Project.
Project Site	The broader area of land including all private and crown land surrounding the development site. Approximately 29,000 ha
Development Corridor / Subject Land	The area that was investigated for the placement of windfarm infrastructure and location of access routes. The Development Corridor should be considered the 'subject land' as defined by the BAM and has undergone ground-validated assessment. This ranged from 10 m either side of the Development Footprint and up to 50 m either side of the Development Footprint. The Development Corridor is approximately 1,322 ha. This is the area that has been assessed and the Development Footprint will be micro-sited within this Development Corridor (Figure 1-2). See Appendix D for details.
Development Footprint	The area of land that is directly impacted by the proposal including layout of WTGs, access roads, transmission line footprint and ancillary infrastructure. The current Development Footprint is 730.73 ha and has been included to understand the maximum impacts associated with construction and operation of the Project. The design is indicative and will be subject to detailed design and further refinement to achieve reduced biodiversity impacts. Micro-siting and Project refinement will be undertaken within the Project Development Corridor.
Assessment / Buffer Area	Land extending 500 m out from the centreline of the Development Footprint in accordance with Section 3.1 of the BAM which requires landscape attributes to be assessed for a 500 m buffer area for linear based developments. Desktop information was used to assess landscape attributes within the 500 m buffer area.

1.3. Response to Submissions

This report aims to satisfy queries raised by both members of the public as well as Agency advice received from the BCS / CPHR in response to the original BDAR during the public exhibition of the EIS during November 2023. A table detailing how this report has addressed comments received by the BCS / CPHR is provided in Appendix P.

1.4. Project Description

Concept design work was completed to confirm a conservative maximum Development Footprint to be assessed in this BDAR. The Project layout proposed is the result of comprehensive wind modelling, environmental investigations and outcomes of community and agency consultation. Many of the WTG locations are located on cleared ridgelines that have been long-term grazed by sheep and these current farming practices will continue next to the WTGs.

The initial scoping report was prepared in September 2020 which involved the construction, operation and decommissioning of up to 105 WTGs and associated ancillary infrastructure, with a total capacity around 650 MW. The Project has now been reduced to a maximum of 70 WTGs with an estimated capacity of between 400-500 MW.

Since the submission of the EIS, the Project has been reviewed in response to feedback received during discussions with stakeholders, and as our knowledge of the Project Site and constraints have increased. Following the exhibition of the EIS, the Proponent has made additional design modifications in response to the consideration of stakeholder feedback, advice from technical consultants and additional biodiversity constraints mapping, including:

Change in Project Site boundary that incorporates:

- Removal of the northern powerline option, in part to avoid potential impacts to identified Aboriginal heritage sites or valued areas following consultation with Aboriginal stakeholders and Registered Aboriginal Parties
- Addition of access track amendments including road upgrade works on Yarrabin Road based on feedback from affected landowners between May 2024 and February 2026, and comments from DPHI in October 2025
- Inclusion of intersection upgrade to Goolma and Twelve Mile Rd (near Two Mile Flat) to accommodate Over Size Over Mass (OSOM) turbine blade movement
- Addition of access tracks to powerline poles
- Addition of a broader Development Corridor that considered areas previously assessed.

Change in Development Corridor:

- The realignment of a section of access track to reduce impacts to Box Gum Woodland that was classified in 'good' condition
- The realignment of a section of access track to WTG 49 to avoid impacts to Aboriginal Site
- Addition of an alternate access track (option A) at the Project Site entrance through the Cudgegong River Holiday Park to reduce impacts to native vegetation. During detailed design either option A or option B will be selected
- Re-alignment of the wind farm powerline to avoid proposed Yarrabin Phoenix Pumped Hydro Energy Storage infrastructure and more detailed design of power line power poles to reduce impacts to Threatened Ecological Communities (TEC), associated impact areas and powerline construction access tracks.

Refinement of the 330kV powerline, resulting in the following changes:

- Reduction of the Development Footprint within the powerline easement disturbance area
- The concept design of access tracks to enable the construction of the powerline and power poles, utilising existing farm tracks as much as possible to minimise the need for clearing of vegetation
- Disturbance footprint of 20 m radius has been assumed around each pole location and the assessment of impacts is based on this area of disturbance. Actual disturbance is expected to be less. Once the construction has been completed, the powerline will have a relatively small footprint on the ground, being mainly limited to the pole locations and maintenance assess tracks
- Inclusion of the provisions for a TWAF within the Development Footprint. This area was previously included and assessed as part of the Development Corridor.

The amended Project layout is shown in Figure 1-3.

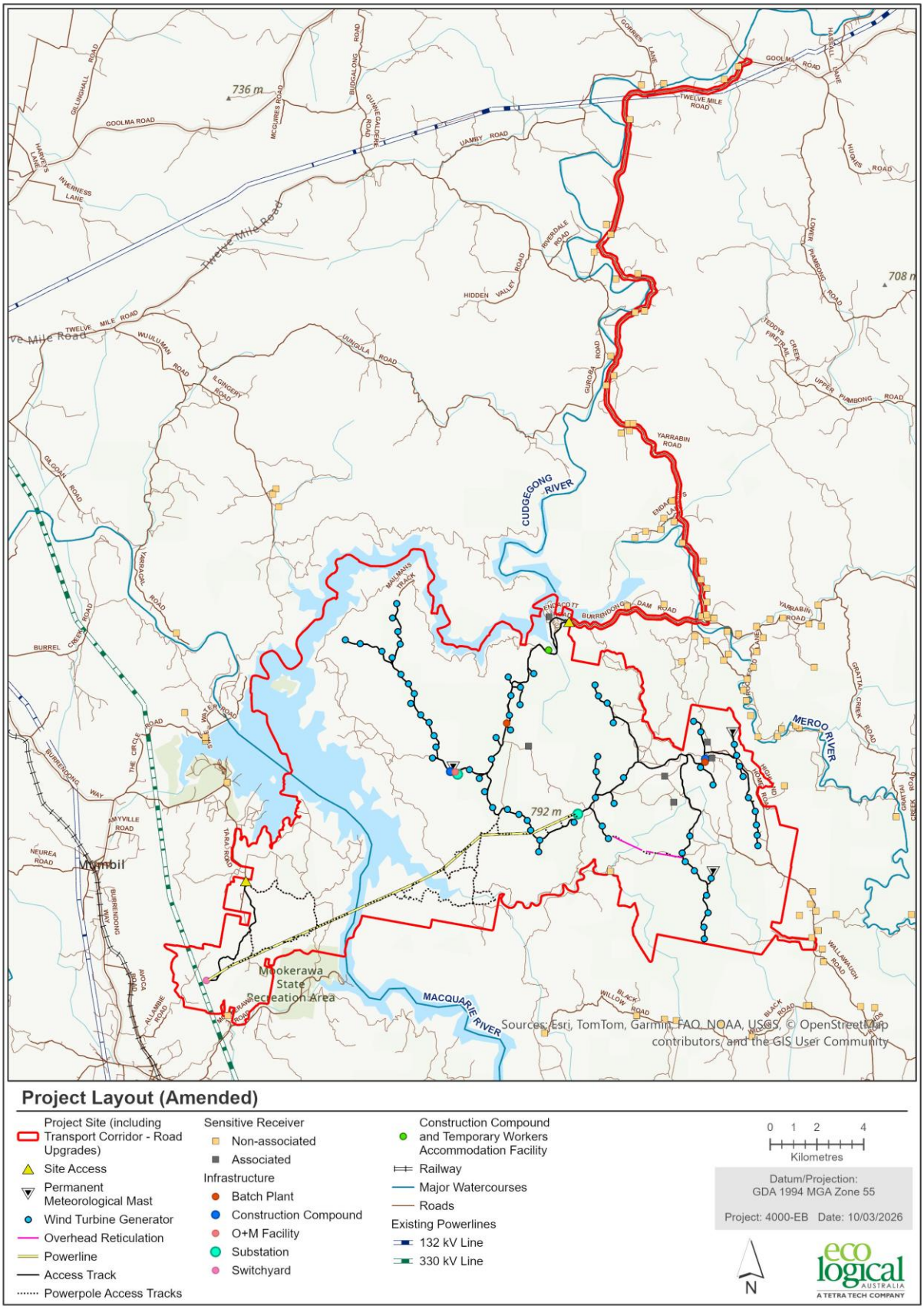


Figure 1-3: Project Layout (Amended)

The Project will involve the construction, operation and decommissioning of a wind farm. Key components of the Project are as follows:

- Maximum of 70 WTGs each with:
    - Three blades mounted on a nacelle atop a tubular steel or steel and concrete tower with a combined height (blade plus tower) to tip not exceeding 250 m (Figure 1-4)
    - Lowermost blade tip 70 m
    - Rotor diameter of up to 180 m
- A crane hardstand area at each WTG
- WTG foundation

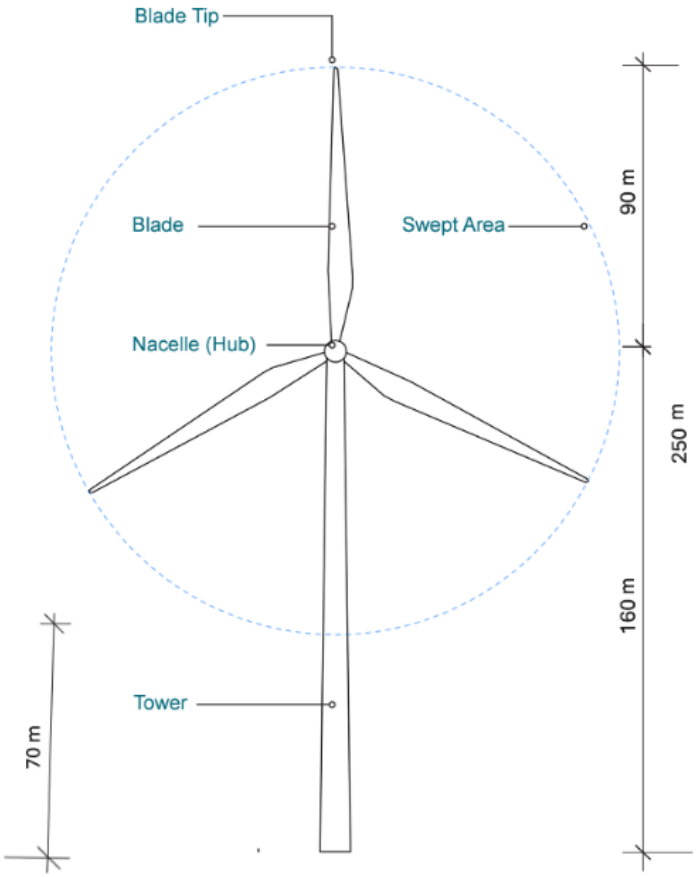


Figure 1-4: Schematic diagram of Wind Turbine Generator

- Up to two (2) collector substations
- One (1) transmission connection switchyard
- Underground cable and overhead powerline electrical connections
- Three (3) permanent meteorological masts with concrete footings and guy wires
- Temporary construction facilities including stockpiles, laydown areas, site compounds and provisions for a TWAF which would be decommissioned post construction

- Local road upgrades to enable delivery of the OSOM components from the Port of Newcastle and access for installation and maintenance of WTGs and related facilities, including required upgrades to the Goolma and Twelve Mile Rd intersection (near Two Mile Flat) to accommodate OSOM turbine blade movement
- Ancillary activities (including boundary adjustments and subdivision if required)
- Civil works.

At the end of its practical life, the Project would be decommissioned, and the site returned to its pre-existing land use in consultation with the affected landholders.

The current Development Footprint, whilst over the course of the assessment has been redesigned and reduced, is indicative only and subject to change during the continued detailed design process. A wider Development Corridor has been assessed which extends between 10 – 50 m outside of the current indicative Development Footprint to support flexibility in the design and final placement (micro siting) of the above components (Figure 1-5). Flexibility is sought in the Development Consent to allow the Proponent to determine the optimal Project layout within the broader Development Corridor. The Development Footprint is 730.73 ha and has been prepared based on the concept design developed to understand the maximum impacts associated with the construction and operation of the Project. A maximum Development Footprint has been proposed for assessment in this BDAR and it is expected to be refined and reduced during the detailed design phases of the Project.

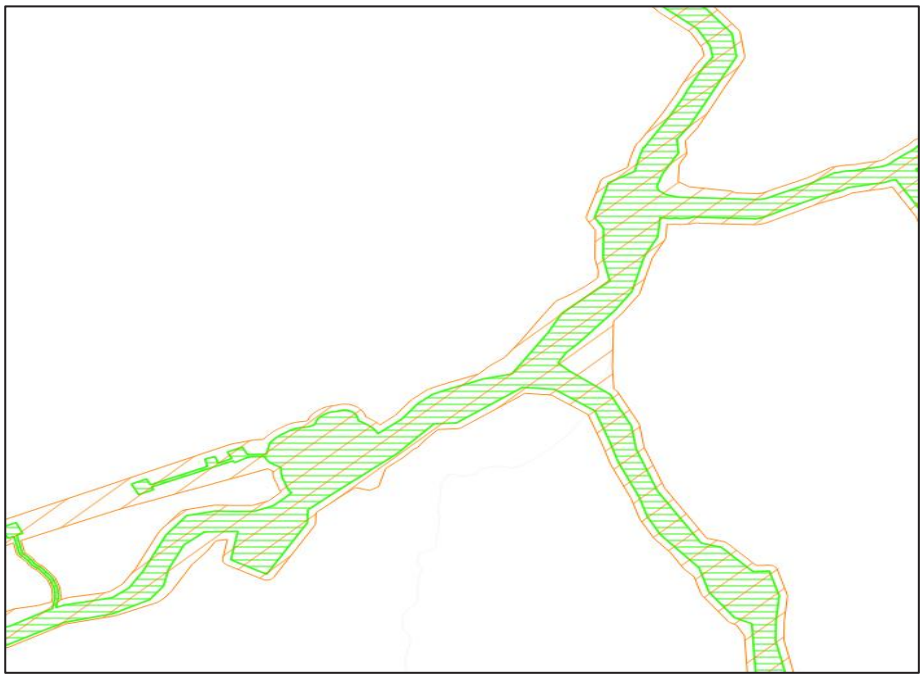


Figure 1-5: Development Footprint (green) within the surveyed Development corridor (orange).

1.5. Proposed Development and the Subject Land

The Project covers a Project Site of approximately 29,000 ha with a Development Corridor of approximately 1,322 ha and a Development Footprint of 730.73 ha.

This report includes two base maps, the Location Map (Figure 1-1) and the Site Map (Figure 1-2).

Alongside the Wind Farm layout and siting of WTGs, biodiversity assessments were conducted on two potential access routes for transporting workers and Over Size Over Mass (OSOM) vehicles delivering plant and WTG components, as well as two transmission line options. The goal was to select routes with the lowest ecological impact.

The Transgrid 330 kV transmission network is located on the western side of Lake Burrendong and both potential connection corridors will need to cross the Macquarie River to join the network. These connection corridors are referred to as the southern and northern option. An additional central connections corridor was also investigated which is used to join either the southern or northern option to the current Transgrid connection. The southern option for the transmission line connection has been selected as the preferred option and the northern transmission line option has been removed from the Project design. The eastern access upgrade has also been removed from the Project design.

An additional access road was also investigated to avoid entering the site through the Cudgegong Caravan Park. Both options have been retained in the current Project design, and both are included in the assessment. However, only one will be selected in the final design, reducing impacts by a further 10 ha.

The Development Footprint also includes a network of internal access tracks for the construction of the transmission line. Many of the tracks are existing farm tracks. A 10 m corridor on each of these tracks has been included wider than the Development Footprint to capture any potential vegetation impacts or minor clearing required to use these tracks.

The Project will impact 730.73 ha, consisting of:

- Overhead Reticulation – 3.95 ha
- Transmission line – 34.02 ha
- Road upgrades – 63.35 ha
- Internal track upgrades – 17.90 ha
- Substation – 4.30 ha
- Windfarm – 596.24 ha (includes TWAF and Option A entrance)
- Access to Windfarm (Option B entrance)[2] – 10.97 ha.

For all project elements a maximum Development Footprint has been proposed for assessment in this BDAR and it is expected to be refined and reduced during detailed design phase. A larger Development Corridor (approximately 1,322 ha) has been surveyed and assessed to allow micro-siting of the Development Footprint within this corridor. All candidate species surveys have been conducted within the Development Corridor.

[2] An alternative access to the Project may be required to facilitate movement of infrastructure and light vehicle assess rather than using the current road (option A) through the Reflections Cudgegong River Holiday Park.

To avoid and minimise impacts an additional 245 ha was assessed across the Project Site for possible WTG locations and access roads. This enabled the Proponent to avoid and minimise impacts to native vegetation and habitat by selecting areas that were of lower vegetation quality.

Much of the vegetation within the Development Corridor is modified by both historical clearing on the lower slopes and ongoing grazing by stock, with large tracts of contiguous woodland on hill slopes. Native vegetation particularly on the undulating lower hillslopes and on the low-lying flats around Lake Burrendong has been cleared. Vegetated areas are limited to steeper slopes or other areas not suitable for grazing purposes.

Broad Vegetation communities within the Development Corridor include:

- Box Gum Woodlands
- Tumbledown Red Gum Woodlands
- Stringy bark / Ironbark Dry Sclerophyll Forests/Woodlands
- Riparian vegetation along watercourses and tributaries.

The subject land boundary, Development Corridor and indicative Development Footprint are presented in Figure 1-3. Detailed maps are provided in Appendix D.

1.6. Biodiversity Offsets Scheme entry

The NSW Biodiversity Offset Scheme (BOS) applies to all SSDs and State Significant Infrastructure (SSI) and assessments under the BAM 2020 are required for the Project. The Project Site also contains areas mapped as Biodiversity Values (BV) on the Biodiversity Values Map, consisting of riparian land. A BDAR is required for this Project.

1.7. Excluded Land

An assessment of land categorisation was undertaken for the Project. No areas were identified as Category 1 Land – exempt land a per the native vegetation regulatory map (NVR 2022). However, the NVR map was updated December 2024 and only small areas of mainly roadside vegetation are mapped as Category 1 land with the majority of the Project Site mapped as excluded land and Category 2 – Regulated Land (Figure 1-6). All areas have been assessed and the only areas removed from assessment were those areas mapped as cleared land (roads, tracks), exotic vegetation (olive grove, garden plants) and dams.

1.8. Matters of National Environmental Significance

The Project was determined to be a Controlled Action and requires approval under the EPBC Act. The BAM has been endorsed as the assessment method for MNES under the Bilateral Agreement. Additional assessments for MNES are discussed in Section 11.1 of this report.

1.9. Sources of Information Used

The following data sources were reviewed as part of this report:

- BioNet Vegetation Classification (VIS) (DPIE 2025a)

- Bionet (Wildlife Atlas) and Protected Matters Search Tool (PMST) for threatened species/populations that may have been previously recorded within 5 km and are listed under the BC Act, and/or the Commonwealth EPBC Act (DAWE 2025a)
- BioNet Threatened Biodiversity Data Collection (TBDC) (DPIE 2025b)
- Species profiles and Threats Database (DAWE 2025b)
- Register of Declared Areas of Outstanding Biodiversity Value (AOBV)
- Waterway Stream Orders (DPI 2013)
- Interim Biogeographic Regionalisation of Australia (IBRA) Version 7 (DoEE 2017)
- NSW Department of Primary Industries (DPI) freshwater threatened species distribution maps (Riches et al 2016)
- Key Fish Habitat (KFH) Maps (DPI 2007)
- Burrendong Wind Farm Scoping Report. Epuron Projects Pty Ltd (ELA 2020)
- NSW Government Central Resource for Sharing and Enabling Environmental Data (SEED) in NSW. Last accessed Aug 2021
- NSW Government BAM (2020) and online Calculator
- NSW Biodiversity Values Map (DPIE 2020)
- NSW Landscapes (Mitchell).

Relevant published literature on threatened biota (see References in Section 13).

Data was initially collected in 2020 and updated throughout the preparation of the BDAR.

Consultation has been undertaken between ELA, the Proponent and CPHR throughout the preparation of this revised BDAR. An onsite field visit with CPHR on 30 May 2024 provided a Project Site overview with a focus on visiting key biodiversity values and constraints, as well as showcasing the challenges identified during the biodiversity assessments. Follow up meetings were held in Mudgee on 31 July 2024 to discuss additional survey requirements, and in Dubbo on 1 July 2025 to discuss possible mitigation measures; as well as ongoing email correspondence with CPHR to discuss various recommendations raised in their submissions to the EIS.

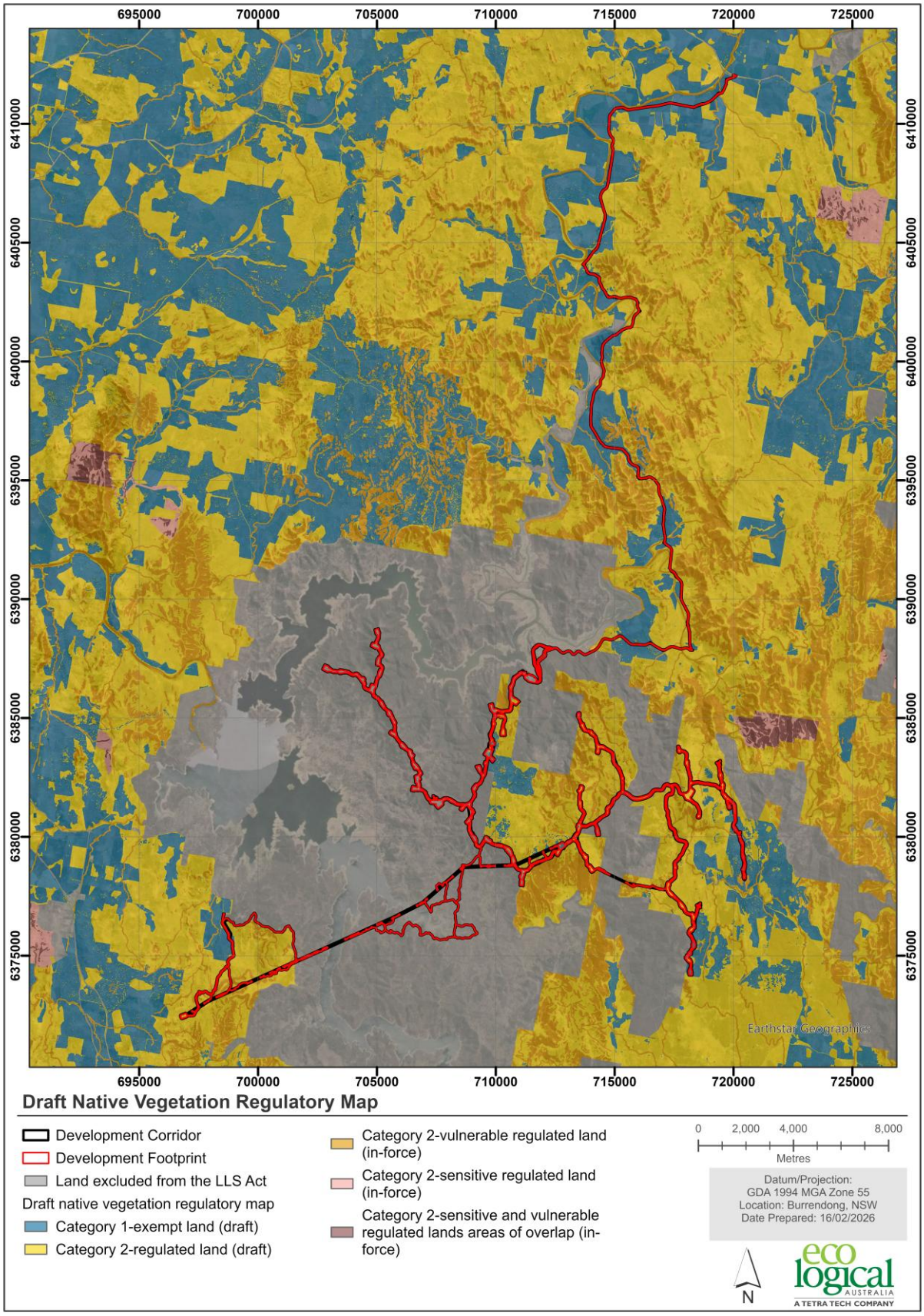


Figure 1-6: Draft Native Vegetation Regulatory Map

1.10. Legislative context

Legislation relevant to the Project Site is outlined in Table 1-3.

Table 1-3: Legislative context

Name	Relevance to the project	Report Section
Commonwealth		
EPBC Act	MNES have been identified on or near the Project Site. Under the Bilateral agreement made under section 45 of the EPBC Act a proposed action does not require assessment under Part 8 of the EPBC Act if the action is assessed under Part 4 Division 4.1 and all impacts are assessed and included in the BDAR. This report assesses impacts to MNES and concludes that the development is likely to have a significant impact on MNES. The Project was referred to the Department of Agricultural, Water and Environment (DAWE; now the Commonwealth Department of Climate Change Environment Energy and water (DCCEEW) and was determined to be a Controlled Action on 2 June 2021 (2021/8916). The Project will be assessed under the bilateral agreement with NSW.	MNES are addressed in Section 11.1. Statement of Significance are in Appendix O.
State		
EP&A Act	The proposed development is SSD and is to be assessed under Part 4.1 (of the EP&A Act. SEARs have been issued and require assessment of: • an assessment of the biodiversity values and the likely biodiversity impacts of the project in accordance with Section 7.9 of the NSW BC Act the BAM and documented in a BDAR, unless CPHR and DPHI determine that the proposed development is not likely to have any significant impacts on biodiversity values; and • the BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM. • an assessment of the likely impacts of the project on aquatic ecology, including aquatic and riparian biodiversity and key fish habitats.	Biodiversity values are assessed in Stage 1 Biodiversity Assessment Impacts are assessed in Section 7 and 8. Aquatic ecology is assessed in Section 4.1.3 and 4.1.4.
BC Act	The proposed development is an SSD and requires submission of a BDAR.	This report is a BDAR prepared in accordance with the BAM (2020).
Fisheries Management Act 1994 (FM Act)	The development involves potential impacts to threatened species or their habitats listed in the FM Act and therefore assessments of significance are required in accordance with s5A of the EP&A Act. There are several waterbodies which are mapped as KFH within the Project Site. KFH is not defined under the FM Act, however the NSW DPI provides a definition for KFH as generally including habitats that are crucial to the survival of native fish stock, excluding man-made habitats such as off-stream dams and ponds, and those natural waterways which are dry for the majority of the time or have limited habitat value. In order to inform a comparative and acceptable assessment of impacts to threatened species and/or aquatic habitat, the regulatory framework of the FM Act and associated guidelines have been adopted for this assessment. Potential impacts to threatened aquatic fauna and ecological communities listed under Schedule 4 of the FM Act are assessed in Section 4.1.4.	Aquatic ecology is assessed in Section 4.1.3 and 4.1.4.

Name	Relevance to the project	Report Section
Water Management Act 2000 (WM Act)	The WM Act is administered by Natural Resources Access Regulator (NRAR) and establishes an approval regime for activities within waterfront land, defined as the land 40 m from the highest bank of a river, lake or estuary. Under the WM Act, activities and works proposed on waterfront land are regulated. These activities include: • the construction of buildings or carrying out of works • the removal of material or vegetation from land by excavation or any other means • the deposition of material on land by landfill or otherwise • any activity that affects the quantity or flow of water in a water source. In accordance with Part 4, Division 4.7, Section 4.41 (1g) of the EP&A Act, a water use approval under Section 89, a water management work approval under Section 90 or an activity approval (other than an aquifer interference approval) under Section 91 of the WM Act is not required to be separately obtained for SSD because water management considerations are included in the assessment of major projects and conditions of consent. The SEARs identify that the regulatory framework of the WM Act and associated guidelines are to be adopted for this assessment. The Project proposes to formalise crossings over watercourses and undertake other activities on waterfront land.	Addressed in EIS
Planning Instruments		
State Environmental Planning Policy (Biodiversity and Conservation) 2021	State Environment Planning Policy (SEPP) – Koala Habitat Protection has been integrated into the SEPP Biodiversity and Conservation 2021. This SEPP only applies to developments where Council is the determining authority. Koalas have been addressed in the BDAR and considered as a MNES.	Koalas are assessed in Section 4 and Section 11.1 of this report.
State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP)	The Planning Systems SEPP aims to identify development that is State or regionally significant and requires approval by the Minister of Planning. In accordance with Part 2, Clause 8 of the SEPP, development is declared to be State significant development for the purposes of the EP&A Act if: *the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and* *the development is specified in Schedule 1 or 2.* Clause 20 of Schedule 1 of the SEPP states that "*development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power) that have a capital investment value of more than $30 million*" shall be classified as SSD under Division 4.7 of the EP&A Act. The Project has a capital investment value estimated to be greater than $30 million, and therefore is deemed SSD. A signed report from a suitably qualified person confirming the capital investment value of the Project is to be provided to DPIE separately to this EIS as part of the DA. The Minister for Planning and Public Spaces is the consent authority for SSD applications. SSD applications are assessed by DPHI, and in some cases the Minister may delegate decision making to Department staff. However, the	Addressed in EIS

Name	Relevance to the project	Report Section
	Independent Planning Commission (IPC) is the consent authority for SSD applications where specific conditions occur.	
MWRC LEP 2012	The Project is an SSD and will comply with EP&A Act and all relevant State Planning Instruments. The proposed development will comply with LEP requirements and objectives in consultation with MWRC.	-
DRC LEP	The Project is an SSD and will comply with EP&A Act and all relevant State Planning Instruments. The proposed development will aim to comply with LEP requirements and objectives in consultation with DRC.	-

2. Methods

2.1. Site Context methods

2.1.1. IBRA bioregions and IBRA subregions

The Project is located across two IBRA regions (Figure 1-2). The northern and western section of the Project consisting of road access and transmission corridors located within the SWS Bioregion and Inland Slopes subregion, whilst the majority of the windfarm itself is located within the SEH Bioregion and Hill End subregion.

Two BAM-Cs were used to separate the areas impacted within each IBRA region. There are several assessment revisions created within the BAM-C and offset credits were calculated separately for the windfarm (WTGs and infrastructure, Section 1.5) and for each road upgrade option and transmission corridors. This information was used by the proponent to inform decisions based on reducing overall impacts to native vegetation. The final BAM-C incorporated all components of the Project within two BAM-Cs. Areas within the current Development Footprint were input into the BAM-C.

2.1.2. Landscape Features

The Project within the SEH is mainly within the Ophir-Hargraves Plateau and the Macquarie Turon-Gorges Landscape with smaller areas located within Goonoo Slopes, Mullion Slopes and the Macquarie Valley Basalts. These landscapes, as described by Mitchell (2002), consist of shallow stony soils and semi-stable scree slopes at elevations of 500 to 700m with woodlands dominated by *Eucalyptus macrorhyncha* (Red Stringybark), *E. dealbata* (Tumbledown Red Gum), *E. goniocalyx* (Long-leaved Box) and *E. polyanthemos* (Red Box) on higher slopes, with *E. melliodora* (Yellow Box) and *E. blakelyi* (Blakely's Red Gum) on lower angled slopes. *Casuarina cunninghamiana subsp. cunninghamiana* (River Oak) dominates the channels.

The northeastern section of the Project is located within the Mullion Slopes and Gulgong Ranges with shallow stony red and yellow textured soils with stony uniform on steep slopes with large areas of dense *Callitris endlicheri* (Black Cypress Pine) on slopes with *E. macrorhyncha* and *E. albens* (White Box) grading into *E. blakelyi* and *E. melliodora* on lower slopes.

Given that most of the SEH Project Site is located with the Ophir-Hargraves Plateau, this was entered in the BAM-C. Given that the majority of the SWS Project Site is located within the Mullion Slopes, this was entered into the BAM-C.

The landscape features considered for this assessment are summarised in Table 2-1 and shown in Figure 1-1 and Figure 1-2 above.

Table 2-1: Landscape features

Landscape Feature	Development Corridor	Data Source
IBRA Region(s)	SWS Bioregion (663 ha) SEH Bioregion (659 ha)	IBRA, Version 7
IBRA subregion(s)	Inland Slopes Hill End	IBRA, Version 7

Landscape Feature	Development Corridor		Data Source
Rivers and streams	There are several 1st, 2nd, 3rd and 4th Strahler streams and ephemeral creeks across the Development Corridor. Major waterways identified in the database review include: the Macquarie River (9th Order) and the Cudgegong River.		NSW LPI Waterway mapping
Estuaries and wetlands	The Development Corridor does not contain any mapped wetlands. The nearest wetland is the Macquarie Marshes which is located 200 km north of Lake Burrendong.		NSW directory of important wetlands
Connectivity of different areas of habitat	The Development Corridor has high levels of connectivity surrounding the Project, dominated by dry sclerophyll forests and Grassy Woodlands providing a matrix of connectivity. Burrendong Dam is located west of the Project Site		Aerial imagery
Geological features of significance and soil hazard features	No geological features of significance (including karst, caves, crevices, cliffs etc) are located within the Development Corridor. The closest cliff lines are located approximately 8 km from the Development Corridor. There are rocky outcrops within the broader landscape but not within 2 km of the Development Corridor.		Aerial imagery
Areas of Outstanding Biodiversity Value	No areas of Outstanding Biodiversity Values are present within the Project Site. Biodiversity values have been mapped around waterways and riparian vegetation.		Register of Declared Areas of Outstanding Biodiversity Value (DPIE 2020)
NSW (Mitchell) Landscapes	Given that most of the SEH Project Site is located with the Ophir-Hargraves Plateau, this was entered in the BAM-C. Given that most of the SWS Project Site is located within the Mullion Slopes, this was entered into the BAM-C.	The Project Site within the SEH Bioregion is located within the Ophir-Hargraves Plateau. The area within the SWS Bioregion is mainly within the Mullion Slopes	NSW (Mitchell) Landscapes – version 3.1 (DPIE 2016)
Percent (%) native vegetation extent	The Percentage Native Vegetation Cover within the 500 m buffer area surrounding the Development Corridor was calculated to be 99% for the SEH Bioregion and 91% within the SWS Bioregion. These were entered into the BAM-Cs.	There are no differences between the mapped vegetation extent and the aerial imagery. The Development Corridor is approximately 1,322 ha and contains approximately 94 % ha of native vegetation. The assessment area is approximately 15,465 ha and contains approximately 13,836.9 ha of native vegetation (90 %).	Calculated using aerial imagery and ArcGIS software

2.1.3. Native Vegetation and Habitat Connectivity

The Project is a linear development and therefore a 500 m buffer was applied to the Development Corridor which covers 15,465 ha. Geographic Information System (GIS) mapping from aerial imagery was used to assess the extent of native vegetation within the buffer area and it was calculated that approximately 13,837 ha of native vegetation persists. The extent of native vegetation within the Development Corridor and buffer is outlined in Figure 1-2 above.

Areas of vegetation within the Project Site are modified by both historical and ongoing farming practices consisting of a mix of remnant woodlands and forests. Native vegetation particularly on the undulating lower hillslopes and on the low-lying flats around Lake Burrendong has been cleared. The Yarrabin Access Road is a heavily modified roadside with very few trees and an abundance of weeds.

Vegetated areas are limited to steeper slopes, rocky less fertile habitats, or other areas not suitable for grazing purposes. Paddock trees and patches of vegetation provide stepping stones to facilitate fauna movement across the landscape to these more vegetated woodland areas.

Broad Vegetation communities within the Development Corridor include:

- White Box Grassy Woodlands
- Grey Box Grassy Woodlands
- Tumbledown Red Gum Woodlands
- Stringy bark / Ironbark Dry Sclerophyll Forests/Woodlands.

The native vegetation in the landscape surrounding the Development Corridor are predominately a shrubby woodland or a derived native grassland form comprising of *E. albens, E. macrorhyncha with C. endlicheri* and *E. dealbata* dominating the hillslopes, with *E. blakelyi. E. melliodora* and *E. camaldulensis* (River Red Gum) on the valley flats.

Cleared areas, roads, dams and waterways within the Development Corridor cover approximately 79.51 ha.

2.1.4. Rivers and Streams

The Project Site is within the Macquarie River Catchment area. The Macquarie River, Cudgegong River and Meroo are the largest rivers within the Project Site with several smaller tributaries running though the landscape comprising 1st, 2nd, 3rd, 4th and 5th order Strahler streams and ephemeral creeks with a moderate coverage of riparian vegetation. Several creeks and drainage lines within the Development Corridor have been identified as KFH. The Development Corridor intersects 45 streams / drainage line / creeks with the majority 1st and 2nd order Strahler streams (Table 2-2). Road upgrades intersect the Meroo Creek, Ruins Creek and Piambong Creek.

The Project is located close to Burrendong Dam, which is managed by the Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source 2016 and the NSW Government, who manages licensed water or the environment. Lake Burrendong was created with the construction of Burrendong Dam which impounds waters on the Macquarie and Cudgegong rivers to improve town water supplies and boost agricultural production in the Macquarie Valley. The dam also supplies environmental flows to the Macquarie Marshes, one of the largest inland wetlands in south-eastern Australia. Due to the size and accessibility of the dam, it is a popular recreation ground primarily accessed via Wellington, from the west and via the Cudgegong Riverside Caravan Park in the east.

The Project Site contains rivers and streams as outlined in Figure 4-3.

Table 2-2: Rivers and streams

River/stream	Order
Meroo	7th
Little Oaky	3rd
Little Oaky	4th
Highland Home	2nd
Gundowda	4th
Sheas	3rd
Kangaroo	1st
Redbank	4th
Ketella	1st
Oakey	5th
Ruins	3rd
Piambong	4th

2.1.5. Areas of Geological Significance and Soil Hazard Features

The Development Corridor does not contain any areas of geological significance such as karsts, caves, crevices, or cliffs. These features are likely to be present within the surrounding landscape but will not be directly or indirectly impacted by the Project. Aerial imagery and binoculars on site were used to assess the Project Site for areas of potential geological significance but there were no cliff-lines within 2 km of the Development Corridor. There were small rocky slopes that may provide diurnal roosts for cave dwelling bats but unlikely to support maternity roosts. The Wellington Caves complex is a known non-breeding roost site for the threatened *Miniopterus orianae oceanensis* (Large Bent-Wing Bat; previously *M. schreibersii subsp. oceanensis*, Eastern Bent-wing Bat) located seven (7) km south of Wellington on the eastern side of the Catombal Range in the Bell River Valley (TRC Tourism and Newscape Design 2017) and 21 km west of the Project Site.

Within the wider landscape approximately 65 km northeast is a known maternity roost site for *Chalinolobus dwyeri* (Large-eared Pied Bat).

The majority of the Project Site sits within the Mookerawa soil landscape which is described as undulating to low rolling hill containing quartz rich greywacke and slates. Soils are considered fragile with solodic soils on lower slopes and red podzolic soils on upper slopes and crests. Some of the Project Site is within the Burrendong soil landscapes with rolling to steep hills with rocky slopes. Parent rocks are sediments and metasediments. Soils are mainly shallow loams and sands on mid and upper slopes with Yellow soloths and Solodic soils on lower slopes and drainage depressions.

These soil landscapes are considered to have either minor to moderate erosion particularly under heavy grazing, with some areas prone to severe gully erosion. No soil hazards are known to occur.

2.1.6. Wetlands

No wetlands occur in the Project Site. The nearest wetland is the Macquarie Marshes which was listed as a Ramsar Wetland of international importance in 1986. It is one of the largest remaining inland semi-permanent wetlands in south-eastern Australia covering an area of 23,141 ha and comprises the

wetlands associated with the floodplains of the Macquarie River and its tributaries. It is located approximately 200 km north-west of Lake Burrendong and 100 km north of the township of Warren.

The Macquarie Marshes supports more than 20,000 waterbirds and provides breeding habitat for nesting waterbirds including large numbers of cormorants, egrets, herons, ibis ducks and spoonbills. It is one of only a few sites in NSW where magpie geese breed. It supports three nationally threatened species including:

- *Botaurus poiciloptilus* (Australasian Bittern)
- *Rostratula australis* (Australasian Painted Snipe)
- *Maccullochella peelii* (Murray Cod).

The Development Corridor contains seven (7) small farm dams. None of these dams contain significant amounts of aquatic vegetation or provide high quality wetland habitat.

2.1.7. Areas of Outstanding Biodiversity Values, Biodiversity Values and Connectivity Features

The NSW BV Map identifies land with high biodiversity value that is particularly sensitive to impacts from development and clearing. The BV map forms part of the BOS threshold which is one of the triggers for determining whether the BOS applies to a clearing or development proposal.

Riparian habitat along the Meroo Creek and larger streams and rivers are mapped as BV's (Figure 2-1). There are only very small areas mapped as BV within the Development Corridor associated with access routes and transmission lines. Importantly, the Development Corridor has been designed to avoid the placement of transmission poles within the 40 m buffer on either side of the waterfront land of Lake Burrendong.

Existing farm tracks crossing Oaky Creek are proposed to be utilised to access the transmission line during construction and installation of power poles. While the existing crossing may be suitable, it is likely that some tracks will require widening to facilitate the safe movement of haulage trucks.

Erosion and waterway protection will be ensured by designing waterway crossings in accordance with the following:

- Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge 2001)
- Policy and Guidelines for Fish Friendly Waterway Crossings (NSW DPI 2003)
- Guidelines for Watercourse Crossings on Waterfront Land (NSW DPI 2012).

The Development Corridor is well connected to vegetation both within and the outside of the 500 m buffer area surrounding the Development Footprint. Native vegetation is present within Crown Land and WaterNSW Land, in small pockets along road reserves, patches on steep slopes and along vegetated drainage lines. The ridgeline corridors are associated with vegetation retained on upper ridgelines and steep slopes, with current and past grazing land uses removing vegetation on more gentler slopes and foothills. There is also a network of native vegetation within the wider landscape.

Connectivity that may facilitate the movement of threatened species across their range are identified on the Site Map (Figure 1-2). There is potential for a flyway for *Pteropus poliocephalus* (Grey Headed Flying Fox) based on location of known camps. There are also known non-breeding roost caves for Large

Bent-Wing Bat located 21 km away in Wellington. BBUS completed to date throughout the Project Site have not confirmed flight data for Grey-headed Flying Fox within the RSA heights of WTGs and therefore cannot be modelled beyond the calculation of their individual species collision risk. A Collision Risk Model (CRM) has been undertaken to determine the collision risk for the Grey-headed Flying Fox (see Section 6).

Desktop assessments completed for this BDAR did not identify flyways for migratory species. BBUS were completed in summer 2020/2021 and 2025, autumn 2024 and 2025, winter 2024 and spring 2024. *Hirundapus caudacutus* (White-throated Needletail) were observed in flocks of up to 60 individuals flying across the Project Site (see Section 4.5.2).

No AOBV are present within the Project Site.

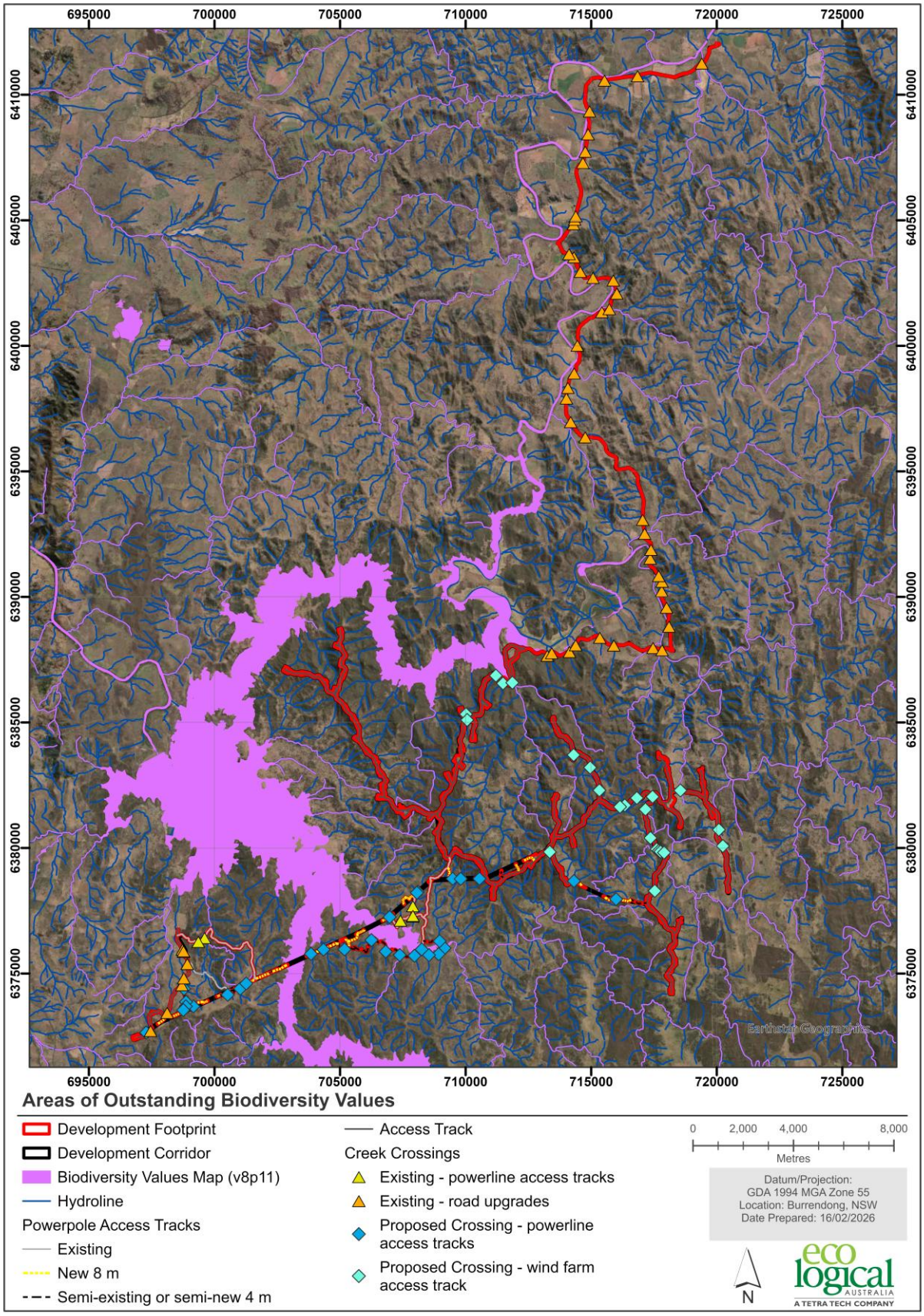


Figure 2-1: Biodiversity Values Map and location of proposed creek crossings

2.2. Native Vegetation threatened ecological communities and vegetation integrity methods

2.2.1. Method Applied

The Project conforms to the definition of a linear-based method under the BAM. The linear based method has been applied to this development.

2.2.2. Existing information

The current percent native vegetation cover in the landscape was assessed in a GIS using State Vegetation Type Mapping (SVTM) and a review of aerial imagery sourced from SIX Maps using increments of 5% with the 500 m buffer of the Development Corridor. Unless verified by visual inspection, areas containing grasslands inside the buffer were assumed to be native grasslands because of existing farming operations in the surrounding landscape of grazing native pasture. The landscape surrounding the Project Site (approximately 29,000 ha) contained similar land management practice and it was therefore assumed that ground cover contained native species.

The Percentage Native Vegetation Cover within the 500 m buffer area surrounding the Project Site was calculated to be 91% within the SWS Bioregion and 99 % for the SEH Bioregion. These were entered into the BAM-C (Table 2-3).

Table 2-3: Native Vegetation Cover

IBRA Region	Native Vegetation extent (ha)	Study area extent (ha)	% landscape assessment area	Cover class
SWS Bioregion	14,073	15,465	91%	>70%
SEH Bioregion	13,724	13,863	99%	>70%

2.2.3. Patch Size

Patch size was calculated using available vegetation mapping for all patches of intact native vegetation on and adjoining the Project Site. Patch size was assigned to one of four classes (<5 ha, 5-24 ha, 25-100 ha or ≥100 ha). The Project Site is surrounded by native vegetation, so patch size was conservatively calculated as 101 ha (i.e. the maximum) for all vegetation zones. This was entered into the BAM-C.

3. Native Vegetation and Extent

3.1. Surveys

Preliminary vegetation survey was undertaken within the broader Project Site by ELA Senior Botanist, David Allworth on the 25 October 2019 to undertake observations to broadly identify the extent and type of native vegetation and possible Plant Community Types (PCT) present and to inform initial vegetation mapping. This information was used to identify and refine the Development Corridor to avoid and minimise impacts to biodiversity values within the Project Site.

Additional field surveys were undertaken by ELA Ecologists, Tomas Kelly, Rebecca Croake, Cheryl O'Dwyer, Kate Maslen, David Allworth, and Elise Keane during August through to December 2020 to identify PCTs within the Development Corridor. PCTs were determined based on the presence of diagnostic species via a rapid assessment and recording of dominant species within each stratum. Over 200 rapid assessments were undertaken across the Development Corridor. Following these initial inspections, a second survey was conducted during February through to March 2021 to collect vegetation integrity (VI) plot data. Additional rapid assessment and VI plot data was collected in June 2023 and October 2025 along the Yarrabin Road upgrade areas. A total of 108 full-floristic VI plots were surveyed in accordance with the BAM to assess the composition, structure, and function components of each vegetation zone for input into the BAM-C, and to confirm PCTs and TECs within the Development Corridor.

Given the large size of the Project Site and the difficult terrain, not all areas were able to be investigated fully and subsequently PCTs for these areas were assigned using aerial imagery, contours, landscape patterns and ELA's knowledge of the surrounding vegetation. At the time of writing, approximately 32 ha of the Development Corridor was not accessible and not field validated (see Appendix D); 7 ha is located within the Development Footprint.

All field data collected at full-floristic and VI plots is included in Appendix B and Appendix C.

3.1.1. Plant Community Type selection

In determining the PCTs within the Development Corridor various attributes were considered in combination to assign vegetation to the best fit PCT. The PCT filter tool in BioNet Vegetation Classification Database was used filtering for IBRA, IBRA subregion, vegetation formation and dominant canopy species. A short list of possible PCTs derived from the filter tool were reviewed taking into consideration plot data including dominant species in each stratum and relative abundance, community composition, PCT descriptions in the OEH VIS database, including soils and landscape position. PCT mapping obtained from NSW SEED (2020 and 2025) was also reviewed.

Floristic data was used to assign TECs as per the Final Scientific Determinations for TECs. Possible PCT options are provided in Table 3-1. Additional information on PCTs is given in Table 3-2. Justifications for individual PCTs are provided in the PCT descriptions detailed in Table 3-9.

Table 3-1: Potential PCTs

Selected PCT ID	PCT Name	Other PCT options
76	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	266, 281,
84	River Oak – Rough-barked Apple – red gum -box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	281
266	White Box grassy Woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	272
270	White Box – Tumbledown Reg Gum – Long-leaved Box shrub/grass woodland in fine-grained sediments of the upper Macquarie River Gorge, NSW central western slopes.	272
272	White Box – Black Cypress Pine – red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes	266
274	White Box – Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee Region	281
277	Blakely's Red Gum – Yellow Box grassy tall woodland on the NSW South Western Slopes Bioregion	281, 276
281	Rough-barked Apple – red gum – Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	277, 276
287	Long-leaved Box – red box – Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	321
312	Yellow Box grassy tall woodland on valley flats in the upper slopes of the NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion	277, 281
331	Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion	321 323, 1095
461	Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion	270, 272

3.1.2. Plant Community Types Present

The Development Corridor consists of 1,242 ha of native vegetation with the remaining 79 ha consisting of cleared tracks, dams and planted exotic vegetation. Twelve (12) PCTs were identified across the Development Corridor (Figure 3-1; Table 3-2). Of these, seven (7) are associated with TECs under the BC Act and/or EPBC Act.

The Development Footprint (730.73 ha) consists of 681.96 ha of native vegetation with approximately 89% (606.61 ha) within non-TEC PCTs. The Development Footprint also contained 44.62 ha of cleared areas (roads, tracks), 3.34 ha of exotic or cropped vegetation and 0.78 ha of water (dams, creeks) which do not conform to a native PCT (total 48.74 ha). A detailed map book showing location of PCTs and VI plots is presented in Appendix D. Given that the northern transmission line is no longer an option, these areas have been removed from the BAM-C.

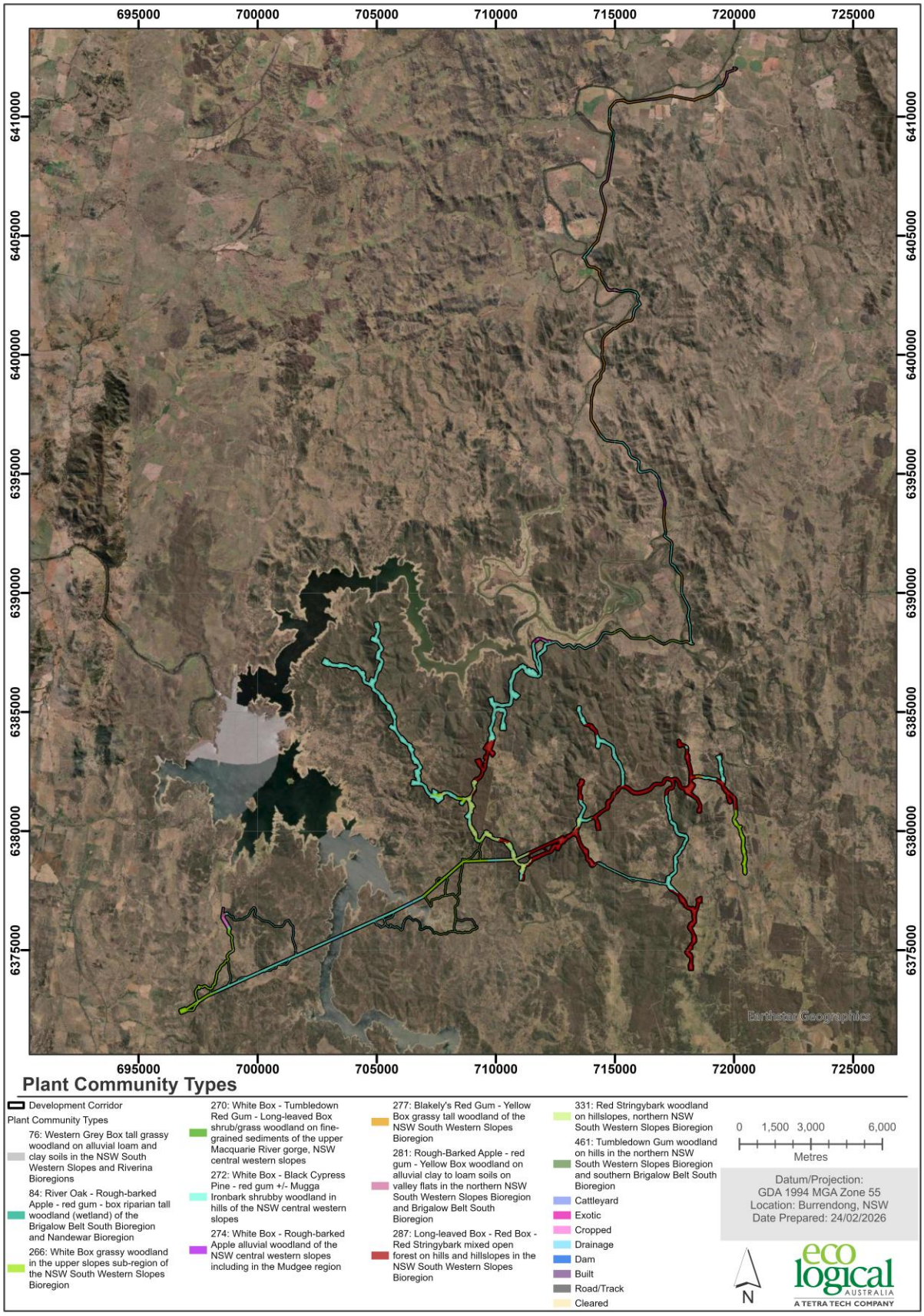


Figure 3-1: Plant Community Type Mapping across Development Corridor

Table 3-2: Plant Community Types and associated TECs.

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Development Corridor across both IBRAs	Development Footprint across both IBRAs	Percent cleared	Associated TEC
76	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	KF_CH3 Grassy Woodlands	Floodplain Transition Woodlands	3.36	0.84	92%	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Part); Listed EPBC Act, E: Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia
84	River Oak – Rough-barked Apple – red gum -box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	KF_CH9 Forested Wetlands	Eastern Riverine Forest	14.04	3.43	40%	Not a TEC
266	White Box grassy Woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	KF_CH3 Grassy Woodlands	Western Slopes Grassy Woodlands	135.24	52.46	94%	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 Highland Bioregion
270	White Box – Tumbledown Reg Gum – Long-leaved Box shrub/grass woodland in fine-grained sediments of the upper Macquarie River Gorge, NSW central western slopes.	KF_CH5B Dry Sclerophyll Forests	Western Slopes Dry Sclerophyll Forests	0.9	0.15	40%	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 Highland Bioregion.
272	White Box – Black Cypress Pine – red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes	KF_CH3 Grassy Woodlands	Western Slopes Grassy Woodlands	591.85	336.13	65%	Not a TEC
274	White Box – Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee Region	KF_CH3 Grassy Woodlands	Western Slopes Grassy Woodlands	2.57	0.89	88%	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 Highland Bioregion.

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PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Development Corridor across both IBRAs	Development Footprint across both IBRAs	Percent cleared	Associated TEC
277	Blakely's Red Gum – Yellow Box grassy tall woodland on the NSW South Western Slopes Bioregion	KF_CH3 Grassy Woodlands	Western Slopes Grassy Woodlands	48.68	16.44	94%	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 Highland Bioregion
281	Rough-barked Apple – red gum – Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	KF_CH3 Grassy Woodlands	Western Slopes Grassy Woodlands	15.23	4.58	67%	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 Highland Bioregion.
287	Long-leaved Box – red box – Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	KF_CH5B Dry Sclerophyll Forests	Western Slopes Dry Sclerophyll Forests	342.415	213.62	67%	Not a TEC
312	Yellow Box grassy tall woodland on valley flats in the upper slopes of the NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion	KF_CH3 Grassy Woodlands	Southern Tableland Grassy Woodlands	0	0	93%	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 Highland Bioregion.
331	Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion	KF_CH5B Dry Sclerophyll Forests	Western Slopes Dry Sclerophyll Forests	86.99	52.88	20%	Not a TEC
461	Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion	KF_CH3 Grassy Woodlands	Western Slopes Grassy Woodlands	1.63	0.57	50%	Not a TEC
0	Cleared, Roads, Dams			79.51	48.74		
TOTAL				**1,322.4**	**730.73**		

3.1.3. Threatened Ecological Communities

Seven of the identified PCTs are associated with TECs as listed under both the BC Act and EPBC Act. These are shown in Table 3-3 below. All areas of PCT 76 conforms to the listing criteria for State and Commonwealth TECs. Six (6) PCTs conform to the NSW BC Act listed Critically Endangered Ecological Community (CEEC) *White Box Yellow Box Blakely's Red Gum Woodland and Derived Native Grassland*. It has been conservatively estimated that all 74.51 ha of Box Gum Woodland within the Development Footprint comprise of the BC Act listed TEC. Disturbed remnants are still considered to form part of the community including remnants where the vegetation, either understorey, overstorey or both, would under appropriate management respond to assisted natural regeneration, such as where the natural soil and associated seed bank are still at least partially intact (NSW Scientific Committee 2020).

The EPBC listing for Box Gum Woodland is dependent upon condition, patch size and presence of important species. Each vegetation zone was validated within the broader patch to determine whether the area conforms to the EPBC listing using the flowchart "*Determining if your land has an area of the listed ecological community*" from White Box – Yellow Box – Blakely's Red Gum Grass Woodlands and Derived Native Grasslands (Department of the Environment and Heritage 2006). To be considered part of the EPBC listed community the patch had to be greater than 0.1 ha with a predominately native understory with 12 or more native understory species present (excluding grasses), with at least 1 important species OR the patch must be greater than 2 ha in size with more than 20 mature trees per ha or natural regeneration of canopy. Plot data was reviewed and where individual patches were not assessed, but in reasonable proximity to data that confirmed the EPBC CEEC, a precautionary approach was taken and the CEEC was mapped.

The majority of the associated Box-Gum Woodland PCT's do not meet the condition threshold for the EPBC Act listed CEEC *White Box Yellow Box Blakely's Red Gum Woodland and Derived Native Grassland* due to the degraded understorey not containing sufficient cover or diversity of native species and lack of natural regeneration. Areas where the corresponding PCTs, where the ground cover was in higher condition is considered to represent the listed community (Table 3-3). 1.98 ha of Box Gum Woodland associated PCTs within the Development Corridor were not field validated. This equated to 0.34 ha within the Development Footprint, so erring on the side caution these areas within the Development Footprint are included as conforming to both the BC Act and EPBC Act listed community (see Appendix D).

A total of 32.02 ha of Box Gum Woodland CEEC, listed under the EPBC Act, is present within the Development Footprint.

Table 3-3: Threatened Ecological Communities

PCT ID	BC Act			EPBC Act		
	Listing status	Name	Area (ha)	Listing status	Name	Area (ha)
76	CE (Part)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregion	0.7	CE (Part)	Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	0.84

PCT ID	BC Act			EPBC Act		
	Listing status	Name	Area (ha)	Listing status	Name	Area (ha)
TOTAL	**GBGW**		**0.84**			**0.84**
266	CE (Part)	White-Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	52.46	CE (Part)	White-Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	30.20
270	CE (Part)	White-Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.15	CE (Part)	White-Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.15
274	CE (Part)	White-Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.89	CE (Part)	White-Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.07
277	CE (Part)	White-Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	16.44	CE (Part)	White-Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.82
281	CE (Part)	White-Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	4.58	CE (Part)	White-Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.79
312	CE (Part)	White-Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0	CE (Part)	White-Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0
TOTAL	**BGW**		**74.51**			**32.02**

Maps showing the location of PCTs and TECs are included in the detailed map book in Appendix H.

3.1.3.1. White Box – Yellow Box Blakely's Red Gum Grassy Woodland and DNG

The distribution of *White-Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* across the Project Site is strongly influenced by topography and location within the landscape occurring on deep basalt or loam soils mainly within the lower valleys. Where it does occur on the ridgeline within the Development Footprint, this TEC is predominately in low condition due to historical clearing and current land management practices. This TEC is represented by six (6) PCTs as shown in Table 3-3 above.

TEC within the Development Footprint is located across the southern transmission line, substation and internal access roads (23.75 ha reduced from 33 ha), across the Windfarm (28.52 reduced from 34 ha),

and along the Yarrabin Road Upgrade (23.09 ha; Table 3-4). The Proponent is committed to further reducing this impact by only clearing around the power poles to allow installation and where possible, utilising existing farm tracks for access tracks. The northern transmission route is no longer considered, reducing the overall impacts to the TEC by 20.7 ha.

3.1.3.2. Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregion

The distribution of TEC Inland Grey Box (*Eucalyptus microcarpa*) woodland is limited to the alluvial soils within the southern transmission line (0.12 ha) and along the road upgrade (0.72 ha, Table 3-4). This TEC is represented by one (1) PCT as shown in Table 3-3 above.

Table 3-4: Location and condition of TEC within the Development Footprint

Vegetation Condition	Windfarm (ha)	Southern transmission (ha)	Northern Transmission *(ha)	Road upgrades (ha)	Total (ha)
White Box – Yellow Box -Blakely's Red Gum Grassy Woodland TEC					
Good	0.43	3.9	1.4	2.46	6.79
DNG	8.84	19.73	19.3	19.89	48.46
Low	19.26				19.26
	28.53	**23.63**	**20.7**	**22.35**	**74.51**
Inland Grey Box Woodland					
DNG		0.12	2.77	0.66	0.78
Good				0.06	0.06
TOTAL	**28.53**	**23.75**	**23.47**	**24.62**	**75.35**

*No longer being considered

3.2. Vegetation Zones

Rapid data, together with field inspections and aerial imagery were used to assist in the delineation of vegetation zones. Of the 12 PCTs identified within the Development Corridor, seven (7) of these PCTs were stratified into additional zones based on their presence or absence of trees and differences in species composition. The factors used to assign a condition class to each PCT are described in Table 3-5. Areas of Derived Native Grassland (DNG) also included areas with scattered trees.

The number of vegetation integrity plots exceeded the minimum number of plots required by the BAM (Table 3-6 and Table 3-7). Data from 108 VI plots were collected which was used to inform the design, hence the design was modified during the assessment resulting in surveys that are outside the current Development Corridor. The results of the plot field data can be found in Appendix B.

Table 3-5: Criteria used to assign vegetation condition classes

Condition Class	Criteria
Non-native/ cleared land	Ground layer dominated by exotic and substantially cleared with exposed bare soil
Derived Native Grassland (DNG)	Trees and shrubs absent or very sparse and ground layer dominated by grasses. DNG areas contain scattered trees

Condition Class	Criteria
Native Vegetation Good condition	Intact canopy / open woodland with advanced tree age class, shrubs and diversity of ground layer as per the PCT benchmarks.
DNG low condition	Trees and shrubs absent or very sparse and ground layer dominated by exotic with native grasses present.

3.2.1. Vegetation zones within the SEH

Seven (7) PCTs were identified within the SEH Hill End sub-region which were stratified into 12 vegetation zones and validated on site (Table 3-6).

3.2.2. Vegetation zones within the NSW SWS

Ten (10) PCTs were identified within the SWS Inland Slopes subregion which were stratified into 18 vegetation zones and validated on site (Table 3-7).

Table 3-6: Vegetation zones and vegetation integrity survey plots collected on the Project Site in the SEH

PCT ID	PCT Name	Condition	Area (ha) Development Corridor	Area (ha) Development Footprint	Number of plots required for Development Footprint	Number of plots surveyed	Plots ID used in the BAM-C
84	River Oak – Rough-barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Good	1	0.32	1	1	Plot **64**
266 *	White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	DNG	8.67	5.09	3	3	90, 92, 105
266*	White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Low	32.26	19.26	4	4	83, 84, 85, 86
266*	White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Good	6.53	0.74	1	0	**Benchmark (BM)#**
270*	White Box – Tumbledown Red Gum – Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes	Good	0.9	0.15	1	1	30
272	White Box – Black Cypress Pine – red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes	Good	102.69	56.62	5	4	5, 88, 93, 91 **BM**
272	White Box – Black Cypress Pine – red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes	DNG	66.95	41.4	4	5	4, 89, 97, 98,
277*	Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	DNG	2.27	1.26	1	0	**BM**
287	Long-leaved Box – Red Box – Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	DNG	157.9	102.1	6	11	21, 24, 26, 31, 34, 37
287	Long-leaved Box – Red Box – Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	Good	184.52	111.55	6	9	25, 27, 32, 53, **18, 33**
331	Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion	Good	67.6	37.21	4	5	6, 7, 8, 22
331	Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion	DNG	16.79	14.12	3	4	9, 23, 29

PCT ID	PCT Name	Condition	Area (ha) Development Corridor	Area (ha) Development Footprint	Number of plots required for Development Footprint	Number of plots surveyed	Plots ID used in the BAM-C
0	Non-native cleared land		11.42	7.92	0	0	
TOTAL			**659.48**	**397.72**	**38**	**48**	

* THREATENED ECOLOGICAL COMMUNITY # BENCH MARK CONDITION USED

Table 3-7: Vegetation zones and vegetation integrity survey plots collected on the Project Site in the SWS

PCT ID	PCT Name	Condition	Area (ha) Development Corridor	Area (ha) Development Footprint	Number of plots required for Development Footprint	Number of plots surveyed	Plots used in the BAMC
76*	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	DNG	3.18	0.77	1	3	**BM**
76	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Good	0.18	0.06	1	1	68
84	River Oak – Rough-barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Good	6.52	1.90	1	4	1, **16**
84	River Oak – Rough-barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	DNG	6.52	3.11	2	2	73, 106
266*	White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	DNG	73.58	23.79	4	7	**46**,57,59,99
266*	White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Good	14.19	3.57	2	3	55, 56
272	White Box – Black Cypress Pine – red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes	Good	299.29	173.19	6	6	2, 47, 49, 96 **BM, BM**
272	White Box – Black Cypress Pine – red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes	DNG	122.92	64.92	5	7	3, 48, 50, 108, 102,

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PCT ID	PCT Name	Condition	Area (ha) Development Corridor	Area (ha) Development Footprint	Number of plots required for Development Footprint	Number of plots surveyed	Plots used in the BAMC
274*	White Box – Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee region	Good	0.28	0.07	1	2	80
274	White Box – Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee region	DNG	2.30	0.83	1	0	**BM**
277*	Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Good	5.24	1.92	2	4	79, **54**
277*	Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	DNG	41.16	13.25	3	5	107, 103**, 14**
281*	Rough-Barked Apple – red gum – Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	DNG	13.04	4.24	2	4	77, 101
281*	Rough-Barked Apple – red gum – Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Good	2.19	0.34	1	0	**BM**
312*	Yellow Box grassy tall woodland on valley flats in the upper slopes of the NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion	Good	0	0	1	1	104
331	Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion	Good	1.89	1.07	1	1	94
331	Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion	DNG	0.71	0.57	1	2	95
461	Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion	Good	0	0	0	2	**BM**
461	Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion	DNG	1.63	0.57	1	0	**BM**
0	Non-native cleared land		68.09	40.81	0	1	

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PCT ID	PCT Name	Condition	Area (ha) Development Corridor	Area (ha) Development Footprint	Number of plots required for Development Footprint	Number of plots surveyed	Plots used in the BAMC
TOTAL			**662.92**	**333**	**34**	**54**	

*THREATENED ECOLOGICAL COMMUNITIES (TEC).

During the planning and implementation of the field survey, BAM plots have been located as much as possible within the Development Corridor or within contiguous patches connected to the Development Corridor to avoid ecotones, disturbed areas, or areas not representative of the broader patch. Due to the multiple revisions to the Development Footprint, there are some instances where plots are no longer located within the Development Corridor assessed in this amended BDAR (plots outside > 50m and used in the BAM-C are shown in bold in Table 3-6 and Table 3-7 above).

Where BAM plots were not located within the Development Corridor and were required for the BAM-C, the plot data was interrogated for consistency. Plots further than 800 m from the Development Corridor were excluded and BM condition was included in the BAM-C to make up for the shortfall. Table 3-8 provides additional justification of the suitability of BAM plots located outside the final Development Corridor to represent the vegetation directly impacted by the project. Six (6) plots were located within vegetation zones that are no longer within the Development Footprint and are no longer required by the BAM-C.

Maps showing the location of all vegetation plots are included within the map book Appendix D.

Table 3-8: BAM plots used in BAM-C outside of Development Corridor

BAM Plot Number	Distance to Footprint (m)	Distance to Corridor (m)	Justification
14	632	626	Plot was located within an earlier iteration of the Development Footprint. Vegetation mapping has been completed in this area has part of the project and therefore to the same standard and criteria.
16	89	83	Plot located adjacent to the Development Footprint within the contiguous patch.
18	169	113	Plot located adjacent to the Development Footprint within the contiguous patch.
30	61	61	Plot located adjacent to the Development Footprint within the contiguous patch.
33	149	76	Plot located adjacent to the Development Footprint within the contiguous patch
46	413	405	Plot located adjacent to the Development Footprint within the contiguous patch
54	710	705	Plot located adjacent to the Development Footprint within the contiguous patch
64	416	398	Plot located adjacent to the Development Footprint within the contiguous patch

Table 3-9: Description of PCTs and Vegetation zones.

PCT 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	
Vegetation formation/class/ structure	Grassy Woodlands / Floodplain Transition Woodland
Conservation status	This PCT forms part of the BC Act listed TEC – *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions*. All areas were considered to conform to the BC Act listing criteria). PCT 76 can also form part of the EPBC Act listed TEC – *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*. All areas were considered to conform to the EPBC Act listing criteria.
Approximate extent within the Project Site	Overall 0.84 ha of PCT 76 occurs within the Development Footprint consisting of: • 0.72 ha occurring within the Yarrabin Road Upgrade area • 0.12 ha occurring within the Southern Powerline.
Condition	This community occurs as a DNG with scattered trees. The Yarrabin Road Upgrade areas is in generally low DNG condition in comparison to the area. A roadside clump of trees has been separated out and assessed as good condition. Overall, there are 3.36 ha of PCT 76 within the Development Corridor. These areas have been refined within the Development Footprint. PCT 76_DNG (0.77 ha) within the current Development Footprint PCT 76_Good (0.07 ha).
General information and Characteristic species associated with this PCT (VIS 2023)	PCT 76 is found on undulating alluvial plains of south-central western NSW in the western section of the SWS Bioregion. This PCT is a tall woodland to 25 m high dominated by *Eucalyptus microcarpa* often as the only tree species often occupying 90% of the canopy cover but other trees may include *Eucalyptus melliodora*, *Callitris glaucophylla* (White Cypress Pine) and minor *Allocasuarina luehmannii* (Buloke). The shrub layer is absent or sparse and includes *Dodonaea viscosa* subsp. *cuneata* (Hop Bush), *Acacia buxifolia* (Box-leaf Wattle), *A. acinacea* (Gold-dust Wattle), *A. hakeoides* (Hakea Wattle), and *Bursaria spinosa* (Sweet Bursaria). Grazing has eliminated shrubs these in many places. A mid-dense or dense grass ground cover is present composed of *Rytidosperma caespitosum* (Ringed Wallaby Grass), *R. setaceum* (Small-flower Wallaby Grass), *Austrostipa scabra* subsp. *falcata* (Speargrass), *Paspalidium constrictum* (Knottybutt Grass), *Themeda triandra* (Kangaroo Grass), *Austrostipa aristiglumis* (Plains Grass), *Aristida behriana* (Bunch Wiregrass) and *Anthosachne scaber* var. *scaber* (Wheatgrass) along with introduced grass species such as *Bromus* spp.(Brome), *Vulpia* spp. (Fescue) and *Hordeum leporinum* (Barley Grass). The small scrambler *Einadia nutan*s subsp. *nutans* (Climbing Saltbush) is usually present. Native forbs include *Sida corrugata* (Variable Sida), *Wahlenbergia gracilis* (Sprawling Bluebell), *Vittadinia gracilis* (Woolly New Holland Daisy), *Dianella porracea* (Riverina Flax-lily), *Oxalis perennans* (Oxalis) and *Euphorbia drummondii* (Caustic Weed).
Field Data and Plot Data collected 2021. PCT Justification process.	This PCT was located on alluvial plains containing scattered *Eucalyptus microcarpa* with an understorey of native grasses (*Aristida ramosa* (Purple Wiregrass), *Austrostipa scabra, Rytidosperma caespitosum* and *Bothriochloa macra* (Red Grass)) and forbs including *Calotis lappulacea* (Yellow Burr-daisy), *Dichondra repens* (Kidney Weed) and *Vittadinia cuneata* (Fuzzweed). The following criteria were filtered using the PCT filter tool: • IBRA – NSW SWS • IBRA Subregion – Inland Slopes • Formation – Grassy Woodland • Dominant Canopy – *E. microcarpa.* PCT 266 and PCT 281 were also considered as possible PCTs, however due to the dominance of *E. microcarpa* and lack of other tree species PCT 76 was the most logical choice.

PCT 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	
High threat weed (HTW) cover	Weeds were abundant along the roadside but no HWTs were recorded in plot data.
Variation and disturbance	Ground species vary across distribution depending on grazing pressure, substrate and soils. Frequent flooding and roadside maintenance may alter the ground cover of plant species and may disturb the soil.
% cleared in NSW	92%
Number of VI plots	Three (3) plots were surveyed but were deemed too far from the revised Development Footprint, so benchmark data was used.
Threatened flora species	Associated with PCT 76: • *Diuris tricolor* (Pine Donkey Orchid) • *Swainsona recta* (Small Purple-pea) • *S. sericea* (Silky Swainson-pea). No associated threated flora species of PCT 76 were identified during floristic survey.
Fauna habitats	No Hollow Bearing Trees (HBTs) were within the vegetation zone.



PCT 76_Good (Yarrabin Road Upgrade)

PCT 84: River Oak – Rough-barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	
Vegetation formation/class/ structure	Forested Wetlands/ Eastern Riverine Forests/ Woodland
Conservation status	No TEC's are associated with PCT 84.
Approximate extent within the Project Site	Overall 3.43 ha of PCT 84 occur within the current Development Footprint with all except 0.32 ha within the Inland Slopes sub-region. This PCT is located along permanent and semi-permanent creek and rivers across the Project Site, including along the Cudgegong River, Macquarie River, Oakey Creek and Leaning Oak Creek.

PCT 84: River Oak – Rough-barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	
Condition	This community occurs in Good condition and as a DNG. Overall, there are 14.04 ha of PCT 84 within the Development Corridor. These areas have been refined within the Development Footprint. • PCT 84_good (1.53 ha) • PCT 84_DNG (1.9 ha).
General information and Characteristic species associated with this PCT (VIS 2021)	PCT 84 is found on the banks of rivers and creeks in low hills and hills landforms of Nandewar and Brigalow Belt South Bioregions, characterised by tall woodland or open forests to 30 m high. Canopy is often dominated by *Casuarina cunninghamiana* subsp. *cunninghamiana* often with *Angophora floribunda* (Rough-barked Apple), *Eucalyptus camaldulensis*, *E. melliodora*, *E. blakelyi* and occasionally *E. albens*. A sparse mid storey may occur comprising of *Acacia implexa* (Hickory Wattle), *Leptospermum* spp., *Dodonaea* spp., *Phyllanthus subcrenulatus* (Spurge), *Bursaria spinosa*, Callistemon spp. (Bottlebrush), and *Olearia viscidula* (Viscid Daisy-bush). In some places a "dry rainforest" lower tree/high shrub layer may occur that includes *Alphitonia excelsa* (Red Ash), *Alectryon* spp., *Ficus rubiginosa* (Rusty Fig) and *Notelaea microcarpa* (Native Olive). The ground cover can be dense or sparse and contains a rich flora of small shrubs, grasses, sedges and forbs including *Microlaena stipoides* (Weeping Grass), *Austrostipa scabra, Lomandra longifolia* (Spiny-headed Mat-rush), *Cynodon dactylon* (Couch), *Chloris virgata* (Feathertop Rhodes Grass), *Carex spp., Cheilanthes sieberi* (Rock Fern), *Urtica incisa* (Stinging Nettle), *Dichondra repens, Aristida ramosa, Einadia hastata* (Saloop).
Field Data and Plot Data collected 2021. PCT justification process.	This community was identified along watercourses, along stream channels and banks next to watercourses. The dominant tree was *Eucalyptus camaldulensis* with *Angophora floribunda*, *Casuarina cunninghamiana* subsp. *cunninghamiana, Callitris glaucophylla* and *E. blakelyi* also present. The midstorey was sparse but included *Acacia implexa* (hickory wattle), *Phyllanthus gunnii* (Scrubby Spurge), *Dodonaea viscosa* (Sticky Hop-bush) and *Callistemon sieberi* (River Bottlebrush). Ground cover contained a diverse array of native grasses and forbs with *Microlaena stipoides* as the dominant cover. *Panicum effusum* (Hairy Panic), *Urtica incisa, Cynodon dactylon,* and *Aristida ramosa* were also present. The following criteria were filtered using the PCT filter tool: • IBRA – NSW SWS • IBRA Subregion – Inland Slopes • Formation – Forested Wetlands • Dominant canopy – *E. camaldulensis* and *E. blakelyi.* Based on landscape position along stream beds, and the presence of *Eucalyptus camaldulensis, Eucalyptus blakelyi* and/or *Casuarina cunninghamiana* subsp. *cunninghamiana,* PCT 84 was considered the most appropriate plant community. PCT 281 was also considered, however, the groundcover was dominated by *Lomandra confertifolia* with a diverse variety of shrubs including *Acacia implexa, Callistemon sieberi, Dodonaea viscosa, Lissanthe strigosa* (Peach Heath) and *Melichrus urceolatus* (Urn-heath) which is more typical of PCT 84.
HTW cover	HTW cover within PCT 84_good averaged 7.74% with *Heliotropium amplexicaule* (Blue Heliotrope) the most abundant weed species. HTW cover across PCT 84_DNG areas averaged 10.2% with *Heliotropium amplexicaule* and *Paspalum dilatatum* (Paspalum) the most abundant weed species.
Variation and disturbance	Ground species vary across distribution depending on grazing pressure, substrate and soils. Frequent flooding may alter the ground cover of plant species and may disturb the soil. Large floods may kill mature trees and scour the water courses. This may lead to a subsequent dense regrowth of *Casuarina cunninghamiana* subsp. *cunninghamiana*.
% cleared in NSW	40%

PCT 84: River Oak – Rough-barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	
Number of VI plots	Seven (7)
Threatened flora species	Associated with PCT 84: • *Pomaderris queenslandica* (Scant Pomaderris) • *Euphrasia arguta* • *Prasophyllum sp. Wybong.* No associated threated flora species of PCT 84 were identified during floristic survey.
Fauna habitats	Fallen logs across all plots and some sites with HBTs present.



PCT 84_good



PCT 84_DNG



PCT 84_good



PCT 84_DNG

PCT 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	
Vegetation formation/class/ structure	Grassy Woodlands / Western Slopes Grassy Woodland / Woodland
Conservation status	Overall 52.46 ha of PCT 266 occur within the Development Footprint with the majority within the Inland Slopes sub-region. This PCT forms part of the BC Act listed CEEC – *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions. All areas were considered to conform to the BC Act listing criteria (52.46 ha). PCT 266 can also form part of the EPBC Act listed CEEC – White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. 30.2 ha is considered to meet the EPBC Act listing criteria based on forb diversity.
Approximate extent within the Project Site	PCT 266 within the Development Footprint is present as good condition (4.31 ha), with the majority in the DNG form (28.9 ha). There is also an area considered low condition (19.26 ha) due to the historical and ongoing agricultural impacts within this zone.
Condition	Overall, there is 135.24 ha of PCT 266 within the Development Corridor and 52.46 ha within the Development Footprint. These areas have been refined and avoided where possible. Three (3) vegetation condition zones occurred within the Development Footprint: • PCT 266_good (4.31 ha) • PCT 266_DNG (28.9 ha) • PCT 266_Low (19.26 ha).
General information and Characteristic species associated with this PCT (VIS 2021)	PCT 266 is characterised by tall woodlands with trees to 25 m high dominated by *Eucalyptus albens* often as the only tree species. *Brachychiton populneus* subsp. *populneus* (Kurrajong) is often present, particularly on limestone or rocky ground. *E. bridgesiana* (Apple Box), *E. blakelyi* or *E. melliodora* may also be present as minor components. Shrub layer is usually sparse or absent depending on grazing history or soil type. Common composition comprises of *Acacia* spp. *Dodonaea viscosa* subsp. *cuneata, Bursaria spinosa* subsp. *spinosa* and *Cassinia* spp. The ground cover is usually mid-dense to dense except during drought and may be very diverse in grass and forb species. Very few areas contain a native ground cover with a rich flora but where this occurs it typically contains grasses such as *Themeda triandra*, *Panicum effusum*, *Anthosachne scabra* and a variety of *Rytidosperma* spp. Forbs in such sites include *Wurmbea dioica* (Early Nancy), *Gonocarpus elatus* (Raspwort), *Microseris lanceolata* (Yam Daisy), *Leptorhynchos squamatus* (Scaly Buttons), *Craspedia variabilis* (Billy Buttons), *Podolepis jaceoides* (Showy Copper-wire Daisy) and *Hypericum gramineum* (Small St John's Wort). In heavily grazed sites fewer native species are present and the sites are dominated by *Austrostipa* spp, *Aristida* spp. and *Rytidosperma* spp.
Field Data and Plot Data collected 2021. PCT justification process	This community was observed on undulating hills and hill slopes, where soils are more fertile. However, much of the community has been cleared with remnants of scattered old trees and a predominantly grazed understorey. The dominant, tree species was *Eucalyptus albens,* with regenerating *Brachychiton populneus* subsp. *populneus* within the area. The mid-storey was sparse to absent with *Acacia implexa, Lissanthe strigosa* and *Solanum cinereum* (Narrawa Burr) present at some locations. Ground cover contained a diverse array of native grasses and forbs including *Austrostipa scabra, Bothriochloa macra, Cheilanthes sieberi, Panicum effusum, Rytidosperma caespitosum* and *Aristida ramosa*, consistent with communities that have been subject to past gazing practices. The following criteria were filtered using the PCT filter tool:

PCT 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	
	• IBRA – NSW SWS • IBRA Subregion – Inland Slopes • Formation – Grassy Woodland • Dominant canopy – *E. albens.* PCT 272 was also considered but based on landscape position, species composition and the dominance of *Eucalyptus albens,* PCT 266 was considered the most appropriate plant community. This community meets the NSW TEC due to the dominance of *Eucalyptus albens* and the presence of a grassy understorey. 30.2 ha of this community also meets the listing criteria under the Commonwealth EPBC Act due to the presence of various forbs within the inter-tussock spaces or the area was not surveyed.
HTW cover	The HTW cover within PCT 266_good averaged 0.35% with *Heliotropium amplexicaule* the most abundant weed species. HTW cover within 266_DNG averaged 4.13% with *H. amplexicaule* and *Hypericum perforatum* (St John's Wort) the most abundant.
Variation and disturbance	PCT 266 occurs over a large range of landscapes, on many lithologies and a number of soil types. Floristic composition varies but Prober (1996) describes consistency in ground cover species composition with a gradual latitudinal change from south to northern NSW.
% cleared in NSW	94%
Number of VI plots	17
Threatened flora species	Associated with PCT 266: • *Acacia ausfeldii* (Ausfeld's Wattle) • *Ammobium craspedioides* • *Grevillea wilkinsonii* (Tumut Grevillea) • *Swainsona recta* • S*. sericea* • *Euphrasia arguta* • *Prasophyllum sp. Wybong*. No associated threated flora species were identified during floristic survey.
Fauna habitats	Large woody debris (LWD) present within some plots and one site containing a HBT.



PCT 266_DNG



PCT 266_DNG

PCT 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion



PCT 266_Low



PCT 266_good



PCT 266-good

PCT 270: White Box – Tumbledown Red Gum – Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes

Vegetation formation/class/ structure	Dry Sclerophyll Forests / Western Slopes Dry Sclerophyll Forests/ Woodland
Conservation status	PCT 270 forms part of the BC Act listed CEEC – *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions. It also forms part of the listed EPBC Act CEEC – White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.
Approximate extent within the Project Site	PCT 270 occurs within the Hill End subregion (0.15 ha). Only small pockets of this PCT exists scattered within the Development Footprint, located along access tracks and the WTG footprint with all areas meeting the NSW listing of the TEC and the EPBC Act listing of TEC.
Condition	Less than 1 ha is within the Development Corridor and less than 0.15 ha is within the Development Footprint. One (1) condition class was identified within the Project Site – PCT 270_good.

PCT 270: White Box – Tumbledown Red Gum – Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes	
General information and Characteristic species associated with this PCT (VIS 2021)	PCT 270 is a mid-high woodland dominated by *Eucalyptus albens* and *E. dealbata,* with *E. macrorhyncha* (Red Stringybark), and *E. goniocalyx*. Shrubs are sparse and include *Olearia elliptica* (Sticky Daisy-bush) and *Cassinia laevis* (Cough Bush). The ground cover is very sparse to mid-dense depending on rainfall and grazing. It includes the forb *Stypandra glauca* (Nodding Blue Lily) and the grasses *Themeda triandra* and *Rytidosperma pallidum* (Redanther Wallaby Grass). PCT 270 generally occurs on red clay soils on steep slopes and ridges composed of fine-grained sedimentary rocks such as shale and mudstone in mountain landscapes including deep gorges in the central – western NSW including in the Macquarie River gorge north-west of Bathurst near Hill End.
Field Data and Plot Data collected 2021. PCT justification process.	Within the Development Footprint, PCT 270 was found on ridgetops and hill slopes, where the dominant tree species were *Eucalyptus albens* and *E. dealbata*, with *Brachychiton populneus* subsp. *populneus, E. macrorhyncha, E. polyanthemos and Allocasuarina verticillata* (Drooping Sheoak). Present in small numbers. The midstorey included *Olearia elliptica* and *Dodonaea viscosa*. The ground cover contained a diverse array of native grasses and forbs including *Austrostipa scabra, Rytidosperma racemosum, Aristida ramosa, Panicum effusum* with *Stypandra glauca*, *Themeda triandra* and *Rytidosperma pallidum* also present in small numbers. The following criteria were filtered using the PCT filter tool: • IBRA – SEH • IBRA Subregion – Hill End • Formation – Dry sclerophyll forest (shrubby sub formation) • Dominant canopy – *E. albens* and *E. dealbata*. Based on the landscape positioning and the presence of *Eucalyptus dealbata* together with *E. albens*, PCT 270 was considered the most appropriate plant community. PCT 272 was considered and excluded based on the absence of other tree species such as *Callitris endlicheri, E. macrorhyncha, E. sideroxylon* (Mugga Ironbark) and *E. blakelyi*. All 0.15 ha of this plant community meets the NSW TEC due to the dominance of *Eucalyptus albens* and the presence of a grassy understorey. It also meets the criteria for the listed Box-Gum Woodland under the EPBC Act.
HTW cover	The HTW cover across PCT 270_good averaged 0.125% with the most abundant weeds being *Hypericum perforatum* and *Carthamus lanatus* (Saffron Thistle). *Ailanthus altissima* (Tree of Heaven) was also recorded. The most dominant weed species within this zone were *H. perforatum*, and *Opuntia aurantiaca* (Tiger Pear) with scattered *C. lanatus*.
% cleared in NSW	40%
Number of VI plots	Two (2)
Threatened flora species	Associated with PCT 270: • *Grevillea divaricata* • *Swainsona recta* • *Euphrasia arguta*. No associated threated flora species were identified during floristic survey.
Fauna habitats	HBTs are present in areas of good condition, while LWD is present in both vegetation condition zones.

PCT 270: White Box – Tumbledown Red Gum – Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes	
 PCT 270_good	 PCT 270_good

PCT 272: White Box – Black Cypress Pine – red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes	
Vegetation formation/class/ structure	Grassy Woodlands/ Western Slopes Grassy Woodlands/ Woodland
Conservation status	No TECs are associated with PCT 272.
Approximate extent within the Project Site	PCT 272 forms most of the vegetation within the Development Footprint (336.13 ha) with the majority (238.11 ha) occurring within the Inland Slopes sub-region. This PCT is located throughout the Development Footprint on the upper slopes and ridges.
Condition	Overall, there are 591.85 ha of PCT 272 within the Development Corridor. These areas have been refined within the Development Footprint. Two (2) vegetation condition zones occur within the Development Footprint: • PCT 272_Good (229.81 ha) • PCT 272_DNG (106.31 ha).
General information and Characteristic species associated with this PCT (VIS 2021)	PCT 272 is a mid-high woodland containing *Eucalyptus albens*, *Callitris endlicheri* with either *E. dealbata* or *E. blakelyi* and *E. macrorhyncha* or occasionally *E. sideroxylon*. The understorey contains a sparse shrub layer including the wattles *Acacia vestita* (Weeping Boree), *A. paradoxa* (Kangaroo Thorn), *A. penninervis* (Mountain Hickory), *A. decora* (Western Silver Wattle) and *A. implexa* and along with *Cassinia laevis*, *Lissanthe strigosa, Leucopogon virgatus* and *Dodonaea viscosa*. Dense regenerating stands of *Callitris endlicheri* may be present in the understorey. The ground cover is sparse dominated by grasses such as *Rytidosperma racemosum*, *Austrostipa densiflora, Echinopogon ovatus* (Forest Hedgehog Grass) and *R. pallidum*. Forbs include *Hydrocotyle laxiflora* (stinking Pennywort), *Acaena ovina, Scutellaria humilis* (Dwarf Skullcap), *Cymbonotus preissianus* (Austral Bear's Ear), *Geranium solanderi* var. *solanderi* (Native Geranium), *Xerochrysum bracteatum* (Golden Everlasting), *Wahlenbergia communis* (Bluebell) *and Einadia hastata*. The rock fern *Cheilanthes sieberi* is often present. Occurs on brown clay loam or loam texture contrast soils derived from acid volcanics, igneous or sedimentary rocks in gullies or on hillslopes on the central western slopes of NSW mainly in the northern part of the NSW SWS Bioregion. Weeds may dominate the edge of remnants.

PCT 272: White Box – Black Cypress Pine – red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes	
Field Data and Plot Data collected 2021. PCT justification process.	PCT 272 was located mostly on the upper hill slopes and ridgetops, on a rocky substrate. The dominant tree species were *Eucalyptus albens*, *Callitris* sp. With smaller numbers of *E. dealbata*, *Brachychiton populneus* subsp. *populneus* and *E. polyanthemos*. The midstorey is dominated by *Olearia elliptica*, with *Dodonaea viscosa*, *Lissanthe strigosa* and *Solanum* sp. also present. The ground cover is sparse but dominated by grasses and forbs such as *Rytidosperma* sp. *Microlaena stipoides, Cyperus gracilis* (Slender Flat-sedge)*, Geranium solanderi and Austrostipa scabra*. Other species such as *Einadia nutans*, *Hydrocotyle laxiflora*, *Cymbonotus lawsonianus* (Bear's Ear)*, Scutellaria* sp. and *Wahlenbergia* sp. are also present. The following criteria were filtered using the PCT filter tool: • IBRA – NSW SWS • IBRA Subregion – Inland Slopes • Formation – Grassy Woodland • Dominant canopy – *E. albens* and *Callitris endlicheri*. Based on the landscape positioning on hillslopes, the dominant midstorey and the presence of *Callitris* sp., PCT 272 was considered the most appropriate PCT. PCT 266 was also considered and excluded due to the soils being shallow and rocky with low fertility and the presence of shrubby understorey.
HTW cover	The HTW cover within PCT 272_good averaged 0.15%. HTW cover within 272_DNG averaged 4.24%. *Hypericum perforatum* and *Heliotropium amplexicaule* were the most abundant HTW.
Variation and disturbance	The quantities of associate species vary with soil type and understorey shrub density alters after fire.
% cleared in NSW	65%
Number of VI plots	23
Threatened flora species	Associated with PCT 272: • *Tylophora linearis* • *Zieria obcordata* (Obcordate-leafed Zieria) • *Acacia ausfeldii* • *Euphrasia arguta* • *Prasophyllum sp. Wybong.* No associated threated flora species were identified during floristic survey.
Fauna habitats	HBTs are present in PCT 272_good, while LWD is present in both vegetation zones.



PCT 272_good



PCT 272_DNG

PCT 272: White Box – Black Cypress Pine – red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes	
 PCT 272_good	 PCT 272_DNG

PCT 274: White Box – Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee region	
Vegetation formation/class/ structure	Grassy Woodland/ Western Slopes Grassy Woodlands/ Woodland
Conservation status	BC Act: CEEC – *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions EPBC Act: CEEC – White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
Approximate extent within the Project Site	Overall, there are 2.57 ha of PCT 274 within the Development Corridor. These areas have been refined within the Development Footprint. Overall 0.9 ha of PCT 274 occur within the Development Footprint all occurring within the Inland slopes sub-region. This PCT occurs within small pockets on the lower slopes mostly in gully's and hillslopes with all areas meeting the NSW BC Act listing criteria. All areas were also considered to satisfy the EPBC Act listing criteria.
Condition	Two (2) vegetation condition zone occurred across the Development Footprint. • PCT 274_good (0.07 ha) • PCT 274_DNG (0.83 ha).
General information and Characteristic species associated with this PCT (VIS 2021)	PCT 274 is characterised as a tall woodland dominated by *Eucalyptus albens* and *Angophora floribunda* with a sparse shrub cover including *Acacia buxifolia, A. implexa, Olearia elliptica, Hibbertia* spp. and *Swainsona galegifolia* (Smooth Darling-pea). The ground cover may be dense in places and mid-dense overall and includes the grasses *Panicum effusum, Themeda triandra, Microlaena stipoides, Lachnagrostis filiformis* (Blowngrass), *Austrostipa ramosissima* (Stout Bamboo Grass) and *Echinopogon ovatus*. Forbs include *Acaena novae-zelandiae* (Bidgee Widgee), *Arthropodium milleflorum* (Pale Vanilla-lily), *Daucus glochidiatus* (Native Carrot) and *Arthropodium fimbriatum* (Nodding Chocolate Lily), and sedges include *Carex appressa* (Tall Sedge). This PCT occurs on alluvial or colluvial red clay soils derived from shale in valley bottoms and on adjoining lower slopes in hill landscapes in the Central Western Slopes Botanical Division being the northern section of the NSW SWS Bioregion around the town of Mudgee.

PCT 274: White Box – Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee region	
Field Data and Plot Data collected 2021. PCT justification process.	PCT 274 was found predominantly on sloped and in gullies close to drainage lines, within a hill's landform pattern. The area was dominated by *Eucalyptus albens* and *Angophora floribunda*, with *Brachychiton populneus* subsp. *populneus* and *E. melliodora*. The midstorey consisted of *Olearia elliptica*, *Acacia decora* and *A. implexa.* The ground layer was sparse with high litter cover with scattered *Dichondra repens*, *Geranium solanderi*, *Microlaena stipoides, Acaena novae-zelandiae* and *Themeda triandra*. The following criteria were filtered using the PCT filter tool: • IBRA – NSW SWS • IBRA Subregion – Inland Slopes • Formation – Grassy Woodlands • Dominant canopy – *E. albens* and *Angophora floribunda*. Based on landscape positioning and the species composition PCT 274 was the most appropriate plant community. PCT 281 was also considered and excluded due to the presence of *Eucalyptus. albens.* 1.45 ha of this community meets the NSW TEC due to the presence of *Eucalyptus albens,* or *E. melliodora* and the presence of a grassy understorey. PCT 274_DNG was considered at Benchmark condition, so 1.45 ha met the listing criteria for the EPBC Act.
HTW cover	The HTW cover within PCT 274_good averaged 0.16%. The major weeds recorded were *Hypericum perforatum, Opuntia stricta* (Prickly Pear) and *Rosa rubiginosa* (Sweet Briar).
Variation and disturbance	Occasional floods may alter ground cover floristic composition and structure.
% cleared in NSW	88%
Number of VI plots	Two (2)
Threatened flora species	Associated with PCT 274: • *Euphrasia arguta* • *Prasophyllum sp*. No associated threated flora species were identified during floristic survey.
Fauna habitats	HBTs and LWD are present.



PCT 274_good



PCT 274_good

PCT 287: Long-leaved Box – Red Box – Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	
Vegetation formation/class/ structure	Dry Sclerophyll Forests / Western Slopes Dry Sclerophyll Forests/ Open-Forest or Woodland
Conservation status	No TEC's are associated with PCT 287
Approximate extent within the Project Site	Overall, there are 342.41 ha of PCT 287 within the Development Corridor. These areas have been refined within the Development Footprint. Overall, 213.62 ha of PCT 287 occurs within the current Development Footprint, all occurring within the Hill End sub-region. The majority of this PCT is located on the turbine footprint on the upper hillslopes and along ridge lines.
Condition	Two vegetation condition zones occurred within the Development Footprint: • PCT 287_good (111.55 ha) • PCT 287_DNG (102.07 ha).
General information and Characteristic species associated with this PCT (VIS 2021)	PCT 287 is characterised by a mid-high to tall open forest or woodland to 25 m high dominated by *Eucalyptus goniocalyx*, *E. polyanthemos* and *E. macrorhyncha*. Other tree species include *E. melliodora* and *E. albens*, with a lower tree layer of *Callitris endlicheri* present at some locations. The mid storey is sparse and includes *Brachyloma daphnoides* (Daphne heath), *Acacia paradoxa, Cassinia sifton* (Sifton Bush), *A. buxifolia, Lissanthe strigosa, Persoonia sericea* (Geebung), and *Leptospermum continentale* (Prickly Tea-tree). The ground layer is mid-dense and includes *Rytidosperma racemosum, Hypericum gramineum, Gonocarpus tetragynus* (Raspwort), *Aristida ramosa, Themeda triandra, Poa sieberiana*, and *Rytidosperma pallidum*. The rock ferns *Cheilanthes austrotenuifolia* and *Cheilanthes sieberi* are common along with the mat-rushes *Lomandra multiflora* and *Lomandra filiformis*. PCT 287 occurs on clayey soils derived from a range of substrates including granite, metamorphic rocks, fine-grained sedimentary and volcanic rocks on hillslopes in hill landform patterns mainly in the NSW South-western Slopes Bioregion extending onto the SHE *Bioregion.*
Field Data and Plot Data collected 2021. PCT justification process.	This community was observed on upper hillslopes mostly on a rocky substrate. Dominant species included *Eucalyptus goniocalyx*, *E. macrorhyncha and E. polyanthemos*. *E. albens* was also present as a subdominant species. The midstorey was dominated by *Olearia elliptica* with *Acacia buxifolia, Lissanthe strigosa, Hibbertia* sp., *A. implexa* and *A. decora* present in small numbers. Groundcover species included a diverse mix of grasses and herbs such as *Cheilanthes sieberi, Themeda triandra*, *Aristida ramosa, Poa sieberiana, Hypericum gramineum, Lomandra multiflora, Lomandra filiformis, Rytidosperma pallidum* and *R. racemosum.* The following criteria were filtered using the PCT filter tool: • IBRA – SEH • IBRA Subregion – Hill End • Formation – Dry Sclerophyll forest (shrubby sub formation) • Dominant canopy – *E. goniocalyx* and *E. polyanthemos.* Based on landscape positioning and the dominant *Eucalyptus* species present, PCT 287 was considered the most appropriate plant community. PCT 321 was also considered and excluded due to differences in underlaying geology.
HTW cover	The HTW cover within PCT 287_good averaged of 0.23%. HTW cover within PCT 287_DNG averaged 0.42%. *Hypericum perforatum* and *Carthamus lanatus* were consistent across the site.
Variation and disturbance	This community covers a wide range and therefore there is substantial variation in the understorey and ground layer. The shrub density varies under differing fire regimes.
% cleared in NSW	67%

PCT 287: Long-leaved Box – Red Box – Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	
Number of VI plots	20
Threatened flora species	Associated with PCT 287 • *Acacia phasmoides* (Phantom wattle) • *Ammobium craspediodes* • *Eucalyptus alligatrix subsp. alligatrix* • *Euphrasia arguta* • *Persoonia marginata* • *Senecio garlandii* (Woolly Ragwort) • *Zieria obcordata.* No associated threated flora species were identified during floristic survey.
Fauna habitats	HBTs are present in PCT 287_good, while LWD is present in both PCT 287_good and PCT 287_DNG.



PCT 287_good

PCT 281: Rough-Barked Apple – red gum – Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	
Vegetation formation/class/structure	Grassy Woodland/ Western Slopes Grassy Woodlands/ Open-Forest or Woodland
Conservation status	BC Act: CEEC – *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions EPBC Act: CEEC – White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland
Approximate extent within the Project Site	Overall, there are 15.23 ha of PCT 281 within the Development Corridor. These areas have been refined within the Development Footprint. Overall 4.58 ha of PCT 281 occurs within the Development Footprint, all within the Inland Slopes sub-region, with all meeting the NSW listing of the TEC. Due to lack of forb diversity only 0.79 ha conform to the EPBC listing criteria. This PCT is located on flat fertile soils along the access tracks, located near the Cudgegong River, Leaning Oak Creek, and Tallawangra Creek.
Condition	This community occurs in two (2) conditions: • PCT 281_DNG (4.24 ha) • PCT 281_Good (0.34 ha).

PCT 281: Rough-Barked Apple – red gum – Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	
General information and Characteristic species associated with this PCT (VIS 2021)	PCT 281 is a tall open forest or woodland with trees up to 30 m high dominated by *Angophora floribunda* usually with *Eucalyptus blakelyi* or *E. melliodora*. Other tree species may include *Callitris glaucophylla, Brachychiton populneus* subsp. *populneus*. *Casuarina cunninghamiana* subsp. *cunninghamiana* may be present but often forms its own riparian community in nearby riverbanks. The shrub layer is often sparse or absent in heavily grazed locations but may include *Acacia implexa, A. decora, A. penninervis* and *A. deanei* (Green Wattle). Other shrub species may include *Dodonaea viscosa, Bursaria spinosa, Olearia elliptica* and *Hibbertia obtusifolia* (Hoary Guinea Flower). The ground cover is usually dense to mid-dense including *Austrostipa scabra, Aristida ramosa, Calotis lappulacea, Arundinella nepalensis* (Reed Grass), *Aristida calycina* var. *praealta, Lomandra longifolia, Lomandra confertifolia , Swainsona galegifolia, Haloragis heterophylla* (Rough Raspwort), *Themeda triandra,* and *Einadia nutans.* PCT 281 occurs on black, brown and grey alluvial and colluvial clay loam, loam or sandy loam soils derived from a range of substrates on valley flats and foot slopes in valleys in hill landform patterns mainly in the Brigalow Belt South Bioregion. Some areas also occur north of Mudgee in the Gulgong-Dunedoo area in the NSW SWS Bioregion.
Field Data and Plot Data collected 2021. PCT justification process.	This PCT was observed within the development footprint on alluvial plains and valley flats. The dominant species were *Angophora floribunda, Eucalyptus blakelyi*, *E.s melliodora* with regenerating *Brachychiton populneus* subsp. *populneus.* There is no dominant mid-story present*, with Bossiaea heterophylla* (Variable Bossiaea)*, Olearia elliptica and Solanum cinereum* present in low numbers. The groundcover was a mix of grasses and herbs, with *Aristida ramosa, Einadia nutans, Lomandra confertifolia, Swainsona galegifolia, Themeda triandra, Sporobolus creber* (Slender Rat-tail Grass)*, Panicum effusum* and *Bothriochloa macra* present*.* The following criteria were filtered using the PCT filter tool: • IBRA – NSW SWS • IBRA Subregion – Inland Slopes • Formation – Grassy Woodlands • Dominant canopy –*Angophora floribunda* and *E. blakelyi*. Based on landscape positioning and the dominance of *Angophora floribunda* together with *Eucalyptus blakelyi* or *E. melliodora* PCT 281 was considered the most appropriate plant community. This community meets the NSW TEC due to the dominance of *E. melliodora* and/or *E. blakelyi* and the presence of a grassy understorey. PCT 277 and PCT 276 were also considered but due to the dominance of *A. floribunda*, both PCTs were excluded.
HTW cover	HTW cover within PCT 281_DNG averaged 0.3% due to the presence of *Heliotropium amplexicaule*.
Variation and disturbance	This PCT varies greatly with disturbance and over its range. In some areas *Eucalyptus blakelyi* has been cut out for fence posts or firewood so *Angophora floribunda* dominates the site. *Angophora floribunda* can regenerate quickly after clearing and dominate sites.
% cleared in NSW	67%
Number of VI plots	Six (6)
Threatened flora species	Associated with PCT 281:

PCT 281: Rough-Barked Apple – red gum – Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	
	• *Dichanthium setosum* (Bluegrass) • *Prasophyllum petilum sp. Wybong* • *Prasophyllum petilum* (Tarengo Leek Orchid) • *Swainsona sericea* • *Acacia ausfeldii* • *Euphrasia arguta.* No associated threated flora species were identified during floristic survey.
Fauna habitats	HBTs and LWD are present in areas of PCT 281_good.



PCT 281_good



PCT 281_DNG

PCT 277: Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	
Vegetation formation/class/ structure	Grassy Woodland/ Western Slopes Grassy Woodlands/Woodland
Conservation status	BC Act: CEEC – *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions EPBC Act: CEEC – *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*
Approximate extent within the Project Site	Overall, there are 48.68 ha of PCT 277 within the Development Corridor. These areas have been refined within the Development Footprint. Overall, 16.44 ha of PCT 277 occurs within the current Development Footprint with 1.26 ha occurring within the Hill End sub region. The majority of this PCT is located on fertile soils next to Redbank creek, Black Willow creek and the Cudgegong River. 16.44 ha meets the NSW listing of the TEC, however only 0.82 ha meets the EPBC Act listing criteria due to lack of forb diversity.
Condition	Two (2) vegetation zones of this community occurred within the Development Footprint: • PCT 277_good (1.92 ha) • PCT 277_DNG (14.52 ha).

PCT 277: Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	
General information and Characteristic species associated with this PCT (VIS 2021)	PCT 277 is characterised as a tall woodland to about 20 m high dominated by *Eucalyptus blakelyi* and *E. melliodora*. *E. blakelyi* and *E. melliodora* vary in their dominance and either can be absent in some places grading into areas with more *E. bridgesiana*, *E. goniocalyx* and rarely *E. microcarpa*. Shrubs are sparse or absent and may include *Acacia dealbata*. The ground cover may be dense to sparse depending on rainfall and is dominated by grass species including *Poa sieberiana* (Snow grass), *Bothriochloa macra, Aristida ramosa, Themeda triandra, Rytidosperma* spp *and Austrostipa* spp. Forbs include *Vittadinia cuneata, Chrysocephalum apiculatum* (Common Everlasting) *and Sida corrugata*. This PCT occurs on flats, foot slopes and hillslopes mainly in the upper slopes sub-region of the NSW South-western Slopes Bioregion mainly east of Wagga Wagga. Grades into *Eucalyptus albens* grassy woodland (PCT 266) on hillslopes and into either PCT 281 (Yellow Box woodland) on alluvial flats. Mainly cleared and subjected to nutrification from fertilizers and associated weed invasion.
Field Data and Plot Data collected 2021. PCT justification process.	This PCT was observed on valley flats in a hill landform pattern, often grading into PCT 266 on the lower slopes. *Eucalyptus melliodora* was dominant with scattered *E. albens* and *E. blakelyi* and regenerating *Brachychiton populneus* subsp. *populneus*. The mid-story was sparse but consisted of a small numbers of *Acacia implexa, Bursaria spinosa* and *Solanum cinereum*. Groundcover included species such *Aristida ramosa*, *Bothriochloa macra*, *Poa sieberiana*, *Rytidosperma caespitosum*, *Sida corrugata,* and *Vittadinia cuneata*. The following criteria were filtered using the PCT filter tool: • IBRA – NSW SWS • IBRA Subregion – Inland Slopes • Formation – Grassy Woodlands • Dominant canopy – *E. melliodora*. Based on the Landscape positioning and the dominance of *Eucalyptus melliodora* PCT 277 was considered the most appropriate plant community. PCT 281 was also considered but was excluded to the lack of *Angophora floribunda* within the vegetation zone. PCT 276 was also considered and excluded due to the presence of *E. blakelyi* and *Brachychiton populneus* subsp. *populneus*. This community meets the NSW TEC due to the dominance of *Eucalyptus melliodora* and the presence of a grassy understorey and 1.05 ha meets the listing criteria for the EPBC listed TEC due to the diversity of forbs within the ground layer.
HTW cover	The HTW cover within PCT 277_good averaged 0.13%. HTW cover within PCT 277_DNG averaged 3.31%. The most abundant HTW were *Heliotropium amplexicaule, Carthamus lanatus* and *Hypericum perforatum*.
Variation and disturbance	Ground cover alters composition across its wide distribution with altitude and latitude, but there are many species that are common to most sites across its range.
% cleared in NSW	94%
Number of VI plots	Nine (9)
Threatened flora species	Associated with PCT 277:

PCT 277: Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	
	• *Ammobium craspedioides* • *Cullen parvum* (Small Scurf-pea) • *Prasophyllum petilum* • *Swainsona recta* • *S. sericea* • *Acacia ausfeldii* • *Euphrasia arguta* • *Prasophyllum sp. Wybong.* No associated threated flora species were identified during floristic survey.
Fauna habitats	HBTs and LWD is present in areas of PCT 277_good.



PCT 277_DNG



PCT 277_good

PCT 312: Yellow Box grassy tall woodland on valley flats in the upper slopes of the NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion	
Vegetation formation/class/structure	Grassy Woodlands / Southern Table Grassy Woodland
Conservation status	This PCT forms part of the BC Act listed CEEC -*White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions. All areas were considered to conform to the BC Act listing criteria). PCT 312 can also form part of the EPBC Act listed CEEC -*White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*.
Approximate extent within the Project Site	This area has been avoided (see Appendix D) and is no longer within the Development Footprint, nor within the Development Corridor.
Condition	This community occurs as a grassy woodland in good condition. PCT 312_Good.

PCT 312: Yellow Box grassy tall woodland on valley flats in the upper slopes of the NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion	
General information and Characteristic species associated with this PCT (VIS 2023)	PCT 312 is a tall woodland or open forest dominated by *Eucalyptus melliodora* and generally lacking *E. blakelyi*. The shrub layer is very sparse or absent and if present may include *Acacia dealbata* or *Hibbertia obtusifolia*. The ground cover is mid-dense to dense and often dominated by grass species such as *Rytidosperma racemosum*, *Poa sieberiana, Microlaena stipoides, Themeda triandra, Austrostipa scabra* subsp. *falcata* and *Dichelachne micrantha* (Shorthair Plumegrass). Forbs include *Bulbine bulbosa* (Bulbine Lily)*, Senecio quadridentatus* (Cotton Fireweed)*, S. bathurstianus, Vittadinia cuneata* var. *cuneata, Wahlenbergia communis, Wahlenbergia gracilis and Wurmbea dioica* subsp. *dioica*. The climbers *Oxytes brachypodum* (Large Tick-trefoil) and *Grona varians* (Slender Tick-trefoil) may occur. Occurs on either orange-brown deep podzolic soils derived from granite or brown loam-clays derived from metasediments or sedimentary rocks in valley floors and on footslopes slopes in the upper slopes sub-region of the NSW South Wales SWS Bioregion.
Field data and plot data collected 2023	The area was dominated by *Eucalyptus melliodora* with an understorey of native grasses including *Microlaena stipoides, Rytidosperma racemosum, Poa sieberiana* and *Austrostipa scabra*. Forbs included *Geranium solanderi, Hydrocotyle laxiflora, Veronica plebeia* (Creeping Speedwell) and *Wahlenbergia gracilis.* The area was surrounded by PCT 272 and therefore there were elements of this PCT such as *Olearia elliptica* and *Callitris endlicheri* present. The patch of PCT 312 was located on a sunken area of deep colluvial sediments in the upper slopes. The following criteria were filtered using the PCT filter tool: • IBRA – NSW SWS • IBRA Subregion – Inland Slopes • Formation – Grassy Woodlands • Dominant canopy – *E. melliodora*. PCT 277 and 281 were also investigated however due to the dominance of *E. melliodora* and the absence of other canopy species, PCT 312 was deemed to be the most appropriate choice.
HTW cover	Twenty individuals of *Hypericum perforatum* covering 0.1% was present. Overall the total cover of weeds were low (1.2%).
Variation and disturbance	Ground species vary across distribution depending on grazing pressure, substrate and soils.
Cleared in NSW	93%
Number of VI plots	One (1)
Threatened flora species	Associated with PCT 312: • *Swainsona recta* • *S. sericea.* No associated threated flora species of PCT 312 were identified during floristic survey.
Fauna habitats	HBTs were within the vegetation zone.

PCT 312: Yellow Box grassy tall woodland on valley flats in the upper slopes of the NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion



PCT 312_Good



PCT 312_Good

PCT 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion

Vegetation formation/class/structure	Dry Sclerophyll Forest/ Western Slopes Dry Sclerophyll Forests/ Woodland
Conservation status	No TEC's are associated with PCT 331
Approximate extent within the Project Site	Overall, there are 86.99 ha of PCT 331 within the Development Corridor. These areas have been refined within the Development Footprint. Overall 52.88 ha of PCT 331 occurs within the current Development Footprint with 1.55 ha occurring within the Inland Slopes sub-region. The majority of this PCT is located on upper hillslopes and ridgetops.
Condition	Two (2) vegetation zones of the community occurred within the Development Footprint: • PCT 331_good (38.28 ha) • PCT 331_DNG (14.6 ha).
General information and Characteristic species associated with this PCT (VIS 2021)	PCT 331 occurs on sandy loam soils derived from sandstone, siltstone or rhyolite substrates on exposed hill slopes in hill landform patterns as a mid-high woodland with trees to 20 m high dominated by *Eucalyptus macrorhyncha* with *E. sideroxylon*, *E. fibrosa* (Red Ironbark), *E. blakelyi* or *E. polyanthemos* subsp. *polyanthemos*. *Callitris endlicheri* often forms a lower tree layer at about 8 m. The mid-storey may be dense or sparse and contains species such as *Grevillea floribunda* (Seven Dwarfs Grevillea), *Acacia buxifolia, Harmogia densifolia, Acrotriche rigida, Brachyloma daphnoides, Hibbertia obtusifolia,* and *Calytrix tetragona* (Common Fringe-myrtle). Ground cover is sparse to very sparse and often there is a high litter cover or rock exposure. Species include *Lomandra filiformis, Aristida calycina, Rytidosperma pallidum, Astroloma humifusum* (Native Cranberry), *Cheilanthes sieberi, Goodenia hederacea* (Ivy Goodenia), and *Stypandra glauca.*

PCT 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion	
Field Data and Plot Data collected 2021. PCT justification process.	PCT 331 was present on poor rocky soils on the upper slopes and ridgetops. The dominant tree species were *Eucalyptus macrorhyncha, E. polyanthemos*, with *E. albens* and *E. goniocalyx*. The dominant mid-story was *Olearia elliptica* with a ground cover dominated by *Lomandra confertifolia* and *Stellaria pungens* (Prickly Starwort) in areas of good condition. In DNG area, grasses are dominant and include *Austrostipa scabra*, *Microlaena stipoides* and *Panicum effusum*. Forbs including *Cheilanthes sieberi* and *Oxalis perennans* are also present. The following criteria were filtered using the PCT filter tool: • IBRA – SEH • IBRA Subregion -Hill End • Formation – Dry sclerophyll forest (Shrubby sub formation) • dominant canopy – *E. macrorhyncha* and *E. polyanthemos.* PCT 321 and PCT 323 were also considered and excluded due to lack of diagnostic species. PCT 1095 was excluded as it is associated with the Upper Riverina. Based on the dominance of *Eucalyptus macrorhyncha* and *E. polyanthemos* with the presence of *E. albens*, and the landscape positioning PCT 331 was considered the best fit PCT.
HTW cover	The HTW cover within PCT 331_good averaged of 0.1%. HTW cover within PCT 331_DNG averaged 1.42%. *Carthamus lanatus* was the most abundant HTW.
Variation and disturbance	*Eucalyptus* species varies depending on position on hillslope and soils.
% cleared in NSW	20%
Number of VI plots	12
Threatened flora species	Associated with PCT 331 • *Diuris tricolor* • *Eucalyptus alligatrix subsp. alligatrix* • *Grevillea divaricata* • *Pomaderris queenslandica* • *Swainsona sericea* • *Tylophora linearis.* No associated threated flora species were identified during floristic survey.
Fauna habitats	HBTs are present in PCT 331_good, while LWD was present in both condition zones.



PCT 331_good



PCT 331_DNG

PCT 461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion	
Vegetation formation/class/structure	Grassy Woodlands/ Western Slopes Grassy Woodland
Conservation status	No TEC's are associated with PCT 461
Approximate extent within the Project Site	Overall, there are 1.63 ha of PCT 461 within the Development Corridor. These areas have been refined within the Development Footprint. Overall 0.57 ha of PCT 461 occurs within the current Development Footprint all within the Inland Slopes sub-region. The majority of this PCT is located on upper hillslopes and ridgetops.
Condition	One (1) vegetation zone of the community occurred within the Development Footprint along the Yarrabin Road Upgrade area. PCT 461_DNG (0.57 ha).
General information and Characteristic species associated with this PCT (VIS 2023)	Mid-high to low open woodland to woodland dominated by *Eucalyptus dealbata* often with no other tree species. Other trees that may be present include *Brachychiton populneus* subsp. *populneus*, *E. albens*, *Callitris endlicheri, E. macrorhyncha* and *E. sideroxylon*. The shrub layer is very sparse or absent. Tall shrubs include *Acacia implexa* and *Allocasuarina verticillata*. Low shrubs include *Acacia decora, Xanthorrhoea glauca* subsp. *angustifolia* (Grass Tree), *Hibbertia obtusifolia, Calytrix tetragona, Brachyloma daphnoides, Pultenaea spinosa* (Spiny Bush Pea) and *Harmogia densifolia*. The ground cover is mainly composed of bare earth or stones with the vegetation cover very sparse to sparse depending on rainfall. Grass species include *Austrostipa scabra* subsp. *scabra, Rytidosperma racemosum, Aristida personata* (Purple Wiregrass), *Aristida vagans* (Threeawn Speargrass), *Poa sieberiana, Bothriochloa macra, Elymus scaber* var. *scaber* and *Panicum effusum*. Forb species include *Daucus glochidiatus, Stypandra glauca, Dichondra* sp. A, *Einadia nutans* subsp. *nutans, Oxalis radicosa, Euphorbia drummondii* and *Cymbonotus lawsonianus*. The rock ferns *Cheilanthes sieberi* and *Cheilanthes distans* are common as it the scrambler *Grona varians*. Occurs on shallow to stony brown to red sandy loam to light clay soils derived from metasediments or granite on hillslopes, hillcrests and gullies in rises, low hills and hills landform patterns mainly in the Gulgong – Dunedoo – Goolma – Tanner Springs region in the NSW SWS Bioregion with minor outliers to the north at the southern edge of the Brigalow Belt South Bioregion. Mostly cleared and overgrazed with some pasture weed infestation.
Field Data and Plot Data collected 2021. PCT justification process	PCT 461 was present on poor rocky soils along the Yarrabin Road Upgrade area. The dominant tree species were *Eucalyptus dealbata* with *Brachychiton populneus* subsp. *populneus and Callitris glaucophylla.* The shrub layer was mainly absent. The ground layer was dominated by *Aristida ramosa* and *Austrostipa scabra* with a variety of scattered forbs. The following criteria were filtered using the PCT filter tool: • IBRA – NSW SWS • IBRA Subregion – Inland Slopes • Formation – Grassy Woodlands • Dominant canopy – *E. dealbata*. PCT 270 and PCT 272 were also considered but due to the dominance of *E. dealbata* and landscape positioning PCT 461 was considered the most appropriate choice.
HTW cover	The HTW cover within PCT 461 averaged of 10% consisting of *Heliotropium amplexicaule*.
Variation and disturbance	Cover of shrubs and ground layer depend upon previous and current management regimes.
% cleared in NSW	50%
Number of VI plots	Two (2)

PCT 461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion	
Threatened flora species	Associated with PCT 461 • *Dichanthium setosum* • *Diuris tricolor* • *Swainsona sericea* • *Tylophora linearis* • *Acacia ausfeldii* • *Prasophyllum sp. Wybong.* No associated threated flora species were identified during floristic survey.
Fauna habitats	HBTs and LWD are both present in PCT 461.



PCT 461_Good



PCT 461_Good

Within the Development Footprint 730.7 ha of vegetation has been mapped. The vegetation has also been mapped in the broader Development Corridor (approximately 1,322 ha) to allow for flexibility in micro-siting. The majority of the native vegetation within the Development Footprint comprises patches of woodland vegetation within an agricultural land-use matrix (Table 3-10).

Table 3-10: Areas within Development Corridor and Development Footprint

Vegetation Condition Class	Area (ha) Development Corridor	Percentage of mapped vegetation	Area (ha) Development Footprint	Percentage of mapped vegetation
Non-native/ cleared land	79.48	6%	48.71	7%
Derived Native Grassland (DNG)	517.61	39%	274.7	38%
Native Vegetation Good condition	693.03	52%	388.03	53%
DNG low condition	32.36	3%	19.26	2%
TOTAL	**1,322.4**		**730.72**	

3.3. Vegetation Integrity (vegetation condition)

3.3.1. VI survey plots

To assist the Proponent to make informed decisions during design development, the Development Footprint was sectioned into areas and were assessed in the BAM-C separately under various revision scenarios:

- Windfarm consisting of footprint for WTG and ancillary infrastructure
    - Sections 1, 2, 3 and 4
- Transmission Line (TL) – Northern option (now excluded)
- Transmission Line (TL) – Southern option
- Road Upgrade consisting of Yarrabin / 12 Mile Road & Burrendong Dam Road
- Road Upgrade consisting of Yarrabin Road from Hill End Road (now excluded).

A vegetation integrity assessment for each section was undertaken using the BAM-C. Given that the Project Site crosses two IBRA Regions, two BAMC were used under the Parent Case 00024561; Child case 00024562 – SEH Assessment; and Child case – 00024650 NSW SWS Assessment. Numerous Revisions were saved in the BAM-C covering separate parts of the development. The final assessments were combined in Revision 19 (00024650) and Revision 21 (00024562). In this updated BDAR, tables showing the separate assessments have been moved to Appendix M.

3.3.2. VI Scores

The minimum number of BAM plots and the plots used in the BAM-C to calculate the VI score is presented in Table 3-6 and Table 3-7 above. The final vegetation integrity scores for the entire Project is outlined in Table 3-11 below.

Table 3-11: VI Scores

Veg Zone	PCT ID	Condition	Area (ha)	Composition Condition Score	Structure Condition Score	Function Condition Score	Presence of Hollow bearing trees	Current vegetation integrity score
SEH								
1	84	Good	0.32	86.8	63.1	63.7	No	70.4
2	266	DNG	5.09	70.8	70.2	28.4	No	52
3	266	Low	19.26	40.4	75.9	5.5	No	25.6
4	270	Good	0.15	69.5	33.3	99.6	Yes	61.3
5	272	Good	56.62	98.3	68.5	98.1	Yes	87.1
6	272	DNG	41.39	76.6	42.2	37.2	No	49.4
7	277	DNG	1.26	76.5	81.1	35	No	60.1
8	287	DNG	102.07	56.4	30	6.1	No	21.8
9	287	Good	111.55	76.4	25.4	96.3	Yes	57.2
10	331	Good	37.21	69.6	34.9	84.5	Yes	59

Veg Zone	PCT ID	Condition	Area (ha)	Composition Condition Score	Structure Condition Score	Function Condition Score	Presence of Hollow bearing trees	Current vegetation integrity score
11	331	DNG	14.12	50.9	29.7	13.7	No	27.5
12	266	Good	0.74	100	100	100	Yes	100
			389.78					
SWS								
1	76	DNG	0.77	72	45.9	65	No	59.9
2	84	Good	1.21	82	52.8	63.5	Yes	65
3	84	DNG	1.9	33.2	39.2	25.2	No	32
4	266	Good	3.57	85	60.4	17.6	No	44.8
5	266	DNG	23.79	77	65.6	7.3	No	33.3
6	272	Good	173.19	99.9	98.9	86.4	Yes	94.8
7	272	DNG	64.92	81.7	65	19.5	No	46.9
8	274	Good	0.07	91.9	17.6	83.5	Yes	51.3
9	277	Good	1.92	86.9	46.6	46.2	No	57.2
10	277	DNG	13.258	81.6	75.3	25.8	Yes	54.1
11	281	DNG	4.24	79.2	77.4	24	Yes	52.8
12	331	DNG	0.48	51.2	17	30.1	No	29.7
13	331	Good	1.07	83.7	55.2	45.7	Yes	59.6
14	461	Good	0.57	100	100	100	Yes	100
15	76	Good	0.06	84.4	49.10	15.2	No	39.8
16	281	Good	0.34	100	100	100	Yes	100
17	274	DNG	0.83	69.2	65.5	35	No	54.1
			292.18					

3.3.3. Use of benchmark data

Due to changes within the location of the Development Footprint, 55 plots were located at a significant distance outside of the Development Footprint / Development Corridor. These plots were discarded and not used in the calculation of the VI score.

Where minimum plot requirements have not been met because of these changes, Benchmark (BM) condition has been assumed for the required plots. In areas of DNG, the required vegetation scores were amended so that the benchmark values for grasses were used, but no shrubs or canopy trees were recorded in the plot data. BM data was sourced within BAM-C for the PCTs. Table 3-6 and Table 3-7 above highlights where BM data was used in the BAM-C.

3.3.4. Inaccessible areas

The following PCTs, vegetation zones and associated areas within the Development Footprint (Table 3-12) were not accessed in 2024 (Figure 3-2), covering a total area of 64 ha. Additional surveys were

undertaken in 2025 substantially reducing this area (Figure 3-3, Table 3-12). PCTs associated with TECs in inaccessible areas were deemed to conform to the listing criteria under both the BC and EPBC Acts and have been included in the total areas for TECs.

Table 3-12: Location of PCTs that were inaccessible within the Development Footprint

PCT	Condition	Location	Area (ha) 2024	Area (ha) 2025
PCT 76	DNG	Transmission Line	0.02	0
PCT 84	DNG	Transmission Line	0.28	0
PCT 84	Good	Transmission Line	0.47	0
PCT 266*	DNG	Transmission Line	1.01	0
PCT 266*	Good	Transmission Line	0.48	0.34
PCT 272	DNG	Transmission Line and OH Reticulation	2.84	0.82
		Wind Farm	3.52	0
PCT 272	Good	Transmission Line and OH Reticulation	10.66	3.8
		Wind Farm	14.60	0
PCT 287	DNG	Transmission Line and OH Reticulation	0.91	0.28
		Wind Farm	1.87	0
PCT 287	Good	Transmission Line	0.26	0.22
		Wind Farm	24.22	0
PCT 331	Good	Transmission	1.69	1.5
Tracks / drainage		Transmission Line and OH Reticulation	0.92	0.05
		Wind Farm	0.27	0
TOTAL			**64 ha**	**7 ha**

*Box Gum Woodland TEC

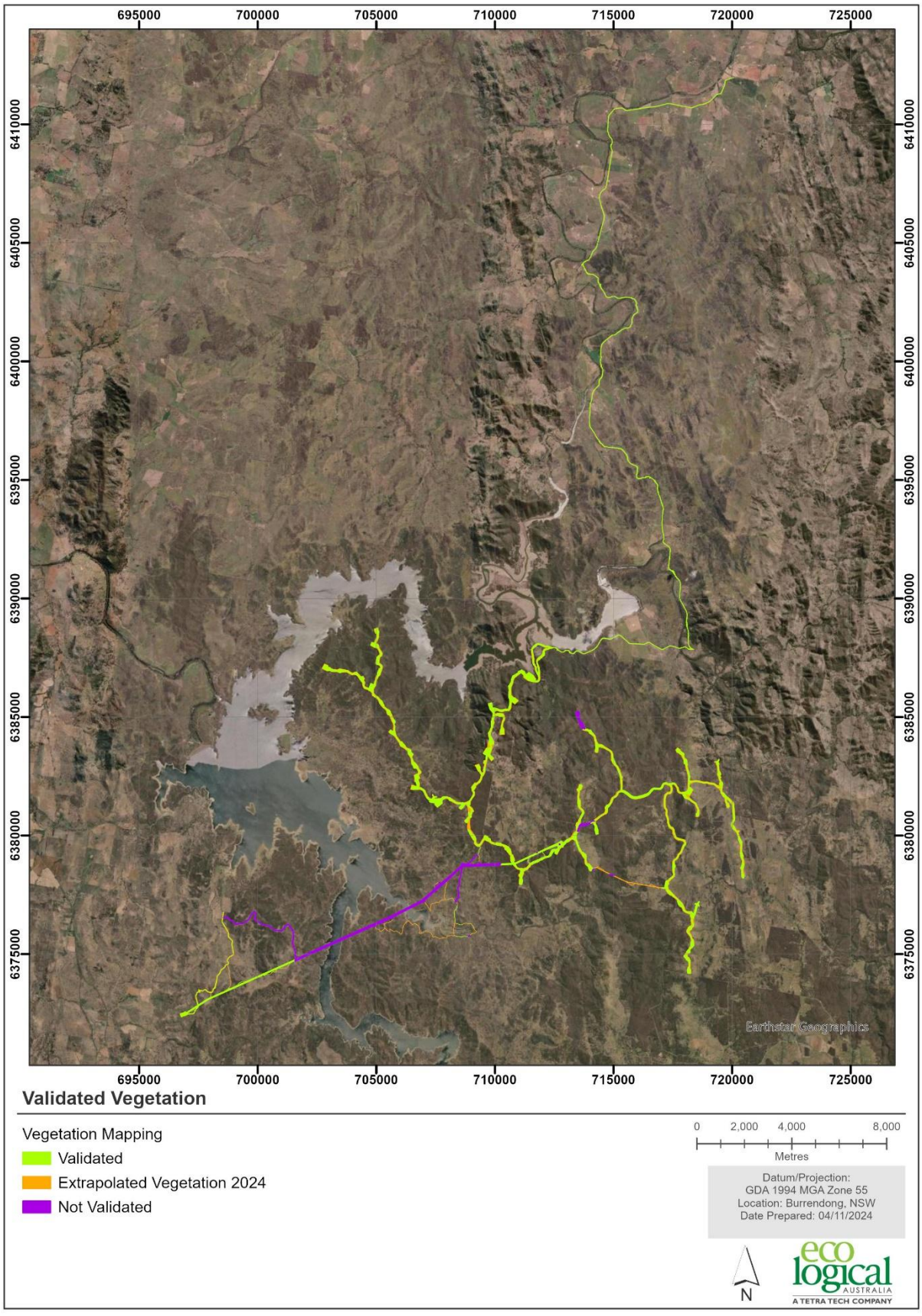


Figure 3-2: Areas that have been validated or extrapolated from aerial imagery (2024)

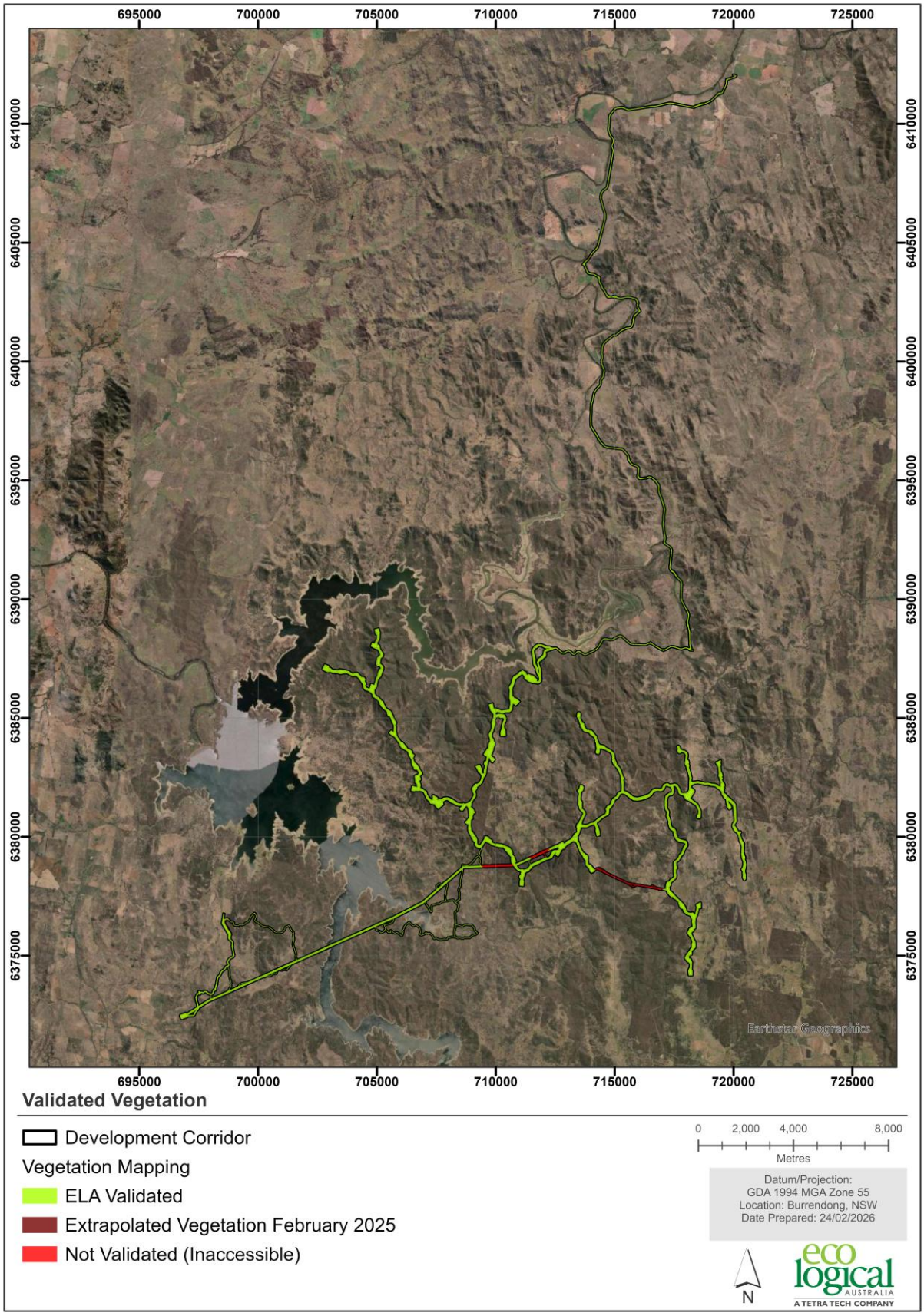


Figure 3-3: Validated and Inaccessible areas 2025

4. Habitat suitability for threatened species

This section outlines the field survey methods and results for identifying threatened flora and fauna, and their habitats within the development footprint, in accordance with Section 5 of the BAM. Descriptions of broad habitat types and conditions are provided.

4.1. Existing Information

Fauna habitats were assessed concurrent with vegetation surveys. Fauna habitats within the Project Site are typical of predominately cleared grazing farmland and surrounding woodland on slopes.

Within the Project Site the following features **were not** present:

- Cliffs, overhangs, escarpments, or crevices
- Old mines or tunnels within 2 km
- Wetlands
- Flying Fox camps
- Mapped important areas for *Anthochaera phrygia* (Regent Honeyeater) or *Lathamus discolor* (Swift Parrot).

4.1.1. Woodland areas

Woodland and open woodland areas within the Project Site are generally in good condition and provide foraging and habitat in the form of seasonal flower resource, trees with hollows and fallen timber (Plate 4-1). The mid-storey was either dominated by *Olearia viscosa* (Sticky daisy Bush) or absent. The ground cover contained scattered tussock grasses (*Austrostipa* spp., *Digitaria* spp., *Rytidosperma* spp.). Hollows of varying sizes and at varying heights were abundant and a variety of woodland birds such as *Eolophus roseicapillus* (Galah), *Platycercus eximius* (Eastern Rosella) and *Cacatua galerita* (Sulphur-crested cockatoo) were observed using these hollows.



Plate 4-1: Woodland areas within the Project Site

4.1.2. Derived Native Grasslands

Areas of DNG (Plate 4-2) present along ridgelines and within low lying areas on deeper fertile soils contained scattered trees and stags with hollows. Shrubs and midstorey were absent within these areas and the ground layer varied from being predominately native (*Aristida* spp., *Rytidosperma* spp., and *Austrostipa* spp.) to predominately exotic (*Heliotropium amplexicaule, Carthamus lanatus, Hypericum perforatum* and *Solanum nigrum* (Black-berry Nightshade)).

Loose scattered surface rocks were present (Plate 4-3) which may provide habitat for threatened reptiles including the Pink-tailed Worm Lizard.

The NSW BioNet Atlas database of threatened flora and fauna was reviewed. Numerous threatened species have been recorded within 10 km of the Project Site (BioNet 2020). These are shown in Figure 4-1 and Figure 4-2.

Potential habitat for threatened flora is present within DNG and woodland areas within the Project Site. No threatened flora species were recorded within the Development Corridor during surveys undertaken for the Project.

Records of *Acacia ausfeldii*, *Dichanthium setosum*, *Eucalyptus cannonii* (Capertee Stringybark), *Swainsona recta* and *S. sericea* occur within 10 km of the Project Site (Figure 4-2) with none of these records occurring within the Development Corridor.

Most of the records for *Swainsona recta*, and *S. sericea* occur on the western side of Lake Burrendong and there is one record for *Acacia meiantha* south of the Development Corridor.



Plate 4-2: Typical derived native grassland on ridges within the Project Site



Plate 4-3: Scattered surface rocks may provide habitat for threatened reptiles within the Project Site

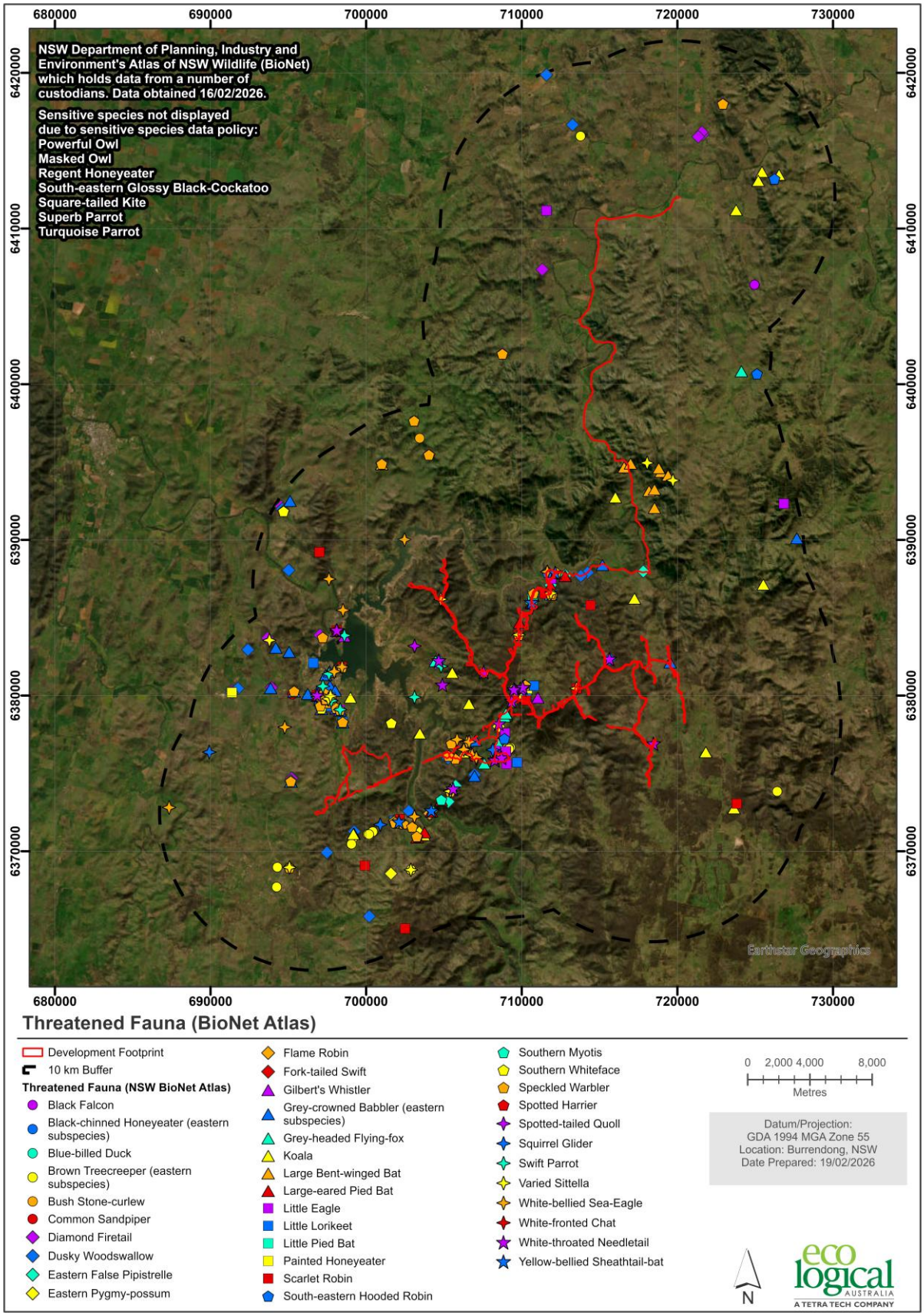


Figure 4-1: Threatened fauna records

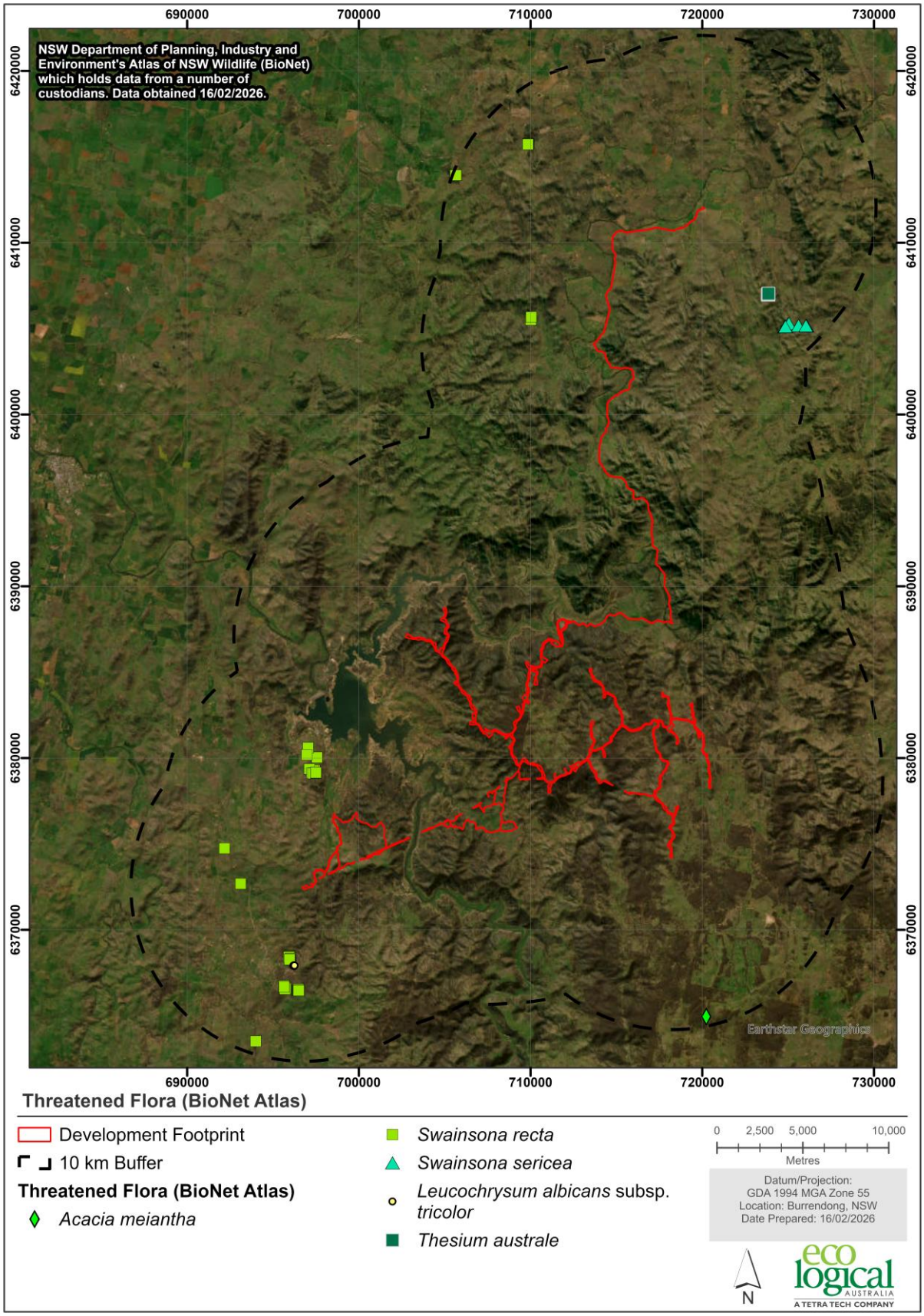


Figure 4-2: Threatened flora records

4.1.3. Aquatic habitat

Numerous small farm dams are present across the Project Site (Plate 4-4). These areas provide habitat for common water birds such as ducks, grebes, herons and egrets. Habitat quality is low owing to the bare, eroded banks and general lack of emergent surrounding vegetation cover.

Several first and second order drainage lines occur within the Project Site. These areas are typically ephemeral drainage lines present as minor depressions. Riparian habitats within the Project Site are highly modified consisting of overstorey with a predominately exotic understorey.

The Development Corridor includes 45 access crossings. Whilst the majority of crossings are 1st and 2nd order ephemeral creeks, there is a south eastern crossing at Oakey Creek (5th order stream; Plate 4-5). Many of the existing crossings are less than 8 m wide and lined with *Juncus usitatus* (Common Rush), *Phragmites australis* (Common Reed), and weeds (including *Rubus fruticosus* agg. (Blackberry) and *Solanum nigrum*). Whilst these creeks have rocky structures within the stream margins, the majority of creeks are not permanent streams (Plate 4-6) and therefore not considered suitable habitat for species such as *Litoria booroolongensis* (Booroolong Frog).

Transmission poles associated with construction of transmissions lines will not be located within riparian areas and therefore impacts to riparian habitat due to these activities is unlikely.



Plate 4-4: Typical farm dams across the Project Site.



Plate 4-5: Typical riparian habitat across the Project Site.



Plate 4-6: Non-permanent drainage line

4.1.4. Key Fish Habitat

Aquatic Ecologists Claire Wheeler and Emily Messer investigated the Project Site during March and April 2021. The wider Project Site contains mapped KFH (Figure 4-3). KFH is present within the Development Corridor along the transmission route which will have over-head lines. Drainage lines and ephemeral creeks within the Development Corridor are considered Class 4 and unlikely to support fish habitat and are not mapped as KFH.

Farm dams within the Project Site do not present KFH. However, there are several records of endangered aquatic species within 20 km of the Project Site. The following species were considered for further assessment:

- *Mogurnda adspera* (Purple Spotted Gudgeon)
- *Tandanas tandanus* (Eel-tailed Catfish)
- *Bidyanus bidyanus* (Silver Perch)
- *Ambassis agassizii* (Olive Perchlet)
- *Maccullochella macquariensis* (Trout Cod).

Purple Spotted Gudgeon is a benthic species that can be found in a variety of habitat types such as rivers, creeks and billabongs with slow moving or still waters or in streams with low turbidity. Cover in the form of aquatic vegetation, overhanging vegetation from riverbanks, leaf litter, rocks or snags are important for the species. The Purple Spotted Gudgeon is listed as endangered under the NSW FM Act.

The Eel-tailed Catfish population in the Murray Darling Basin is listed as an endangered population under Schedule 4, Part 2 of the FM Act. It is an Australian endemic species that was once highly abundant throughout the Murray Darling River system in NSW, although most riverine population have declined significantly since the 1970s. They are known to prefer sluggish or still waters and often build nests in still water for breeding. Areas of potential habitat within the Project site include the streams and small creeks during times of inundation.

Silver Perch is listed as a vulnerable species under Schedule 5, Part 1 of the FM Act. They were once widespread and abundant throughout most of the Murray-Darling River system. They have now declined to low numbers or disappeared from most of their former range. Only one remaining secure and self-sustaining population occurs in NSW in the central Murray River downstream of Yarrawonga weir, as well as several anabranches and tributaries. Although there are no records from within 10 km of the Development Footprint, indicative distributions suggest that this species could be present in the Macquarie River.

The Olive Perchlet (western population) is listed as an endangered population under Schedule 4, Part 2 of the FM Act. They were once widespread throughout the Murray Darling system but have since suffered serious decline. The population is now restricted to a few sites in the Darling River drainage and an isolated population in the central Lachlan catchment. Olive Perchlet can inhabit creeks, rivers, swamps, and ponds and are usually found in slow flowing or still waters. These fish use sheltered areas such as overhanging vegetation, logs, boulders, macrophyte beds, and usually disperse to feed at night. Although there are no records from within 10 km of the Development Footprint, indicative distributions suggest that this species could be present in the Cudgegong and Macquarie Rivers.

The Trout Cod is listed as an endangered Species under Schedule 4, Part 1 of the FM Act. Trout Cod were once widespread throughout the southern tributaries of the Murray-Darling River system, but the species has undergone a dramatic decline in distribution and abundance over the past century. rout Cod tend to occupy areas which have lots of large in-stream woody debris or ‘snags’, which provide complex habitats for each stage of the species’ life cycle.

Impacts to these species are likely to occur during construction of watercourse crossings and trenching to lay cables across watercourses. Within the Project Site, there are 45 streams intersecting the Development Footprint, however not all will be impacted by the proposed works. The extent of impact for these crossings is unknown at this point, however a typical crossing is likely to directly disturb a 10 m width of watercourse, plus indirectly impact an additional 5 m either side of the crossing. A typical trench

across a watercourse is likely to directly impact a 5 m width across the watercourse plus indirectly impact an additional 5 m either side of the trench.

Habitat quality for the above listed species within the Project Site is low due to:

- Limited covering habitat such as overhanging trees and banks, snags and rocks
- Lack of surrounding tree and shrub vegetation
- Ephemeral nature (ie the site would be dry at times)
- High level of disturbance and eutrophication from agricultural activities.

As such, these species are considered unlikely to occur within the Project Site and therefore will not be impacted by construction activities.

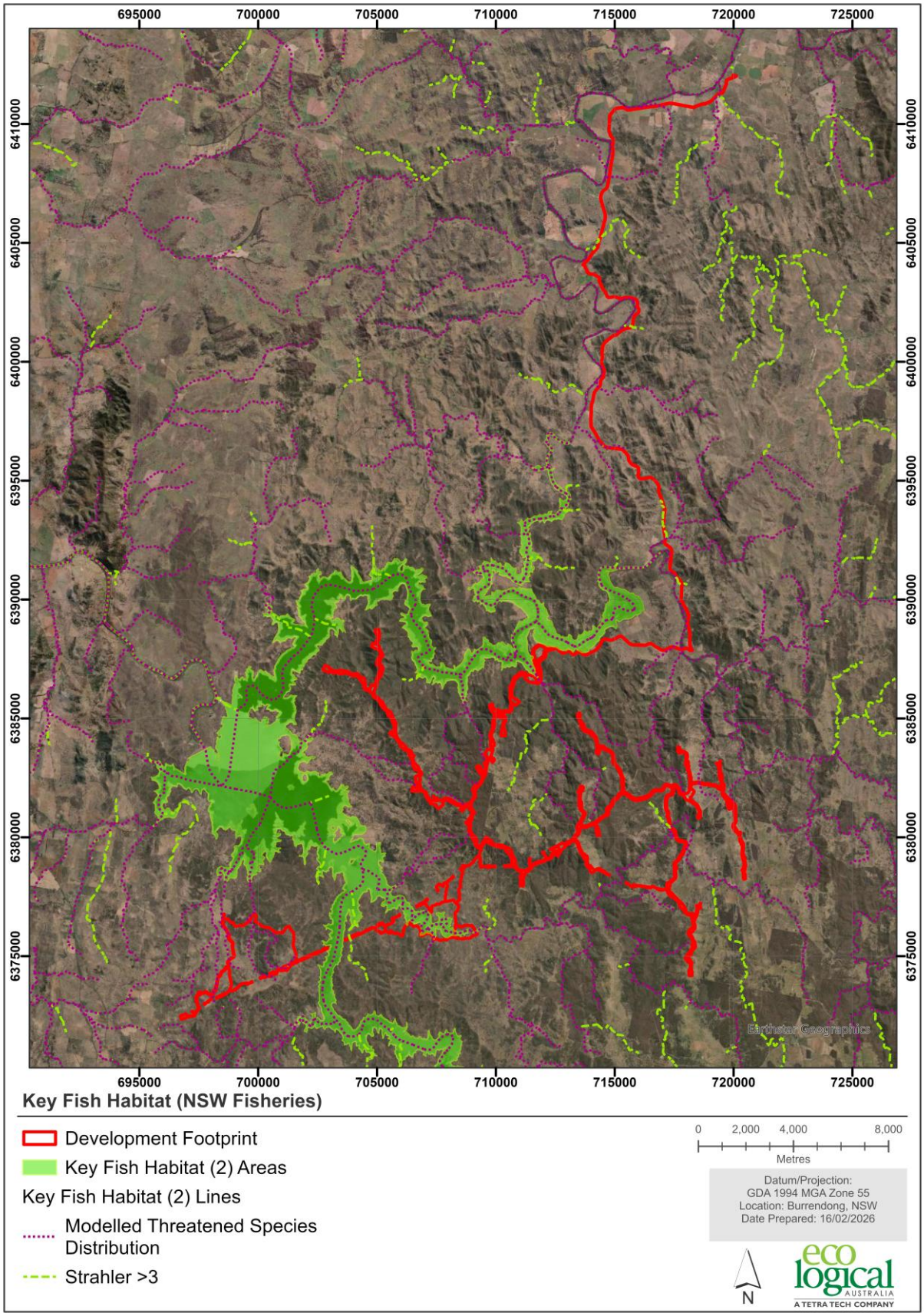


Figure 4-3: Key Fish Habitat

4.1.5. Hollow-bearing tree survey

To supplement the habitat assessment, a comprehensive ground-based traverse was undertaken in February 2023 within a 50 m radius of all proposed WTG locations. The objective was to assess the presence of hollow-bearing trees (HBTs) that may provide breeding or roosting habitat for candidate threatened species. This targeted HBT survey was used to inform the need for species polygons and potential breeding habitat mapping for fauna species of conservation concern.

At each potential hollow-bearing tree, the following information was captured:

- Tree species (or stag)
- Diameter at breast height (DBH)
- Number of hollows from 5 size classes (300mm)
- Notes.

Trees that were suspected as only having small (< 5cm) hollows were not marked, as nearly all trees have some form of hollow resource of this size.

Over 1,500 HBTs were identified and recorded. While the majority of hollows observed were small (<10 cm in diameter), 56 trees contained hollows >20 cm situated more than 4 m above ground and were assessed as suitable for forest owl species. An additional 48 trees met the structural criteria considered suitable for *Calyptorhynchus lathami lathami* (Glossy Black-Cockatoo), including hollows greater than 15 cm in diameter located at least 8 m above the ground and positioned on stems angled between 45° and 180°.

4.2. Ecosystem Credit Species

Ecosystem credit species predicted to occur within the Project Site are generated by the BAM-C following the input of VI data and the PCTs identified within Section 3. Ecosystem credit species predicted to occur within the Project Site across all BAM-Cs, are presented in Table 4-1. No surveys are required for these species. Several species were excluded from the assessment based on whether the PCT and / or vegetation zone provided foraging resources. PCTs and Vegetation zones removed from the BAM-C and their justification are provided in Table 4-2.

Table 4-1: Predicted ecosystem credit species from both BAM-Cs.

Species	Common Name	Habitat Constraints	Sensitivity to gain class	NSW listing status	EPBC Listing status
Anthochaera phrygia	Regent Honeyeater	Foraging habitat only	High	CE	CE
Aphelocephala leucopsis	Southern Whiteface		Low	V	V
Artamus cyanopterus cyanopterus	Dusky Woodswallow		Moderate	V	NL
Callocephalon fimbriatum	Gang-gang Cockatoo		Moderate	V	NL
Calyptorhynchus lathami	Glossy Black-Cockatoo	Presence of Allocasuarina and Casuarina species	High	V	NL

Species	Common Name	Habitat Constraints	Sensitivity to gain class	NSW listing status	EPBC Listing status
Chalinolobus picatus	Little Pied Bat		High	V	NL
Chthonicola sagittata	Speckled Warbler		High	V	NL
Circus assimilis	Spotted Harrier		Moderate	V	NL
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)		High	V	NL
Daphoenositta chrysoptera	Varied Sittella		Moderate	V	NL
Dasyurus maculatus	Spotted-tailed Quoll		High	V	E
Ephippiorhynchus asiaticus	Black-necked Stork	Swamps within 300 m of waterbodies	Moderate	E	NL
Falco subniger	Black Falcon		Moderate	V	NL
Falsistrellus tasmaniensis	Eastern False Pipistrelle		High	V	NL
Glossopsitta porphyrocephala	Purple-crowned Lorikeet		High	V	NL
Glossopsitta pusilla	Little Lorikeet		High	V	NL
Grantiella picta	Painted Honeyeater	Mistletoe present at a density greater than 5 mistletoes per ha	Moderate	V	V
Haliaeetus leucogaster	White-bellied Sea-Eagle	Within 1 km of waterbodies.	High	V	NL
Hamirostra melanosternon	Black-breasted Buzzard	Foraging	Moderate	V	NL
Hieraaetus morphnoides	Little Eagle	Foraging	Moderate	V	NL
Hirundapus caudacutus	White-throated Needletail		High	NL	V
Lathamus discolor	Swift Parrot	Foraging habitat only	Moderate	E	CE
Lophocarpa leadbeateri	Pink Cockatoo	Foraging	Moderate	V	NL
Lophoictinia isura	Square-tailed Kite		Moderate	V	NL
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)		Moderate	V	NL
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)		Moderate	V	NL
Miniopterus australis	Little Bent-winged Bat	Foraging habitat only	High	V	NL
Miniopterus orianae oceanensis	Large Bent-winged Bat	Foraging habitat only	High	V	NL

Species	Common Name	Habitat Constraints	Sensitivity to gain class	NSW listing status	EPBC Listing status
Neophema pulchella	Turquoise Parrot		High	V	NL
Ninox connivens	Barking Owl	Foraging habitat only	High	V	NL
Ninox strenua	Powerful Owl	Foraging habitat only	High	V	NL
Nyctophilus corbeni	Corben's Long-eared Bat	Foraging habitat only	High	V	V
Pachycephala inornata	Gilbert's Whistler		Moderate	V	NL
Petaurus australis	Yellow-bellied Glider		High	V	V
Petroica boodang	Scarlet Robin		Moderate	V	NL
Petroica phoenicea	Flame Robin		Moderate	V	NL
Phascolarctos cinereus	Koala	Foraging habitat only	High	V	V
Polytelis swainsonii	Superb Parrot	Foraging habitat only	Moderate	V	V
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)		Moderate	V	NL
Pteropus poliocephalus	Grey-headed Flying-fox	Foraging habitat only	High	V	V
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat		High	V	NL
Stagonopleura guttata	Diamond Firetail		Moderate	V	NL
Tyto novaehollandiae	Masked Owl	Foraging habitat only	High	V	NL

CE = Critically Endangered, E = Endangered, V = Vulnerable, NL = Not Listed.

The following species were removed from the BAM-C and justifications are provided in Table 4-2 below.

Table 4-2: Ecosystem species removed from the BAM-C

Species	Common Name	Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification for removal
Pseudomys novaehollandiae	New Holland Mouse	North of Canowindra, West of Cumnock	High	NL	V	The project site is located north east of Cumnock. Based on geographical constraints, this species has been removed.
Varanus rosenbergi	Rosenberg's Goanna	South-east of a line that runs between	High	V	NL	The project site is located approximately 260 km north of Galong and is outside the species range.

Species	Common Name	Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification for removal
		Tarcutta and Galong				Based on geographical constraints, this species has been removed

4.3. Species Credit Species

Species credit species that require further assessment within the Development Corridor (i.e. candidate species), their associated habitat constraints, geographic limitations and sensitivity to gain class is included in Table 4-3.

Candidate species were identified through operation of the BAM-C in accordance with the BAM. *Vespadelus troughtoni* (Eastern Cave Bat) was manually added to the list of candidate species as ELA records show that the species has been recorded in proximity to the Development Corridor. Information on PCT associations and habitat features was obtained from BioNet Threatened Species to PCT Association data, TBDC, NSW threatened species profiles, and Recovery Plans where available.

Table 4-3: Candidate Species from BAM-C (SWS and SEH)

Species	Common Name	Habitat Constraints / Geographical limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Presence of habitat on site	Survey timing	IBRA and PCT associations*	Targeted surveys required?
Acacia ausfeldii	Ausfelds Wattle	Footslopes and low rises on sandstone	High	V	NL	Bionet Threatened Species to PCT communities Power Query dated 15/3/24 lists associated PCTs as 277, 281, 272 and 266 with a recent addition of PCT 461 (in progress). The species is associated with the Inland Slopes subregion. There is habitat for this species located within the Project Site.	Aug-Oct	**Inland Slopes** – PCT 266, 272, 277, 281, 461 / **Hill End** – PCT 266 272 277	Yes. Survey required and undertaken. Majority of the Project Site consists of steep slopes with quartz and shale. Areas of alluvial soils on lower slopes (PCT 266, 277, 281) were searched for the presence of *A ausfeldii* using the 20 m wide parallel traverse. PCT 272 and PCT 461 were not associated with sandstone and removed from the survey effort due to these habitat constraints.
Acacia phasmoides	Phantom Wattle	East of Albury	Moderate	V	V	Occurs East of Albury within the Inland Slopes subregion and is associated with PCT 287. The species is highly restricted only known from one location in NSW; Woomagarma. Based on geographical constraints, this species is not expected to occur within the Project Site as it is outside of the species geographical range.	Sept	**Inland Slopes** – PCT 287	No. Species removed due to geographical constraints.
Ammobium craspedioides	Yass Daisy	South of Cowra	High	V	V	Occurs South of Cowra within the Inland Slopes subregion and is associated with PCT 266, 277 and 331. Most populations are within the Yass Region. Based on geographical constraints the species is not expected to occur within the Project Site as it is outside of the species geographical range. .	Sept – Nov	**Inland Slopes** – PCT 266, 277, 331	No. Species occurs south of Cowra. Removed due to geographical constraints.
Anthochaera phrygia	Regent Honeyeater (Breeding)	As per mapped areas	High	CE	CE	Areas are not within important mapped areas.			No. Not Mapped as important areas.
Aprasia parapulchella	Pink-tailed Legless Lizard	Rocky Areas or within 50 m of rocky areas	High	V	V	Associated with PCT 266, 270, 272, 274, 277, 281, 312, 331, and 461. With a predominantly grassy ground layers with partially buried rocks, in association with *Themeda triandra*. There is potential habitat within the Project Site.	Sept-May	**Inland Slopes** – PCT266 272 274 277 281 312 331 461 / **Hill End** – PCT 266 270 272 277 331	Yes. An expert report has been included in this assessment.
Austrostipa wakoolica	Spear-grass	Alluvial plains. West of Cowra	Moderate	E	E	Likely to be outside of the species geographical range. Occurs west of Cowra. The species is associated with PCT 76 within the Inland Slopes subregion.	Oct-Dec	**Inland Slopes** – PCT 76	No. Removed due to geographical constraints as the species occurs west of Cowra.
Burhinus grallarius	Bush Stone-curlew	Fallen / standing dead timber including logs	High	E	NL	Areas of fallen timber within the Project Site across both IBRA subregions, associated with PCT 76, 266, 274, 277, 281, 287, 312, 331 and 461.	All year	**Inland Slopes** – PCT 76 266 274 277 281 312 331 461 / **Hill End** PCT 266 277 287 331	Yes. Survey required and undertaken. Methods used include call playback, transects and spotlighting. Presence has been assumed in areas that were inaccessible.
Caladenia arenaria	Sand-hill Spider Orchid		Moderate	E	E	Occurs in woodlands with sandy soils especially dominated by *Callitris glaucophylla*. It is currently only known to occur in the Riverina. It is associated with PCT 76. There is no suitable habitat within the Development Corridor.	Sept	**Inland Slopes** -PCT 76	No. Removed due to lack of sandy soils associated with this species. Within the Project Site, PCT 76 occurred on clay loams of alluvial origin but not sandy soils.
Callocephalon fimbriatum	Gang-gang Cockatoo (Breeding)	Hollow bearing trees. 9 cm diameter	High	V	NL	Suitable hollow bearing trees present.	Oct-Jan	**Inland Slopes** - PCT 84 266 272 274 277 281 312 331 / **Hill End** PCT- 84 266 272 277 287 331	Yes. Survey required and undertaken.
Calyptorhynchus lathami	Glossy Black-Cockatoo (Breeding)	Hollow bearing trees. 15 cm diameter	High	V	NL	Suitable hollow bearing trees present.	Jan – Aug	**Inland Slopes** - PCT 76 266 331 461 / **Hill End** PCT – 266 270 331	Yes. Survey required and undertaken.

Species	Common Name	Habitat Constraints / Geographical limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Presence of habitat on site	Survey timing	IBRA and PCT associations*	Targeted surveys required?
Cercartetus nanus	Eastern Pygmy-possum		High	V	NL	Suitable hollow bearing trees with a shrubby understorey present and/or lone trees. Associated with PCT 272, 277, 287, 312, 331 and 461 across both IBRA subregions.	Oct-Mar	**Inland Slopes** – PCT 272 277 312 331 461 / **Hill End** – PCT 272 277 287 331	Yes. Survey required and undertaken in areas of high quality habitat within the windfarm in accordance with advice from the species expert. Presence assumed along transmission line and road upgrades due to survey not being undertaken.
Chalinolobus dwyeri	Large-eared Pied Bat	Cliffs. Within 2 km of rocky areas containing caves, mines etc	Very High	V	V	There are no cliffs, caves or rocky overhangs within the development corridor. The species is known in the locality and there is suitable foraging habitat within the Development Footprint.	Nov-Jan	**Inland Slopes** - PCT 272 274 277 281 331 461 / **Hill End** – PCT 270 272 277 331	Surveys undertaken as a requirement of BBAMP. However, there is no breeding habitat within the Development Corridor, nor within 2 km of the Development Corridor.
Crinia sloanei	Sloane's Froglet	Semi-permanent / ephemeral wetlands with submergent vegetation	Moderate	V	E	Typically associated with periodically inundated areas in grasslands, woodlands and disturbed habitat. There is no suitable habitat within the Development Footprint as dams lack emergent vegetation. Potential to be within the broader Project Site.	July – Aug	**Inland Slopes** – PCT 76	No. No suitable habitat within Development Corridor. Removed from assessment due to habitat constraints.
Cullen parvum	Small Scurf-pea		High	E	NL	Associated with PCT 277 in the Inland Slopes Bioregion. The species was known from two herbarium collections, Wagga Wagga (1884) and Jindera (1967). Recent records were found in a travelling stock reserve in Wagga Wagga, on a private property in Young and in Red Gum Woodlands in Barmah State Park. Winter floods are important to the species long term survival. PCT 277 is located along the road upgrade areas north of Yarrabin Road covering 16.2 ha.	Dec-Jan	**Inland Slopes** – PCT 277	Yes. Survey required and undertaken. Roadside was searched using parallel transects 5 m apart.
Delma impar	Striped Legless Lizard	South of mid-western hwy	Moderate	V	V	Associated with PCT 274 and 277 in the Inland Slopes subregion. No individuals have been found in the general locality with populations being recorded well east of the Project Site, near Muswellbrook, Tumut Cooma and Yass and across the Victoria and ACT borders. Unlikely to occur within the Development Footprint.	Sept-Dec	**Inland Slopes** – PCT 274 277	No. Removed due to geographical constraints. Project Site is located north of the Mid-Western Highway and species is found south of the Mid-Western Hwy.
Dichanthium setosum	Bluegrass		High	V	V	Associated with PCT 281 and 461 on fertile soils within the Inland Slopes subregion. Suitable habitat present.	Nov-May	**Inland Slopes** – PCT 281 461	Yes. Survey required and undertaken. Parallel transects 5 m apart were undertaken along the southern transmission line and road upgrades during February 2023.
Diuris tricolor	Pine Donkey Orchid		Moderate	V	NL	Associated with PCT 76, 331 and 461 within the Inland Slopes subregion. Suitable habitat is present within the Project Site.	Sept- Oct	**Inland Slopes** 76 331 461	Yes. Presence assumed where surveys were not undertaken during the required survey period.
Eucalyptus alligatrix* subsp. *Alligatrix	Eucalyptus alligatrix		High	V	V	Associated with PCT 287, 331 within the Inland Slopes subregion. Confined to shallow infertile soils associated with ironstone. Suitable habitat is present within the Project Site.	All year	**Inland slopes** – PCT 331	Yes. Survey required and undertaken. Parallel transects 20 m were undertaken across access roads, transmission lines and the majority of the Project Site.
Euphrasia arguta	Euphrasia arguta		High	CE	CE	Associated with PCT 84, 266, 270, 274, 272, 277, 281 and 287 within the Inland Slopes subregion. Found in meadows near rivers in open forest country. Suitable habitat is present within the Project Site.	Nov-Mar	**Inland slopes** – PCT 84 266 272 274 277 281	Yes. Surveys consisting of parallel transects 5 m apart were undertaken along the transmission line in accordance with the BAM during February 2023. Surveys consisting of 40 m grids across the Development Corridor during February 2025 were completed.

Species	Common Name	Habitat Constraints / Geographical limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Presence of habitat on site	Survey timing	IBRA and PCT associations*	Targeted surveys required?
Grevillia divaricata	Grevillia divaricata		High	E	NL	This species has not been seen since 1823. Known only from type collection north of Bathurst. Very little is known but is associated with PCT 331, 270 growing on rocky river margins. Potential habitat within the Project Site although unlikely. The species is possibly extinct.	April	**Hill End** – PCT 270 331	Yes. One (1) VI plot within 270 which was searched. Presence assumed in PCT 331 in areas that were inaccessible.
Grevillea wilkinsonii	Tumut Grevillea		High	CE	CE	The Tumut Grevillea has a highly restricted distribution located along a 6 km stretch of the Goobarragandra River 20 km east of Tumut and a small population at Gundagai. This species is restricted to riparian vegetation associated with PCT 266 at altitudes between 310 and 340 m. Usually associated with *Ricinocarpos bowmanii* and *Dodonaea viscosa* with *Themeda triandra* and *Pos sieberiana*. No suitable habitat exists and it is outside of the species geographical range.	Oct	**Inland Slopes** – PCT 266	Yes. Presence assumed in inaccessible areas. PCT 266_DNG and PCT 266_Good were surveyed using the meander transect – 20 m apart – no unusual shrubs observed. Targeted Flora surveys using the 40 m grid method as per the guidelines were completed in February 2025.
Haliaeetus leucogaster	White-bellied Sea Eagle (Breeding)	Living or dead mature trees within suitable vegetation within 1 km of water	High	V	NL	Associated with PCT 76, 84, 266, 272, 277, 281, 287, 312 and 331. Suitable habitat is present within the Project Site.	July-Dec	**Inland Slopes** PCT 76 84 266 272 277 281 312 331 / **Hill End** PCT – 84 266 272 277 287 331	Yes. Survey required and undertaken.
Hamirostra melanosternon	Black-breasted Buzzard (Breeding)	Waterbodies Land within 40m of riparian woodland containing stags	Moderate	V	NL	Associated with PCT 84. Suitable habitat is present within the Project Site however the species is associated with inland areas <500 m rainfall so this species is unlikely to be present.	Sept-Nov	**Inland Slopes** – PCT 84	Yes. Survey required and undertaken
Hieraaetus morphnoides	Little Eagle (Breeding)	Nest trees – large old trees	Moderate	V	NL	Associated with all PCTs within the Project Site. Suitable habitat is present within the Project Site.	Aug-Oct	**Inland Slopes** - PCT 76 84 266 272 274 277 281 312 331 461 / **Hill End** PCT – 84 266 270 272 277 287 331	Yes. Survey required and undertaken
Hoplocephalus bitorquatus	Pale-headed Snake		High	V	NL	Associated with PCT 84 and within 500 m of moderate to good habitat containing HBTs and rocky outcrops. Habitat is degraded and unlikely to support the species.	Nov-Mar	**Inland Slopes** – PCT 84	No. Habitat was regarded as degraded. There were no suitable hollow bearing trees in close proximity to rocky outcrops associated with PCT 84.
Indigofera efoliata	Leafless Indigo		High	E	E	Associated with PCT 76 within the Inland Slopes subregion in association with *Allocasuarina luehmannii* and *Exocarpos cupressiformis*. Suitable habitat is unlikely to exist within the Development Footprint.	Sept-Oct	**Inland Slopes** – PCT 76	Yes. Surveys undertaken using parallel transects along roadside where *Allocasuarina* was present. Surveys were undertaken outside of ideal survey timing but no similar species was potentially identified. Surveys were undertaken using 5 m wide parallel transects along access roads.
Keyacris scurra	Key's Matchstick		High	E	NL	Associated with PCT 266, 277 and 312 within both IBRA subregions. Associated with *Themeda* and *Asteraceae's*.	Aug-Dec, Mar-May	**Inland Slopes** - PCT 266 277 312 / **Hill End** PCT 266 277	Yes. Expert report was completed.
Lathamus discolor	Swift Parrot (Breeding)	As per mapped areas	Moderate	E	CE	Not within mapped areas			No surveys required

Species	Common Name	Habitat Constraints / Geographical limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Presence of habitat on site	Survey timing	IBRA and PCT associations*	Targeted surveys required?
Litoria booroolongensis	Booroolong Frog		High	E	E	Associated with PCT 84, 277, 281, 287, 332, 331 and 461 within permanent streams with fringing vegetation and rocky cobble banks. Permanent streams were not present within the Development Corridor. Unlikely to occur as only found within permanent streams northeast of Lithgow. However, streams were investigated. Images of streams and waterways were shared with Dr Francis Lemckert (expert herpetologist) who suggested that the habitat was not suitable for this species. Habitat is degraded within the Development Footprint.	Oct-Dec	**Inland Slopes** - PCT 84 277 281 312 331 461 / **Hill End** – PCT 84 277 287 331	No. Lack of suitable habitat on site due to lack of permanent flowing water within the Development Corridor. Removed due to habitat constraints.
Lophochroa leadbeateri	Pink Cockatoo (Breeding)	Hollow bearing trees. Hollows > 10 cm diameter	High	V	NL	Associated with PCT 76, 84, 331 and 461. Suitable HBTs present.	Sept-Dec	**Inland Slopes** PCT – 76 84 331 461	Yes. Survey required and undertaken
Lophoictinia isura	Square-tailed Kite (Breeding)	Nest trees	Moderate	V	NL	Associated with all PCTs across the Project Site. Suitable HBTs present.	Sept-Jan	**Inland Slopes** PCT 76 84 266 272 274 277 281 312 331 461 / **Hill End** PCT 84 266 270 272 277 287 331	Yes. Survey required and undertaken
Miniopterus australis	Little Bent-winged bat (Breeding)	Caves, tunnels, mines	Very High	V	NL	There are no caves, tunnels, mines or culverts that could be used for breeding within the Project Site. No suitable habitat on site.	Dec-Feb	**Inland Slopes** PCT – 84 266 277 281 312 331 461 / **Hill End** PCT – 84 266 270 277 331	No. Species removed due to habitat constraints.
Miniopterus orianae oceanensis	Large Bent-winged bat (Breeding)	Caves, tunnels, mines	Very High	V	NL	There are no caves, tunnels, mines or culverts that could be used for breeding within the Project Site. No suitable habitat on site.	Dec-Feb	**Inland Slopes** PCT – 84 266 277 281 312 331 461 / **Hill End** PCT – 84 266 270 277 331	No. Species removed due to habitat constraints.
Myotis macropus	Southern Myotis	Waterbodies and permanent pools greater than 3m wide including rivers, creeks, dams	High	V	NL	Species added to BAM-C post submission		**Inland Slopes**	No. Surveys not undertaken as this species was recently added to BAMC after initial submission of BDAR. However, ultrasonic detectors were deployed across the site including areas adjacent to water and the species was not recorded
Ninox connivens	Barking Owl (Breeding)	Hollow bearing trees. 20 cm diameter	High	V	NL	Associated with all PCTs within the Project Site. Suitable HBTs present.	May-Nov	**Inland Slopes** PCT-76 84 266 272 274 277 281 312 331 461 / **Hill End** PCT – 84 266 270 272 277 287 331	Yes. Survey required and undertaken
Ninox strenua	Powerful Owl (Breeding)	Hollow bearing trees. 20cm diameter	High	V	NL	Associated with PCT 84, 274, 281. Suitable HBTs present.	May-Aug	**Inland Slopes** PCT- 84 274 281 / **Hill End** PCT – 84 287	Yes. Survey required and undertaken

Species	Common Name	Habitat Constraints / Geographical limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Presence of habitat on site	Survey timing	IBRA and PCT associations*	Targeted surveys required?
Persoonia marginata	Clandulla Geebung		High	V	V	Associated with PCT 287 within both IBRA subregions. Only found between Kandos to Clarence in the Blue Mountains. This species prefers growing on sandstone (OEH 2025c) on sandy soils (NPWS 2000) and along road edges. The geology of the Burrendong landscape consists mainly of metasediments and volcanic rocks with slates, shales and siltsone and granitic intrusions at higher elevations. Soils are generally stony loams with deeper colluvial soils in valleys. Given the soils and geology this species is unlikely to be within the Development Corridor.	Jan – Mar	**Hill End** – PCT 287	Whislt this species is unlikely to be present due to incompatible geology and soils, surveys were undertaken focusing on areas with better quality soils. 5-20 m wide parallel transects conducted in open areas. Assumed presence in inaccessible areas.
Petauroides volans	Southern Greater Glider	Hollow bearing trees with large hollows (Lindenmayer et al 1991)	High	NL	V	Associated with PCT 270 and 274. Unlikely to occur within this PCT as the species is often associated with taller moist eucalypt forests with abundant hollows. The trees within this PCT are all small (average DBH 20 cm) with small hollows (5 cm). Habitat is marginal at best.	All year	**Inland Slopes** PCT-274 / **Hill End** PCT – 270	Yes. Surveys required and undertaken during spotlighting.
Petaurus norfolcensis	Squirrel Glider		High	V	NL	Associated with all PCTs within the Project Site. Suitable HBTs present.	All year	**Inland Slopes** PCT-76 84 266 272 274 277 281 312 331 461 / **Hill End** PCT – 84 266 270 272 277 287 331	Yes. Survey required and undertaken including spotlighting and baited cameras. Assumed present where surveys were not compliant with BAM 2020, i.e. along transmission line.
***Petaurus norfolcensis* – endangered population**	Squirrel Glider in the Wagga Wagga LGA	Wagga Wagga LGA	High	E	NL	Outside of the species geographical range.			No. Species removed due to geographical constraints
Petrogale penicillata	Brush-tailed Rock Wallaby	Land within 1 km of rocky escarpment, cliff lines, outcrops and gorges	Very High	E	V	Occupies rocky escarpments, outcrops and cliffs. There are no suitable habitat features within the Project Site.	All year	**Inland Slopes** PCT – 84 266 272 274 277 281 331	No. Lack of suitable habitat. No rocky/ boulder habitat considered suitable for this species. Habitat constraints not met.
Phascogale tapoatafa	Brush-tailed Phascogale		High	V	NL	Associated with PCT 76, 266, 272, 277, 281, 331 and 461. Suitable hollow bearing trees present.	Dec-June	**Inland Slopes** PCT-76 266 272 274 277 281 331 461 / **Hill End** PCT – 266 272 277 331	Yes. Survey required and undertaken. Assumed present where surveys were non-compliant with BAM 2020, ie along transmission line. Methods included Spotlighting and baited camera traps.
Phascolarctos cinereus	Koala (Breeding)	Areas identified as important habitat	High	V	V	Associated with all PCTs within the Project Site. Known to occur within the Project Site.	All year	All PCTs with koala feed trees	Yes. Survey required and undertaken.
Polytelis swainsonii	Superb Parrot (Breeding)	Hollow bearing trees (*E. blakelyi, E. melliodora, E. albens, E. polyanthemus*). Hollows greater than 5 cm diameter in trees greater with DBH > 30cm.	High	V	V	Associated with all PCTs within the Project Site except PCT 287. Known to occur within the Project Site.	Sep-Nov	**Inland Slopes** PCT-76 84 266 272 274 277 281 331 461 / **Hill End** PCT – 84 266 270 272 277 331	Yes. Surveys required and undertaken. However, the national recovery plan for the species identifies that the species does not breed in proximity to the Project Site. Breeding is known and likely to occur from Bathurst, south to the ACT and west to Deniliquin, NSW.
Pomaderris cotoneaster	Cotoneaster Pomaderris		High	E	E	Recorded in a range of habitats in forested country. Suitable habitat along rocky forested slopes. Associated with PCT 281	Oct-Nov	**Inland Slopes** – PCT 281	Yes. Surveys undertaken using parallel transects 5 m wide along the roadside and transmission line.

Species	Common Name	Habitat Constraints / Geographical limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Presence of habitat on site	Survey timing	IBRA and PCT associations*	Targeted surveys required?
Pomaderris queenslandica	Scant Pomaderris		High	E	NL	Associated with PCT 84 and 331 within the Inland Slopes subregion on sandy loam associated with sandstone or conglomerate. Suitable habitat is present within the Project Site.	All year	**Inland Slopes** – PCT 84 331	Yes. Survey required and undertaken using parallel transects 5m wide along roadside and transmission line. Surveys undertaken across windfarm using 20m parallel transects. Targeted flora surveys using 40m grid searches across the Development Corridor was completed in February 2025.
Prasophyllum petilum	Tarengo Leek Orchid	East of Binalong, South and east of Boorowa	High	E	E	Associated with PCT 277 and 281 on fertile soils within open woodlands and DNG. It occurs in moist area where the water table is high and standing free water resides for up to 24 hrs after storms. Associated with *Schoenus apogon, Drosera peltata* and *Haloragis heterophylla* confirming that the site is poorly drained.	Sept-Dec	**Inland Slopes** – PCT 277 281	Yes. Presence assumed where targeted surveys were not undertaken during the required survey period.
Prasophyllum sp, Wybong	Prasophyllum Wybong		Moderate	NL	CE	NSW does not consider this a separate species from the above.	Sept – Oct	**Inland Slopes** – PCT 84 266 272 274 277 281 461	No. The NSW herbarium considers *P. petilum* and Wybong to be the same species and the two species are treated as one for NSW regulatory purposes with the distinction maintained under Commonwealth legislation.
Pteropus poliocephalus	Grey-headed Flying Fox (Breeding)	Breeding camps	High	V	V	Associated with all PCTs within the Project Site. Breeding / roost camps are generally found in gullies, close to water and in vegetation with a dense canopy. No breeding camps identified.	Oct-Dec	**Inland Slopes** - PCT 76 84 266 272 274 277 281 331 461 / **Hill End** PCT 84 266 270 272 277 287 331	No. Breeding camps are not present.
Swainsona recta	Small Purple-pea		Moderate	E	E	Associated with PCT 76, 266, 270, 277 and 312 within both IBRA subregions usually in association with *Themeda australis*. Suitable habitat is present within the Project Site.	Sept-Nov	**Inland Slopes** - PCT 76 266 277 312 / **Hill End** – PCT 266 270 277	Yes. Assumed presence where surveys were not undertaken during the required survey period.
Swainsona sericea	Silky Swainson-pea		Moderate	E	NL	Associated with PCT 76, 266, 277, 281, 312. 331 and 461 within both IBRA subregions within Box-Gum Woodland. Suitable habitat is present within the Development Corridor.	Sept-Nov	**Inland Slopes** – PCT 76 266 277 281 312 331 461 / **Hill End** – PCT 266 277 331	Yes. Assumed presence where surveys were not undertaken during the required survey period.
Synemon plana	Golden Sun Moth	Wallaby Grass. South of Mid-Western Hwy	Moderate	E	CE	Associated with PCT 266, 277 and 312. The species historical distribution extends south and east of Bathurst through Yass plains and through central and western Victoria. No records have been listed further north of Bathurst. Outside of the species geographical range. No areas of *Rytidosperma* sp. with bare ground for female display sites (O'Dwyer and Attiwill 1998).	Nov-Dec	**Inland Slopes** PCT 266, 277, 312	No. Species removed due to geographical constraints
Tylophora linearis	Tylophora linearis		High	V	E	Associated with PCT 272, 331 and 461 within the Inland Slopes subregion. Suitable habitat is present within the Development Corridor.	Oct – May	**Inland Slopes** – 272 331 461	Yes. Targeted surveys using 40 m grid method across the Development Corridor was completed in February 2025. Assumed presence within PCT 461 as surveys were not undertaken during the required survey period.
Tyto novaehollandiae	Masked Owl (Breeding)	Hollow bearing trees. 20 cm diameter	High	V	NL	Suitable hollow bearing trees present.	May-Aug	**Inland Slopes**- PCT 76 84 266 272 274 277 281 331 461 / **Hill End** PCT – 84 266 270 272 277 287 331	Yes. Survey required and undertaken
Vespadelus troughtoni	Eastern Cave Bat	Cliffs. Within 2 km of rocky areas containing caves, mines etc	Very High	V	NL	No suitable habitat exists on site. There are no caves, cliffs or overhangs within 2km of the Project Site. Associated with PCT 84, 274. Breeding habitats are areas within 100 m of caves/ over hangs.			No. No suitable habitat. Species removed due to habitat constraints.

Species	Common Name	Habitat Constraints / Geographical limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Presence of habitat on site	Survey timing	IBRA and PCT associations*	Targeted surveys required?
Zieria obcordata	Granite Zieria	Rocky areas containing granite boulders or rocky outcrops	High	E	E	Associated with 287 and 272 within both IBRA subregions, dominated by *Acacia* on rocky hillsides among granite boulders ranging in altitude between 500-800 m. No suitable habitat is within the Development Corridor as there are no granite boulders.	Sept – Oct	**Inland Slopes** PCT-272 / **Hill End** PCT – 272 287	No. No suitable habitat. Removed due to habitat constraints.

*CORRECT AT THE TIME OF WRITING

4.4. Candidate species requiring further assessment

Under Section 5.2.2 of the BAM, a species credit species can be considered unlikely to occur on a development site (or within specific vegetation zones) if following field assessment, it is determined that the habitat is substantially degraded that the species is unlikely to utilise the Project Site (or specific vegetation zone). Such species, in relation to the Project, are identified in Table 4-3 above along with justification regarding the habitats present.

Based on an assessment of habitat constraints, geographic limitations, and site degradation, the following species have been considered for further assessment:

Flora

- *Acacia ausfeldii*
- *Cullen parvum*
- *Dichanthium setosum*
- *Diuris tricolor*
- *Eucalyptus alligatrix subsp. alligatrix*
- *Euphrasia arguta*
- *Grevillea divaricata*
- *Grevillea wilkinsonii*
- *Indigofera efoliata*
- *Persoonia marginata*
- *Pomaderris cotoneaster*
- *Pomaderris queenslandica*
- *Prasophyllum petilum*
- *Swainsona recta*
- *Swainsona sericea*
- *Tylophora linearis.*

Fauna

- Pink-tailed Legless Lizard
- Bush Stone Curlew
- Gang-gang Cockatoo
- Glossy Black-Cockatoo
- Eastern Pygmy-possum
- White-bellied Sea-Eagle
- Black-breasted Buzzard
- Little Eagle
- Key’s Matchstick Grasshopper
- Pink Cockatoo
- Square-tailed Kite
- Southern Myotis
- Barking Owl
- Powerful Owl

- Squirrel Glider
- Southern Greater Glider
- Brush-tailed Phascogale
- Koala
- Superb Parrot
- Masked Owl.

4.5. Threatened species surveys

Surveys were undertaken within the Development Corridor and surrounding landscape.

Targeted surveys for species credit species were undertaken on the dates outlined in Table 4-4. Targeted surveys were undertaken in accordance with the relevant guidelines for fauna (DEC 2004). The location of targeted surveys are shown on Figure 4-7, Figure 4-8 and Figure 4-9 with the results of the surveys shown as individual species polygons (Figure 4-15 through to Figure 4-21). Many of the surveys were undertaken prior to the implementation of the NSW guidelines for surveying particular threatened species. Assessor update 36 – item 4 describes the application of new or revised survey guidelines:

> "*Where survey has been completed prior to the publication of a survey guide, the Department expects the assessor (or surveyor) to have applied current best-practice in searching for the target species (in accordance with BAM s6.5.1.4). Assessors can use information from other published, peer-reviewed sources to guide survey technique and effort, but this must be clearly documented and justified in the BAR as well as indicating how this differs from our recently published guide."*

As such any guideline published on or after January 2022 may not have been considered in this assessment. ELA has a strong knowledge of the site and the local surroundings, and have undertaken long-term field investigations across the site over 5 years with the results of surveys undertaken considered to be representative of the use of the site by species. Additional surveys were undertaken in February 2025.

Given the large size of the Development Corridor and access issues particularly on the western side of Lake Burrendong many species-credit species have assumed to be present due to surveys not being undertaken within the survey timing requirements (see Table 4-3 above). However, given the extensive surveys undertaken and the likelihood that the vegetation is not dissimilar to the areas surveyed, it is unlikely that any threatened fauna other than those already identified as occurring or likely to occur are present.

Surveys were completed under Scientific Licence SL100243.

Relevant experience of staff undertaking surveys are provided in Appendix S. Detailed maps are provided in Appendix D.

Table 4-4: Targeted surveys for candidate species

Date	Surveyors	Location	Target species
Surveys			
12-18 August 2020	Cheryl O'Dwyer, David Allworth, Elise Keane, Kate Maslen	Windfarm Southern Transmission Northern Transmission	*Acacia ausfeldii, Eucalyptus alligatrix, Pomaderris queenslandica, Persoonia marginata, Indigofera efoliata, Pomaderris cotoneaster, Grevillea wilkinsonii and G. divaricata.*
19-27 Aug 2020	Cheryl O'Dwyer, Tomas Kelly, Rebecca Croake, Dan Magdi, Elise Keane	Windfarm	Koala, Barking Owl, Powerful Owl, Masked Owl, Bush-stone Curlew, Squirrel Glider, Brush-tailed phascogale
6 Nov – 6 Dec	Cheryl O'Dwyer, Darren O'Dwyer, Amanda Sales	Windfarm	Koala, Eastern Pygmy Possum, Squirrel Glider, Brush-tailed phascogale
16-17 Dec 2020	Cheryl O'Dwyer, Elise Keane	Windfarm	Gang-gang cockatoo, Glossy Black Cockatoo, Major Mitchell Cockatoo Superb Parrot White-bellied Sea Eagle, Black Breasted Buzzard, Little Eagle, Square tailed kite. Koala, Barking Owl, Powerful Owl, Masked Owl, Bush-stone Curlew, Squirrel Glider, Brush-tailed phascogale, Eastern Pygmy Possum, Booroolong Frog
17 Jan – 26 Feb 2021	Cheryl O'Dwyer, Rebecca Croake, Amanda Sales	Windfarm	Koala, Eastern Pygmy Possum, Squirrel Glider, Brush-tailed phascogale
29 Jan -19 Feb 2021	Cheryl O'Dwyer, Tomas Kelly, Rebecca Croake, Elise Keane, Kate Maslen, Justin Russell	Windfarm Northern Transmission Southern Transmission	*Dichanthium setosum, Euphrasia arguta, Tylophora linearis* (VI plot data). *Grevillea divaricata, Pomaderris queenslandica, P. cotoneaster, Eucalyptus alligatrix.* Gang-gang cockatoo, Glossy Black Cockatoo, Major Mitchell Cockatoo Superb Parrot White-bellied Sea Eagle, Black Breasted Buzzard, Little Eagle, Square tailed kite.
28 April 2021	Cheryl O'Dwyer, Elise Keane	Windfarm Yarrabin Road	*Acacia ausfeldii, Eucalyptus alligatrix, Tylophora linearis Pomaderris queenslandica, P. cotoneaster, Indigofera efoliata, Persoonia marginata (*VI plot data and rapids points).
9-10 Aug 2021	Cheryl O'Dwyer, Kate Maslen, Amanda Sales	Yarrabin Road	*Acacia ausfeldii, Eucalyptus alligatrix, Pomaderris queenslandica P. cotoneaster, Persoonia marginata.*
2-26 Aug 2021	Cheryl O'Dwyer, Elise Keane, Justin Russell, Amanda Sales, Lachlan Metzler, David Allworth, Kate Maslen.	Windfarm Yarrabin Road Northern Transmission Southern Transmission	Gang-gang cockatoo, Glossy Black Cockatoo, Major Mitchell Cockatoo. Superb Parrot. White-bellied Sea Eagle, Black Breasted Buzzard, Little Eagle, Square tailed kite. Koala, Barking Owl, Powerful Owl, Masked Owl, Bush-stone Curlew, Squirrel Glider, Brush-tailed phascogale

Date	Surveyors	Location	Target species
16 Sept 2021	Tomas Kelly and Elise Keane	Windfarm Yarrabin Road	Gang-gang cockatoo, Glossy Black Cockatoo, Major Mitchell Cockatoo. Superb Parrot. White-bellied Sea Eagle, Black Breasted Buzzard, Little Eagle, Square tailed kite.
14 and 21 Oct 2021	Tomas Kelly and Elise Keane	Windfarm Yarrabin Road	Gang-gang cockatoo, Glossy Black Cockatoo, Major Mitchell Cockatoo. Superb Parrot. White-bellied Sea Eagle, Black Breasted Buzzard, Little Eagle, Square tailed kite
20 -24 Feb 2023	Cheryl O'Dwyer, Lachlan Metzler, Melaina Chapman, Kylie Lopes, Michael Gregor, Russell Eagles	Windfarm Yarrabin Road Southern Transmission	*Dichanthium setosum, Euphrasia arguta, Tylophora linearis, Pomaderris queenslandica, P. cotoneaster, Acacia ausfeldii, Cullen parvum. E. alligatrix.* HBT assessment
26-29 June 2023	Ronnie Hill, Lachlan Metzler	Yarrabin Road	VI plots, *Pomaderris queenslandica, P. cotoneaster, A. ausfeldii, Indigofera efoliata*, Bush-Stone Curlew, Glossy Black Cockatoo
27 and 28 Feb 2024	Cheryl O'Dwyer. Lachlan Metzler and Alex Copan	Southern transmission line realignment and workers camp	PCT mapping, Diurnal birds, threatened flora transects
27-31 May 2024	Cheryl O'Dwyer, Lachlan Metzler, Tomas Kelly, Kieren Stephenson-Banks, Greg Natesan	Windfarm	BBUS across 16 locations (10 in windfarm, 6 as control sites). Anabat deployment at same 16 sites – 4 nights.
19-23 August 2024	Cheryl O'Dwyer, Lachlan Metzler	Windfarm	BBUS across 16 locations (10 in windfarm, 6 as control sites). Anabat deployment at same 16 sites – 4 nights
22-25 October 2024	Cheryl O'Dwyer, Lachlan Metzler, Shirley Chia, Phillip Allen	Windfarm	BBUS across 16 locations (10 in windfarm, 6 as control sites). Anabat deployment at same 16 sites – 4 nights
3-7 February 2025	Cheryl O'Dwyer, Shirley Chia, Natalie DeLosa, Greg Natesan	Windfarm	BBUS across 16 locations (10 in windfarm, 6 as control sites). Anabat deployment at same 16 sites – 4 nights
24-28 February 2025	Cheryl O'Dwyer, Ellie Young, Lilly Outram, Mel Thurtell, Liam Scanlan, Sophie Montgomery, Alex Yates	Windfarm Transmission Line Access tracks	556 grid circles (40m diameter) searches for *Euphrasia arguta, Tylophora linearis, Pomaderris queenslandica, Grevillea divaricata, Persoonia marginata, Grevillea wilkinsonii.*
24-27 March 2025	Rob Spiers, Jarmin Thornberry (Capital Ecology). Cheryl O'Dwyer, Ellie Young, Kasey Tada	Windfarm Transmission Line Access tracks	Targeted searches for Pink-Tailed Legless Lizard habitat
28-30 April, 1-2 May 2025	Cheryl O'Dwyer, Phil Allen, Matt Dale, Ellie Young, Natalie DeLosa	Windfarm	BBUS across 16 locations (10 in windfarm, 6 as control sites). Anabat deployment at same 16 sites – 4 nights
18-22 August 2025	Cheryl O'Dwyer, Phil Allen, Lachlan Metzler, Natalie DeLosa	Windfarm	BBUS across 19 locations (11 in windfarm, 8 as control sites). Anabat deployment at 16 sites – 4 nights

Date	Surveyors	Location	Target species
13-16 October 2025	Matt Dale, Natalie DeLosa, Ellie Young	Windfarm	BBUS across 19 locations (11 in windfarm, 8 as control sites). Anabat deployment at 16 sites – 4 nights
24 October 2025	Cheryl O'Dwyer, Edward Moar	Windfarm Transmission Line	Targeted Keys Matchstick Grasshopper surveys
28 October 2025	Cheryl O'Dwyer, Edward Moar	Yarrabin Road	Targeted searches for *Diuris tricolor, Swainsona sericea, S.recta, Prasophyllum petilum*
10 November 2025	Cheryl O'Dwyer, Lily Outram	Yarrabin Road	Targeted searches for *Diuris tricolor, Swainsona sericea, S.recta, Prasophyllum petilum*
2-6 February 2026	Cheryl O'Dwyer, Phil Allen, Kasey Tada	Windfarm	BBUS across 18 locations (11 in windfarm, 7 as control sites). Anabat deployment at 16 sites – 4 nights

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4.5.1. Weather conditions

Weather conditions during the targeted surveys are outlined in Table 4-5.

Table 4-5: Weather conditions

Date	Rainfall (mm)	Minimum temperature °C	Maximum temperature °C
12-08-20	0	7.1	21
13-08-20	0	5.3	20.8
14-08-20	0	4.4	12
15-08-20	11	8.5	12
16-08-20	1.4	8.5	15
17-08-20	0	8.5	15.5
18-08-20	1	3	19
19-08-20	2.4	3.2	16.6
20-08-20	1.2	8.5	13.2
21-08-20	5	4.8	15
22-08-20	4.2	6	10.1
23-08-20	0	5.5	11.4
24-08-20	0	1.5	13.5
25-08-20	0	-0.5	13.5
26-08-20	0	-2	17.5
27-08-20	0	-1.5	18.0
16-12-20	1.0	21.3	30.5
17-12-20	4	20.5	36.4
18-12-20	10	21	32.6
19-12-20	1.4	13.2	30.0
20-12-20	0.4	16.2	28.5
21-12-20	0	14.5	21
22-12-20	21.4	17.2	24.5
23-12-20	0	9.8	28
24-12-20	0	16	32
25-12-20	0	10.8	31
26-12-20	0	17.3	30.6
27-12-20	0	15.8	33.6
28-12-20	0	22	33.6
29-12-20	31.2	17.4	26.5
30-12-20	5.8	16	30
31-12-20	0	16.2	30.2
01-01-21	1	19.3	23.2

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Date	Rainfall (mm)	Minimum temperature °C	Maximum temperature °C
02-01-21	19.2	16.0	28.6
03-01-21	4.6	18.5	29.5
04-01-21	0	18	28.5
29-01-21	0	21.0	29.0
30-01-21	0.2	21.0	33.2
31-01-21	3	18.1	35.5
01-02-21	33.0	20.0	33.5
02-02-21	19.2	14.5	28.6
03-02-21	0	14.2	29.0
04-02-21	0	18.8	32.0
05-02-21	0	20.0	31.2
06-02-21	2.6	20.4	29.5
07-02-21	16.8	16.8	27.2
08-02-21	0	15.0	26.5
09-02-21	0	17	28.5
10-02-21	0	13.4	31.5
11-02-21	0	14	32.2
12-02-21	0	15.5	34
13-02-21	25.0	20.5	35.5
14-02-21	18.0	15.2	37.2
15-02-21	0	12.5	32.7
16-02-21	0	17	26.4
17-02-21	0	14.6	29.7
18-02-21	0	17	30.6
19-02-21	0	15.5	34.2
28-04-21	0	6.6	
02-08-21	0.4	1.5	23.3
03-08-21	3	7.2	14.7
04-08-21	1	6.5	12.1
05-08-21	0.2	7.0	14.5
09/08/21	0	6.3	19.4
10/08/21	0	4	20.8
11/08/21	0	6.2	21.7
12/08/21	1.2	10.1	16.7
17/08/21	0	0.4	16.7
18/08/21	0	1	19.4

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Date	Rainfall (mm)	Minimum temperature °C	Maximum temperature °C
19/08/21	0	2.8	19.8
25/08/21	2.2	2	13.4
26/08/21	0	-0.8	16.9
16/09/21	0	2.4	20
14/10/21	0	12.9	25.7
21/10/21	0	6.8	23.7
20/2/23	0	16.6	34.4
21/2/23	0	15.7	34
22/2/23	16.4	19.3	21.1
23/2/23	0	15.3	26.2
24/2/23	0.4	13.5	27.1
26/6/23	0	1.1	15.3
27/6/23	0	1.9	14.1
28/6/23	0.4	6.7	8.1
27 -28/2/24	0	19.6	35.3
27-31/5/24	0.2	-0.7	21.3
19-23 /8/24	0.2	0.5	21.2
22-25 /10/24	0.0	3.5	28.5
3-7/2/2025	38.6	17.1	35.6
24-28/2/ 2025	0	15.5	35.2
24-27/3/2025	0	16.5	27.3
28-30 /4/2025	8.2	9.2	25.3
1-2 /5/2025	0	5.8	22.4
18-22/08/2025	15.2	-1.7	19.2
13-16/10/2025	4.8	4.6	32.7
24/10/2025	0	6.0	24.0
28/10/2025	0	11.8	15.5
10/11/2025	0	5.0	26.8
2-6/02/2026	0	15.3	38.7

NOTE: RAINFALL DATA IS COLLECTED FROM THE BUREAU OF METEOROLOGY, STATION MUMBIL (BURRENDONG DAM), TEMPERATURE DATA IS COLLECTED FROM STATION WELLINGTON (D&J RURAL) GULGONG AND MUDGEE AIRPORT DEPENDING ON LOCATION OF SURVEYS.

4.5.2. Diurnal birds

Bird surveys were undertaken using the 20 min / 2 ha search method over December 2020, January 2021, April 2021, June 2021, August 2021, September 2021, and October 2021 at 11 locations targeting areas that represent the highest quality and most connected habitat, including road reserves, and along creek lines. All species heard and observed were recorded. Each site was visited at least twice, morning and evening (25 surveys).

Bird surveys were also undertaken at an additional 16 locations (Bird Utilisation Surveys; BUS, Figure 4-4) on five separate occasions resulting in a total of 107 bird surveys across the Project Site. To achieve greater coverage across the Project Site during the week of 27-31 May 2024, 40 additional surveys were undertaken at 10 locations within the Development Corridor and at another 9 locations (control sites; 36 surveys) within the Project Site. These same surveys were repeated in winter (19–23 August 2024; 76 bird surveys), spring (22 – 25 October 2024; 76 bird surveys), summer (3-7 February 2025; 76 bird surveys) autumn (28-30 April and 1-2 May 2025; 75 surveys). Additional surveys have been completed in winter 2025 (18-22 August 2025), spring 2025 (12-16 October 2025) and summer 2026 (2-6 February 2026), with the additional data to be analysed and incorporated into a BBAMP for the Project. A total of 640 diurnal bird surveys have been completed to date (Table 4-6). Surveyors also recorded opportunistic sightings throughout other surveys and whilst traversing the Project Site. Survey effort for each species is shown in Table 4-7.

Table 4-6: Bird surveys (diurnal and BUS) across Project Site

Survey Period	Survey Type	Total Surveys	Comments
December 2020	11 sites	25	Targeted high-quality and connected habitats including road reserves and creek lines. (Minimum of two visits per site, morning and evening)
December 2020-October 2021	16 sites	107	Initial BUS surveys were visited at least 5 x across the Project Site at various times throughout the day
27-31 May 2024	Increased coverage at 10 WTG locations and 9 Control sites	55	40 additional surveys in Development Corridor and 36 surveys within control sites. Each site was visited at various times throughout the day.
19-23 August 2024	As above	76	Repeated survey for seasonal coverage in winter
22-25 October 2024	As above	76	Repeated survey for seasonal coverage in spring
3-7 February 2025	As above	69	Repeated survey for seasonal coverage in summer
28-30 April and 1-2 May 2025	As Above	75	Repeated survey for seasonal coverage in autumn
18-22 August 2025	As above	74	Repeated survey for seasonal coverage in winter
12-16 October 2025	As above	74	Repeated survey for seasonal coverage in spring
2-6 February 2026	As above	70	Repeated survey for seasonal coverage in summer
Total		**640**	

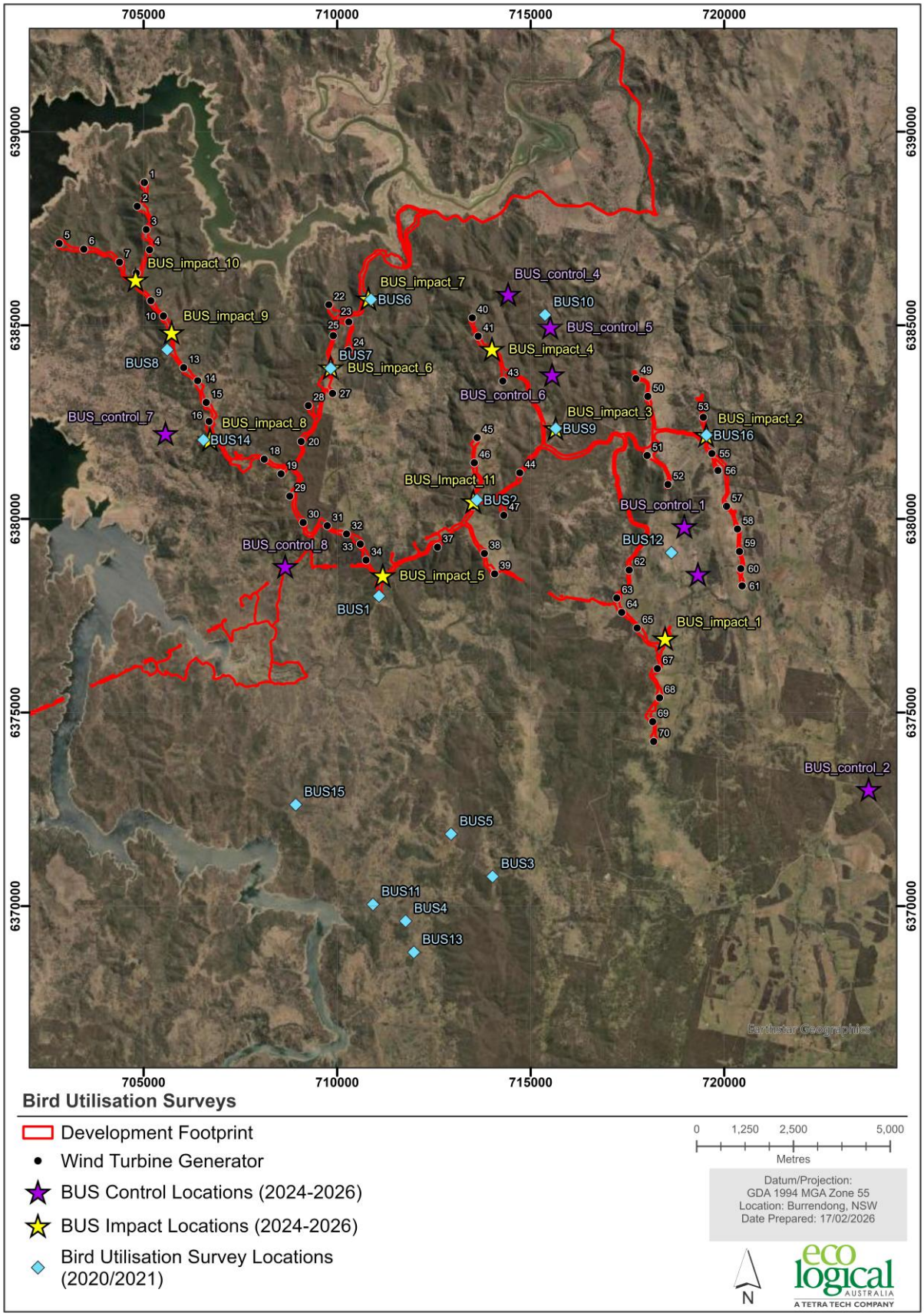


Figure 4-4: Location of BUS sites

Table 4-7: Diurnal bird survey effort

Scientific Name	Common Name	Survey Method	Timing of survey	Effort	Present?	Further assessment required?
Burhinus grallarius	Bush Stone-curlew	20 min / 2ha transect search and spotlighting / call playback	All year	483 individual diurnal surveys across the Project Site. 24 nights of spotlighting / call playback for a total of 288 person hours.	No	In areas that were inaccessible the species was assumed to be present (see species polygon)
Callocephalon fimbriatum	Gang Gang cockatoo	20 min / 2ha transect search and bird utilisation surveys	Oct-Jan	483 individual diurnal surveys across the Project Site. BUS surveys across 56 sites – 175 of these surveys were within the required survey period	No	No
Calyptorhynchus lathami	Glossy Black Cockatoo	20 min / 2ha transect search and bird utilisation surveys	Apr - Aug	483 individual diurnal surveys across the Project Site. BUS surveys across 56 sites – 334 of these surveys were within the required survey period.	Yes. Not within the Development Corridor. Observed at BBUS location Control 4.	No. Searches across the Project Site failed to record signs of breeding behaviour. This species is an ecosystem species and will be offset in accordance with the ecosystem credit liability.
Haliaeetus leucogaster	White-bellied Sea-Eagle	20 min / 2ha transect search and bird utilisation surveys	July - Dec	483 individual diurnal surveys across the Project Site. BUS surveys across 56 sites – 334 of these surveys were within the required survey period	Yes. Not within the Development Corridor. Observed on lake foreshore.	No This species is an ecosystem species and will be offset in accordance with the ecosystem credit liability.
Hamirostra melanosternon	Black-breasted Buzzard	20 min / 2ha transect search and bird utilisation surveys	Sept – Nov	483 individual diurnal surveys across the Project Site. BUS surveys across 56 sites – 175 of these surveys were within the required survey period.	No	No
Hieraaetus morphnoides	Little Eagle	20 min / 2ha transect search and bird utilisation surveys	Aug – Oct	483 individual diurnal surveys across the Project Site. BUS surveys across 56 sites – 275 surveys were within the required survey period.	Yes- Not within the Development Corridor. Observed on lake foreshore.	No nests were observed within the Development Corridor.

Scientific Name	Common Name	Survey Method	Timing of survey	Effort	Present?	Further assessment required?
Lophochroa leadbeateri	Pink Cockatoo	20 min / 2ha transect search and bird utilisation surveys	Sept – Dec	483 individual diurnal surveys across the Project Site. BUS surveys across 56 sites –175 surveys were within the required survey period.	No	No
Lophoictinia isura	Square-tailed Kite	20 min / 2ha transect search and bird utilisation surveys	Sept – Jan	483 individual diurnal surveys across the Project Site. BUS surveys across 56 sites – 175 surveys were within the required survey period.	No	No
Polytelis swainsonii	Superb Parrot	20 min / 2ha transect search and bird utilisation surveys	Sept – Nov	483 individual diurnal surveys across the Project Site. BUS surveys across 56 sites –175 surveys were within the required survey period.	Yes. Along 12 Mile Road at Wellington Not within the Development Corridor.	No

4.5.2.1. Hollow dependent birds and raptors

During February 2023 a team of four (4) ecologists assessed and recorded all hollow bearing trees within a 50 m radius around each proposed WTG location. The number of hollows, size and height were recorded to assist with identifying potential breeding habitat for threatened owls, cockatoos, and parrots.

Searches for large stick nests such as those used by raptors such as White-bellied Sea Eagle, Square-tailed Kite and Little Eagle were also recorded across the Development Corridor during vegetation surveys, hollow bearing tree assessments and general bird surveys.

4.5.2.2. Bird Utilisation Survey (BUS)

This method provides a standardised measure of bird activity across multiple seasons as required for detailed collision risk modelling. Surveys were conducted over each season in 2021 and additional seasons in 2024 and 2025. Additional surveys have been completed in winter 2025 (18-22 August 2025), spring 2025 (12-16 October 2025) and summer 2026 (2-6 February 2026), with the additional data to be analysed and incorporated into a BBAMP for the Project. These seasonal breakdown of bird surveys is:

- Summer 2020/2021: 52 surveys
- Autumn 2021: 1 survey
- Winter 2021: 7 surveys
- Spring 2021: 20 surveys
- Autumn 2024: 55 surveys
- Winter 2024: 76 surveys
- Spring 2024: 76 surveys
- Summer 2025: 69 surveys
- Autumn 2025: 74 surveys
- Winter 2025: 74 surveys
- Spring 2025: 74 surveys
- Summer 2026: 70 surveys.

BUS sites identified as impact sites were located at proposed turbine locations sites which included both woodland and along cleared ridgelines providing vantage point locations to observe flight paths of raptors across the broader Project Site.

Sixteen sites located near proposed turbines were surveyed across the Project Site with each visited on at least five separate occasions incorporating morning (early and mid) and afternoon surveys (mid and late). All birds flying at turbine rotor height were recorded and the flight height and flight path recorded to identify any species (threatened or common) that may be impacted by blade strike. Diurnal bird surveys were also undertaken at the same time. A total of 80 BUS surveys were undertaken in these areas.

An additional 21 sites were surveyed outside the Development Corridor on the 8 and 9 September 2021 as potential control sites. Advice from BCS/CPHR recommended additional control and impact sites be surveyed to provide greater coverage across the Development Corridor. Nineteen sites (10 impact and 9 control sites) were surveyed during 27-31 May 2024. These same sites were surveyed in August 2024,

October 2024, February 2025, April 2025, August 2025, October 2025 and February 2026. A total of 568 surveys were completed (Table 4-8) equating to 140 hours of bird survey.

During each BUS all birds visible and audible were recorded within a 20-minute survey period with the following information collected:

- Bird species
- Count/quantity
- Minimum and maximum flight height and distance from the observer
- Bird behaviour (Flying above canopy, Flying below canopy, On ground, In tree)
- Any relevant notes e.g. bird age, sex, breeding activity.

Particular attention was paid to flights occurring within the proposed WTG Rotor Swept Area (RSA; 65-250 m), with the flight paths of at listed and raptor species recorded using geo-referenced spatial software (ESRI Field Maps).

Table 4-8: Bird Utilisation Survey Effort

Survey Type	Year	Season	Dates	Number of field days	Number of Sites	Number of surveys
BDAR	2020-2021	Summer	17 Dec - 24 Feb	12	16	52
BBUS	2021	Spring	16 Sept - 29 Oct	4	10	20
Total 2020-2021				**16**		**72**
BBUS	2024	Autumn	27 - 31 May	5	16	55
BBUS	2024	Winter	19 - 23 Aug	5	19	76
BBUS	2024	Spring	21 - 25 Oct	5	19	76
BBUS	2025	Summer	2 - 6 Feb	5	19	69
BBUS	2025	Autumn	28 Apr - 2 May	5	19	74
BBUS	2025	Winter	18-22 Aug	5	19	74
BBUS	2025	Spring	12-16 Oct	5	19	74
BBUS	2026	Summer	2-6 Feb	5	18	70
Total 2024-2026				**40**		**568**
Total Surveys				**41**		**640**

4.5.3. Nocturnal survey

Nocturnal surveys were planned in accordance with the *Threatened biodiversity and assessment. Guidelines for development and activities 2004 working draft* (DEC 2004) using a combination of survey methods such as baited cameras, call playback and spotlighting to maximise the chance of recording threatened species.

Discussions were also held with species experts and published literature was reviewed to ensure that current best practice survey methods were being employed for a particular species (e.g. Eastern Pygmy Possum).

4.5.3.1. Spotlighting / Call playback

Daytime searches were conducted on foot during daylight hours to locate roosts, feed trees, hollows, or nest sites to identify suitable habitat for the following species:

- Koala
- Squirrel Glider
- Greater Glider
- Eastern Pygmy Possum
- Brush-tailed Phascogale
- Bush Stone Curlew
- Barking Owl
- Powerful Owl
- Masked Owl.

No signs of owl roosts such as faeces and owl pellets were recorded. Spotlighting and call playback were conducted over sixteen nights (19-20, 24-27 August 2020, 15-26 August 2021) at fifteen locations and again on 2-12 August 2021 (eight nights) along eleven locations along access roads (6 sites are now outside the Development Corridor due to the removal of the eastern access road upgrades). Call Playback repeated at each location sequence included calls of the three owl species, koala and Bush Stone-curlew with periods of 2-5 min of continuous calls interspersed with periods of 2-5 min of silence to listen between each species. Simultaneously, spotlighting searches were conducted on foot and out of a slow-moving vehicle through areas of potential habitat for a minimum of 4 survey hours per night and up to a maximum of 8 hours per night. A total of 288 spotlighting hours were undertaken across the Project Site.

4.5.3.2. Nocturnal mammals

A targeted survey using Remote Cameras was completed across 6 locations of potential habitat targeting Squirrel Gliders, Koala, Brush-tailed Phascogales and Eastern Pygmy Possum (Figure 4-7) over the period November 2020 – January 2021 (Table 4-9).

Prior to undertaking the survey, ELA consulted with recognised Eastern Pygmy Possum expert Dr. Martin Schultz to determine the optimal habitat to target survey efforts (correspondence in Appendix M). Given that the landscape and vegetation communities were similar to the approved approach used at Uungula Wind Farm, this approach was implemented for this project and approved by CPHR (meeting dated 31 July 2024). Areas containing hollow bearing trees and shrubby understorey were selected and each camera was installed for a minimum of 14 days. Each site contained fifteen (15) Remote Infrared Cameras (90 cameras deployed;1,246 trap nights) which were installed on trees and spaced 50-100 m apart to saturate the area (M. Schultz pers comm 2020). If Eastern Pygmy Possums were recorded, then additional surveys would be undertaken more broadly across the Development Corridor to determine extent. Eastern Pygmy Possums are inquisitive and often investigate novel structures (BCS memo ref DOC24/430155), so therefore, cameras were baited using a mix of honey, oats and peanut butter with a diluted honey mix poured over the bait ball and secured to a tree. A 30 cm ruler was attached to the tree next to the bait bag, to assist with fauna identification. On day 7 all cameras were rebaited, checked and re-sprayed with honey water. All images were reviewed by ELA ecologists with further clarification gained from mammal expert Dr. Rodney Armistead.

Table 4-9: Nocturnal mammal survey effort

Scientific Name	Common Name	Survey Method	Timing of survey	Effort	Present?	Further assessment required?
Phascolarctos cinereus	Koala	Spotlighting and Call playback	All year	16 nights and 15 locations within Windfarm. 8 nights along 5 sites along Yarrabin Road for 288 spotlighting person hours.	Yes	Offset credits calculated for the Windfarm and transmission line.
Petaurus norfolcensis	Squirrel Glider	Spotlighting and baited camera traps.	All Year	90 cameras deployed within windfarm during November - January – 1,246 trap nights. Spotlighting for 16 nights and 15 locations within Windfarm. 8 nights along 5 sites along Yarrabin Road for 288 spotlighting person hours.	No	Nocturnal surveys were not completed along transmission line and associated access tracks. Assumed present in these areas, and credits calculated.
Petauroides volans	Greater Glider	Spotlighting and baited camera traps.	All Year	90 cameras deployed within windfarm – 1,246 trap nights. Spotlighting for 16 nights and 15 locations within Windfarm. 8 nights along 5 sites along Yarrabin Road for 288 spotlighting person hours.	No	No - no associated PCTs along transmission line
Cercartetus nanus	Eastern Pygmy Possum	Spotlighting and baited camera traps.	Oct - March	90 cameras deployed within windfarm – 1,246 trap nights.	No	Nocturnal surveys were not completed along transmission line and associated access tracks. Assumed present in these areas, and credits calculated.
Phascogale tapoatafa	Brush-tailed Phascogale	Spotlighting and baited camera traps.	All Year	90 cameras deployed within windfarm – 1,246 trap nights. Spotlighting for 16 nights and 15 locations within Windfarm. 8 nights along 5 sites along Yarrabin Road for 288 spotlighting person hours.	No	Nocturnal surveys were not completed along transmission line and associated access tracks. Assumed present in these areas, and credits calculated.
Burhinus grallarius	Bush-Stone Curlew	Spotlighting and call playback	All Year	Spotlighting for 16 nights and 15 locations within Windfarm. 8 nights along 5 sites along Yarrabin Road for 288 spotlighting person hours.	No	Assumed present in associated PCTs inaccessible areas, and credits calculated.
Ninox connivens	Barking Owl	Spotlighting and call playback	Jan - Aug	Spotlighting for 16 nights and 15 locations within Windfarm. 8 nights along 5 sites along Yarrabin Road for 288 spotlighting person hours during required survey period.	No	Nocturnal surveys were not completed along transmission line and associated access tracks. Assumed present in these areas, and credits calculated.

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Scientific Name	Common Name	Survey Method	Timing of survey	Effort	Present?	Further assessment required?
Ninox strenua	Powerful Owl	Spotlighting and call playback	Jan - Aug	Spotlighting for 16 nights and 15 locations within Windfarm. 8 nights along 5 sites along Yarrabin Road for 288 spotlighting person hours during required survey period.	Potential	Nocturnal surveys were not completed along transmission line and associated access tracks. Assumed present in these areas, and credits calculated.
Tyto novaehollandiae	Masked Owl	Spotlighting and call playback	Jan - Aug	Spotlighting for 16 nights and 15 locations within Windfarm. 8 nights along 5 sites along Yarrabin Road for 288 spotlighting person hours during required survey period.	No	Nocturnal surveys were not completed along transmission line and associated access tracks. Assumed present in these areas, and credits calculated.

4.5.3.3. Amphibian surveys

The Booroolong Frog requires permanent or near permanent river environment with rocky structures with breeding habitat consisting of rocky structures in shallow water along the riparian zone (DPIE 2020d). Searches for potential habitat for Booroolong Frog were investigated on foot during daylight hours. All creek crossings within the Development Corridor were characterised for habitat. Images of waterways with rocky habitat and potential submerged vegetation were sent to Dr. Francis Lemckert (specialised herpetologist) to confirm potential survey locations. Only four locations contained water at the time of survey and all were outside the Development Corridor. Habitat within the Corridor lacked flowing permanent water, and therefore habitat for Booroolong Frog was considered unsuitable. Water had pooled in creeks after recent rains and whilst no surveys were required for Booroolong frogs, general frog surveys were conducted in these areas for a minimum of 2 hours during the evening of 16 and 17 December 2020. No notable calls for any threatened amphibian were heard during call playback.

4.5.4. Microbats

Bat Activity Surveys (BAS) have been completed to understand microbat presence and activity across the Project Site, including species listed in the Schedules of NSW BC Act and Commonwealth EPBC Act. Surveys were undertaken over a total of ten survey events, commencing in summer 2020-21 through to autumn 2025 (Table 4-10). Additional surveys have been completed in winter 2025 (18-22 August 2025), spring 2025 (12-16 October 2025) and summer 2026 (2-6 February 2026), with the additional data to be analysed and incorporated into a BBAMP for the Project. Field surveys were also undertaken to locate the presence of any caves, cliffs or rocky crevices within the Development Corridor and a GIS desktop assessment was completed to identify the presence of these features within 2 km of the Development Corridor that could be used as potential breeding habitat for cave dwelling microbats.

Table 4-10: Bat survey effort

Survey Type	Year	Season	Dates	Sites	Survey Nights
BDAR Baseline	2020 -2021	Summer	21 Dec – 15 Feb	45*	210
Met Mast (2 m & 50 m)	2021	Spring	21 Oct – 20 Nov	1 (BDG1)	31
Met Mast (2 m & 50 m)	2022	Summer / Autumn	24 Feb – 25 Mar	1 (BDG1)	60
BBUS	2024	Autumn	27 – 31 May	16	64
BBUS	2024	Winter	19 – 23 Aug	16	64
BBUS	2024	Spring	21 – 25 Oct	19	76
Met Mast (2 m, 50 m 100 m)	2024	Spring / Summer	6 Sep – 6 Dec	2 (BDG1 & BDG2)	265
BBUS	2025	Summer	3 – 6 Feb	18	72
BBUS	2025	Autumn	28 Apr – 2 May	19	73
Met Mast (2 m, 50 m 100 m)	2025	Summer / Autumn	10 Feb – 27 Mar	2 (BDG1 & BDG2)	20
Met Mast (2 m, 50 m 100 m)	2025	Autumn	28 Apr – 2 May	2 (BDG1 & BDG2)	24
BBUS	2025	Winter	18 – 22 Aug	16	64
BBUS	2025	Spring	13-16 Oct	16	64

Survey Type	Year	Season	Dates	Sites	Survey Nights
BBUS	2026	Summer	2-6 Feb	15	60
					1,150

*21 of these sites were located in the previous development corridor, between 700 m and 7.3 km from the current development corridor (see Figure 4-5).

In summer 2020/21, ultrasonic detectors (Anabat SD-2 and Swift; Titley Scientific and SongMeter Mini Bat; Wildlife Acoustics- see Plate 4-7) were deployed across 45 sites within the Project Site for a minimum of 4 nights per site (Figure 4-5). These provided a baseline assessment of microbat presence and species diversity. In October 2021, bat activity surveys were undertaken at the first meteorological (met) mast (BGD1) established within the Project Site (Figure 4-5). One ultrasonic detector (SongMeter SM4-BAT; Wildlife Acoustics) was located at ground level and one SMM-U2 ultrasonic microphone was fixed to a pully via an extension cable and deployed at 2 m and 50 m, to create a vertical stratified survey design (Plate 4-8 and Plate 4-9)Plate 4-8: Location of Anabat Detector microphones at height. The SMM-U2 omni-directional microphones are capable of detecting and recording calls within an approximate 30 m radius in all directions. This capability allowed the detection of calls from ground level to an approximate total height of 80 m, capturing microbat call data within the lower rotor swept path of the proposed turbines. Each detector was synchronised to passively record ultrasonic microbat calls from 30 minutes prior to sunset until 30 minutes after sunrise for the duration of the survey period, at a minimum frequency of 8 kHz, consistent with the lowest frequency that Australian bat species are known to call. An additional survey period was undertaken at met mast BDG1 in summer and autumn 2022, with data again recorded at both 2 m and 50 m during this period of typical peak microbat call activity.

Following consultation with CPHR, additional BAS surveys have been completed across the same eleven (11) impact sites and eight control sites established as part of the expanded BBUS program for the Project. Systematic surveys (four nights per site per season) have been completed in autumn, winter and spring 2024, and summer and autumn 2025 to evaluate seasonal species presence, diversity and call activity (Figure 4-6). Consistent with earlier baseline surveys, Anabat Swift, Chorus, SongMeter Mini Bat and SM4-BAT ultrasonic devices were deployed and set to record from 30 minutes prior to sunset until 30 minutes after sunrise.

In September 2024, three (3) ultrasonic detectors (SongMeter SM4-BAT) were permanently attached to two (2) met masts (BDG1 and BDG2; Figure 4-5) within the Project Site, at 2 m, 50 m and 100 m. Plate 4-8 and Plate 4-9 show the installation of SM4-BAT detectors permanently fixed to the met masts. Data has been collected and analysed from these detectors during the following survey seasons: spring-summer 2024, summer-autumn 2025 and autumn 2025. Additional data has been collected during winter 2025, spring 2025 and summer 2026, with the additional data to be analysed and incorporated into a BBAMP for the Project.



Plate 4-7: SongMeter Mini bat (left) and Anabat Swift (right) deployed at ground level during autumn 2024



Plate 4-8: Location of Anabat Detector microphones at height



Plate 4-9: Installation of SM4 Devices at Met masts

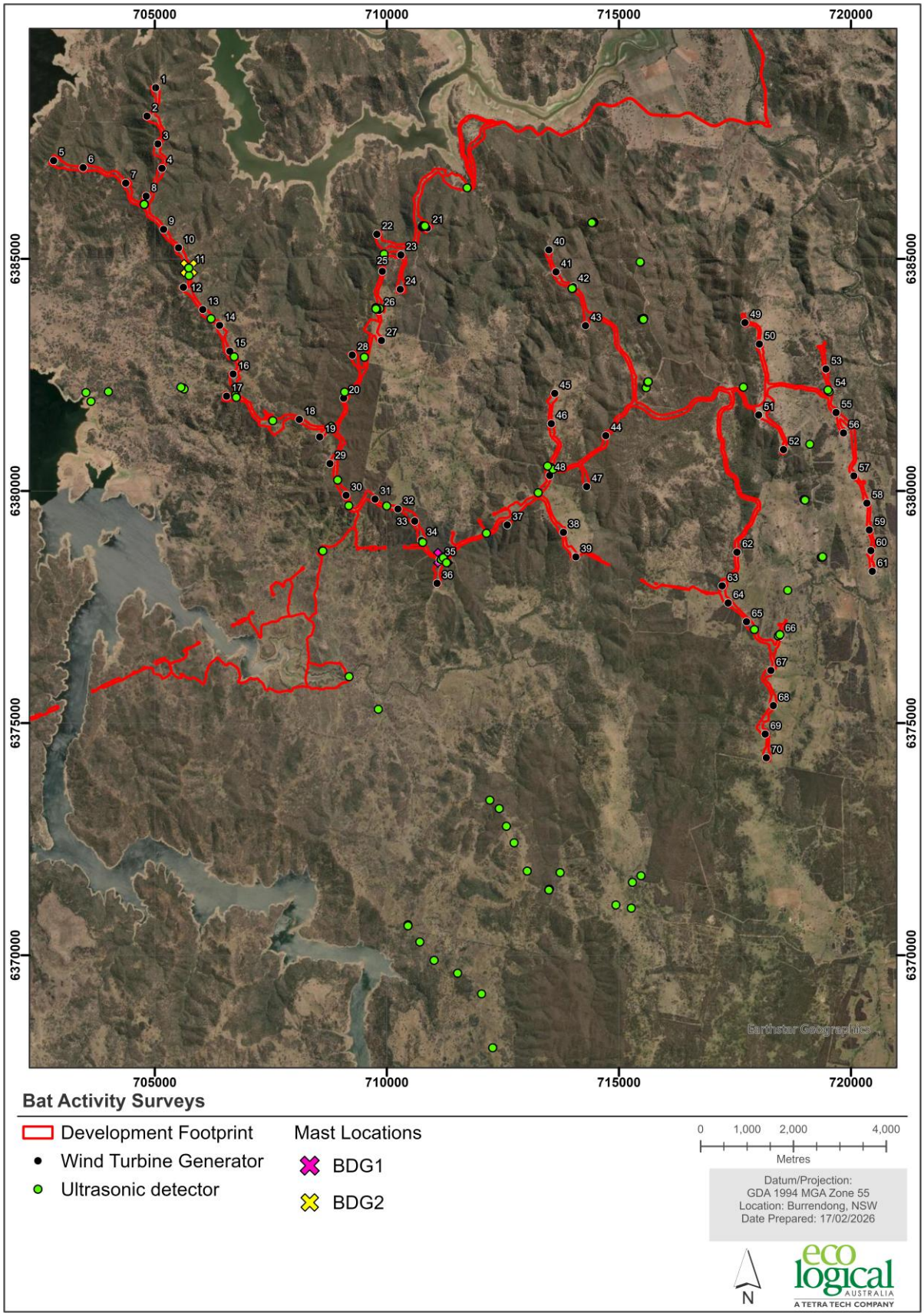


Figure 4-5: Location of Ultrasonic detectors deployed across the Project Site

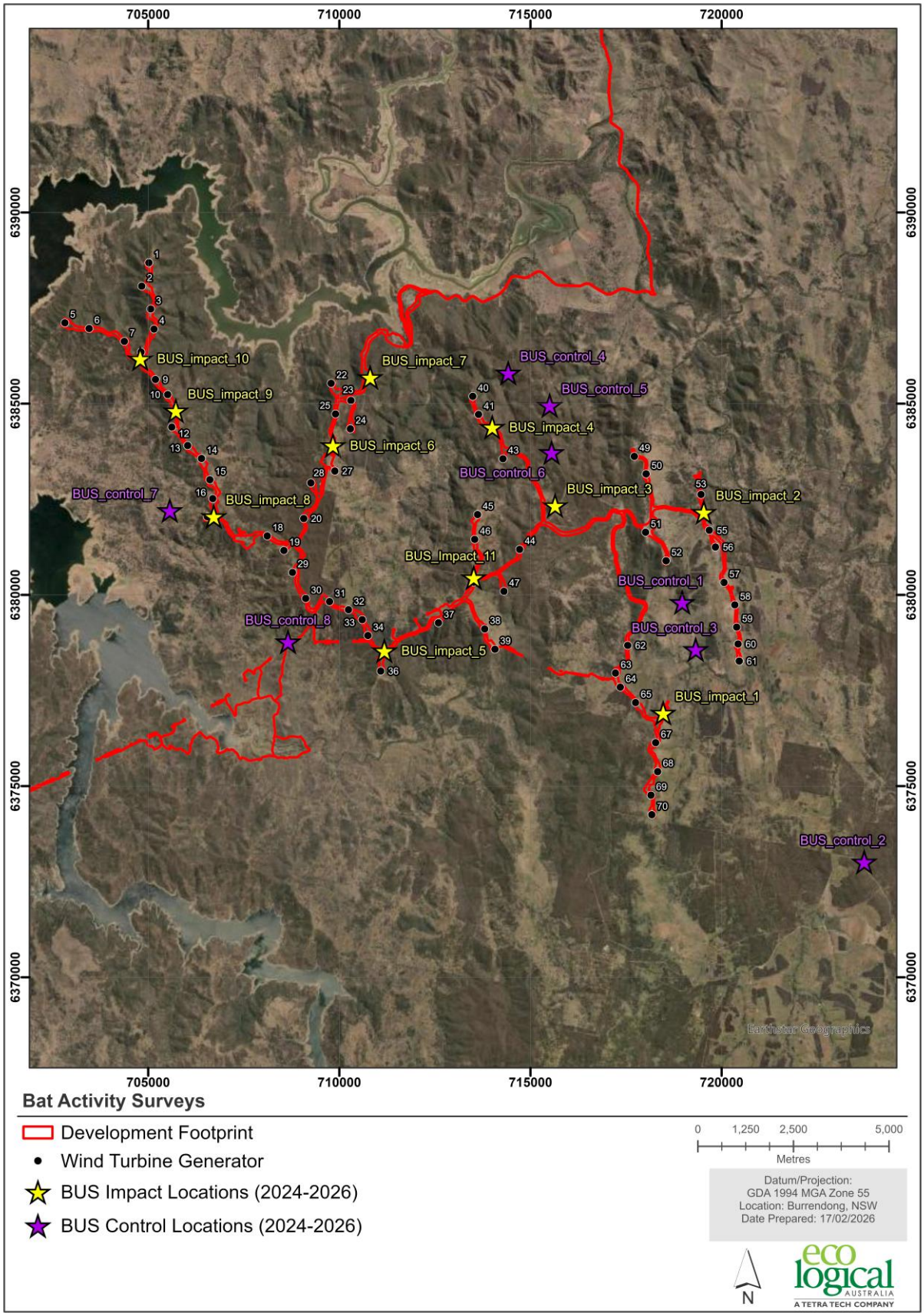


Figure 4-6: Location of BAS control and impact sites

4.5.5. Threatened Flora Surveys

Threatened flora surveys were undertaken across the Development Corridor (Table 4-11).

The following summarises the methodology and assumptions for threatened flora surveys across the Development Corridor:

- **Methodology Adaptation**: Due to the large area under investigation and changes in methodology after initial surveys, targeted flora surveys using parallel transects less than 5 m apart searching for threatened herbs and forbs were not conducted across the entire Development Corridor. Instead, seasonal surveys were carried out using random meanders within areas of potential habitat during vegetation integrity plots, rapid assessments, and vegetation mapping (refer to Figure 4-8).
- The targeted survey methodology was updated in February 2025 using the **Two-phase grid-based systematic survey** (Figure 4-9). A 100 m grid was applied across the Development Corridor. Where grid intersects overlapped suitable habitat for *Euphrasia arguta* and *Tylophora linearis*, circular plots with a 40 m diameter (1,256 m²) were surveyed. The survey design specifically targeted these two species. However, given their cryptic nature and the opportunity presented by the systematic approach, additional threatened shrub species—*Grevillea wilkinsonii*, *Persoonia marginata*, *Pomaderris queenslandica*, and *Acacia ausfeldii*—were also searched for opportunistically. These species are larger and more visible, making incidental detection more likely. All target species were searched for within each plot and while walking between them. Additional 5 m-spaced transects were completed along access roads. A total of 384 grid intersects overlapped the Development Corridor. However, many additional intersects fell just outside the boundary. To maintain survey integrity while ensuring coverage within the Corridor, nearby suitable habitat inside the boundary was substituted. This resulted in 550 circular plots being surveyed, covering 67.5 ha—well above the required survey effort.
- Use **of Parallel Transects**:
    - Within the wind farm site: Parallel transects spaced 10 - 20 m apart were used for general vegetation and threatened flora detection, especially of shrubs and trees. Much of the vegetation was open, enable viewing of any threatened trees and shrubs. Any species that was deemed unusual were investigated.
    - Along access roads and transmission lines: Parallel transects spaced 5 m apart were employed to maximize detection.

Table 4-11: Threatened flora survey effort

Species	Method	Timing of Survey	Effort / area	Present?
Acacia ausfeldii	Meandering transects whilst vegetation mapping, VI Plots and rapid points. 20 m wide transects in PCT 277, 281 and 461. 550 Grid assessment across PCT 266 and 272.	Aug 2020 Apr 2021 Aug 2021 Feb 2023 June 2023 Feb 2024 Feb 2025	PCT 266 = 132 ha PCT 272 = 575 ha PCT 277 = 48 ha PCT 281 = 12.5 ha PCT 461 = 2 ha TOTAL = 770 ha	No

Species	Method	Timing of Survey	Effort / area	Present?
Cullen parvum	5 m transect along roadside. Whilst this was conducted outside the required survey period, no similar vegetative material was recorded during the survey warranting additional investigations.	Feb 2023	Inland Slopes PCT 277 = 16 ha TOTAL = 16 ha	No
Dichanthium setosum	5 m wide transects in PCT 281 and 461. 550 Grid assessment across PCT 266	Jan 2021 Feb 2021 Feb 2023 Feb 2025	Inland Slopes PCT 281 = 12.5 ha PCT 461 = 2 ha TOTAL = 15 ha	No
Diuris tricolor	5 m wide transects in PCT 76.	Oct 2025 Nov 2025	Inland Slopes PCT 76 = 2.37 ha TOTAL = 2.37 ha	Assumed present in inaccessible and areas not adequately surveyed (0.41 ha).
Eucalyptus alligatrix subsp. alligatrix	Meandering transects whilst vegetation mapping, VI Plots and rapid points. 20 m wide transects in PCT 331 whilst doing VI plots	Aug 2020 Jan 2021 Feb 2021 Apr 2021 Aug 2021 Feb 2023	Inland Slopes PCT 331 = 3 ha TOTAL = 3 ha	No
Euphrasia arguta	5 m wide transects 556 grid circles	Feb 2022 Feb 2025	Inland Slopes PCT 84 = 12.5 PCT 266 = 87 ha PCT 272 = 424 ha PCT 274 = 3 ha PCT 277 = 46 ha PCT 281 = 12.5 ha TOTAL = 585 ha	No
Grevillea divaricata	Meandering transects whilst vegetation mapping, VI Plots and rapid points. 20 m wide transects whilst doing VI plots This species is associated with rocky river margins (OEH 2025b) and areas not associated with this habitat feature were deemed unsuitable. These areas were surveyed. Inaccessible areas were not surveyed	Aug 2020 Jan 2021 Feb 2021	Hill End PCT 270 = 1 ha PCT 331 = 46 ha TOTAL = 47 ha	Assumed present in inaccessible and areas not adequately surveyed.
Grevillea wilkinsonii	5 m wide transects 556 grid circles Whilst this was conducted outside the required survey period, no	Feb 2023 Feb 2025	Inland Slopes PCT 266 = 87 ha TOTAL 87 ha	No

Species	Method	Timing of Survey	Effort / area	Present?
	similar vegetative material was recorded during the survey warranting additional investigations.			
Indigofera efoliata	Meandering transects whilst vegetation mapping, VI Plots and rapid points. 5 m wide transects along roadside. Whilst this was conducted outside the required survey period, no similar vegetative material was recorded during the surveys warranting additional investigations. Whilst it is acknowledged that this species dies back to root stock during unfavourable conditions, it is also known to flower in August to October and fruiting in November to February (OEH 2025).	Aug 2020 Jan 2021 Feb 2021 Apr 2021	Inland Slopes PCT 76 = 3.5 ha TOTAL = 3.5 ha	No
Persoonia marginata	Meandering transects whilst vegetation mapping, VI Plots and rapid points 5 m wide transects along roads This species is associated with sandy soils (NPWS 2000) on sandstone (OEH 2025c) so the survey effort focused on areas.	Aug 2020 Jan 2021 Feb 2021 Apr 2021 Feb 2023 Feb 2024	PCT 287 = 283 ha TOTAL = 283 ha	Assumed present in inaccessible areas and areas not adequately surveyed
Pomaderris cotoneaster	Meandering transects whilst vegetation mapping, VI Plots and rapid points 5 m wide transects along roads 556 grid circles Whilst this was conducted outside the required survey period, no similar vegetative material was recorded during the surveys warranting additional investigations.	Aug 2020 Jan 2021 Feb 2021 Apr 2021 Aug 2021 Feb 2023 Feb 2025	Inland Slopes PCT 281 = 12.5 ha TOTAL = 12.5 ha	No
Pomaderris queenslandica	Meandering transects whilst vegetation mapping, VI Plots and rapid points 5 m wide transects along roads 556 grid circles Whilst this was conducted outside the required survey period, no similar vegetative material was recorded during the surveys	Aug 2020 Jan 2021 Feb 2021 Apr 2021 Aug 2021 Feb 2023 Feb 2025	Inland Slopes PCT 84 = 12.5 ha PCT 331 = 3 ha TOTAL = 15 ha	No

Species	Method	Timing of Survey	Effort / area	Present?
	warranting additional investigations.			
Prasophyllum petilum	5 m wide transects in PCT 277 and PCT 281.	Oct 2025 Nov 2025	Inland Slopes PCT 277 = 10.15 ha PCT 281 = 2.36 ha TOTAL = 12.51 ha	Assumed present in inaccessible and areas not adequately surveyed (8.08 ha).
Swainsona recta	5 m wide transects in PCT 76, PCT 266, PCT 270 and PCT277.	Oct 2025 Nov 2025	Inland Slopes PCT 266 = 18.85 ha PCT 277 = 10.15 ha PCT 281 = 2.36 ha TOTAL = 31.36 ha	Assumed present in inaccessible and areas not adequately surveyed (42.09 ha).
Swainsona sericea	5 m wide transects in PCT 76, PCT 266, PCT 277, PCT 281, PCT 331 and PCT 461.	Oct 2025 Nov 2025	Inland Slopes PCT 266 = 18.85 ha PCT 277 = 10.15 ha PCT 281 = 2.36 ha TOTAL = 31.36 ha	Assumed present in inaccessible and areas not adequately surveyed (96.83 ha).
Tylophora linearis	5 m wide transects 556 grid circles PCT 461 was not surveyed	Jan 2021 Apr 2021 Feb 2022 Feb 2025	Inland Slopes PCT 272 = 424 ha PCT 331 = 3 ha TOTAL = 427 ha	Assumed present in PCT 461

4.5.6. Survey effort

Survey effort undertaken within the Development Corridor and within additional areas is summarised in Table 4-12 and shown in Figure 4-7 and Figure 4-8.

Table 4-12: Summary of targeted survey effort

Method	Habitat (ha)	Stratification units	Total effort	Target species
Area search	1447 ha	Woodlands Derived native Grasslands Creeklines	46 sites, 32 person hours plus incidental observations over 73 separate survey days.	Diurnal Birds
Call playback	1447 ha	Woodlands	24 nights across 25 locations. 288 hours	Barking Owl, Powerful Owl, Masked Owl Koala and Bush Stone Curlew
Bat Call recording	1447 ha	Derived Native Grassland Woodland Dams	64 sites, 256 survey nights Wind mast – 5m and 80 m for 32 survey nights	Threatened bats.

Method	Habitat (ha)	Stratification units	Total effort	Target species
			Met mast – 2m, 50m and 100m for minimum of 152 trap nights 2025 19 sites, 228 trap nights during three seasons in 2024	
Random meander	1447 ha	Derived native Grassland Woodland	108 VI plots and 200 rapid points	Flora
Remote camera traps		Woodland	90 cameras deployed for 14 nights (89 cameras recording 1246 trap nights)	Squirrel gliders, Greater Glider, Koala, Eastern Pygmy possum, Brush-tailed Phascogale
Spotlighting		Woodland Paddock trees DNG with LWD	24 nights across 25 locations (288 hours)	Barking Owl, Powerful Owl, Masked Owl Koala and Bush Stone Curlew, Squirrel Glider, Greater Glider, Brush-tailed Phascogale.
Transects – 5m wide for herbs, orchids and grasses	127 ha	Woodland DNG	3 days along southern transmission line x 3 ecologists 46days along Yarrabin Road Upgrade areas x 2 ecologists	*Tylophora linearis, Euphrasia arguta* *Dichanthium setosum, Dirurus tricolor, Prasophylum petilum*
Transects – 20m wide for shrubs and trees	700 ha	Woodland DNG	16 days x 4 ecologists	*Pomaderris queenslandica, P. cotoneaster, Eucalyptus alligatrix, Acacia ausfeldii, Grevillea wilkinsonii*
Two phase grid based systematic search. 40m circles (550 x 1256m2) at 100 m grid locations	68 ha	Woodland DNG	4 days x 7 ecologists	*Tylophora linearis, Euphrasia arguta. Pomaderris queenslandica, G. wilkinsonii,*

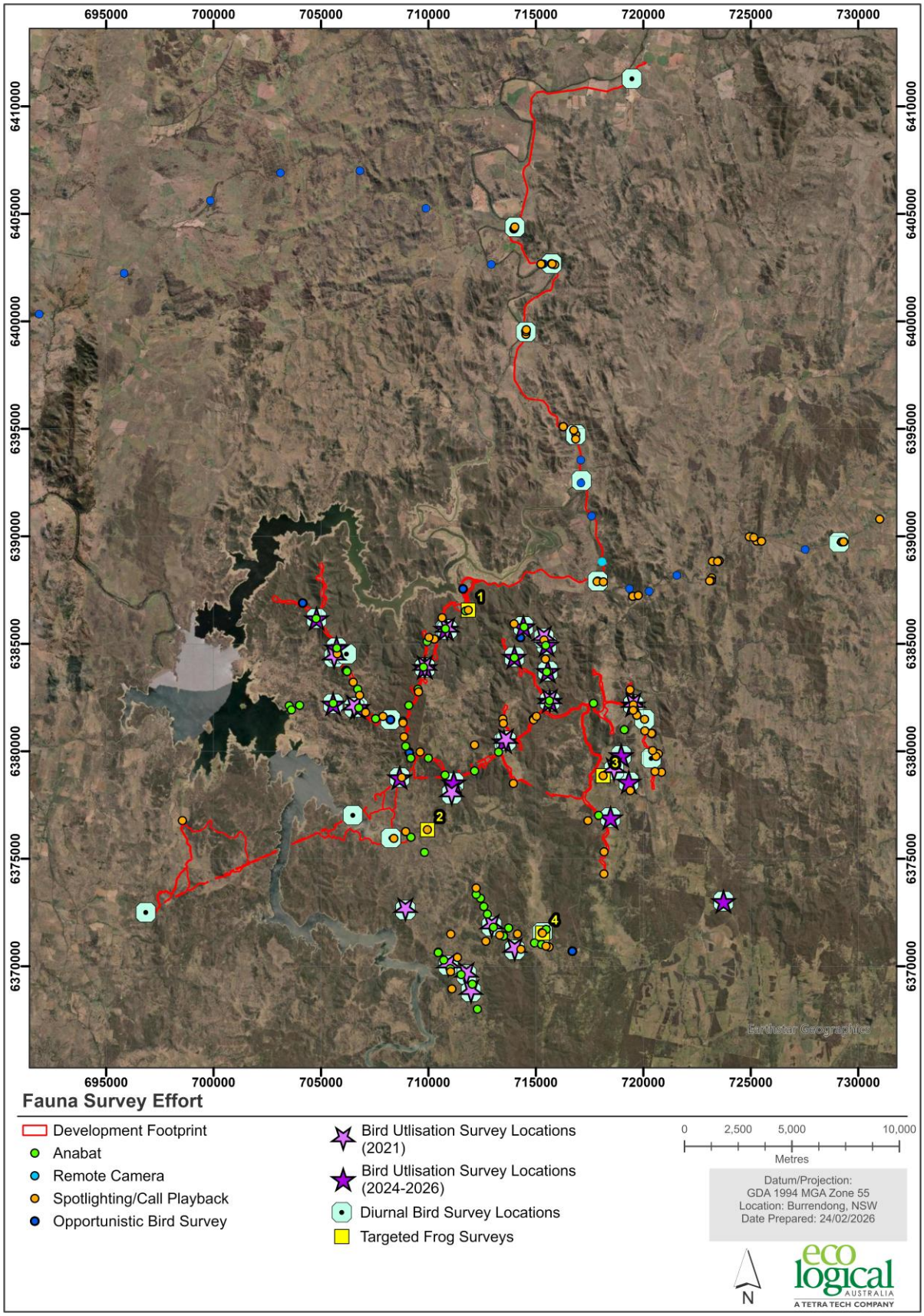


Figure 4-7: Targeted fauna surveys

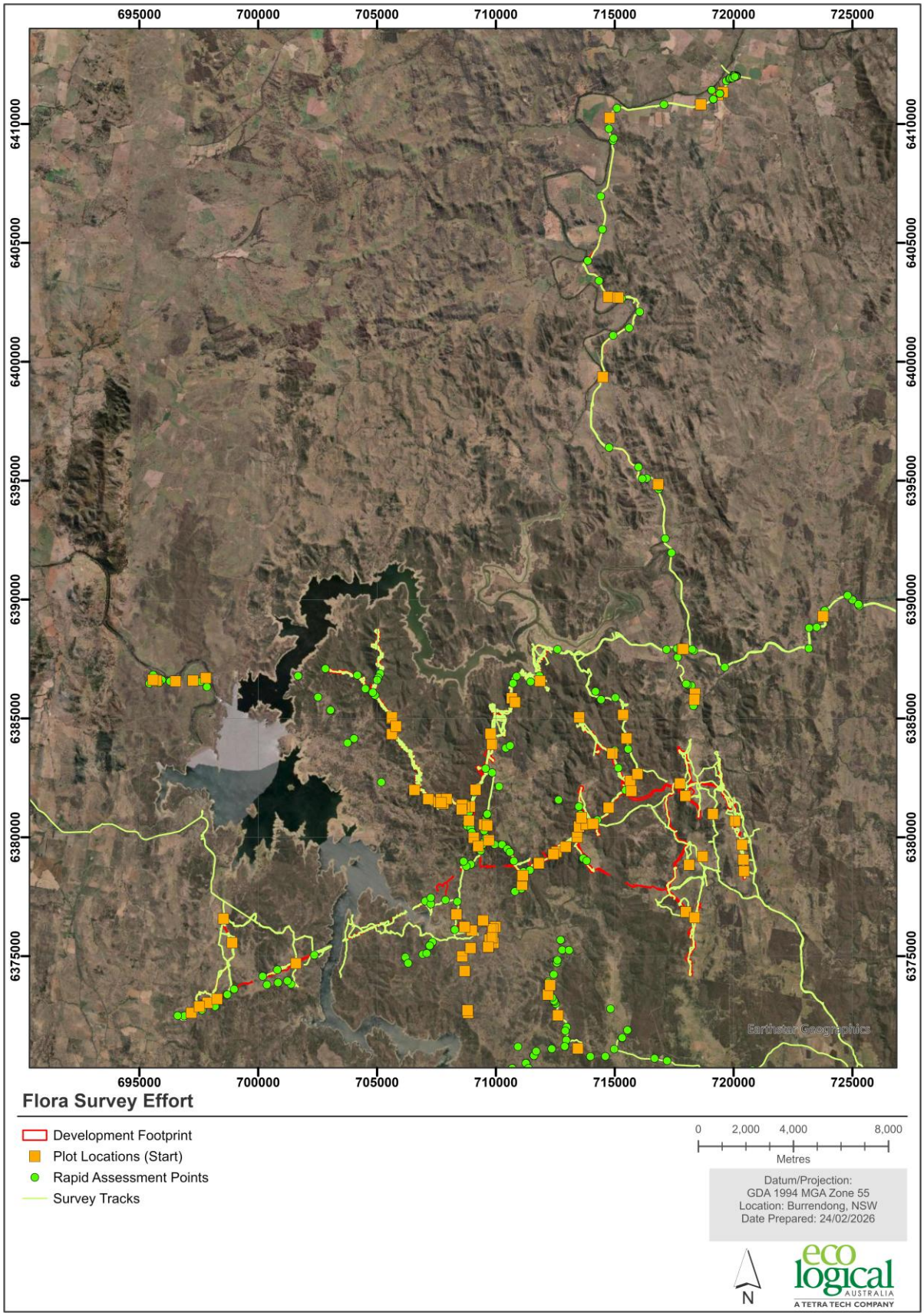


Figure 4-8: Targeted flora surveys

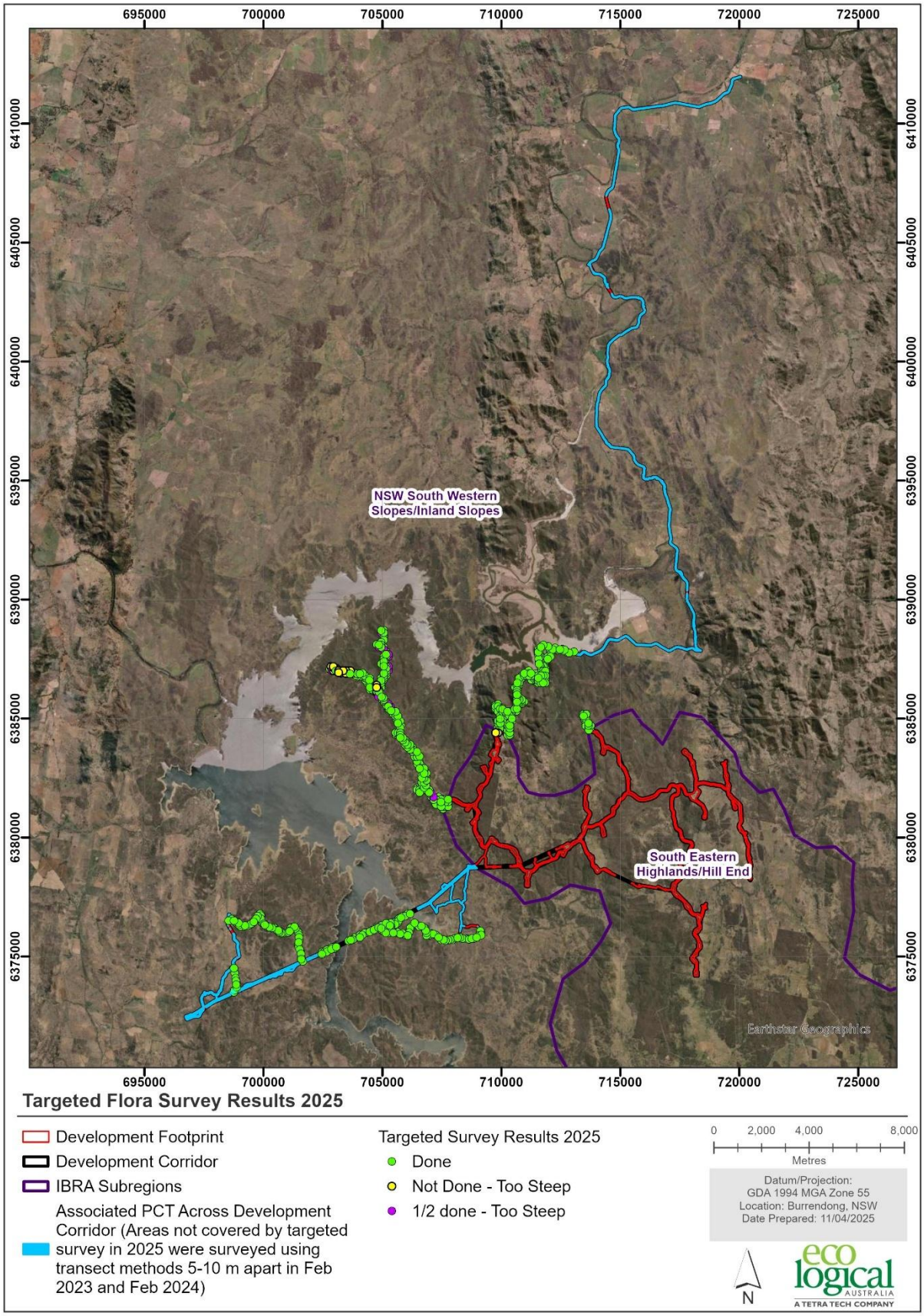


Figure 4-9: Grid surveys 2025

4.5.7. Threatened fauna

Habitat surveys were not undertaken for the following species, and they were initially assumed to be present across all sections within their associated PCTs across the entire Development Footprint. Expert reports and additional targeted field survey have now been completed for these species:

- Pink-tailed Worm-lizard
- Key's Matchstick Grasshopper.

One night of nocturnal spotlighting and call playback was undertaken along the southern transmission line. Access issues prevented further surveys on the west side of Lake Burrendong. This survey effort was inadequate and therefore the following species have also been included in the assessment for this section of the proposed development:

- Eastern Pygmy Possum
- Barking Owl
- Powerful Owl
- Squirrel Glider
- Brush-tailed Phascogale
- Masked Owl.

Due to changes made to the Development Footprint within the Road Upgrade areas, surveys were not undertaken for Brush-tailed Phascogale during the required survey period and therefore credits have also been calculated for this species along this section.

4.5.8. Threatened flora

Areas that were not surveyed due to being inaccessible or partially surveyed were included in the BAM-C for the following species:

- *Grevillea divaricata*
- *Persoonia marginata*
- *Tylophora linearis*
- *Diuris tricolor*
- *Swainsona recta*
- *Swainsona sericea*
- *Prasophyllum petilum*.

4.5.9. Insufficient survey effort

A desktop review of the Development Corridor (Figure 4-10) was undertaken to identify areas where survey effort was limited or incomplete. Within the Hill End subregion, small areas of PCT 287 and PCT 331 (Table 4-13) were identified as lacking adequate survey coverage for threatened flora. These areas correspond to potential habitat for *Grevillea divaricata* and *Persoonia marginata*. To account for the potential presence of these threatened flora species, these areas were conservatively included within the species polygons. This approach ensures that all potentially suitable habitat is captured in the assessment.

Table 4-13: Insufficient surveyed areas

PCT	Condition	Area (ha)	Location within Project Site
PCT 287	DNG	16.46	Powerline (0.62 ha) Windfarm (15.83)
PCT 287	Good	36.54	Powerline (0.03 ha) Windfarm (30.5 ha)
Total		**47**	
PCT 331	DNG	0	
PCT 331	Good	3.96	Powerline (0.13 ha) Windfarm (3.82 ha)
Total		**3.96**	
TOTAL		**51**	

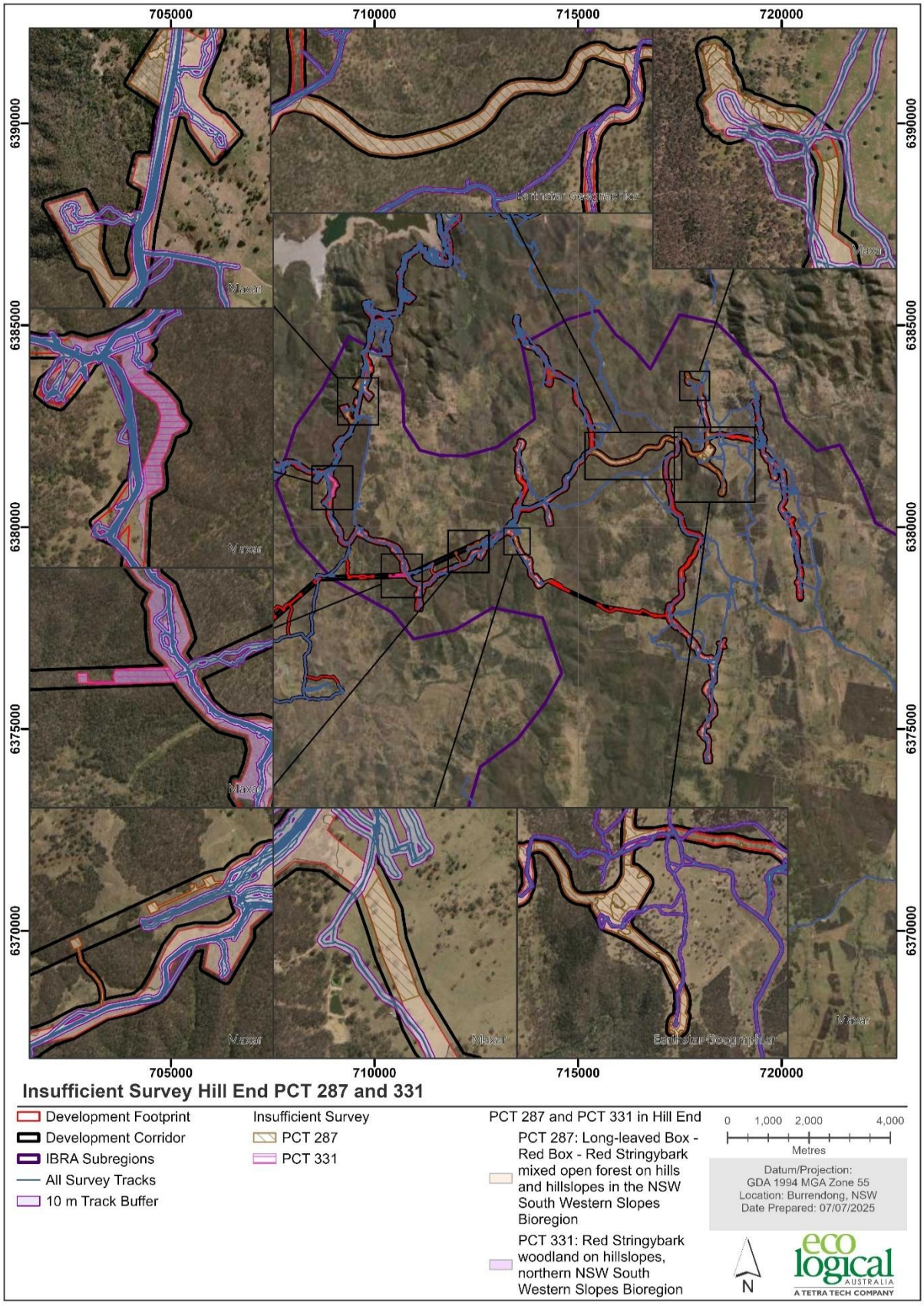


Figure 4-10: Areas of insufficient surveys in the Hill End Subregion

4.6. Results of targeted surveys

Threatened species recorded within the Project Site are provided in Figure 4-14.

One White-bellied Sea Eagle was recorded opportunistically on 26 January 2023 by Senior Ecologist Cheryl O'Dwyer. This individual was flying around the dam. One Little Eagle was observed flying above the open paddock whilst travelling along Burrendong Dam Road and a pair was observed flying on the foreshore of the Dam. A discarded possum tail was found during the field visit with CPHR indicating the presence of Powerful Owls. No other predatory avifauna species or evidence of their breeding (i.e. large stick nests) were observed during the surveys. Appendix E provides a complete list of species observed.

Hollow bearing trees inspected during targeted surveys had no evidence of use by any threatened fauna with more common species such as Galahs, Red-rump parrots and Brush-tailed possums typically using hollow within the Development Corridor.

A pair of Glossy Black-Cockatoos were recorded at BUS site Control 4, located outside the Development Corridor. The individuals were observed feeding within a stand of *Allocasuarina* species, which are known food sources for this species. There were no signs of breeding behaviour observed during the survey. Given the location and context of the observation, the species was considered to be present in a foraging capacity only and was therefore classified as an ecosystem-credit species for the purposes of the assessment.

White-throated Needletails (7 to 20 individuals) were observed soaring above in the north east section of the Development Corridor in 2020 north east of WTG 21 and WTG 40-42. A flock of approximately 60 individuals were recorded during surveys in 2024 above WTG 27 and 28.

There is a known population of Superb Parrots that are routinely observed along 12 Mile Rd near Wellington residing within *Eucalyptus melliodora* located within the Project Site. However, no individuals were recorded within the Development Corridor.

4.6.1. Nocturnal Surveys

During targeted surveys for threatened owls no response was detected despite call playback searches in areas considered to be good habitat with large hollows. No nocturnal threatened birds were seen or heard during the August 2020, December 2020 and August 2021 nocturnal call playback survey. *Podargus strigoides* (Tawny Frogmouth), *Ninox boobook* (Boobook Owl) and *Aegotheles cristatus* (Owlet Nightjar) were observed during spotlighting. *Pseudocheirus peregrinus* (Common Ringtail Possum) and *Trichosurus vulpecula* (Common Brushtail possum) were regularly observed within the Development Corridor. An unidentified glider (*Petaurus* sp.) was observed briefly but due to its size it was most likely *P. breviceps* (Sugar Glider). This result was further supported from camera traps with all the images of gliders identified as *P. breviceps* (Plate 4-10). *Acrobates pygmaeus* (Feathertail Glider) was also observed. None of the images were identified as being Eastern Pygmy Possum, Brush-tailed Phascogales, Greater Gliders or Squirrel Gliders.



Plate 4-10: Sugar Glider

During call playback a faint reply call of a male koala was heard. A male was also heard call during a subsequent site visit. Given the recent sightings in the broader landscape, i.e. at Grattai, Hargraves, World's End, along Hill End Road and surrounds, it is likely that koalas are present, although in small numbers. An individual was recorded outside of the Development Corridor in the vicinity of BBUS location Impact 11 on 5 February 2025. Species credits have been calculated for this species across associated PCTs.

4.6.1.1. Forest Owls

Forest owls require large, contiguous home ranges that support sufficient prey populations and contain mature hollow-bearing trees suitable for breeding. Home ranges for Powerful Owls and Barking Owls typically exceed 2,000 ha, while Masked Owls have home ranges of 1,000 ha. These species are classified as species-credit species for breeding habitat and ecosystem-credit species for foraging habitat. Creating species polygons for threatened forest owls requires all vegetation zones within 800 m of the location of a detected owl which contain suitable breeding hollows (>20 cm above 4 m) (TBDC 2025).

Each forest owl species displays distinct habitat preferences. Powerful Owls are typically associated with sheltered gullies and wet forests that have a dense understory, particularly in areas along watercourses containing old-growth eucalypt trees (Bilney 2013). In contrast, Barking Owls are more commonly found in semi-cleared or open woodland habitats near rivers and creeks, where scattered large trees provide nesting sites (Kavanagh 1995). Masked Owls display broader habitat tolerance and occupy areas extending further inland. Their preferred habitat overlaps with those of both Powerful and Barking Owls but also includes open forests and woodlands throughout the tablelands and western slopes (Debus 1993).

While a discarded possum tail was found on site within PCT 272, (a non-associated PCT) indicating the potential presence of Powerful Owls, the species is unlikely to be breeding within this PCT. This record is treated as an ecosystem species for foraging habitat, and a breeding habitat species polygon is not required.

Survey coverage across the southern portion of the Development Corridor was limited. Due to this lack of targeted survey effort, the presence of all three forest owl species was assumed in accordance with the BAM 2020 precautionary guidelines. As a result, the species polygons for breeding habitat were calculated by incorporating the full extent of the associated PCTs, rather than mapping individual hollow-bearing trees. While this broad mapping approach ensures compliance with survey limitations, it likely overestimates the actual area of breeding habitat, as it assumes the presence of suitable hollows throughout the entire PCT area. For comparison, this mapped extent is equivalent to modelling breeding habitat around 675 trees with an 800-metre buffer, which would exceed the number and distribution of hollow-bearing trees that would typically be observed in a field-verified assessment.

In late 2025, a recording of Powerful Owl and Masked Owl were added to the BioNet database. Adding an 800 m buffer around these locations does not overlap with the Development Corridor.

4.6.2. Microbat surveys

The initial baseline survey undertaken in summer 2020/21 was analysed by ELA Bat Ecologists Dr Rodney Armitage and Alicia Scanlon. Call analysis for recordings collected during surveys undertaken in 2024 and 2025 were analysed by RA Environmental Consultants (Dr Rodney Armistead), Specialised Zoological, and Balance! Environmental. Call data was analysed for the presence and call activity (calls per night) of all detectable microbat species and species complexes, with microbat call reports for each survey provided in Appendix K of the BDAR.

A total of 23 species of microbat (Table 4-14) were either identified as present or potentially present from all microbat call recordings across the combined 2020 – 2025 survey period. Approximately 74% of definite, positively identified calls across the combined survey period were recorded from just four common species:

- Gould's Wattled Bat (*Chalinolobus gouldii*) – 14,222 total calls, 30%
- South-eastern Freetail Bat (*Ozimops planiceps*) –10,872 total calls, 23%
- White-striped Freetail Bat (*Austronomus australis*) – 5,447 total calls, 11%
- Little Forest Bat (Vespadelus vulturnus) – 4,918 total calls, 10%.

Table 4-14: Bats recorded within the Project Site

Species	Common Name	BC Act	EPBC Act
Austronomus australis	White-Striped Free-tailed Bat		
Chalinolobus dwyeri	Large-eared Pied Bat	V	V
Chalinolobus gouldii	Gould's Wattled Bat		
Chalinolobus morio	Chocolate Wattled Bat		
Chalinolobus picatus	Little Pied Bat	V	
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	
Miniopterus australis	Little Bent-winged Bat	V	
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	
*Nyctophilus corbeni**	Corben's Long-eared Bat	V	V
*Nyctophilus geoffroyi**	Lesser Long-eared Bat		
*Nyctophilus gouldi**	Gould's Long-eared Bat		

Species	Common Name	BC Act	EPBC Act
*Ozimops petersi**	Inland Free-tailed Bat		
Ozimops planiceps	South-eastern Free-tailed Bat		
Ozimops ridei	Ride's Free-tailed Bat		
Saccolaimus flaviventris	Yellow-bellied Sheath-tailed Bat	V	
Scotorepens balstoni	Inland Broad-nosed Bat		
Scotorepens greyii	Little Broad-nosed Bat		
Scotorepens orion	Eastern Broad-nosed Bat		
Scoteanax rueppellii	Greater Broad-nosed Bat	V	
Vespadelus darlingtoni	Large Forest Bat		
Vespadelus regulus	Southern Forest Bat		
Vespadelus troughtoni	Eastern Cave Bat	V	
Vespadelus vulturnus	Little Forest Bat		

*Potentially present. V = Vulnerable listed species under the NSW BC Act / Commonwealth EPBC Act.

Eight threatened species were definitively recorded as present during microbat surveys:

- *Chalinolobus dwyeri* (Large-eared Pied Bat) – 30 total calls, 0.06%
- *Chalinolobus picatus* (Little Pied Bat) – 9 total calls, 0.02%
- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle) – 18 total calls, 0.04%
- *Miniopterus australis* (Little Bent-winged Bat) – 3 total calls, <0.01%
- *Miniopterus orianae oceanensis* (Large Bent-wing bat) – 3,010 total calls, 6%
- *Saccolaimus flaviventris* (Yellow-bellied Sheath-tailed Bat) – 115 total calls, 0.24%
- *Scoteanax rueppellii* (Greater Broad-nosed Bat) – 41 total calls, 0.09%
- *Vespadelus troughtoni* (Eastern Cave Bat) – 15 total calls, 0.03%.

Nyctophilus corbeni (Corben's Long-eared Bat), listed as vulnerable under both the BC Act and EPBC Act could also potentially be present within the Development Corridor. This is based upon the recording of calls that could potentially be attributed to this species, as well as the presence of suitable habitat for the species. In this part of NSW, the calls of Corben's Long-eared Bat is indistinguishable from two other more common and non-listed Long-eared Bats, *Nyctophilus geoffroyi* and *Nyctophilus gouldi* (Pennay et. al 2004). The *Nyctophilus* species group was recorded commonly in the Project Site, with their calls making up 4.7% of the total proportion of calls.

Overall, threatened species were detected only infrequently, with the proportion of total calls from each species only exceeding 0.1% for two species, Large Bent-winged Bat (6%) and Yellow-bellied Sheath-tailed Bat (0.24%). Outside of these two species, this very low detection rate suggests these species are uncommon in the Project Site.

One megabat species, Grey-headed Flying-fox (*Pteropus poliocephalus*), whilst not recorded during field surveys, is known to occur in the surrounding locality (NSW DCCEEW 2025) and with suitable foraging habitat present within the Project Site, has therefore been included in the bat risk assessment (see Section 6).

Field surveys confirmed that the Development Corridor does not contain any caves, cliffs or rocky crevices and the GIS desktop assessment that these potential breeding habitat features for cave dwelling microbats are not present within 2 km of the Development Corridor.

4.6.2.1. Seasonal bat activity

Bat activity across the Project Site has followed expected seasonal trends, with the highest number of calls and call activity recorded during summer 2025, spring 2024 and summer 2020-21, with lowest activity recorded during autumn 2024 and winter 2024 (Table 4-15). This pattern is typical of insectivorous bats, whose activity levels decline in cooler months due to reduced insect abundance, with many species entering daily torpor (Churchill 2008). Summer also represents a key period for foraging and reproductive activity of many locally-occurring microbat species.

Table 4-15 Bat call activity (calls per night) during seasonal BUS

Season	Total Survey Nights	Total Calls	Call Activity (calls/night)
Summer 2020/21	210	46192	219.96
Autumn 2024	64	6411	100.17
Winter 2024	64	7370	115.16
Spring 2024	76	20348	267.74
Summer 2025	72	35656	495.22
Autumn 2025	73	16528	226.41

4.6.2.2. Bat activity at height

Met mast BDG 1 recorded data at 50 m during spring 2021 and summer 2022 and both met mast BDG1 and BDG2 have recorded data at 50 m and 100 m from spring 2024 to autumn 2025. The location of met masts BDG1 and BDG2 within the Development Footprint are displayed in Figure 4-5. The typical call detection range of the SongMeter SM4BAT and SMM-U2 Microphone is approximately 30 m (Agranat 2014) and therefore, microphone placement at 50 m has the potential to record bat activity from approximately 20 m to 80 m height, additionally due to the overlap in recoding range for the three microphones, it's noted that some calls could have been recorded by two of the microphones simultaneously resulting in double counting of calls, refer to Figure 4-11. Given a small proportion of these calls reflect bat activity within or near to the lower RSA and that it is not possible to determine at what height the call was made, a conservative approach has been taken to include all of the 50 m recorded calls for the at height bat activity analysis detailed below. Figure 4-11 demonstrates the design of vertically stratified at height monitoring on met masts BDG1 and BDG2 and the approximate recording range of the detectors of the detectors placed on the masts, relative to the proposed WTG RSA.

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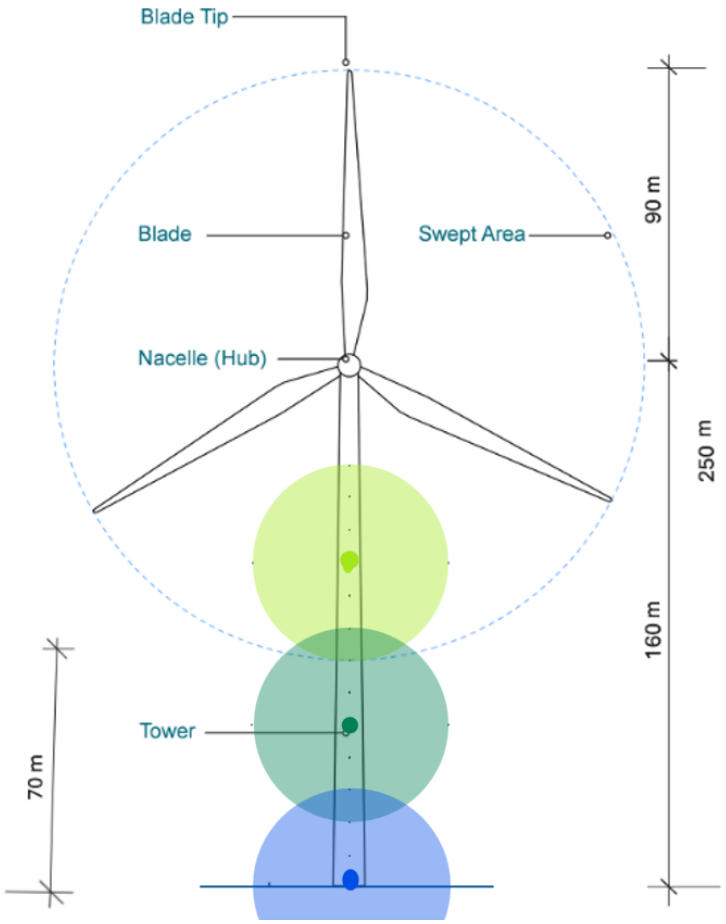


Figure 4-11: At height, vertically stratified microbat call monitoring utilised met masts with ground-based detectors (2 m; blue dot) and at height detectors at 50 m (dark green dot) and 100 m (light green dot), each with an approximate 30 m recording range. The 50 m and 100 m detectors provide microbat call activity data which partly intersects the lower RSA of proposed WTGs

The proportion of microbat calls declined substantially with increasing height, with approximately 85% fewer calls recorded at 50 m and 100 m combined, compared to calls recorded at 2 m. A marked reduction in calls was also evident at 100 m compared to 50 m, with approximately 64% fewer calls recorded at 100 m and several species recorded at 50 m only (Table 4-16). This pattern of decreased bat call activity with increased height aligns with findings from other Australian wind farms (Wind Energy Partners 2020; Biosis 2023). The South-eastern Freetail Bat (*Ozimops planiceps*) recorded by far the highest proportion of at height calls, responsible for 36% of all total calls, double the next highest single-species in White-striped Freetail Bat (*Austronomus australis*) with 18% of total calls (Figure 4-12; Table 4-16). Both species commonly forage on flying insects well above the canopy height, though both still recorded a pattern of fewer calls at increased altitude (Figure 4-12).

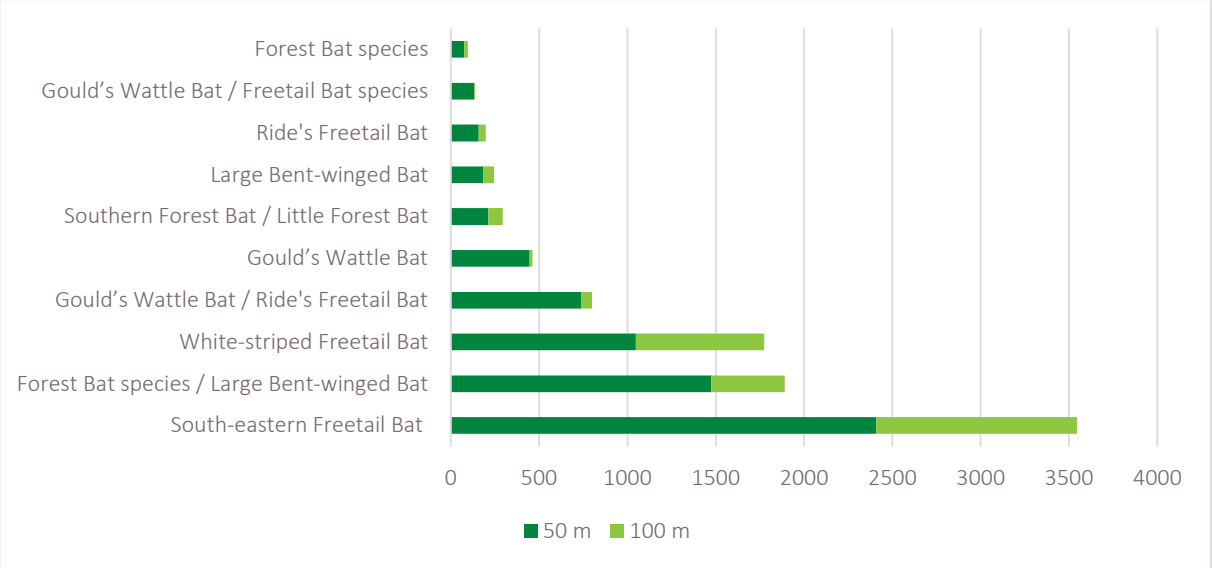


Figure 4-12: Total number of bat calls at 50 m and 100 m for the most abundant microbat species / species complexes

Three threatened microbat species, the Large Bent-winged Bat (*Miniopterus orianae oceanensis*), Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*) and Greater Broad-nosed Bat (*Scoteanax rueppellii*) were definitively recorded at height, with a fourth species, Eastern False Pipistrelle (*Falsistrellus tasmaniensis*), potentially recorded (Table 4-16). Greater Broad-nosed Bat calls were only recorded at 50 m, whilst the other threatened species recorded calls at both 50 m and 100 m, however, proportionally much fewer calls at 100 m (Table 4-16). Overall, definite threatened species call activity at height was low and proportionally only 2.7% of total calls, with fewer than one call per night for each of Large Bent-winged Bat (0.92 calls/night), Yellow-bellied Sheathtail Bat (0.03 calls/night) and Greater Broad-nosed Bat (0.05 calls/night).

Additional potential Large Bent-winged Bat calls were recorded at height as part of the Forest Bat / Large Bent-winged Bat species complex which includes the three locally occurring, common and non-listed Large Forest Bat, Little Forest Bat and Southern Forest Bat species. Calls from this species group are difficult to definitively assign to an individual species given similarities and overlaps in the call frequency and pulse characteristics of these species (Pennay et al. 2004). Whilst it is not possible to attribute the precise proportion of species group calls to individual species, proportionally assessing the definite calls for each species within the species group has been recommended for Victorian wind farm assessments (see DEECA 2025). Of the total definite calls recorded from the four species within the Forest Bat / Large Bent-winged Bat species complex, Large Bent-winged Bat contributes 245 of 770 definite calls or 31.8% (Table 4-16). Indicatively, 31.8% of the 1,890 total at height calls of the Forest Bat / Large Bent-winged Bat species complex (601 calls) could therefore be assigned to Large Bent-winged Bat using this proportionate approach.

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Table 4-16: At height bat calls recorded at 50 m and 100 m and call activity (calls per night) for each species / species complex

Species		Total calls	Total calls	Total calls at Height	Survey Nights	Survey Nights	Total Survey Nights	Call Activity	Call Activity	Total Call Activity
Scientific Name	Common Name	50m	100m	50/100m	50m	100m	100m/50m	50m	100m	100m/50m
A.australis	White-Striped Free-tailed Bat	1048	727	1775	152	114	266	6.89	6.38	6.67
A.australis/ S.flaviventris	White-Striped Free-tailed Bat/ Yellow-bellied Sheath-tailed Bat	21	8	29	152	114	266	0.14	0.07	0.11
C.gouldii	Gould's Wattle Bat	447	16	463	152	114	266	2.94	0.14	1.74
C.gouldii/ O.ridei	Gould's Wattle Bat / Eastern Free-tailed Bat	739	61	800	152	114	266	4.86	0.54	3.01
C.gouldii/ S.balstoni	Gould's Wattle Bat / Inland Broad-nosed Bat	4	1	5	152	114	266	0.03	0.01	0.02
C.gouldii/ S.balstoni/ Ozimops spp.	Gould's Wattle Bat / Inland Broad-nosed Bat / Free-tailed Bat species	1	0	1	152	114	266	0.01	0.00	0.00
C.gouldii/ O.planiceps	Gould's Wattle Bat / South-Eastern Free-tailed Bat	34	5	39	152	114	266	0.22	0.04	0.15
C.gouldii/ Ozimops spp.	Gould's Wattle Bat / Free-tailed Bat species	133	5	138	152	114	266	0.88	0.04	0.52
C.morio	Chocolate Wattle Bat	25	0	25	152	114	266	0.16	0.00	0.09
C.morio/ V.vulturnus	Chocolate Wattle Bat / Little Forest Bat	4	3	7	152	114	266	0.03	0.03	0.03
M.australis	Little Bent-winged Bat	0	0	0	152	114	266	0.00	0.00	0.00
M.orianae oceanensis	Large Bent-winged Bat	183	62	245	152	114	266	1.20	0.54	0.92
Nyctophilus spp.	Gould's Long-eared Bat / Lesser Long-eared Bat / Corben's Long-eared Bat	3	0	3	152	114	266	0.02	0.00	0.01
O.planiceps	South-Eastern Free-tailed Bat	2408	1137	3545	152	114	266	15.84	9.97	13.33
O.planiceps/ S.flaviventris	South-Eastern Free-tailed Bat / Yellow-bellied Sheath-tailed Bat	0	2	2	152	114	266	0.00	0.02	0.01
O.ridei	Eastern Free-tailed Bat	158	40	198	152	114	266	1.04	0.35	0.74
Ozimops spp.	South-Eastern Free-tailed Bat / Eastern Free-tailed Bat / Ride's Free-tailed Bat	11	24	35	152	114	266	0.07	0.21	0.13

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Species		Total calls	Total calls at Height	Total calls at Height	Survey Nights	Survey Nights	Total Survey Nights	Call Activity	Call Activity	Total Call Activity
S.flaviventris	Yellow-bellied Sheath-tailed Bat	7	1	8	152	114	266	0.05	0.01	0.03
S.rueppellii	Greater Broad-nosed Bat	14	0	14	152	114	266	0.09	0.00	0.05
S.balstoni	Inland Broad-nosed Bat	13	0	13	152	114	266	0.09	0.00	0.05
Scotorepens spp./ S.ruepellii/ F.tasmaniensis	Broad-nosed Bat species / Greater Broad-Nosed Bat / Eastern False Pipistrelle	24	17	41	152	114	266	0.16	0.15	0.15
V.darlingoni	Large Forest Bat	15	7	22	152	114	266	0.10	0.06	0.08
V.regulus	Southern Forest Bat	75	0	75	152	114	266	0.49	0.00	0.28
V.vulturnus	Little Forest Bat	37	2	39	152	114	266	0.24	0.02	0.15
V.darlingtoni/ V.regulus/ V.vulturnus	Large Forest Bat / Southern Forest Bat / Little Forest Bat	77	19	96	152	114	266	0.51	0.17	0.36
V.regulus/ V.vulturnus	Southern Forest Bat / Little Forest Bat	213	80	293	152	114	266	1.40	0.70	1.10
Vespadelus spp./ M.orianae oceanensis	Large Forest Bat / Southern Forest Bat / Little Forest Bat / Large Bent-winged Bat	1476	414	1890	152	114	266	9.71	3.63	7.11
Vespadelus spp./ C.morio	Large Forest Bat / Southern Forest Bat / Little Forest Bat / Chocolate Wattle Bat	54	1	55	152	114	266	0.36	0.01	0.21

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The Large-eared Pied Bat, Large Bent-wing Bat and Eastern Cave Bat require caves for roosting and can travel up to 60 km each night to forage. Whilst there are no known cliffs, caves or potential breeding habitat within the Development Footprint, populations are known from Wellington Caves (21 km) and Borenore Caves (50 km). Following the NSW guidelines (OEH 2018) species polygons for these species are associated PCTs on the subject land that are within 2 km of caves, scarps, cliffs, rock, overhangs and disused mines. Given that there are no features within the Development Footprint, nor within the Development Corridor, no species-credits are required for these species.

4.6.3. Bird Utilisation Survey (BUS)

During the BUS, a total of 125 bird species have been recorded (see Appendix E) from 10,232 individual bird observations collected over the seven seasonal survey periods. The Noisy Miner (*Manorina melanocephala*) was the most abundant and commonly recorded species, detected across all sites and seasons. The top eight most abundantly observed species are shown in Table 4-17.

Table 4-17: Most abundant birds across the Project Site

Species	Scientific Name	Total Observation
Noisy Miner	*Manorina melanocephala*	610
Noisy Friarbird	*Philemon corniculatus*	470
Yellow Thornbill	*Acanthiza nana*	469
Australian Raven	*Corvus coronoides*	340
Australian Magpie	*Gymnorhina tibicen*	294
Wedge-tailed Eagle	*Aquila audax*	224
Pied Currawong	*Strepera graculina*	196
Eastern Rosella	*Platycercus eximius*	185

A total of fifteen threatened bird species were recorded across the Project Site and surveyed surrounds (Table 4-18). Threatened bird species have been recorded across both Control and Impact BBUS sites, as well as opportunistically both within and outside of the proposed Development Corridor (including transport routes to the Project Site), indicating a relative abundance of suitable habitat for these predominantly woodland and forest dwelling species in the surrounding landscape. Of the recorded threatened bird species, only the seasonally migratory and highly mobile White-throated Needletail and the typically mobile and aerial Dusky Woodswallow were recorded flying within the Development Corridor at RSA heights (Table 4-18).

Table 4-18: Threatened bird species recorded during surveys

Common Name	*Scientific Name*	BC Act	EPBC Act	Recorded within RSA
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	Vulnerable		No
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	Vulnerable	Vulnerable	No
Diamond Firetail	*Stagonopleura guttata*	Vulnerable	Vulnerable	No
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	Vulnerable		Yes

Common Name	*Scientific Name*	BC Act	EPBC Act	Recorded within RSA
Glossy Black-Cockatoo (south-eastern)	*Calyptorhyncgus lathami lathami*	Vulnerable	Vulnerable	No
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	Vulnerable		No
Hooded Robin (south-eastern)	*Melanodryas cucullata cucullata*	Vulnerable	Endangered	No
Little Eagle	*Hieraaetus morphnoides*	Vulnerable		No
Scarlet Robin	*Petroica boodang*	Vulnerable		No
Southern Whiteface	*Aphelocephala leucopsis*	Vulnerable	Vulnerable	No
Speckled Warbler	*Chthonicola sagittata*	Vulnerable		No
Superb Parrot	*Polytelis swainsonii*	Vulnerable	Vulnerable	No
Varied Sittella	*Daphoenositta chrysoptera*	Vulnerable		No
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	Vulnerable	Vulnerable	Yes
White-throated Needletail	*Hirundapus caudacutus*	Vulnerable	Vulnerable, Migratory	Yes

A total of 16 species were recorded flying at heights RSA (65 m – 250 m) within the Development Corridor, including several raptors and threatened species (Table 4-19).

Table 4-19: Species observed flying at RSA height within the Development Corridor (65-250 m)

Species	Number of indiv. flights in RSA	Total number of indiv. flights	Proportion of flights in RSA (%)
Raptors			
Brown Falcon	3	7	42.9
Nankeen Kestrel	5	10	50.0
Peregrine Falcon	1	1	100.0
Wedge-tailed Eagle	136	230	59.1
Whistling Kite	1	2	50.0
Threatened Species			
White-throated Needletail^	148	273	54.2
Dusky Woodswallow*	24	106	22.6
Others			
Australian Raven	14	340	4.1
Australian Magpie	12	294	4.1
Australian White Ibis	20	35	57.1
Pied Currawong	9	196	4.6
Sulphur-crested Cockatoo	1	171	0.6
Great Cormorant	2	2	100.0

Species	Number of indiv. flights in RSA	Total number of indiv. flights	Proportion of flights in RSA (%)
Tree Martin	2	73	2.7

Black Shoulder-kite (*Elanus axillaris*), Brown Goshawk (*Accipiter fasciatus*), Collared Sparrowhawk (*Accipiter cirrocephalus*), Little Eagle (*Hieraaetus morphnoides*), Southern Boobook (*Ninox boobook*), White-bellied Sea Eagle (*Haliaeetus leucogaster*) and Tawny Frogmouth (*Podargus strigoides*) were also recorded within the Project Site or surrounds but not flying within the RSA. Powerful Owl (*Ninox strenua*) was not recorded from any surveys (including targeted call playback surveys) and is considered unlikely to fly at RSA heights, however, a discarded possum tail was observed, indicative of feeding behaviour of the species.

Whilst most threatened species were recorded flying at low heights, typically below 20 m (see Section 6), White-throated Needletail and Dusky Woodswallow were recorded flying within the RSA, with 54.2% and 22.6% of flights respectfully, occurring in the RSA (Table 4-19).

Wedge-tailed Eagle was the most observed raptor species, with 230 total observations, 59.1% of which occurred within RSA height. Brown Falcon (*Falco berigora*), Peregrine Falcon (*Falcon peregrinus*), Nankeen Kestrel (*Falco cenchroides*) and Whistling Kite (*Haliastur sphenurus*) were also observed flying within the RSA (Table 4-19).

4.6.3.1. Seasonal flight trends

Of all bird flights observed, approximately 95% occurred below 60 metres, indicating that most avifauna activity within the Project Site is unlikely to intersect with the WTG RSA, thus presenting a negligible to low overall collision risk for the majority of recorded bird species.

On a seasonal basis, summer 2025 recorded the highest proportion of total flight recordings within the RSA at 8.9%, whilst spring 2021 recorded the lowest proportion (0.7%; Figure 4-13). Increased flight activity within RSA heights during summer 2025 was due to the recording of multiple flocks of White-throated Needletail during their southern migration, along with relatively high Wedge-tailed Eagle activity. Apart from these two species, there were no clear seasonal trends for other bird species recorded flying within the RSA.

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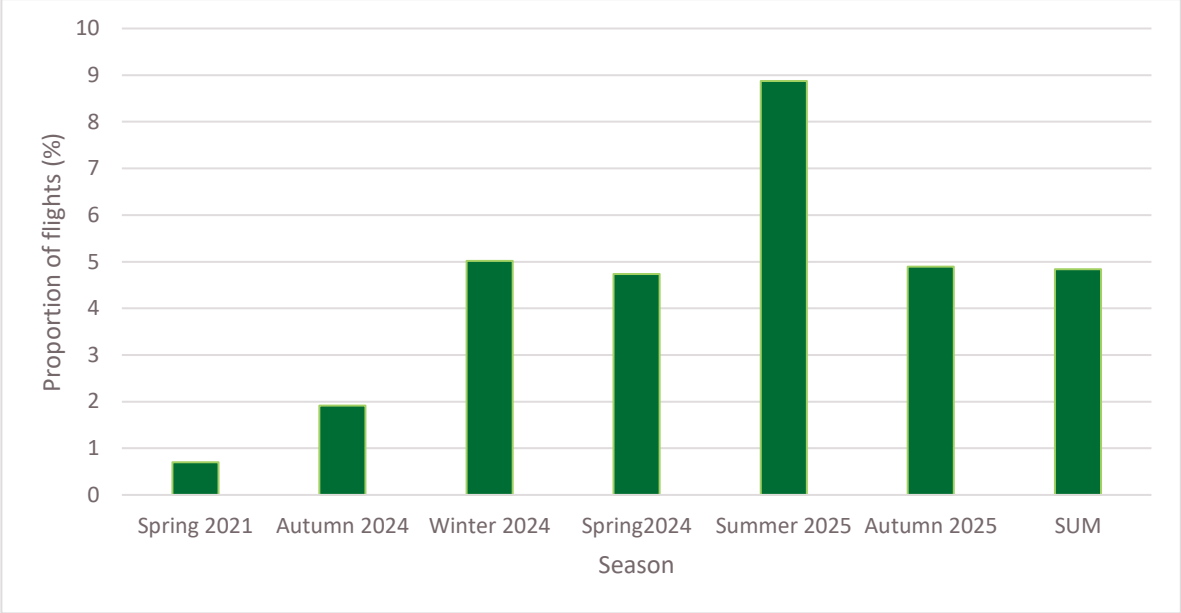


Figure 4-13: Proportion (%) of birds flying within RSA

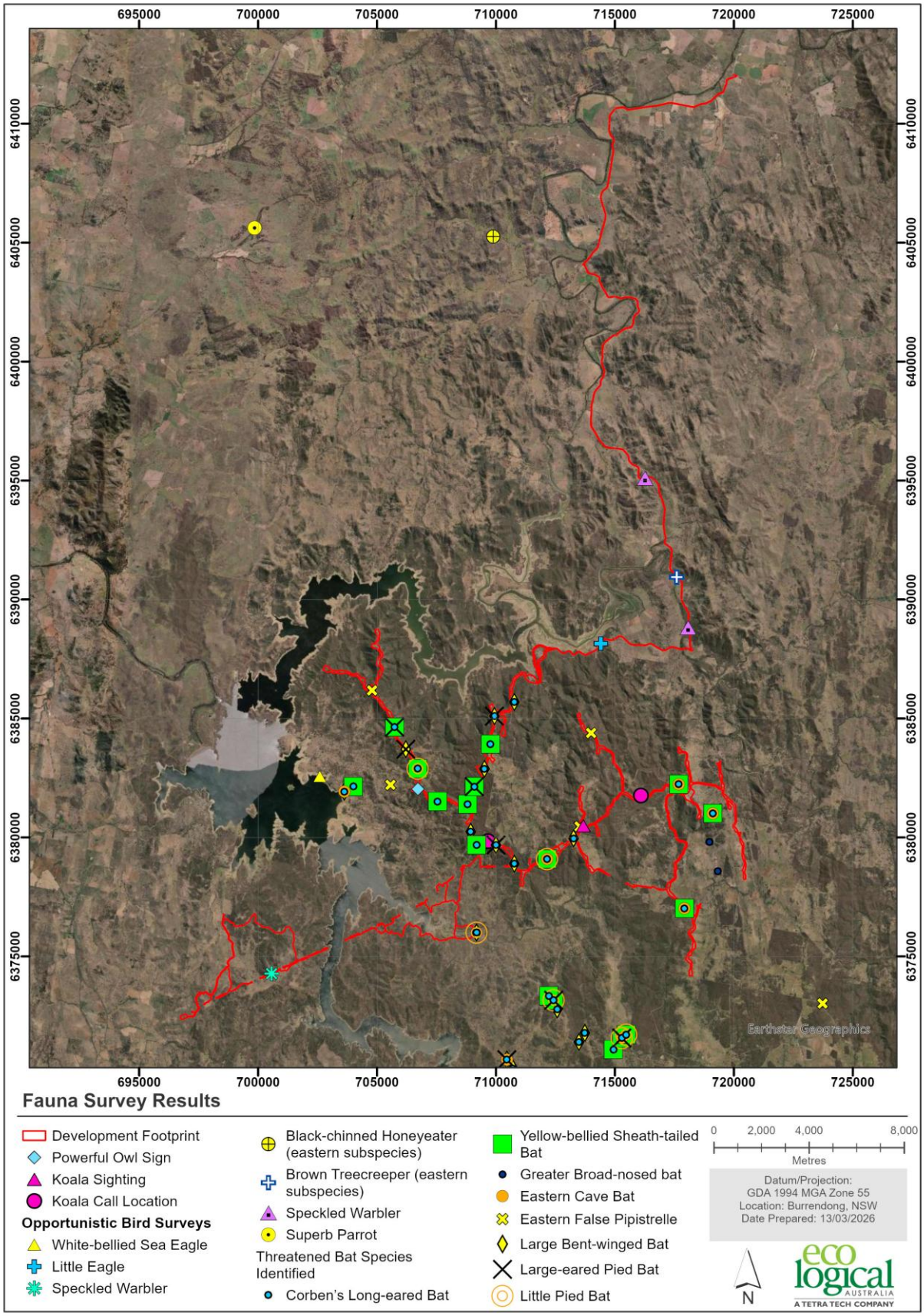


Figure 4-14: Threatened fauna survey

4.6.4. Threatened flora

No threatened plants were recorded during parallel surveys, whilst undertaking rapid or VI assessments nor during the large-scale grid assessment method. Of the 550 plots searched, 23 (<3 ha) were inaccessible due to steep, unstable terrain and were assessed as unsuitable habitat for the target species. The methodology and results were discussed with CPHR (19 May 2025; DOC25/396152) and the survey results were deemed adequate. Given the comprehensive coverage of suitable habitat and absence of target species within surveyed areas, it was reasonable to conclude that no threatened species are unlikely to occur within the small, unsurveyed portions of the Project Site.

4.6.5. Species polygons

Following completion of targeted surveys, the species credit species that are present within the Development Footprint are outlined in Table 4-20 and shown on Figure 4-15 through to Figure 4-21.

Table 4-20: Species credit species within the Development Footprint

Species	Common Name	Species presence	Number of individuals / Habitat (ha)	Biodiversity Risk Weighting
Aprasia parapulchella	Pink-tailed Legless Lizard	Yes Expert Report	Associated with PCT Inland Slopes – PCT 266 272 274 277 281 312 331 461 / Hill End – PCT 266 270 272 277 331 with a predominantly grassy ground layers with or within 50 m of partially buried rocks. All PCTs listed above were included in the BAMC. Inland Slopes subregion = 51.4 ha Hill End subregion = 13.42 ha Total = 64.82 ha	2
Phascolarctos cinereus	Koala	Yes. Recent records and suitable habitat are present on the site. A faint call was potentially heard during call playback so the species cannot be confirmed absent. Spotlighting and call playback were conducted along Yarrabin Road in August 2021 prior to the updated survey guidelines. No signs of koalas. In February 2025 one an individual was recorded near WGT 37 within the Development Corridor.	Areas identified as important habitat for breeding are PCTs associated with feed trees. All 12 PCTs are associated with koala feed trees (PCT 76, 84, 266, 270, 272, 274, 277, 281, 287, 312, 331, 461). All PCTs were put in the BAMC. Koalas were not recorded on Yarrabin Road so these areas are not included in the credit calculations. Habitat along the roadside is not contiguous with the Windfarm. Inland slopes subregion = 255.8 ha Hill End subregion = 389.79 Total = 645.59 ha	2
Swainsona sericea	Silky Swainson-pea	Presence assumed where targeted surveys were not undertaken	Found in Box Gum woodlands. Associated with PCT Inland Slopes – PCT 76 266 277 281 312 331 461 / Hill End – PCT 266 277 331. Inland slopes subregion = 19.14 ha	2

Species	Common Name	Species presence	Number of individuals / Habitat (ha)	Biodiversity Risk Weighting
			Hill End subregion = 77.69 Total = 96.83 ha	
Swainsona recta	Small Purple-pea	Presence assumed where targeted surveys were not undertaken	Associated with PCT Inland Slopes - PCT 76 266 277 312 / Hill End – PCT 266 270 277 usually in association with *Themeda australis* and *Austrostipa* spp. Inland slopes subregion = 15.58 ha Hill End subregion =26.50 ha Total = 42.08 ha	2
Diuris tricolor	Pine donkey Orchid	Presence assumed where targeted surveys were not undertaken	Associated with PCT 76, 331 and 461 with grassy understorey within the Inland Slopes sub-region. Inland slopes subregion = 0.50 ha	1.5
Prasophyllum petilum	Tarengo Leek Orchid	Presence assumed as targeted surveys were not undertaken.	This species is associated with Inland Slopes – PCT 277 and 281. Inland Slopes subregion = 8.08 ha	2
Keyacris scurra	Key's Matchstick Grasshopper	Yes Expert Report	This species was only recently included in the BAMC for PCTs within the IBRA region. It is associated with PCT 266 and 277 containing *Themeda triandra* and species of Asteraceae. Inland Slopes subregion = 5.67 ha Hill End subregion = 5.83 ha Total = 11.5 ha	2

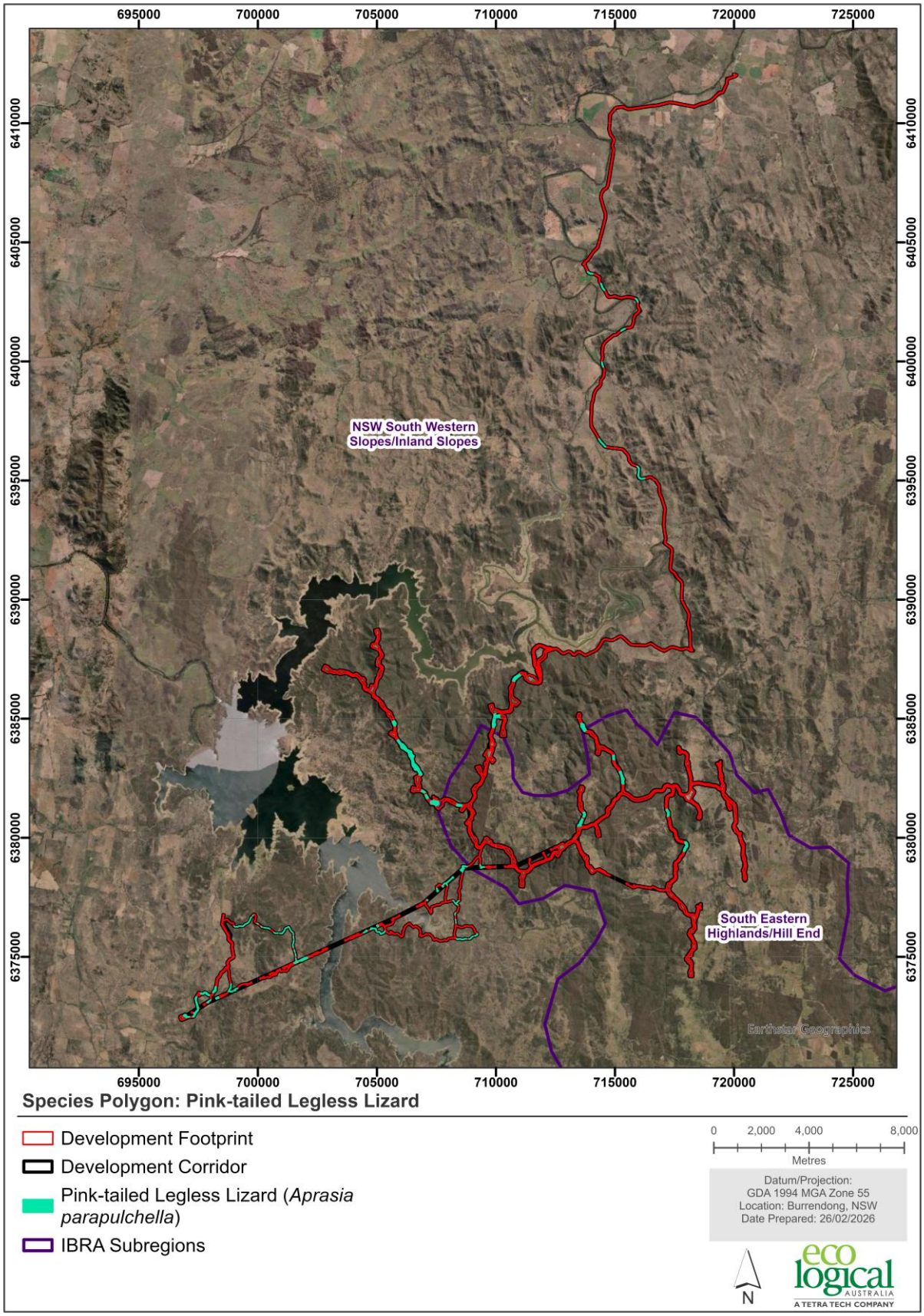


Figure 4-15: Species polygon – *Aprasia parapulchella*

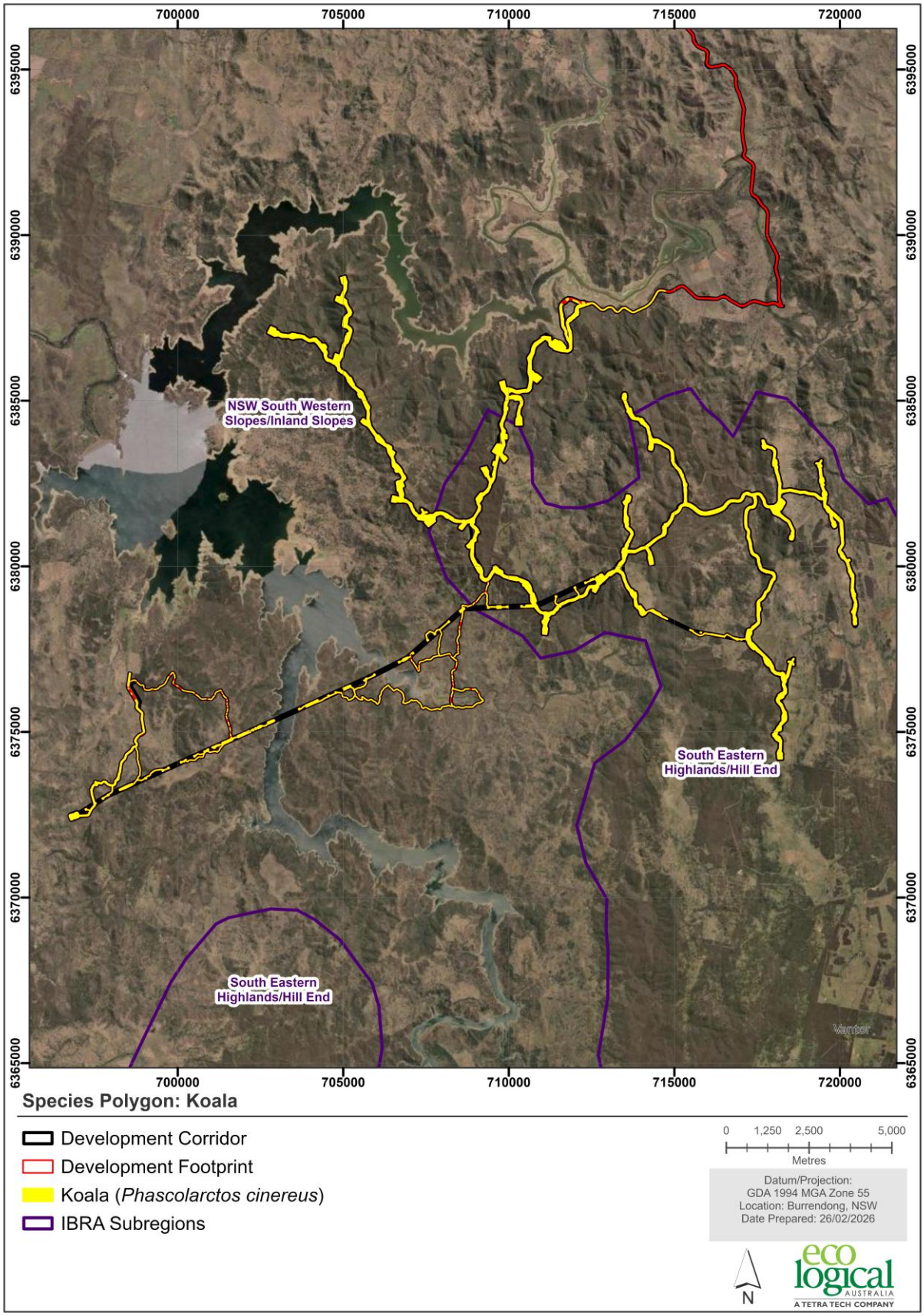


Figure 4-16: Species polygon – Koala

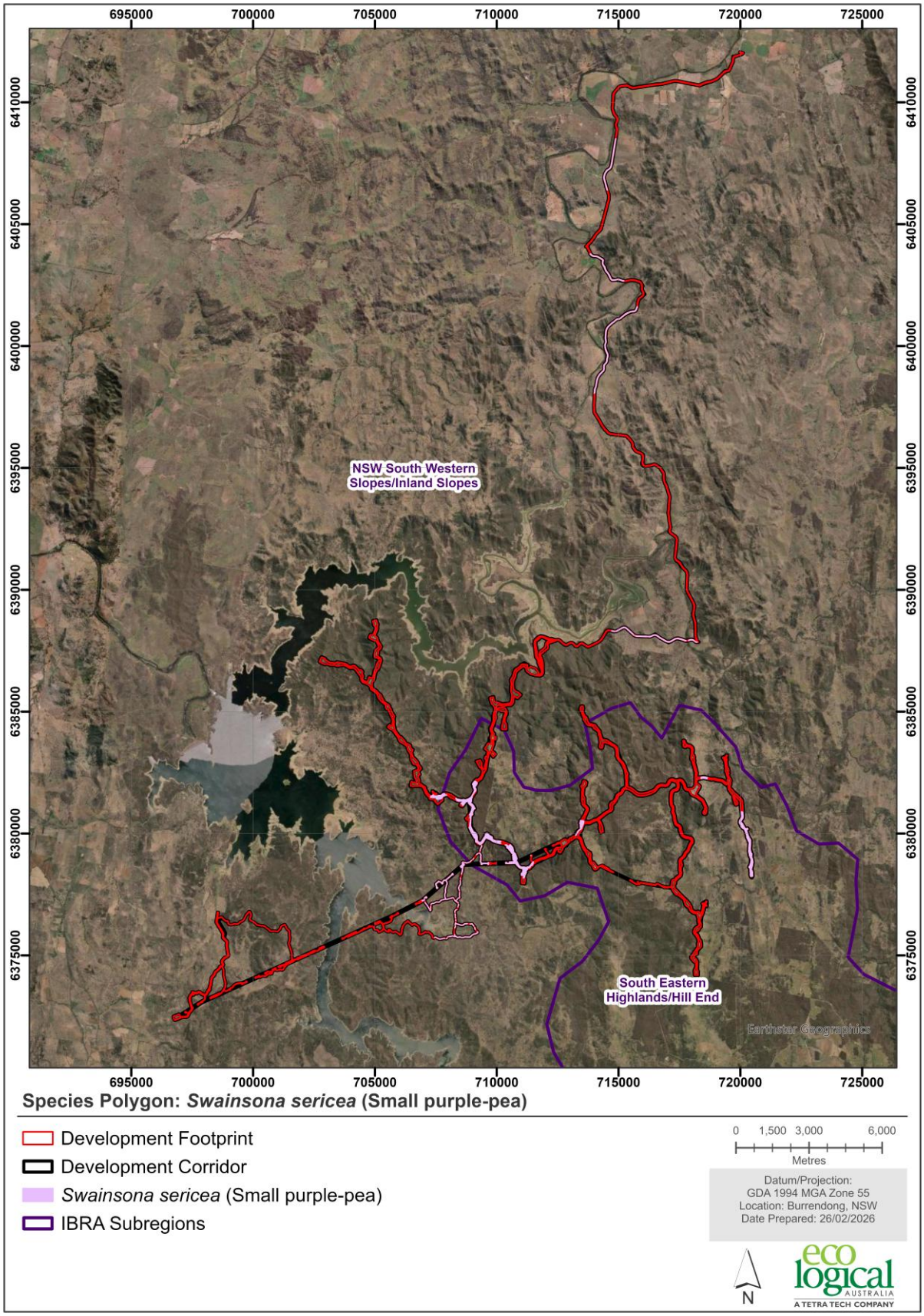


Figure 4-17: Species polygon – *Swainsona sericea*

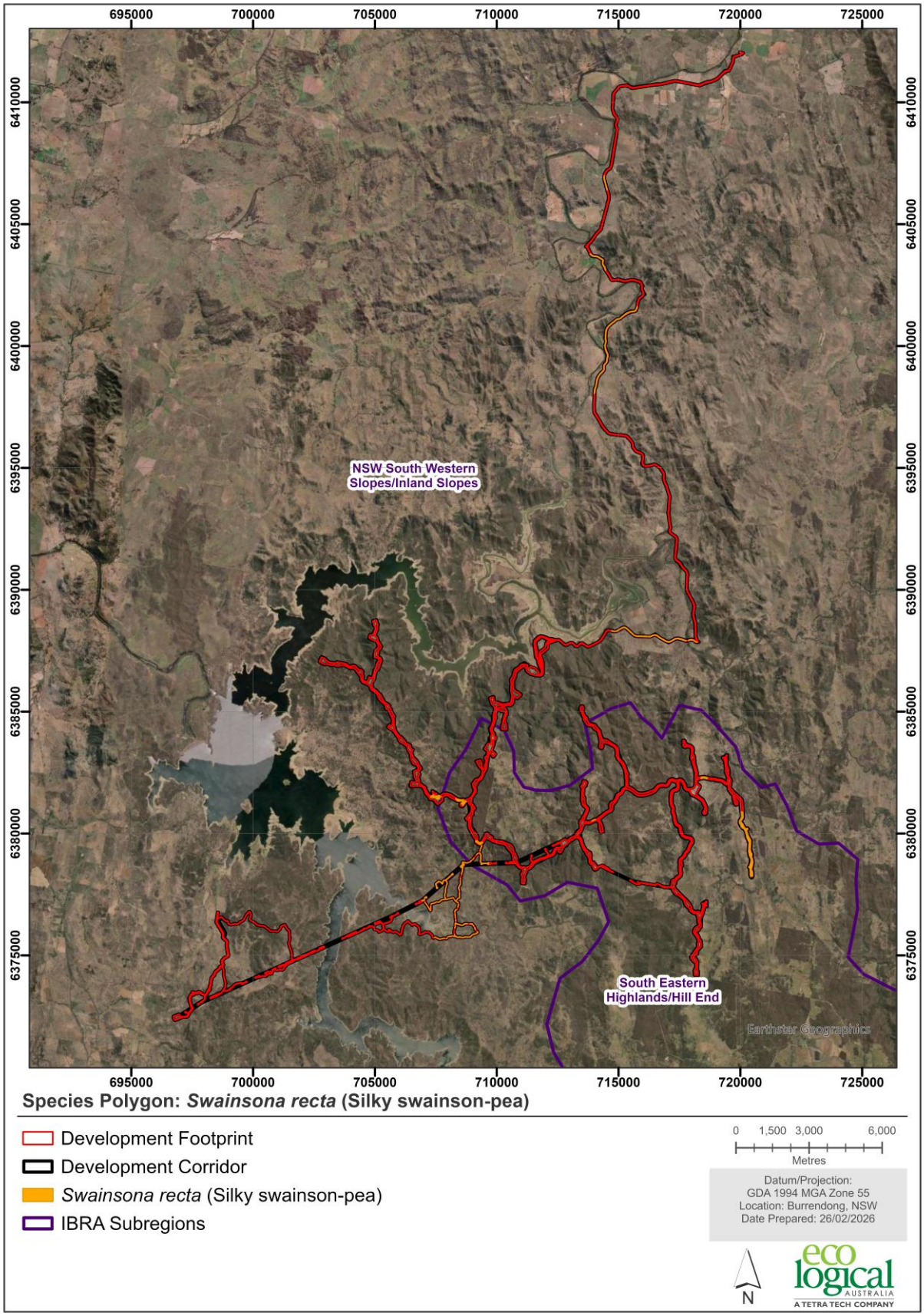


Figure 4-18: Species polygon – *Swainsona recta*

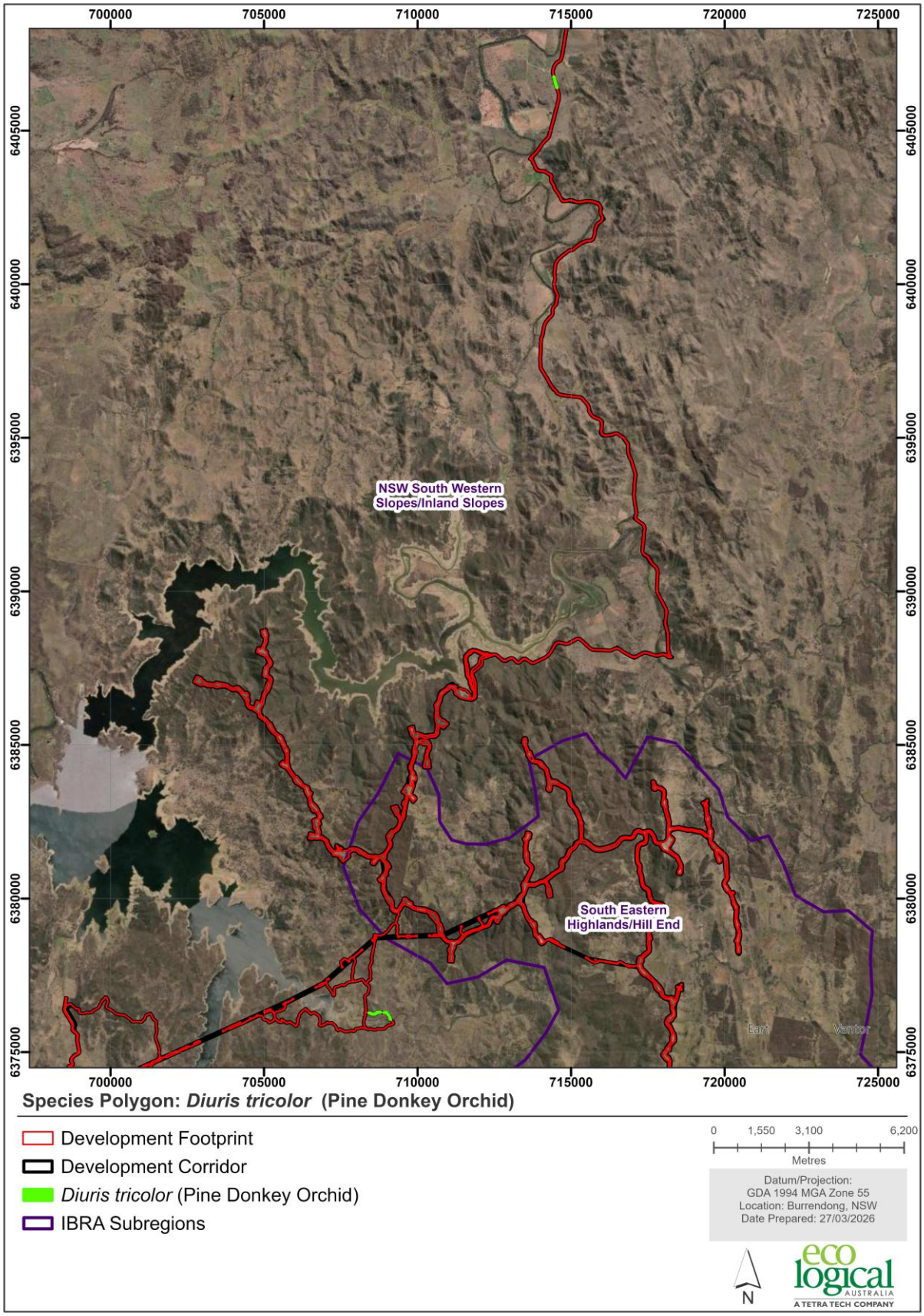


Figure 4-19: Species polygon – *Diuris tricolor*

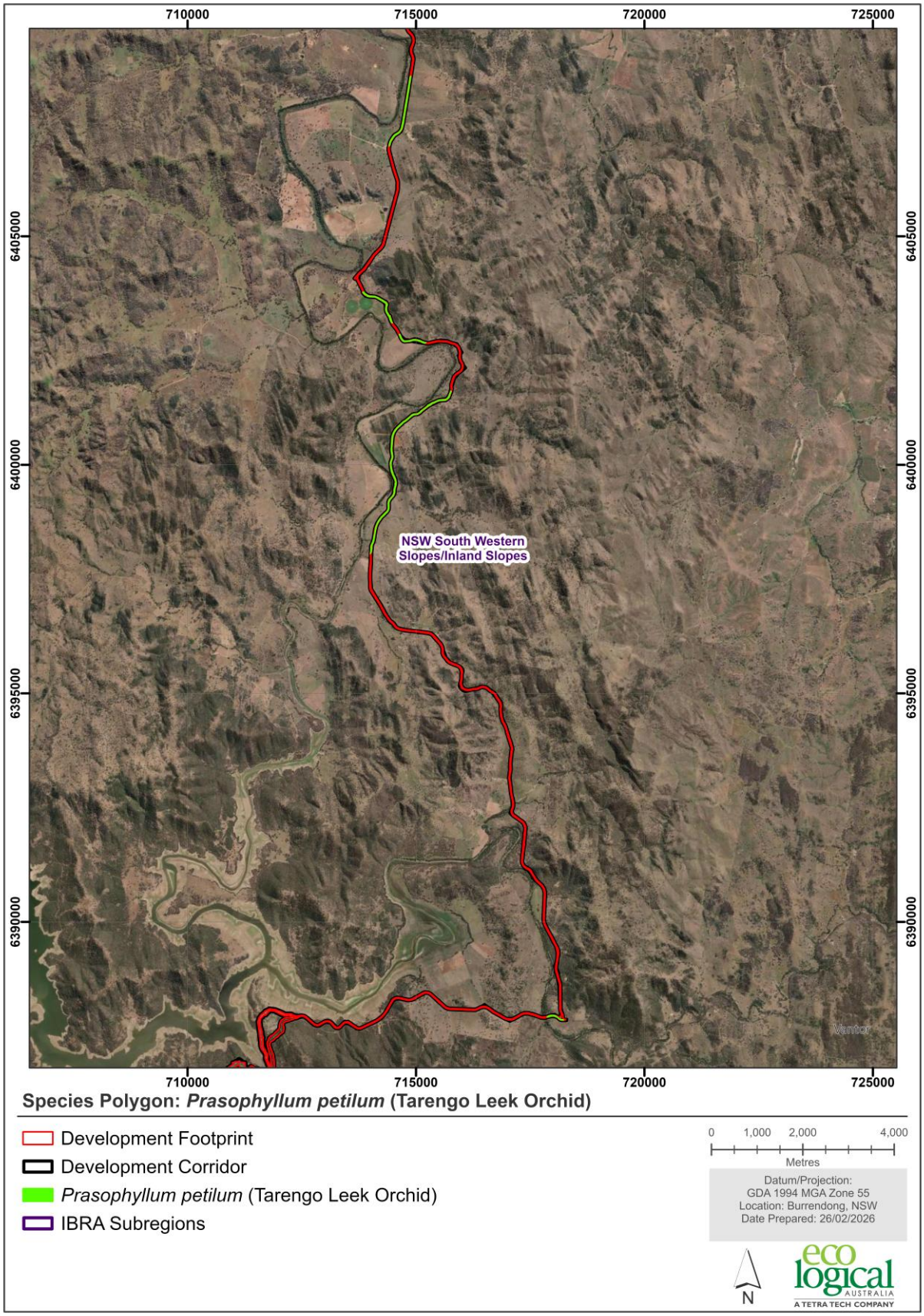


Figure 4-20: Species polygon – *Prasophyllum petilum*

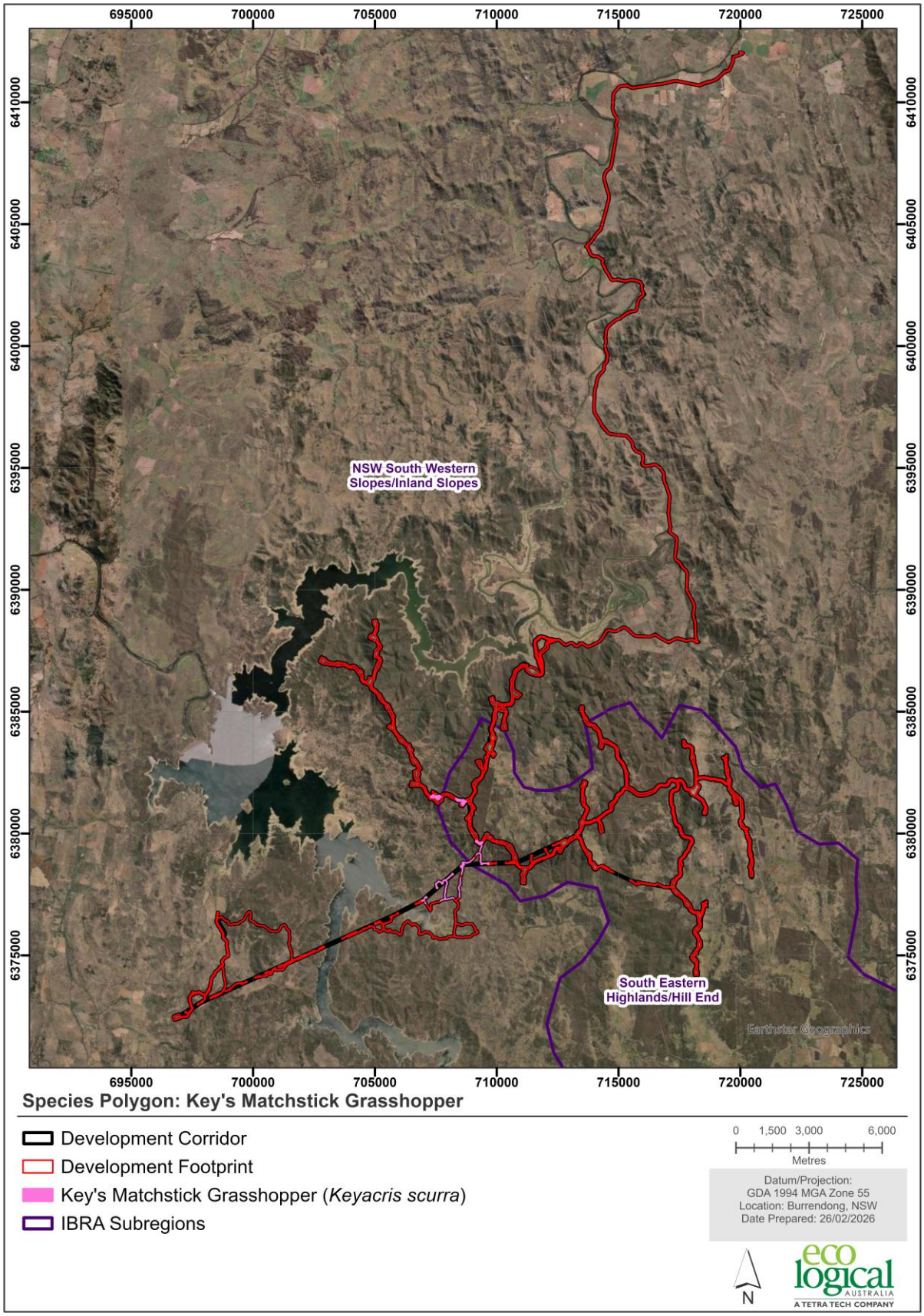


Figure 4-21: Species polygon – *Keyacris scurra*

In addition to the above species- credits (Table 4-20) the following species (Table 4-21) have been included in the assessment due to incomplete partial surveys due to survey timing or areas of associated PCTs being inaccessible. Species polygons for species assumed to be present due to incomplete survey effort are included in Appendix H.

Table 4-21: Species credit species included in the areas inadequately surveyed (partial surveys)

Species	Common Name	Species presence	Number of individuals / Habitat (ha)	Biodiversity Risk Weighting
Burhinus grallarius	Bush Stone-curlew	Presence assumed as targeted surveys were not undertaken west of Lake Burrendong	This species is associated with Inland Slopes – PCT 76 266 274 277 281 312 331 461 / Hill End PCT 266 277 287 331 where large woody debris (LWD) is present. 266_low was removed due to lack of LWD. The southern transmission line was walked during the day over 2 days. Spotlighting and call playback in addition to transects were conducted across the Windfarm and along Yarrabin Road upgrade area. Areas that were not surveyed have been included in the BAMC. Areas were also surveyed during targeted flora surveys in 2025. Hill End subregion = 18.78 ha Total = 18.78 ha	2
Cercartetus nanus	Eastern Pygmy Possum	Presence assumed as targeted surveys were not undertaken west of Lake Burrendong	This species is associated with Inland Slopes – PCT 272 277 312 331 461 / Hill End – PCT 272 277 287 331 with a rich shrubby understorey. Although they are known to occur in grassy woodlands The windfarm area is deemed to be adequately surveyed as per discussions with BCS. Areas along the transmission line and Yarrabin Road upgrade has been included in the BAMC. Inland Slopes subregion = – 50.03 ha Hill End subregion Total area – 8 ha Total = 58.03 ha	2

Species	Common Name	Species presence	Number of individuals / Habitat (ha)	Biodiversity Risk Weighting
Grevillea divaricata	Grevillea divaricata	Presence assumed in areas not surveyed	This species is associated with Hill End – PCT 270 331. Surveys were conducted within PCT 270 and many areas within PCT 331. Inaccessible (1.58 ha) and inadequate survey areas (3.96 ha) have been included in the BAMC. Hill End Subregion Total Area = 5.54 ha	3
Ninox connivens	Barking Owl	Presence assumed as targeted surveys were not undertaken west of Lake Burrendong	This species is associated with Inland Slopes PCT-76 84 266 272 274 277 281 312 331 461 / Hill End PCT – 84 266 270 272 277 287 331 residing within large hollows. Spotlighting and call playback was conducted across the Windfarm and Yarrabin road upgrade and adequately surveyed. PCTs along the transmission line, substation and associated access tracks were included in the BAMC. Inland Slopes subregion = 45.22 ha Hill End Subregion Total area – 8. 92 ha Total = 54.14 ha	2
Ninox strenua	Powerful Owl	Presence assumed as targeted surveys were not undertaken west of Lake Burrendong	This species is associated withInland Slopes PCT- 84 274 281 / Hill End PCT – 84 287. Spotlighting and call playback was conducted across the Windfarm and Yarrabin road upgrade. PCTs along the transmission line, substation and associated access tracks were included in the BAMC. Inland Slopes subregion = 1.58 ha Hill End Subregion Total area – 1.6 ha Total = 3.18 ha	2
Persoonia marginata	Clandulla Geebung	Presence assumed in areas not surveyed	This species is associated with PCT 287 within both IBRA subregions. This PCT is not located within the	2

Species	Common Name	Species presence	Number of individuals / Habitat (ha)	Biodiversity Risk Weighting
			Development Corridor in the Inland Slopes. Areas along Road Upgrade areas have been adequately surveyed. Inaccessible areas (0.51 ha) and areas inadequately surveyed (47.00 ha) have been included in the BAMC. Hill End Subregion area = 47.51 ha	
Petaurus norfolcensis	Squirrel Glider	Presence assumed as targeted surveys were not undertaken west of Lake Burrendong	This species is associated with Inland Slopes PCT-76 84 266 272 274 277 281 312 331 461 / Hill End PCT – 84 266 270 272 277 287 331. The windfarm area and Yarrabin Road upgrade has been adequately surveyed with spotlighting and camera traps. PCTs along the transmission line, and associated access tracks have been included in the BAMC. Inland Slopes subregion = 45.22 ha Hill End Subregion Total area – 8.92 ha Total = 54.14 ha	2
Phascogale tapoatafa	Brush-tailed Phascogale	Presence assumed in areas not surveyed - ie west of Lake Burrendong	This species is associated with Inland Slopes PCT-76 266 272 274 277 281 331 461 / Hill End PCT – 266 272 277 331. The windfarm area was adequately surveyed with spotlighting and camera traps. Surveys were completed in accordance with the TBDC guidelines prior to the updated survey requirements. PCTs along the transmission line, associated access tracks and Yarrabin Road upgrade have been included in the BAMC. Whilst spotlighting surveys were completed along Yarrabin road they were outside the survey requirements for Brush-tailed Phascogales. Inland Slopes subregion = 80.76 ha	2

Species	Common Name	Species presence	Number of individuals / Habitat (ha)	Biodiversity Risk Weighting
			Hill End Subregion Total area – 7.32 ha Total = 88.08 ha	
Tylophora linearis		Presence assumed in areas not surveyed	This species is associated with Inland Slopes PCT 272, 331 and 461. Surveys 5 m apart were conducted along the Yarrabin road Upgrade and within the Transmission line during February 2023. Surveys across the windfarm were completed in 2025. No surveys were conducted in 461 and these areas were added to the BAMC. Inland Slopes subregion = 0.57 ha	2
Tyto novaehollandiae	Masked Owl	Presence assumed as targeted surveys were not undertaken west of Lake Burrendong	This species is associated with Inland Slopes- PCT 76 84 266 272 274 277 281 331 461 / Hill End PCT – 84 266 270 272 277 287 331. Spotlighting and call playback was conducted across the Windfarm and Yarrabin road upgrade. PCTs along the transmission line, substation and associated access tracks were included in the BAMC. Inland Slopes subregion = 45.22 ha Hill End Subregion Total areas = 8.92 ha. Total area = 54.14 ha	2

4.6.6. Expert reports

Expert reports have been prepared for Key's Matchstick Grasshopper and Pink-tailed Legless Lizard. Full reports are included in Appendix R.

4.6.6.1. Keys Matchstick Grasshopper

Dr Michael Kearney and PhD graduate Hiromi Yagui, recognised species experts for Key's Matchstick Grasshopper, conducted a desktop habitat assessment. This assessment incorporated floristic attributes and species distribution modelling, using bioclimatic and geological variables to identify areas of potential habitat. The modelling estimated that approximately 30 ha of potential habitat may occur within the Development Footprint. Targeted Key's Matchstick Grasshopper surveys were undertaken in November 2025 within areas of suitable grassland habitat identified from the Expert Report (approximately 30 ha). Targeted Key's Matchstick Grasshopper survey methods were based on guidance

from the BOS Helpdesk (dated 30/07/2024) which recommends meandering slowly through preferred habitat, observing the preferred flora species and disturbing the vegetation slightly to enhance detectability of the species if present by encouraging movement. Waving vegetation with a dowel or something similar may also be of use. Areas identified as containing suitable habitat or areas that were not surveyed (Figure 4-21 above) have been incorporated into the BAM-C and credit liability calculated accordingly.

4.6.6.2. Pink-Tail Legless Lizard

Habitat assessments were undertaken across the Development Corridor by species expert Robert Speirs, with support from Jarmin Thornberry of Capital Ecology. Assessments considered factors such as rock size, shape, location, surrounding vegetation, and lithology to determine the potential suitability of habitat for the Pink-Tailed Legless Lizard. Based on these parameters, approximately 65.66 ha of potential habitat were identified (Figure 4-15). These areas have been incorporated into the BAM-C and credit liability calculated accordingly.

4.7. Request for Concurrence - Targeted Survey Requirements

In accordance with the BC Act and the BAM 2020, the Proponent is seeking formal concurrence from the Minister for the Environment under Section 7.14 of the *Biodiversity Conservation Amendment (Biodiversity Offsets Scheme) Act 2024* to defer targeted surveys for the threatened species listed in Table 4-22 and Table 4-23 until post-approval.

This request is made on the basis of:

- Seasonal constraints preventing surveys during optimal detection periods
- Land access limitations affecting survey coverage
- Partial survey efforts completed for several species, with remaining areas outstanding.

If concurrence is granted, the following will be implemented as post-approval measures:

- Completion of targeted surveys during the appropriate seasonal window and in accordance with NSW survey guidelines
- Confirmation of species presence or absence to inform
    - micro-siting,
    - species-specific management measures
    - salvage if necessary
- Adjustment to adaptive mitigation strategies based on survey outcomes
- Adjustment of biodiversity offset obligations in accordance with confirmed species presence and habitat extent.

Table 4-22 identifies threatened species have been assessed as having a low to moderate likelihood of occurrence with the Project Site. These species have been assumed present in the BAM assessment due to the absence of targeted surveys during their optimal detection period.

Targeted surveys for these species were not undertaken prior to completion of the BDAR due to both seasonal constraints and land access limitations. As such, species presence has been assumed in

accordance with BAM 2020 and their potential habitat has been included in the assessment of species credits.

Table 4-22: Threatened species not surveyed

Species	Common Name	Likelihood of Occurrence	Assumed in BAM	Survey timing	Area (ha)
Diuris tricolor	Pine Donkey Orchid	Low	Yes	Sept - Oct	0.50 ha
Swainsona recta	Small Purple Pea	Low - moderate	Yes	Sept - Nov	42.09 ha
Swainsona sericea	Silky Swainson Pea	Low	Yes	Sept - Nov	96.83 ha
Prasophyllum petilum	Tarengo Leek Orchid	Low - moderate	Yes	Sept- Dec	8.08 ha

Additionally, partial surveys have been completed for the species outlined in Table 4-23. Whilst no individuals were recorded, these species are considered to have low to moderate (except Powerful Owl) likelihood of occurrence within the Project Site that were inaccessible or not surveyed adequately due to land access limitations and timing constraints. Consequently, these species have also been assumed present in the BAM assessment.

Table 4-23: Threatened species with partial surveys

Species	Common Name	Likelihood of Occurrence	Assumed in BAM	Survey timing	Survey Effort	Outstanding Survey Area
Cercartetus nanus	Eastern Pygmy Possum	Low	Yes	Oct - Mar	1,246 trap nights have been completed.	Approximately 58 ha requires survey.
Petaurus norfolcensis	Squirrel Glider	Low - moderate	Yes	All Year	1,246 trap nights and 288 hours of spotlighting have been completed.	Approximately 55 ha requires survey.
Phascogale tapoatafa	Brush-tailed Phascogale	Low - moderate	Yes	Dec - June	1,246 trap nights and 288 hours of spotlighting have been completed. .	Approximately 97 ha requires survey. Survey methodology was updated
Tyto novaehollandiae	Masked Owl	Moderate	Yes	All Year	Completed 288 hours of spotlighting and call playback at 15 locations.	Approximately 55 ha requires survey.
Ninox strenua	Powerful Owl	Moderate - high	Yes	All Year	Completed 288 hours of spotlighting and call playback at 15 locations.	Approximately 3 ha requires surveying.
Ninox connivens	Barking Owl	Moderate	Yes	All Year	Completed 288 hours of spotlighting and call playback at 15 locations.	Approximately 55 ha requires survey.
Grevillea divaricata		Low	Yes	Apr	Completed 10 m transect surveys across 47 ha. Whilst the survey is limited, this species is visible all year. No species with the same leaf type was recorded	Approximately 5.5 ha requires survey.
Persoonia marginata	Clandulla Geebung	Low	Yes	Jan-Mar	Completed 10 m transect surveys across 47 ha. Whilst the survey is limited, this species is visible all year. No species with the same leaf type was recorded	Approximately 48 ha requires survey.
Keyacris scurra	Key's Matchstick Grasshopper	Low - moderate	Yes	Mar – May Sept – Nov	Expert report completed in February 2025. Requested information from the BOS Helpdesk which was received after the optimal detection period.	Approximately 11.5 ha requires surveying.
Burhinus grallarius	Bush Stone-Curlew	Low	Yes	All Year	Completed 288 hours of spotlighting and call playback at 15 locations. 483 independent bird surveys across 19 sites. Transect walks over 770 ha.	Approximately 22 ha requires survey.

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5. Identifying prescribed biodiversity impacts

The BC Regulations (Clause 6.1) identifies actions that are prescribed as impacts to be assessed under the biodiversity offset scheme:

The following prescribed impacts are relevant to the Project:

- Impacts on the habitat of threatened species or ecological communities associated with rocks
- Impacts of development on the connectivity of different areas of habitat or threatened species that facilitate the movement of these species across the range
- Impacts on water quality, water bodies and hydrological process that sustain threatened species and threatened ecological communities
- Impacts of wind turbine strikes on threatened species or on animals that are part of a TEC
- Impacts of vehicle strikes on threatened species or on animals that are part of a TEC.

Prescribed impacts are summarised in Table 5-1 below.

Table 5-1: Direct impacts on prescribed biodiversity impacts

Prescribed biodiversity impact	Description (Nature, extent, and frequency)	Consequences	Justification	Additional information
Karst, caves, crevices, cliffs, rocks and other geological features of significance	No areas of karst, caves, cliffs occur within the Project Site. Partially embedded rocks occur which could be damaged through vehicle movement.	There will be no impacts to these features.	NA	Wellington Caves and Borenore Caves are located 21 km and 50 km respectively from the closest WTG. Wellington Caves contains a known roosting and breeding site for the Large Bent-winged Bat. A BBAMP will monitor impacts to these species.
Habitat connectivity	The location of WTG is within predominately cleared areas along ridgelines. Paddock trees create steppingstones to assist movement. Woodland areas on the lower slopes are more extensive maintaining connectivity. Installation of transmission lines are unlikely to impede species movement. The transmission line will be above tree height minimising the need to remove canopy or clearing for an easement.	Potential impacts to natural movements and reduction in gene pool. The consequence of these impacts are likely to be minor; aerial species have the ability to fly under, over and around WTG and transmission lines. Species with restricted dispersal ability such as *Aprasia parapulchella* (Pink-tailed Legless Lizard) may isolate individuals. Some species may avoid locations near activity and avoid foraging and nesting sites, and alter flight pathways. Most of the project has been located within areas of disturbance along ridgelines and formed access tracks.	The loss of paddock trees and smaller patches within the Project Site would result in a minor loss of connectivity for more transient species, however the lack of complex vegetative structure would unlikely impact threatened species. Given the linear nature of the Project and the remaining vegetation within the Subject Land, it is unlikely that arboreal mammals, reptiles and aerial species will be impacted.	The Project Development Corridor consists of a mosaic of large areas of intact remnant vegetation, smaller remnants and agricultural lands. WTG are to be located on cleared ridges with few scattered trees. These trees are already isolated and would only provide habitat for highly mobile species such as birds.
Water bodies, water quality and hydrological processes	There are several major waterways that intersect the Project Site, such as the Macquarie River, Cudgegong River and Meroo River. Potential for erosion and sedimentation through run-off impacting water quality during construction. Impacts to rivers will be limited to	Potential to occur at any time throughout construction or operational phases. Impacts will be localised and short-term.	The Project Site crosses several ephemeral drainage lines, and creeks. It is unlikely that the Project would result in substantial environmental impacts to aquatic systems with appropriate water management	Sedimentation and erosion controls will be implemented

Prescribed biodiversity impact	Description (Nature, extent, and frequency)	Consequences	Justification	Additional information
	transmission lines structure construction. Whilst smaller streams may be impacted by access tracks.		measures to be implemented. Impacts may include trimming and clearing of riparian vegetation. Placement of transmission poles will not be within 40 m of the Macquarie River.	
Wind turbine strikes on protected animals	Transmission lines and Wind Turbines represent a source of hazards for bats and birds, especially through collision barotrauma and/or electrocution.	Injury or death of birds and bats caused by operating WTG and overhead powerlines	Detailed Bird and Bat strike assessment undertaken as part of the preparation of this BDAR. Monitoring pre and post construction as per the BBAMP.	Detailed assessment undertaken for this prescribed impact is detailed in Section 6. Detailed mitigation measures have been proposed (Section 7.1 and 7.2 and 10.2) and will be implemented through the Project BBAMP. Deterrent strategies for transmission lines and associated structures including bird flappers and perching deterrents to deter avifauna effectively and safely away from energised infrastructure will be implemented.
Vehicle strikes	An increase in vehicle traffic during construction and required maintenance may slightly increase the risk of vehicle strike on threatened species occurring within or near the Project Site. Vehicle strike is listed as a Key Threatening Process for Koala's, Powerful Owls and Masked Owls.	Injury or death of threatened fauna caused by vehicle collisions The risk of vehicle strike is likely to be greatest during the construction phase of the project where the number of vehicles and machinery would be greatest.	Mitigation measures will be implemented to enforce a site speed, particularly early in the morning and late in the afternoon.	With the recommended mitigation measures it is unlikely that vehicles will have a substantial impact on any species.

6. Prescribed Impacts due to wind farm developments

Wind farm developments can impact wildlife through habitat loss, fragmentation, and noise disturbance during construction. Once operational, they pose direct collision risks, particularly to birds and bats that regularly fly within the RSA of WTGs (Roeleke et al. 2016; Richardson et al. 2021). Raptors, in particular, are among the most vulnerable bird groups due to their typical flight heights, low reproductive rates, and long lifespans. Globally, raptor species have been documented as being at high risk of wind turbine collisions, and this trend also applies to Australian species (Hull and Muir 2013).

Bat mortality linked to wind farm operations has been reported worldwide (Whitby et al. 2024), with bats susceptible to both turbine collision and barotrauma, a condition caused by rapid air-pressure changes near moving turbine blades that can lead to fatal internal injuries. Recent research suggests that the pressure change necessary to cause barotrauma occurs in such close proximity to the wind turbine generator (WTG) blade surface, that there is a higher probability of direct collision with the blade itself, rather than barotrauma (Guest & Hein 2023). Accordingly, the impacts of barotrauma and collision risk have been assessed collectively.

In addition to direct mortality, post-construction studies have shown that raptors may avoid areas around operational wind farms. While this may reduce collision risk, it can lead to displacement from established territories, potentially affecting foraging efficiency and breeding success (Hull and Muir 2013).

Consistent with the requirements of Section 8.3.5 of the BAM (DPIE 2020) assessment of prescribed impacts of wind turbine strike on protected animals has been undertaken. Detailed ecological assessments (see Section 4.5 for methods and 4.6 for results) have been undertaken to assess potential prescribed impacts including:

- Bird utilisation surveys
- Bat activity surveys
- Wind turbine strike assessment, incorporating:
    - Baseline bird and bat risk assessment
    - Collision risk modelling for at risk species
    - Turbine risk assessment proposed turbines
- Impact avoidance, minimisation, mitigation and management, incorporating:
    - Measures to avoid, minimise and mitigate impacts from bird and bat turbine strike
    - Bird and Bat Adaptive Management Plan (BBAMP).

The details of the prescribed impact assessment is summarised in Table 6-1 below.

Table 6-1: Assessment of wind turbine strike impacts

Prescribed impact consideration	Assessment of Impacts - Justification
Predict the impact on species living in, or likely to fly over, the proposed	A program of BUS and BAS has been undertaken within the Project Site and surrounds (including the proposed Development Footprint), with the results provided in Section 6.4 and Section 6.5.

Prescribed impact consideration	Assessment of Impacts - Justification
Development Footprint, including bat or bird strike and barotrauma	Baseline bird and bat risk assessment, inclusive of collision risk assessment, has been undertaken to predict impacts on bird and bat species and are detailed in Section 6.1 and Section 6.5. The risk of impacts to a total of 30 bird and 19 bat species has been assessed. A total of six bird and seven bat species have been predicted to be at moderate risk of impact and one bird and one bat species has been predicted to be at high risk of impact.
Predict the rate and timing of impact per turbine per year for species likely to be affected	The rate and timing of collisions with turbines has been modelled for moderate (excluding Little Eagle due to absence of flights within RSA and high-risk bird species within a project-specific CRM, the methodology of which is detailed in Section 6.2 and results are provided in Section 6.4. The timing of impact is accounted for in the CRM given that the number of flights at risk is calculated seasonally, which translates into a seasonal collision risk. Modelled collision estimates at 90% and 95% avoidance rates were generally low, ranged from 0.04 to 0.02 for Peregrine Falcon, to 12.4 to 6.2 for Wedge-tailed Eagle (Table 6-8). As individual bat flights are not able to be quantified, CRM is not possible for this species group, however, a qualitative collision risk assessment has been completed and is detailed in Section 6.5. White-striped Freetail Bat has been assessed as the most at risk bat species for the Project given its recording at heights (50 m and 100 m) near to and within the lower turbine Rotor Swept Area (RSA; 65-250 m) and its known susceptibility to turbine strike (Section 6.6.1). A WTG risk assessment has also been completed, which assesses relative risk of each of the 70 individual WTGs. The WTG risk assessment is detailed in Section 6.7. Five WTGs have been assessed as low risk, 45 WTGs as moderate risk and 20 WTGs as high risk.
Predict the consequences of impacts for the persistence of populations	The consequence of predicted impacts has been assessed for all relevant bird and bat species within the bird and bat risk assessments provided in Section 6.1 and Section 6.5. Population information for all moderate and high-risk bird and bat species is provided in the risk assessments, including the number of records of the species local population recorded in the Project Site and total population estimates (where available). The quantity of known mortalities of species from operational Wind Farms in Australia is also presented in the bird and bat risk assessments (see Table 6-5 and Table 6-10). Overall, the predicted consequence of impacts to bird and bat population viability is considered negligible to low, however, given the potential for impacts to local and regional populations of moderate and high-risk species, a range of mitigation measures and a robust monitoring program is proposed to be implemented through the Project BBAMP.
Predict the cumulative impacts of the proposed development alongside existing wind farms, on species mortality, movement patterns and use of adjacent habitat	Potential cumulative impacts to at risk bird and bat species are described in the bird (Section 6.1) and bat (Section 6.5) risk assessments and in the review of operational and approved wind farms in the region (Section 6.15). The Project is not co-located with any other existing wind farms locally, with the nearest existing wind farm, Bodangora Wind Farm, located approximately 24 km northwest of the Project and the nearest approved wind farm is Uungula, located 12 km northwest. Eight operational or approved wind farms occur within the Central West Orana Renewable Energy Zone and adjacent IBRA subregions (within 200 km).

Prescribed impact consideration	Assessment of Impacts - Justification
	Turbine collision predicted for the project has the potential to contribute to cumulative impacts at a regional scale, with the Project committed to the implementation of a robust monitoring program and adaptive management through the Project BBAMP, to contribute relevant data and increase understanding of cumulative impacts at a regional scale.
Predict the likelihood and nature of impacts on aerial species living in, or likely to fly over, the proposed Development Footprint, including barriers to migratory pathways, and breeding, feeding and resting resources	The likelihood of impact is assessed as a key component of the baseline bird and bat risk assessments (see Table 6-2) and the impacts have been assessed for species assessed as being 'Potential', 'Likely' or 'Almost certainly' at risk of impact (Table 6-5 and Table 6-10). A project-specific flight barrier impact assessment has been completed and is detailed in Section 6. Due to the predominant low flight height (20 m and below) and behaviour (flying below or just above the canopy) of recorded bird and bat flights, combined with the WTG design (RSA of 65-250 m) and layout (mean distance between WTGs >500 m), the impacts to aerial species has been assessed as low. The WTG layout does not intersect the major regional river valleys which likely form and contain the main movement, breeding, foraging and resting pathways for locally dispersive and wide-ranging (e.g. migratory) bird and bat species.
Predict the impact of avoidance behaviour for migratory species relative to migration distances, and the availability of suitable habitat for breeding, feeding and resting over the migration route	A project-specific avoidance impact assessment has been completed and is detailed in Section 0. Given the typical low flight height and behaviour of most of the bird and bat movements recoded from the Project Site, combined with the WTG design and layout, negligible avoidance impacts are expected. The Project Site does not contain and is not located adjacent to any specialist bird and bat breeding, feeding, or resting areas, including maternity roosts for cave-dwelling microbat species or mapped important habitat areas for migratory shorebirds or the migratory Swift Parrot (NSW DCCEEW 2025). Avoidance impacts to the one listed migratory species recorded within the Project Site, White-throated Needletail, are likely to be negligible. Given the species wide-range and high mobility, it has the capacity to demonstrate both meso- and macro-avoidance (see Smales 2023) and fly both around (Figure 6-5) and through (Figure 6-6) the WTG layout where required.
Justify predictions with reference to data, collision risk modelling (if available), relevant literature or other published sources including any publications by the Department	A project-specific CRM has been completed for bird species (Section 6.2) and a qualitative risk assessment completed for bat species (Section 6.5) informed by baseline data, relevant literature (see Section 13) and mortality data from operation wind farms, including the two proximally located wind farms to the Project Site (Bodangora Wind Farm – 24 km northwest, and Crudine Ridge Wind Farm – 37 km southeast).
Map the disturbance zone around wind turbines, and the significant landscape and habitat features within that zone, for species likely to be affected, e.g. hollow bearing trees and important habitat for migratory species.	The disturbance zone of WTGs is a key component of the CRM completed for moderate and high-risk bird species (Section 6.2). Disturbance zones around wind turbines have been incorporated into the development footprint which allows for an area of additional impact (50 m) around each turbine. No hollow-bearing trees or other significant bird and bat habitat features outside of this zone are to be impacted. The development footprint does not contain and is not located adjacent to any specialist bird and bat breeding, feeding, or resting areas, including maternity roosts for cave-dwelling microbat species or mapped important habitat areas for migratory shorebirds or the migratory Swift Parrot (NSW DCCEEW 2025).

6.1. Collision Risk Modelling - Birds

The initial step of the Collision Risk Modelling (CRM) process involves the identification of at-risk bird species through a baseline bird risk assessment. Consistent with Step 1 of the Band CRM model (Band 2000; Band et al. 2007), the baseline collision risk assessment was informed by:

- Field survey data, including BUS conducted from summer 2020 to autumn 2025
- Historical records within a 10 km radius of the Project Site (BioNet search; NSW DCCEEW 2025)
- Documented fatalities at operational wind farms in Australia[3].

The results of the baseline bird risk assessment are detailed in Table 6-5 and will be reviewed and revised as necessary through the implementation of the Project BBAMP, where it will eventually transition into an operational bird and bat risk assessment during the operational phase of the Project.

6.2. Collision Risk Model Assessment Methodology

6.2.1. Step 1: Identification of Species at Risk

Each bird species returned from the baseline bird risk assessment was evaluated using a two-factor matrix:

1. Likelihood of collision was determined by assessing:

- Whether the species was recorded during surveys or within the 10 km BioNet search radius (NSW DCCEEW 2025)
- Observations of flight within RSA height (65 – 250 m), or the likelihood of such flight based on behaviour and habitat use
- Records of fatalities at operational wind farms in Australia.

2. Consequence of collision was based on:

- Conservation listing under the BC Act or EPBC Act
- Habitat availability within the Project Site and surrounds with regards to foraging, breeding and dispersal
- Frequency and duration of observations during surveys or from records within the search radius, with respect to the likely local population size and occurrence (e.g. resident, migratory, vagrant)
- Proportion of individuals recorded flying within RSA height
- Known susceptibility to collision based on documented fatalities.

[3] ELA maintains an internal database of publicly available mortality data from operational wind farms in Australia. The database includes non-exhaustive mortality data from 11 wind farms in New South Wales (including Bodangora Wind Farm and Crudine Ridge Wind Farm, also located within the Central West Orana Renewable Energy Zone), 10 wind farms in Victoria, three wind farms in Tasmania, two wind farms in Queensland and one wind farm in each of South Australia and Western Australia. The database was last updated on 21 July 2025.

The resulting risk levels were determined using a collision risk matrix (Table 6-2, Table 6-3, Table 6-4), with species ratings presented in Table 6-5.

Table 6-2: Likelihood ratings for collision risk assessment

Likelihood	Description
Almost certain	It is very probable that the risk event could occur in any year (>95%)
Likely	It is more probable than not that the risk event could occur in any year (>50%)
Potential	It is equally probable that the risk event could or could not occur in any year (50%)
Unlikely	It is less probable than not that the risk event could occur in any year (<50%)
Rare	It is improbable that the risk event could occur in any year (<5%)

Table 6-3: Consequence ratings for collision risk assessment

Consequence	Description
High	Major loss in numbers of non-listed species or loss of Critically Endangered or Endangered listed threatened species*, leading to reduction in population viability
Moderate	Moderate loss in numbers of non-listed species or loss of Vulnerable listed threatened or Migratory species*, leading to reduction in population viability
Low	Repeated loss of non-listed species but no reduction in population viability
Negligible	Occasional loss of non-listed species but no reduction in population viability

***listed threatened species under the NSW BC Act or threatened or Migratory under the Commonwealth EPBC Act**

Table 6-4: Collison risk rating

Likelihood	Consequence			
	Negligible	Low	Moderate	High
Almost certain	Low	Moderate	High	High
Likely	Negligible	Low	Moderate	High
Potential	Negligible	Low	Moderate	High
Unlikely	Negligible	Negligible	Low	Moderate
Rare	Negligible	Negligible	Low	Moderate

Table 6-5: Baseline bird risk assessment

Common Name	Species Name	BC Act	EPBC Act	No. of BWF records (no. of individuals)	Recorded flights in RSA (no. of individuals)	Recorded fatalities at Australian wind farms	Likelihood	Consequence	Risk Rating
Australian Magpie	*Gymnorhina tibicen*	-	-	135 (294)	3 (12)	222	Almost certain	Negligible	Low
Australian Raven	*Corvus coronoides*	-	-	171 (340)	8 (14)	78	Almost certain	Negligible	Low
Australian White Ibis	*Theskiornis moluccus*	-	-	2 (35)	1 (20)	2	Potential	Negligible	Negligible
Australian Wood Duck	*Chenonetta jubata*	-	-	2 (21)	0	27	Potential	Negligible	Negligible
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	V	-	2 (2)	0	0	Rare	Moderate	Low
Black-shouldered Kite	*Elanus caeruleus*	-	-	3 (3)	0	13	Potential	Negligible	Negligible
Brown Falcon	*Falco berigora*	-	-	3 (7)	2 (3)	109	Likely	Moderate	Moderate
Brown Goshawk	*Accipiter fasciatus*	-	-	3 (3)	0	10	Potential	Negligible	Negligible
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	V	23 (26)	0	0	Rare	Moderate	Low
Diamond Firetail	*Stagonopleura guttata*	V	V	5 (12)	0	0	Rare	Moderate	Low
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	-	21 (106)	2 (24)	1	Potential	Moderate	Moderate

Common Name	Species Name	BC Act	EPBC Act	No. of BWF records (no. of individuals)	Recorded flights in RSA (no. of individuals)	Recorded fatalities at Australian wind farms	Likelihood	Consequence	Risk Rating
Glossy Black-Cockatoo (south-eastern)	*Calyptorhynchus lathami lathami*	V	V	1 (2)	0	0	Rare	Moderate	Low
Great Cormorant	*Phalocrocorax carbo*	-	-	1 (2)	1 (2)	0	Unlikely	Negligible	Negligible
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V	-	2 (9)	0	0	Rare	Moderate	Low
Hooded Robin (south-eastern form)	*Melanodryas cucullata cucullata*	V	V	8 (11)	0	0	Rare	Moderate	Low
Little Eagle	*Hieraaetus morphnoides*	V	-	2 (3)	0	4	Potential	Moderate	Moderate
Nankeen Kestrel	*Falco cenchroides*	-	-	4 (10)	3 (5)	184	Likely	Moderate	Moderate
Peregrine Falcon	*Falco peregrinus*	-	-	1 (1)	1 (1)	5	Potential	Moderate	Moderate
Pied Currawong	*Strepera graculina*	-	-	142 (196)	3 (9)	7	Almost certain	Negligible	Low
Powerful Owl	*Ninox strenua*	V	-	0	0	0	Rare	Moderate	Low
Scarlet Robin	*Petroica boodang*	V	-	16 (42)	0	0	Rare	Moderate	Low
Southern Whiteface	*Aphelocephala leucopsis*	V	V	1 (2)	0	0	Rare	Moderate	Low
Speckled Warbler	*Chthonicola sagittata*	V	-	18 (73)	0	0	Rare	Moderate	Low
Superb Parrot	*Polytelis swainsonii*	V	V	4 (1)	0	0	Rare	Moderate	Low
Sulphur Crested Cockatoo	*Cacatua galerita*	-	-	25 (171)	1 (1)	33	Potential	Negligible	Negligible

Common Name	Species Name	BC Act	EPBC Act	No. of BWF records (no. of individuals)	Recorded flights in RSA (no. of individuals)	Recorded fatalities at Australian wind farms	Likelihood	Consequence	Risk Rating
Varied Sittella	*Daphoenositta chrysoptera*	V	-	8 (25)	0	0	Rare	Moderate	Low
Wedge-tailed Eagle	*Aquila audax*	-	-	144 (230)	76 (136)	190	Almost certain	Moderate	High
Whistling Kite	*Haliastur sphenurus*	-	-	2 (2)	1 (1)	4	Potential	Negligible	Negligible
White-throated Needletail	*Hirundapus caudacutus*	V	V, Mi	17 (273)	10 (148)	42	Likely	Moderate	Moderate
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V	-	1 (1)	0	3	Unlikely	Moderate	Low

V = Vulnerable. Mi = migratory

The CRM methodology followed the refined Band CRM (Band 2000 and Band et al. 2007) as presented in Christie and Urquhart (2015). The baseline bird risk assessment (Table 6-5) identified a total of seven bird species at 'Moderate' or 'High' collision risk. For these species the CRM then includes the following steps:

- Step 2 - Assess individual species collision risk
- Step 3 - Assess bird activity for at-risk species
- Step 4 - Incorporate steps 1 and 2 to estimate number of bird collisions.

Species that were not recorded flying within RSA (Little Eagle; see Table 6-5) could not be modelled beyond the calculation of their individual species collision risk (Step 2 of the Band CRM). Accordingly, calculation of collision risk estimates applying the full Band CRM, was completed for the following species:

- Brown Falcon
- Dusky Woodswallow
- Nankeen Kestrel
- Peregrine Falcon
- Wedge-tailed Eagle
- White-throated Needletail.

6.2.2. CRM wind turbine generator parameter inputs

Step 2 of the Band CRM model (Band 2000 and Band et al. 2007) also uses parameter inputs based on the WTG specifications, whilst Step 3 of the Band CRM uses the proposed WTG layout to calculate both the Total Risk Area and Proportional Risk Window. The proposed WTG specifications and WTG layout is based on the latest Development Corridor and underground electrical reticulation layout provided by Ark Energy on 02 October 2024.

6.2.3. Step 2 – Assess individual species collision risk

Collision risk for each of the bird species identified above in Section 6.2.1 was undertaken. The Band CRM estimates collision risk based on the blade dimensions and speed of rotation and bird speed/size, based on a range of up-wind and down-wind trajectories. The collision risk assessment uses parameter inputs for the WTG specifications (Table 6-6), as well as each bird species dimension and behaviour (Table 6-7).

For each species, collision risk was modelled at wind speeds of 0 m/s, 5 m/s and 10 m/s, to incorporate the variability in predominant wind speeds likely to be experienced within the Project Site. The averaged risk across all wind speeds was used to determine the overall Band collision risk for each individual species (Table 6-7).

Table 6-6: Band Collision Risk Model Parameters - WTG

Turbine Parameters	Value
RSA Radius (m)	90
Blades	3
Pitch (degrees)	24

Turbine Parameters	Value
Maximum Chord width (m)	2
Period (s)	4.29

Table 6-7: Band Collision Risk Model Parameters for at-risk species

Species	Length (m)	Wingspan (m)	Flight Speed (m/s)	Flapping 0 / Gliding 1	Band collision risk
Brown Falcon	0.45	1.0	15	1	5.55%
Dusky Woodswallow	0.18	0.325	15	1	4.90%
Little Eagle	0.5	1.22	15	1	6.25%
Nankeen Kestrel	0.3	0.7	15	1	5.10%
Peregrine Falcon	0.46	0.9	15	1	7.30%
Wedge-tailed Eagle	1.06	2.32	15	1	10.97%
White-throated Needletail	0.2	0.6	15	1	4.63%

6.2.4. Step 3 – Assess bird activity at risk of collision

The third step of the Band CRM has two components, firstly, calculating the at-risk bird activity and secondly, calculating the proportional risk window of the proposed WTG area. At-risk bird activity is based on the BUS data to calculate the number of Birds at risk (flights within the RSA) per survey hour (20-minute survey multiplied by 3), per day (average hours of daylight, adjusted for each season (USNO 2024), with an additional 2 hours added for White-throated Needletail to account for pre-dawn and post-dusk activity (Tarburton 2021) and per month (30.4 average days per month). The proportional risk window is calculated using the following formula:

Proportional risk window = (π x r^2 x No. of WTGs)/Total risk area. Based on a top of blade height of 250 m and internal WTG-related underground electrical reticulation distance of 52.8 km the total risk area = 13.2 km^2. Based on 70 turbines with 90 m blades the turbine risk area = 1.78 km^2; and therefore, the Proportional risk is 0.1348. Combining the two components of Step 2, the total number of birds at risk of collision per month (passing through the rotor area) is calculated by multiplying the Birds at risk by the Proportional risk window.

6.2.5. Step 4 – Incorporate Step 2 and Step 3 to estimate number of bird collisions

The final step of the Band CRM incorporates the above data to calculate an annual (yearly) collision risk for each at-risk bird species. This is calculated by multiplying the Birds at risk per month (Step 3), by the Band collision risk for each relevant at-risk bird species (Step 2) for which data is available (see Section 2) and then extrapolating this monthly estimate for each season (monthly estimate multiplied by 3) and finally, a yearly estimate (the sum of each seasonal estimate).

6.3. Birds at risk

6.3.1. Wedge-tailed Eagle

Species description

The Wedge-tailed Eagle (*Aquila audax*) is Australia's largest raptor species weighing in at 3.5 kg (males – see Plate 6-1) and 4.1 kg (female) with a wingspan of approximately 2 m (Debus 2019). The species is widely distributed across mainland Australia, Tasmania, and southern New Guinea. It occupies a broad range of habitats, including open woodlands, forested landscapes, grasslands, shrublands, and arid and semi-arid regions. The species shows a preference for large tracts of open country interspersed with elevated perching or nesting sites, such as trees, cliffs, or escarpments (Debus 2019). It is frequently observed soaring over ridgelines, open plains, or along thermal currents while foraging.

The species primarily preys on medium to large mammals, including adult rabbits, brown hares, and juvenile kangaroos (Olsen et al. 2010). It also consumes lambs and goats, with sheep likely scavenged as carrion. A study by Olsen et al. (2010) investigating a population near Canberra reported that eastern grey kangaroos comprised approximately 25% of the eagle's diet.

Wedge-tailed Eagles typically construct large stick nests in the upper canopy of mature trees, most commonly tall eucalypts. However, in regions lacking suitable trees, they are also known to nest on cliffs or rocky outcrops (Debus 2019). Wedge-tailed Eagles frequently re-use nest sites across successive breeding seasons, progressively adding material to form large and prominent stick nests (Olsen et al. 2006).

Listing status and population information

Wedge-tailed Eagles are widespread and abundant throughout mainland Australia and NSW (Higgins and Peter 2002) with its conservation status considered 'least concern' (BirdLife International 2025), except for the larger Tasmanian subspecies, *Aquila audax fleayi,* which is listed as Endangered under the Commonwealth EPBC Act. An estimate of the species total population is unavailable, however, the species population trend is considered to be increasing (BirdLife International 2025).

Wedge-tailed Eagles are known to be at risk of collision with wind turbines due to their large size, soaring flight, and frequent use of ridgelines, hill slopes and uplift zones whilst flying at heights in the RSA (Smales 2015; Hull and Muir 2010). The species is commonly recorded in mortality monitoring at operational wind farms in Australia, including the two closest operational wind farms in Bodangora Wind Farm (Nature Advisory 2024) and Crudine Ridge Wind Farm (ELA 2024).

Likelihood and Consequence of impacts

Wedge-tailed Eagle was by far the most commonly and abundantly recorded raptor during BUS, with a total of 230 individual flights recorded from 144 observations, of which 59.1% of individual flights were in the RSA (Table 4-19). High flight activity areas are located along the northern ridge (WTG 20 – 21) and north-western ridge (WTG 1 – 17), and in the broad valley in the south-east of the Project Site, between WTGs 57 – 64 (Figure 6-1). Flight activity was typically recorded above valleys and adjacent to ridge lines containing proposed WTGs, however, Wedge-tailed Eagles were recorded undertaking flights which cross over the ridge line, therefore, coinciding with the location of proposed WTGs. Due to the species

high activity across the Project Site within the RSA, combined with recorded fatalities at operational wind farms (Table 6-5), the Wedge-tailed Eagle has been assessed as having an 'Almost certain' likelihood of impact.

The consequence of impact to Wedge-tailed Eagle has been assessed as 'Moderate' given the potential for loss of moderate numbers of a non-listed resident population which utilises the Project Site for foraging, breeding and dispersal. Whilst no active Wedge-tailed Eagle nests have been recorded within the Development Corridor during surveys, including during winter and spring 2024 BBUS coinciding with the species typical breeding season (BirdLife Australia 2023; Debus 2019), adult pairs have been recorded flying throughout the Project Site, with multiple records in both the north-west and south-east of the Project Site (Figure 6-1). An active Wedge-tailed Eagle nest was recorded during BUS in October 2024, located approximately 1.3 km south of the Development Corridor and approximately 600 m west of Control site 8.

It is likely that the Project Site, with the turbine layout covering approximately 120 km^2, includes breeding territories of several pairs, given the recorded breeding territories maintained by the species (3-9 km^2; Sharp et al. 2001, and 31-42 km^2; Cherriman 2007) and the recording of multiple adult pairs simultaneously and across multiple sections of the Project Site. Applying the upper limit of the species recorded breeding territory sizes (9 km^2 and 41 km^2) to the Project Site (120 km^2), results in an estimate of between three and twelve (12) Wedge-tailed Eagle pairs occupying the Project Sites.

The abundant and widespread recording of the species during BUS is supportive of the occurrence of a relatively dense Wedge-tailed Eagle population. During a single day of BUS in spring 2024, a total of 24 individual Wedge-tailed Eagle flights were recorded from 13 observations. These observations included the concurrent recording of four birds at BUS site Control_7, located on the western side of the Project Site, and two birds at BUS site Control_3, located approximately 13.6 km away in the east of the Project Site (Figure 6-1). Groups of five independent, sub-adult Wedge-tailed Eagles have also been recorded within the Project Site in both autumn and spring 2024 and further demonstrate a relatively abundant and active local population.



Plate 6-1: Adult male Wedge-tailed Eagle (Photo: T. Kelly, 2024)

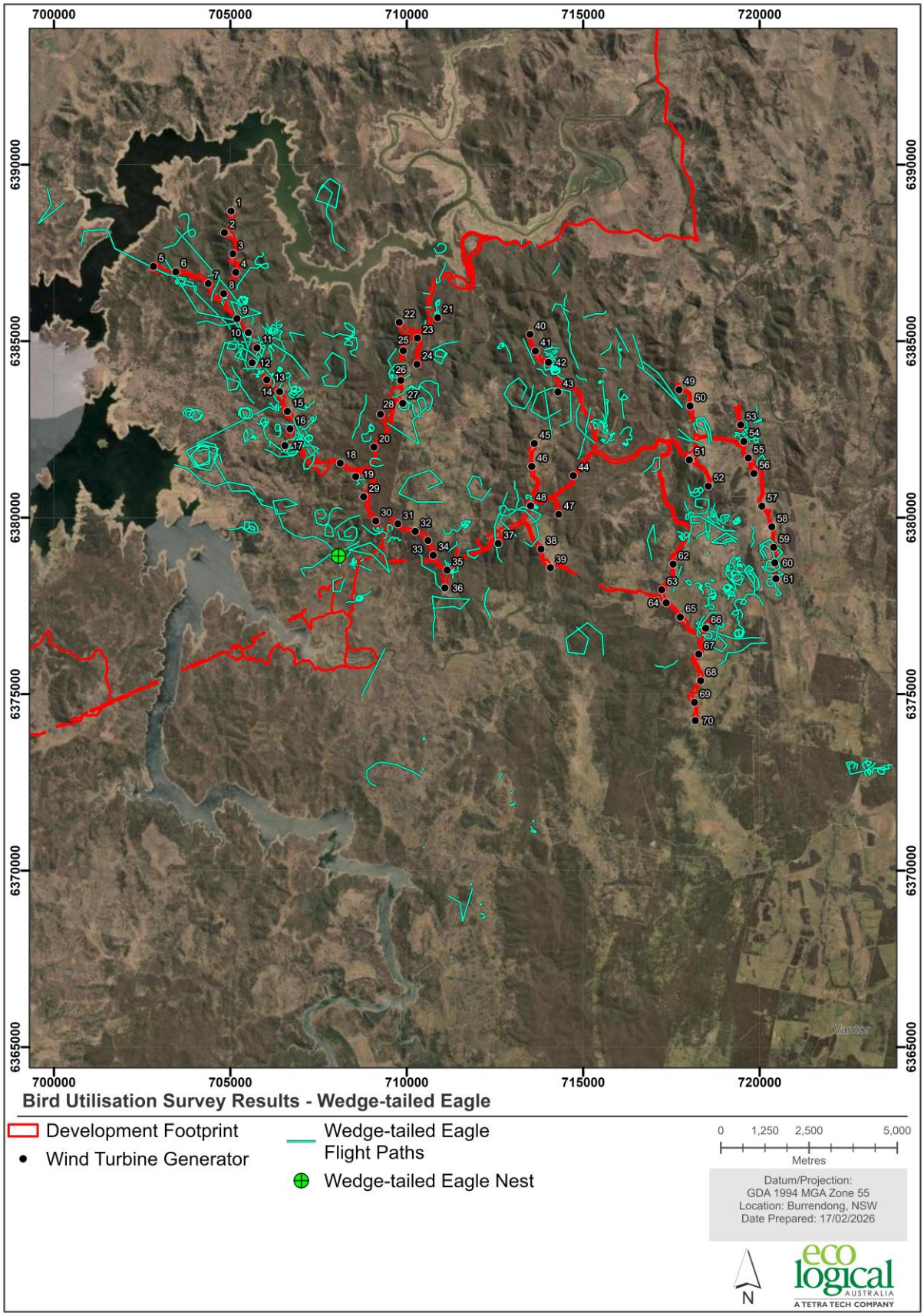


Figure 6-1: Flight paths of Wedge-tailed Eagles and adjacent WTGs showing abundant raptor activity along northern and north-western ridges and south-eastern valley

6.3.2. White-throated Needletail

Species description

The White-throated Needletail (*Hirundapus caudacutus*) is a large, migratory swift recognised for its exceptional aerial agility and high-speed flight. It is easily identified by its dark olive-brown plumage contrasted by a white throat and undertail, as well as its long, swept-back wings and short, pointed tail feathers. Adults reach around 20 cm in length with a wingspan of approximately 50 cm (Pizzey and Knight 2012) and they are almost always observed in flight, rarely seen perching.

This species breeds in the temperate and boreal forests of south-eastern Siberia, Mongolia, northern Japan, and the Korean Peninsula (OEH 2025). During the austral summer, it migrates to Australia, where it is most commonly seen along the eastern seaboard, including New South Wales and Queensland. While in Australia, the White-throated Needletail is not tied to specific habitats. Instead, it forages high above a variety of landscapes, including open forests and woodlands most prominently (Higgins and Peter 2002), but also agricultural land and urban areas. It feeds on flying insects, often forming large flocks and soaring over ridgelines and coastal valleys, using thermals to hunt. The bird's behaviour is predominantly aerial whilst present in Australia (Higgins and Peter 2002). It is rarely observed at rest, and while its roosting behaviour is not well understood, it is believed to predominantly roost in trees, including tree-hollows (Tarburton 1993).

Listing status and population information

White-throated Needletails are listed as vulnerable under both the BC Act and the EPBC Act and is also listed as *migratory under the EPBC Act and protected* under several international agreements, including JAMBA, CAMBA, ROKAMBA, and the Bonn Convention. The subspecies which occurs in Australia (*Hirundapus caudacutus caudacutus*) is considered one entire population, which is estimated at 41,000 mature individuals (Tarburton and Garnett 2021), with evidence of progressive declines recorded for the species, caused in a large part through the loss of nesting hollows in the species northern hemisphere breeding grounds (Tarburton 2021).

White-throated Needletails are known to be at risk of collision with wind turbines due to the large portion of time spent foraging at heights within the typical RSA of WTGs as well as pre-dawn and post-dusk flights to and from roost sites (Tarburton 2021). The species has been recorded in mortality monitoring at operational wind farms in Australia (Table 6-5), however, has not been recorded from the two closest operational wind farms in Bodangora Wind Farm (Nature Advisory 2024) and Crudine Ridge Wind Farm (ELA 2024). Whilst the species commonly occurs in moderate to large sized flocks (>30 to 100s; Tarburton 2021 and eBird 2025) recorded fatalities at operational wind farms have been of individual and small numbers of birds (Moloney et al. 2019 and Hull et al. 2013).

Likelihood and Consequence of impacts

A total of 273 individual White-throated Needletails from 17 observations have been recorded during BUS, of which 54.2% of individuals were flying in the RSA (Table 4-19). The species has been recorded in surveys from late October to early May which is broadly in line with the species occurrence in the region during its austral migration (mid-spring to mid-autumn), as recorded in publicly available datasets (NSW DCCEEW 2025; eBird 2025). Flock sizes have ranged from two birds to approximately 60 birds and flight behaviour has included foraging at heights well above the RSA and directional flights of birds passing

through the Project Site (Figure 6-2) both below and within the RSA. Given the species occurrence within the RSA and its recorded susceptibility to turbine collision, the likelihood of impact has been assessed as 'Likely'.

The consequence of impact to White-throated Needletail has been assessed as 'Moderate' given the potential for loss of a species listed as Vulnerable (BC Act and EPBC Act) and Migratory (EPBC Act) which utilises the Project Site for foraging and dispersal.

6.3.3. Dusky Woodswallow

Species description

The Dusky Woodswallow is a small to medium-sized, insectivorous bird native to Australia, recognised for its soft grey-brown plumage, dark face mask, and pale underwings (OEH 2025d). Although not a true swallow, it shares many similar aerial behaviours and is known for its sociable nature, often observed in small flocks perched together or gliding in loose foraging groups (Pizzey and Knight 2012).

This species is widespread across south-eastern Australia, including NSW, where it inhabits a variety of open woodland and forest environments. It shows a strong preference for eucalypt woodlands, particularly those with sparse understorey, and is also found along forest edges, in regenerating vegetation, roadside corridors, and open paddocks with scattered trees (Higgins and Peter 2002). Dusky Woodswallow are highly mobile, moving in response to food availability, and are considered partially migratory, especially in southern populations (Higgins and Peter 2002; NSW Scientific Committee 2016).

Feeding mostly on flying insects, the Dusky Woodswallow forages aerially or by sallying from perches. It may also take insects from foliage and occasionally feeds on nectar or lerps (Higgins and Peter 2002; NSW Scientific Committee 2016). Breeding occurs in spring and summer, with nests constructed in tree hollows, crevices, or sheltered forks. The species is cooperative during the breeding season, with some individuals helping to feed young at communal nests (BirdLife Australia 2025).

Listing status and population information

Dusky Woodswallow is listed as vulnerable under the BC Act. The population size in NSW has been calculated based upon published density estimates (H. Ford *in litt*. May 2014) at approximately 200,000 adults. Whilst this estimate is coarse and the population assessed as declining, the total NSW population is considered unlikely to be low or very low (NSW Scientific Committee 2016).

The species has just one recorded mortality from operational wind farms in Australia, with this record originating from mortality monitoring data from 2003 to 2018 at a Victorian wind farm (Moloney et al. 2019). There are no publicly available mortality records form operational wind farms in NSW, including the two closest operational wind farms (Bodangora Wind Farm; Nature Advisory 2024, and Crudine Ridge Wind Farm; ELA 2024), also located in the Central West Orana Renewable Energy Zone.

Likelihood and Consequence of impacts

A total of 106 individual Dusky Woodswallow from 21 observations have been recorded during BUS, of which 22.6% of individuals were flying in the RSA (Table 4-19). Whilst the species has been recorded across all seasonal BUS, flights in RSA height were only recorded on two occasions when flocks of 12 individuals were recorded flying up to a height of 80 m height in both winter 2024 (BUS site Impact_8)

and autumn 2025 (BUS site Impact_3; see Figure 6-2). Interestingly, the two flocks of species recorded flying within the lower RSA were the two largest flock sizes recorded for the species during BUS, with the species recording a mean flock size of 4.7 individuals. Given the species has been recorded flying within the lower RSA on two occasions, combined with a previously recorded mortalities at a Victorian operational wind farm, the likelihood of impact for Dusky Woodswallow has been assessed as 'Potential'.

The consequence of impact to Dusky Woodswallow has been assessed as 'Moderate' given the potential loss of this Vulnerable (BC Act) listed species which utilises the Project Site for foraging, breeding and dispersal. No nests of the Dusky Woodswallow have been recorded within the Development Corridor, however, suitable breeding habitat for the species (BirdLife Australia 2025) does occur.

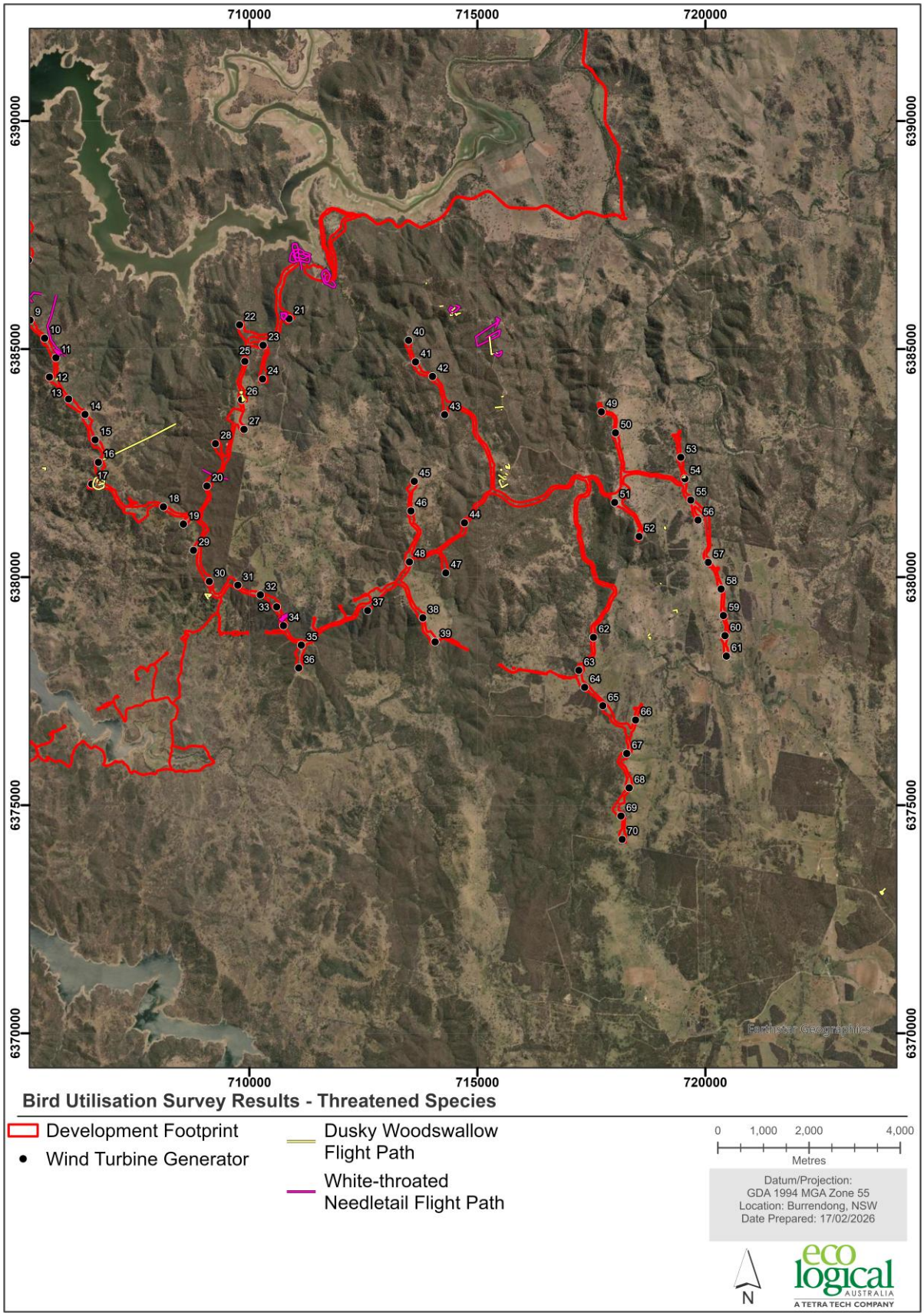


Figure 6-2: Flight paths of White-throated Needletail and Dusky Woodswallow and adjacent proposed WTGs in the Development Corridor

6.3.4. Falcons

Species description

The Peregrine Falcon (*Falco peregrinus*) is a widespread, medium-sized bird of prey renowned for its speed, agility, and precision as an aerial hunter (Pizzey and Knight 2012). It occurs across all continents except Antarctica and occurs throughout central west NSW (NSW DCCEEW 2025), where it inhabits a range of open and wooded landscapes. In Australia, the species is not listed as threatened, but it remains ecologically significant due to its role as a top predator and its fidelity to nesting sites.

The Peregrine Falcon shares its range with other medium-sized falcons, including the Brown Falcon (*Falco berigora*) and Nankeen Kestrel (*Falco cenchroides*). Both species are also commonly found across central west NSW (NSW DCCEEW 2025), favouring open habitats such as native grasslands, agricultural paddocks, lightly wooded farmland, roadside corridors, and cleared pastoral areas. These raptors are well adapted to modified environments, with Brown Falcon and Nankeen Kestrel frequently seen perched on fences, powerlines, and paddock trees, using these vantage points to hunt and larger trees and structures for nesting (Debus 2019).

Peregrine Falcons, in contrast, are more likely to be seen soaring or stooping at high speed, often nesting on cliffs, rocky outcrops, and occasionally tall man-made structures. Their diet primarily consists of birds, which they capture mid-flight in dramatic high-speed dives (Debus 2019). The Brown Falcon and Nankeen Kestrel, which show more generalist feeding behaviours, with prey including invertebrates, small mammals and reptiles (Debus 2019).

Listing status and population information

Nankeen Kestrel, Brown Falcon and Peregrine Falcon are not listed under State or Commonwealth legislation, with their overall conservation status considered ‘least concern’ (BirdLife International 2025). The total Australian and NSW populations of these species is poorly understood, however, Cade (1982) provides an estimate of 225,000 Brown Falcon pairs and Peregrine Falcon 3000-5000 pairs.

All three species are at risk of collision with WTGs given their use of elevated airspace for foraging and undertaking some directional flights, which can bring them into contact with the typical RSA heights of WTGs. Each of the species have recorded mortalities at operational wind farms (Hull et al. 2013; Maloney et al. 2019; Symbolix 2020), with Brown Falcon and Nankeen Kestrel among the most frequently recorded bird species in mortality monitoring (see Table 6-5). Both species also have recorded fatalities at the two closest operational wind farms in Bodangora Wind Farm (Nature Advisory 2024) and Crudine Ridge Wind Farm (ELA 2024).

Likelihood and Consequence of impacts

Relatively few total individual flights and flights within the RSA have been recorded for Nankeen Kestrel (ten total, five in RSA), Brown Falcon (seven total, three in RSA) and Peregrine Falcon (one total, one in RSA) (see Table 4-19). As all three species have been recorded flying within the RSA within the Project Site (Figure 6-3), combined previous records of mortalities at operational wind farms, the likelihood of impact has been assessed as ‘Likely’ for Brown Falcon and Nankeen Kestrel, and ‘Potential’ for Peregrine Falcon, given the fewer recorded flights in RSA and mortality records.

The consequence of impact to all three species has given the potential for loss of moderate numbers of a non-listed resident population which utilises the Project Site for foraging, breeding and dispersal. No nests of these species have been recorded within the Development Corridor; however, suitable breeding habitat (Debus 2019) does occur.

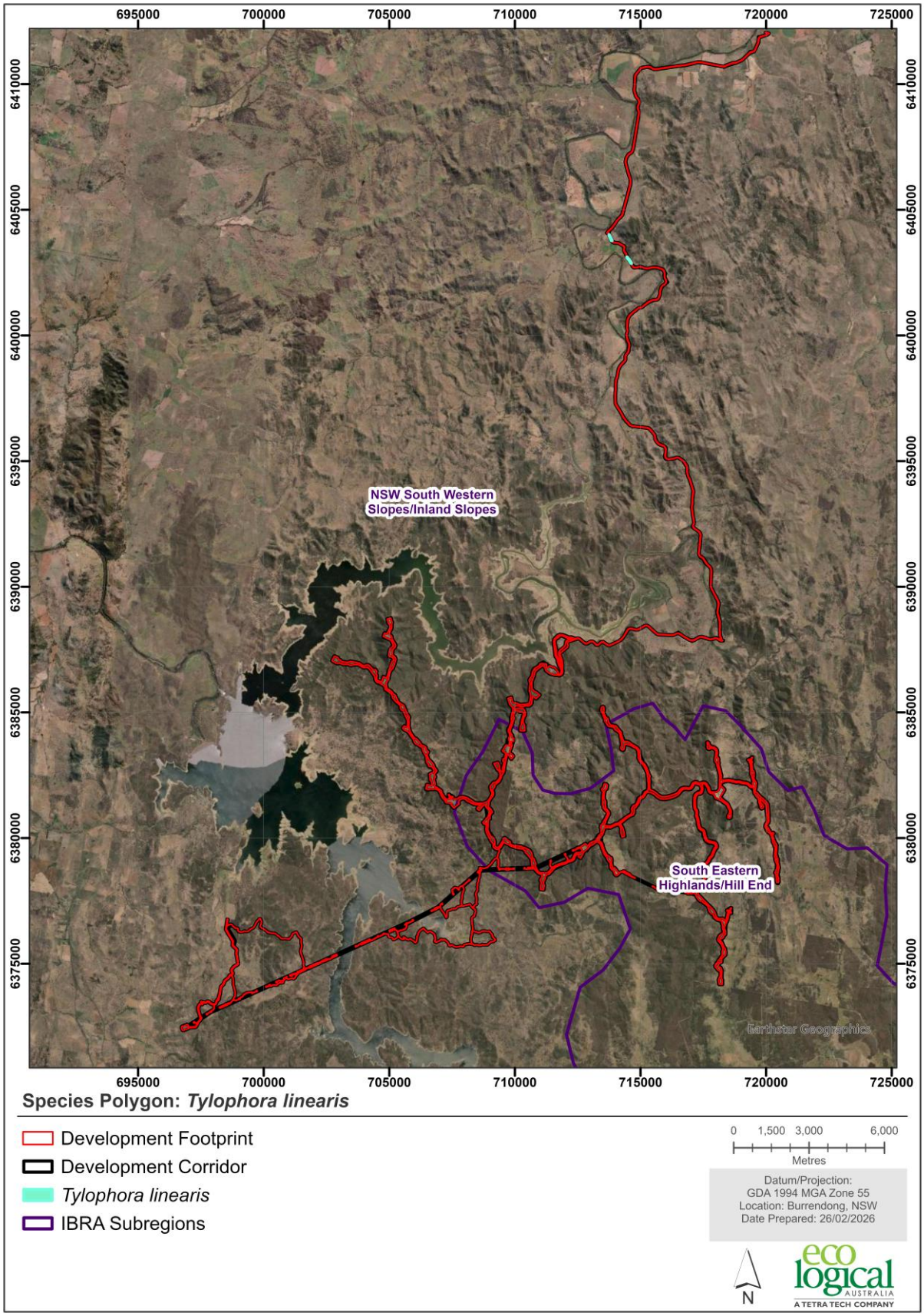


Figure 6-3: Flight paths of Falcons and adjacent proposed WTGs in the Development Corridor

6.4. Collision Risk Monitoring Results - Birds

Collision risk estimates were calculated through the application of the Band CRM. The yearly collision estimate for Brown Falcon, Dusky Woodswallow, Nankeen Kestrel and Peregrine Falcon was relatively low, ranging from 0.43 (Peregrine Falcon) to 10.53 (Dusky Woodswallow) birds under a no avoidance scenario, through to 0.02 (Peregrine Falcon) birds and 0.53 (Dusky Woodswallow) birds under a 95% avoidance scenario (Table 6-8). For White-throated Needletail with large flocks recorded in the RSA during spring 2024 BUS (60 individuals) and autumn 2025 BUS (53 individuals), the yearly collision estimates ranges from 65.45 birds under a no avoidance scenario, through to 6.55 birds and 3.27 birds under a 90% and 95% avoidance scenario, respectively (Table 6-8).

Owing to the species relatively high abundance (230 total individual flights recorded), flight behaviour (136 individuals recorded flying within the RSA) and large size (see Table 6-7), the Wedge-tailed Eagle yearly collision estimate is highest, ranging from 124.04 birds under a no avoidance scenario, through to 12.40 birds and 6.20 birds under a 90% and 95% avoidance scenario, respectively (Table 6-8). The full CRM results for all five modelled bird species is presented in Table 6-9.

Table 6-8: Yearly Collision Estimate

Species	Band Collision Risk	Yearly Estimate Number of Collisions		
		No Avoidance	90% Avoidance	95% Avoidance
Brown Falcon	0.075	2.03	0.20	0.10
Dusky Woodswallow	0.049	10.53	1.05	0.53
Nankeen Kestrel	0.062	2.91	0.29	0.15
Peregrine Falcon	0.073	0.43	0.04	0.02
Wedge-tailed Eagle	0.13	124.04	12.40	6.20
White-throated Needletail	0.056	65.45	6.55	3.27

Each of the above bird species are highly mobile and demonstrate avoidance of natural and man-made obstacles in their general flight behaviour and day to day flight activity. Whilst there are gaps in the understanding of avoidance rates of specific species when encountering WTGs, avoidance of most bird species is considered to be high and a minimum of 95% for most sampled species (Smales 2006). Hull and Muir (2013) analysed avoidance rates for Wedge-tailed Eagle and White-bellied Sea-Eagle at two Tasmanian operational wind farms and recorded avoidance rates between 81-97%. Validation of CRM estimates with actual mortality rates of Wedge-tailed Eagle at the same two Tasmanian wind farms, along with an additional wind farm in Tasmania and Victoria, indicate that actual mortalities closely approximate avoidance rates of 96%, 97%, ~85% and ~95% (Smales 2023). The results of the CRM at 90% and 95% avoidance rates (Table 6-8) are therefore considered most suitable for the assessment of the impact of turbine collision for these species.

The modelled rates of collisions for the three Falcon species and Dusky Woodswallow are low and unlikely to impact upon the local, regional or total population viability of these species. The White-throated Needletail is considered a single population of an estimated 41,000 mature individuals within Australia (Tarburton and Garnett 2021) of which only a small proportion has been recorded across the

Project Site, with a maximum flock size of 60 individuals and a total of 273 individual birds recorded across 17 observations during BUS.

Whilst the rate of modelled collisions at 90% and 95% avoidance rates is unlikely to impact the viability of the total population, the loss of individuals within the Project Site, may contribute to wider cumulative impacts, given the species range coincides with the majority of operational and planned wind farms in eastern Australia (eBird 2025; Renew Economy 2025) and mortality records exist from several of these operational wind farms (Moloney et al. 2019; Hull et al. 2013; Tarburton 2021). A robust operational monitoring program is proposed to monitor potential impacts to the White-throated Needletail, inclusive of carcass monitoring and BUS during the species migratory period to the region (see Section 11).

The modelled rate of impacts to Wedge-tailed Eagle (Table 6-8) has the potential to impact upon the local population, despite this population being recorded in relatively high abundance, across the extent of the Project Site and surrounds during BUS. An annual collision rate of up to six individuals may reduce local population viability, particularly where resident breeding adults or their fledged young are impacted, given the species relatively slow reproductive rate and low fledgling success rate (0.9-1.5 young per clutch; Debus 2019). The species was predominantly recorded (88% of observations) as individuals and pairs of mostly adult birds, where observed close enough to age.

Recorded Wedge-tailed Eagle mortalities from the two closest operational wind farms, also located in the Central West Orana Renewable Energy Zone, indicate that modelled collisions predicted for the Project may contribute to cumulative impacts to the species regional population. Bodangora Wind Farm, located approximately 24 km north of the Project Site, recorded a mean annual mortality of 3.3 Wedge-tailed Eagles across the first three years of operational monitoring (Nature Advisory 2024). Crudine Ridge Wind Farm, located approximately 37 km south-east of the Project Site, recorded a mean annual mortality of 9.7 Wedge-tailed Eagles across its first three years of operational monitoring (ELA 2024). Crudine Ridge Wind Farm has recorded predominantly sub-adult birds in mortality monitoring and given the quantity and repeated nature of impacts, it is likely that at least some mortalities represent non-resident birds. Combined with the abundant flight observations recorded from both wind farms (ELA 2024 and Nature Advisory 2024) and the high density of regional database records (eBird 2025; NSW DCCEEW 20250), this would indicate a large and multi-generational regional Wedge-tailed Eagle population.

There are uncertainties, however, as to the resilience of local and regional populations in response to collision impacts, including the capacity and rate of replacement of breeding individuals and the impact of sub-adult mortality on longer term population viability, given pair bonding is thought to form in sub-adults (Morris and Fox 1971). Accordingly, a robust program of operational monitoring is proposed for the Wedge-tailed Eagle (see BBAMP).

Table 6-9: Collision Risk Model Results

Species	Band Collision Risk	Season	Total Observations	No. of surveys	Observations in RSA	Birds at Risk Per BUS Hour	Birds at Risk (per Month)	Total Risk Area (km^2)	Turbine Risk Area (km^2)	Proportional Risk Window	Birds in RSA (per Month)	Seasonal Estimated Number of Collisions		
												No Avoidance	90% Avoidance	95% Avoidance
Brown Falcon	0.075	Summer 2021/22	0	87	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
		Autumn 2024	0	40	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
		Winter 2024	1	44	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
		Spring 2024	5	44	2	0.14	53.48	13.2	1.78	0.1348	7.21	1.62	0.162	0.081
		Summer 2025	1	44	1	0.07	26.74	13.2	1.78	0.1348	3.61	0.81	0.081	0.041
		Autumn 2025	0	44	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
Dusky Woodswallow	0.049	Summer 2021/22	6	87	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
		Autumn 2024	14	40	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
		Winter 2024	14	44	12	0.82	256.19	13.2	1.78	0.1348	34.55	5.08	0.508	0.254
		Spring 2024	7	44	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.265	0.133
		Summer 2025	50	44	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000

Species	Band Collision Risk	Season	Total Observations	No. of surveys	Observations in RSA	Birds at Risk Per BUS Hour	Birds at Risk (per Month)	Total Risk Area (km^2)	Turbine Risk Area (km^2)	Proportional Risk Window	Birds in RSA (per Month)	Seasonal Estimated Number of Collisions		
												No Avoidance	90% Avoidance	95% Avoidance
		Autumn 2025	15	44	12	0.82	282.55	13.2	1.78	0.1348	38.10	5.60	0.560	0.280
Nankeen Kestrel	0.062	Summer 2021/22	4	87	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
		Autumn 2024	0	40	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
		Winter 2024	1	44	1	0.07	21.35	13.2	1.78	0.1348	2.88	0.54	0.054	0.027
		Spring 2024	4	44	3	0.21	80.22	13.2	1.78	0.1348	10.82	2.01	0.201	0.101
		Summer 2025	1	44	1	0.07	28.81	13.2	1.78	0.1348	3.89	0.72	0.072	0.036
		Autumn 2025	0	44	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
Peregrine Falcon	0.073	Summer 2021/22	0	87	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
		Autumn 2024	0	40	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
		Winter 2024	0	44	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
		Spring 2024	0	44	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
		Summer 2025	1	44	1	0.07	28.81	13.2	1.78	0.1348	3.89	0.85	0.085	0.043

Species	Band Collision Risk	Season	Total Observations	No. of surveys	Observations in RSA	Birds at Risk Per BUS Hour	Birds at Risk (per Month)	Total Risk Area (km^2)	Turbine Risk Area (km^2)	Proportional Risk Window	Birds in RSA (per Month)	Seasonal Estimated Number of Collisions		
												No Avoidance	90% Avoidance	95% Avoidance
		Autumn 2025	0	44	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	0.000	0.000
Wedge-tailed Eagle	0.13	Summer 2021/22	32	87	13	0.45	189.42	13.2	1.78	0.1348	25.54	9.96	0.283	0.142
		Autumn 2024	26	40	15	1.13	388.51	13.2	1.78	0.1348	52.39	20.43	0.000	0.000
		Winter 2024	27	44	17	1.16	362.93	13.2	1.78	0.1348	48.94	19.09	0.000	0.000
		Spring 2024	66	44	37	2.52	989.31	13.2	1.78	0.1348	133.41	52.03	3.916	1.958
		Summer 2025	44	44	31	2.11	893.138	13.2	1.78	0.1348	120.44	46.971	1.889	0.945
		Autumn 2025	35	44	23	1.57	541.562	13.2	1.78	0.1348	73.03	28.481	3.086	1.543
White-throated Needletail	0.056	Summer 2021/22	35	87	8	0.28	124.95	13.2	1.78	0.1348	16.85	2.83	0.996	0.498
		Autumn 2024	0	40	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	2.043	1.022
		Winter 2024	0	44	0	0.00	0.00	13.2	1.78	0.1348	0.00	0.00	1.909	0.954
		Spring 2024	60	44	60	4.09	1728.65	13.2	1.78	0.1348	233.11	39.16	5.203	2.601
		Summer 2025	125	44	27	1.84	833.86	13.2	1.78	0.1348	112.44	18.89	4.697	2.349

Species	Band Collision Risk	Season	Total Observations	No. of surveys	Observations in RSA	Birds at Risk Per BUS Hour	Birds at Risk (per Month)	Total Risk Area (km^2)	Turbine Risk Area (km^2)	Proportional Risk Window	Birds in RSA (per Month)	Seasonal Estimated Number of Collisions		
												No Avoidance	90% Avoidance	95% Avoidance
		Autumn 2025	53	44	53	3.61	1362.20	13.2	1.78	0.1348	183.69	30.86	2.848	1.424

6.5. Collision Risk Modelling – Bats

BAS have been completed to understand microbat presence and activity across the Project Site. Surveys were undertaken over a total of ten survey events, commencing in summer 2020-21 to autumn 2025. Details of methods and results are presented in Section 4.5 and 4.6 above.

The initial step and consistent methodology of the CRM outlined in Section 6.2 above (Step 1 of the Band CRM model; Band 2000 and Band et al. 2007), has been applied for bat species.

A baseline bat collision risk assessment was undertaken to identify species at potential risk of WTG collision within the Project Site. This assessment was informed by:

- Field survey data, collected from ultrasonic detectors conducted from December 2020 through to summer 2025 (autumn 2025 data has also been collected but analysis not yet finalised)
- Historical records within a 10 km radius of the Project Site (BioNet search; NSW DCCEEW 2025)
- Documented fatalities at operational wind farms across Australia.

Species were included in the risk assessment if they met one or more of the following criteria:

- Listed as threatened under the NSW BC Act and/or the Commonwealth EPBC Act, including Migratory species
- Known to be prone to turbine collision, based on documented fatalities at operational wind farms.
- Bat call activity recorded at heights of 50 m and 100 m, indicating the potential to fly within the RSA (70–250 m) of proposed WTGs.

In the absence of species-specific flight data within RSA, collision risk modelling could not be progressed beyond Step 1 of the CRM, which calculates the baseline likelihood of individual species encountering turbine blades. Hence a qualitative collision risk assessment has been undertaken for relevant bat species (Table 6-10). The results of the baseline bat risk assessment are detailed in Table 6-10 will be reviewed and revised as necessary through the implementation of the Project BBAMP, where it will eventually transition into an operational bird and bat risk assessment during the operational phase of the Project.

While Grey-headed Flying-foxes (*Pteropus poliocephalus*) were not recorded within the Project Site during surveys, known camps are present in nearby regional centres, including Wellington and Mudgee. In consideration of the species' broad foraging range and mobility and recorded fatalities of the species at operational wind farms, this species has been included in the assessment.

Table 6-10: at species at risk

Common name	Species Name	BC Act	EPBC Act	Total no. of definite calls	50 m	100 m	Definite calls at RSA heights (50 m / 100 m)	Proportion of calls at RSA height	Recorded fatalities at Australian wind farms	Likelihood	Consequence	Risk rating
Chocolate Wattle Bat	*Chalinolobus morio*	-	-	2,061	25	0	25	0.4	36	Potential	Negligible	Negligible
Corben's Long-eared Bat	*Nyctophilus corbeni*	V	V	0	0	0	0	0.0	0	Rare	Moderate	Low
Eastern Cave Bat	*Vespadelus troughtoni*	V	-	15	0	0	0	0.0	0	Unlikely	Moderate	Low
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	V	-	18	0	0	0	0.0	33	Potential	Moderate	Moderate
Gould's Wattle Bat	*Chalinolobus gouldii*	-	-	14,222	447	16	463	3.3	232	Almost certain	Low	Moderate
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V	-	41	14	0	14	34.1	0	Potential	Moderate	Moderate
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	N/A	NA	NA	N/A	N/A	17	Potential	Moderate	Moderate
Inland Broad-nosed Bat	*Scotorepens balstoni*	-	-	768	13	0	13	0.2	0	Potential	Negligible	Negligible
Large-eared Pied Bat	*Chalinolobus dwyeri*	E	E	30	0	0	0	0.0	0	Unlikely	Moderate	Low

Common name	Species Name	BC Act	EPBC Act	Total no. of definite calls	50 m	100 m	Definite calls at RSA heights (50 m / 100 m)	Proportion of calls at RSA height	Recorded fatalities at Australian wind farms	Likelihood	Consequence	Risk rating
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	V	-	3,010	183	62	245	8.1	4	Likely	Moderate	Moderate
Large Forest Bat	*Vespadelus darlingtoni*	-	-	927	15	7	22	2.4	48	Potential	Negligible	Negligible
Little Pied Bat	*Chalinolobus picatus*	V	-	9	0	0	0	0.0	0	Unlikely	Moderate	Low
Little Bent-winged Bat	*Miniopterus australis*	V	-	3	0	0	0	0.0	0	Unlikely	Moderate	Low
Little Forest Bat	*Vespadelus vulturnus*	-	-	4,918	37	2	39	0.8	54	Likely	Negligible	Negligible
Ride's Freetail Bat	*Ozimops ridei*	-	-	607	158	40	198	32.6	3	Likely	Negligible	Negligible
Southern Forest Bat	*Vespadelus regulus*	-	-	1,901	75	0	75	3.9	22	Likely	Negligible	Negligible
South-eastern Freetail Bat	*Ozimops planiceps*	-	-	10,872	2,408	1,137	3,545	32.6	63	Almost certain	Low	Moderate
White-striped	*Austronomus australis*	-	-	5,447	1,048	727	1,775	32.6	555	Almost certain	Moderate	High

Common name	Species Name	BC Act	EPBC Act	Total no. of definite calls	50 m	100 m	Definite calls at RSA heights (50 m / 100 m)	Proportion of calls at RSA height	Recorded fatalities at Australian wind farms	Likelihood	Consequence	Risk rating
Freetail Bat												
Yellow-bellied Sheath-tailed Bat	*Saccolaimus flaviventris*	V	-	115	7	1	8	6.9	10	Potential	Moderate	Moderate

V = Vulnerable. E = Endangered

6.6. Bat species at risk

6.6.1. White-striped Freetail Bat

Species description

A large and distinctive tree-roosting microbat species with a wide-ranging distribution across the Australian mainland (ABS 2025; Churchill 2008). Occupies a broad range of habitats where they forage for prey by flying at high speeds often at heights of 50 m or move above the ground (Churchill 2008). Typical of most microbat species which exhibit a relatively low reproductive rate, females give birth to a single young during summer, usually from mid-December to late-January (Churchill 2008).

Listing status and population information

The White-striped Freetail Bat is not listed under State or Commonwealth legislation. There is limited information on the species population size, however, they are generally considered common across their wide distribution. The species generally roosts solitarily or in small groups of up to 10 individuals (Churchill 2008). White-striped Freetail Bat was the third most common species recorded during BAS with the species definitively recorded across all seasons of BAS, though predominantly in spring and summer, at an overall call activity of approximately seven calls per night. The species has also been recorded at each of the 11 impact and 8 control BAS sites, indicating a widespread and common local population.

White-striped Freetail Bat has the highest quantity of mortality records from operational wind farms in Australia, including from the nearby Bodangora Wind Farm (Nature Advisory 2024) and Crudine Ridge Wind Farm (ELA 2024).

Likelihood and Consequence of impacts

The likelihood of impact to White-striped Freetail Bat has been assessed as ‘Almost certain’ given the relatively high quantity of definite calls within the RSA and recorded fatalities from turbine collision.

The consequence of impact to White-striped Freetail Bat has been assessed as ‘Moderate’ given the potential for the loss of moderate numbers of this non-listed species which utilises the Project Site for foraging, breeding and dispersal. Whilst the call activity of the species indicates a local population that is common and widespread, the loss of moderate numbers of individuals has the potential to contribute to cumulative impacts on the species given recorded mortality at nearby operational wind farms and the potential for additional loss from approved wind farms in the region. To date, the species has recorded collision rates of 0.27 and 0.14 individuals per turbine per year respectfully, at the nearby Bodangora and Crudine Ridge Wind Farms (see Section 10). There are uncertainties as to how such a rate of impact may effect local and/or regional population viability, a robust program of operational monitoring is proposed (see BBAMP).

6.6.2. Eastern False Pipistrelle

Species description

A large and robust tree-roosting microbat distributed mostly east of the Great Dividing Range in south-eastern Australia and in Tasmania (ABS 2025; Churchill 2008). The species typically occurs in tall forest

and woodland habitat, preying on large insects via swift and direct flight within or just below the canopy (Churchill 2008). The species is also capable of moving through cleared landscapes and foraging in open areas (Churchill 2008).

Listing status and population information

The Eastern False Pipistrelle is listed as vulnerable under the NSW BC Act. There is limited information on the species population size. The species often roosts solitary or in small, single sex colonies of three to 80 individuals (Churchill 2008). There are scattered records of the species in the central west NSW region (DCCEEW 2025) with the Project Site appearing to be located towards the western limit of its range. Based on call and harp trapping data collected by ELA in the region, the species is generally considered uncommon. The species has been recorded from only 18 definite calls during summer 2025 BAS, at a very low overall call activity rate.

A relatively low number of potential calls have been recorded for the species as part of two species complexes: Eastern False Pipistrelle / Greater Broad-nosed Bat / Little Broad-nosed Bat (150 total calls); and Eastern False Pipistrelle / Large Forest Bat (16 total calls). The other microbat species which comprise these two species complexes have much larger quantities of definite calls recorded from the Project Site and so the proportional contribution of Eastern False Pipistrelle to these potential calls is likely to be low.

The species has recorded mortalities from operational wind farms in Australia, however, no mortalities have been recorded from the two most proximal wind farms to the Project Site.

Likelihood and Consequence of impacts

The likelihood of impact to Eastern False Pipistrelle has been assessed as ‘Potential’ given the species has a low quantity of potential calls within the RSA and is known to be at risk of turbine collision.

The consequence of impact to Eastern False Pipistrelle has been assessed as ‘Moderate’ given the potential for loss of this Vulnerable (BC Act) listed species which utilises the Project Site for foraging, breeding and dispersal.

6.6.3. Gould’s Wattle Bat

Species description

An extremely common and widespread microbat which occurs the entirety of Australia, excluding far-north Queensland (ABS 2025; Churchill 2008). An adaptable species which occupies virtually all habitat types and prey on an equally diverse range of insects whilst flying mostly within or just below canopy height. The species typically roosts in tree hollows, however, have also been recorded roosting in buildings and amongst leaves. Gould’s Wattle Bat usually give birth to twins in late November (Churchill 2008).

Listing status and population information

Gould’s Wattle Bat is not listed under State or Commonwealth legislation. There is limited information on the species total population size, however, they generally one of the most common microbat species across their wide distribution. Males are usually solitarily whilst females form small colonies of eight to

10 individuals (Churchill 2008). Gould's Wattle Bat was the most common microbat species recorded during BAS, with the species definitively recorded across all seasons of BAS at an overall call activity of approximately 19 calls per night. The species has also been recorded at each of the 11 impact and 8 control BAS sites, indicating an abundant, widespread and common local population.

Gould's Wattle Bat has the second highest quantity of mortality records from operational wind farms in Australia, including from the nearby Bodangora Wind Farm (Nature Advisory 2024) and Crudine Ridge Wind Farm (ELA 2024).

Likelihood and Consequence of impacts

The likelihood of impact to Gould's Wattle Bat has been assessed as 'Almost certain' given the moderate to high quantity of definite calls within the RSA, as well as the relatively high quantity of recorded fatalities from turbine collision.

The consequence of impact to Gould's Wattle Bat has been assessed as 'Low' given that repeated losses of this non-listed and locally abundant species is unlikely to lead to a reduction in population viability. To date, the species has recorded collision rates of 0.33 and 0.04 individuals per turbine per year respectfully, at the nearby Bodangora and Crudine Ridge Wind Farms (see Section 10). There is the potential that losses within the Project Site and from other approved wind farms may contribute to cumulative impacts upon the species in a regional context (see Section 10), and so a robust operational monitoring program is proposed to collect data and inform adaptive management (see Section 11).

6.6.4. Greater Broad-nosed Bat

Species description

Another large and robust tree-roosting microbat species occurring mostly east of the Great Dividing Range along the eastern Australia coast (ABS 2025; Churchill 2008). The species occurs in a variety of woodland and forest habitat and flies with low manoeuvrability, generally foraging on the edge and above the canopy and along vegetation and riparian corridors (Churchill 2008).

Listing status and population information

The Greater Broad-nosed Bat is listed as vulnerable under the NSW BC Act. There is limited information on the species population size. The species often roosts solitary or in small, single sex colonies of three to 80 individuals (Churchill 2008). There are few records of the species in the central west NSW region (DCCEEW 2025) with the Project Site appearing to be located towards the western limit of its range. Based on call and harp trapping data collected by ELA in the region, the species is generally considered uncommon. The species has been recorded from only 41 definite calls, which includes 14 calls at 50 m at met mast BDG1.

A relatively low number of potential calls (150 total calls) have also been recorded as part the species complex containing Eastern False Pipistrelle / Greater Broad-nosed Bat / Little Broad-nosed Bat. Proportionally, Greater Broad-nosed Bat contributed 5.6% of the total quantity of definite calls from the three microbat species which comprise the species complex (i.e. 41 of 736 total definite calls) and so only a small number of additional calls (8 calls approximately) are likely attributable to the species.

The species has no recorded mortalities from operational wind farms in Australia.

Likelihood and Consequence of impacts

The likelihood of impact to Greater Broad-nosed Bat has been assessed as 'Potential' given the species has a low quantity of definite calls recorded at 50 m, towards the lower RSA height (65-250 m) and therefore, at potential risk of turbine collision.

The consequence of impact to Greater Broad-nosed Bat has been assessed as 'Moderate' given the potential for loss of this Vulnerable (BC Act) listed species which utilises the Project Site for foraging, breeding and dispersal.

6.6.5. Grey-headed Flying-fox

Species description

The Grey-headed Flying-fox is the largest species of Australian bat and is distributed in a broad band along the south-eastern Australian coastline. In central west NSW, the species extends west just beyond Dubbo and Parkes (ABS 2025). The species roosts colonially in camps, generally within 20 km of a regular food source, with camps often located close to water in gullies and river valleys (DAWE 2021). The species feeds on the nectar, pollen and fruits of a range of native and introduced trees, including locally occurring native trees *Angophora floribunda* (Rough-barked Apple) and *Eucalyptus albens* (White Box). Camps located within Wellington and Mudgee are beyond the typical nightly foraging range for the species (20 km), however, this highly mobile species is known to travel up to 40-50 km (DAWE 2021). The species is a seasonal breeder, giving birth to a single young from October to December (DAWE 2021).

Listing status and population information

The Grey-headed Flying-fox is listed as vulnerable under the NSW BC Act and Commonwealth EPBC Act. The total population has been estimated to be the order of 680,000 (Westcott et al. 2015). Population counts undertaken at the Wellington and Mudgee camps indicate that Grey-headed Flying-fox numbers typically range from several hundred to several thousand, with substantial variations in numbers and occupancy from spring through to autumn (DCCEEW 2024 and ELA unpublished data). The species has not been recorded within the Project Site during field surveys, though suitable foraging habitat does occur and the species may fly in the vicinity of the Project Site when transiting between camps or towards Burrendong Dam.

Grey-headed Flying-fox has records of mortality from operational wind farms in Australia, including seven occurrences from the nearby Bodangora Wind Farm (Nature Advisory 2024).

Likelihood and Consequence of impacts

The likelihood of impact to Grey-headed Flying-fox has been assessed as 'Potential' given the species is known to occasionally fly at RSA heights and recorded fatalities from turbine collision.

The consequence of impact to Grey-headed Flying-fox has been assessed as 'Moderate' given the potential for loss of this Vulnerable (BC Act and EPBC Act) listed species which has the potential to utilise the Project Site for foraging and dispersal.

6.6.6. Large Bent-winged Bat

Species description

The Large Bent-winged Bat is a cave roosting microbat species distributed across the entirety of the eastern Australian coastline and extending to just west of the Great Dividing Range (ABS 2025). It occupies a broad range of habitats where they predominantly above the canopy, particularly in forested environments and have been recorded foraging substantial distances from roost sites (Churchill 2008). Adult females congregate in large maternity colonies in limestone caves and birth a single young in December to January.

Listing status and population information

Large Bent-winged Bat is listed as vulnerable under the NSW BC Act. There is limited information on the species total population size, however, population counts have been undertaken at known maternity roosts for the species in NSW. Recent counts from two of the three large known maternity caves, Church Cave and Drum Cave (both sites located in southern NSW, approximately 275 km and 240 km south of the Project Site), have estimated maximum populations at each cave of 28,200 and 16,000 respectively (NSW DCCEEW pers. comm; NSW Saving Our Species 2022). Given these two maternity caves comprise only a portion (though perhaps the majority) of the adult female and dependant young population, the species NSW population is likely to exceed 50,000 individuals. The species generally roosts in small groups of two to six individuals (Churchill 2008). Based on trapping data collected by ELA in the region, the species is generally considered widespread and common within central west NSW and a non-breeding roost is known from Wellington Caves. The species has been definitively recorded across all 11 impact and 8 control BAS sites, at an overall call activity rate, of approximately 4 calls per night.

Additional potential Large Bent-winged Bat calls were recorded as part of the Forest Bat / Large Bent-winged Bat species complex (29,784 calls), including calls at heights of 50 m and 100 m, as well as an additional species complex comprising the Forest Bat / Large Bent-winged Bat / Chocolate Wattle Bat (6,147 calls). Proportionally, Large Bent-winged Bat contributed 14.7% of the total quantity of definite calls (inclusive of all ground-based and at height recorded calls) from the four microbat species which comprise the Forest Bat / Large Bent-winged Bat species complex (i.e. 3,010 of 20,427 total definite calls). Approximately 4,389 additional calls may therefore be attributable to the species. Proportionally, Large Bent-winged Bat contributed 9.9% of the total quantity of definite calls (inclusive from the five microbat species which comprise the Forest Bat / Large Bent-winged Bat / Chocolate Wattle Bat species complex (i.e. 3,010 of 30,360 total definite calls). Approximately 609 additional calls may therefore be attributable to the species.

The species has four recorded mortalities from a single operational wind farm in Australia (Boco Rock Wind Farm in southern NSW) and has not been recorded from either Bodangora or Crudine Ridge Wind Farms, being the two nearby operational wind farms in the region.

Likelihood and Consequence of impacts

The likelihood of impact to Large Bent-winged Bat has been assessed as ‘Likely’ given the relatively high quantity of definite and potential calls of the species overall and within the RSA, along with previous mortality records resulting from turbine collision at a NSW operational wind farm.

The consequence of impact to Large Bent-winged Bat has been assessed as ‘Moderate’ given the potential for loss of this Vulnerable (BC Act) listed species which utilises the Project Site for foraging and dispersal.

6.6.7. South-eastern Freetail Bat

Species description

A medium sized tree-roosting microbat species with a distribution through the central third of NSW, extending into western Victoria and south-easter South Australia (ABS 2025; Churchill 2008). Occupies predominantly dry open forest and woodland habitats where they forage for prey at or above the canopy and in gaps between trees (Churchill 2008). A single young is birthed during summer, usually in December or January (Churchill 2008).

Listing status and population information

The South-eastern Freetail Bat is not listed under State or Commonwealth legislation. There is limited information on the species population size, however, they are generally considered common throughout their distribution. Roost colony sizes are sex-dependant, with males roosting in small numbers (three to four) whereas females form large colonies of 30-40 individuals (Churchill 2008). South-eastern Freetail Bat was the second most common species recorded during BAS with the species definitively recorded across all seasons of BAS, at an overall call activity of approximately 14 calls per night. The species has also been recorded at each of the 11 impact and 8 control BAS sites, indicating a widespread and common local population.

South-eastern Freetail Bat has the third quantity of mortality records from operational wind farms in Australia, including from the nearby Bodangora Wind Farm (Nature Advisory 2024) and Crudine Ridge Wind Farm (ELA 2024).

Likelihood and Consequence of impacts

The likelihood of impact to South-eastern Freetail Bat has been assessed as ‘Almost certain’ given the relatively high quantity of definite calls within the RSA and recorded fatalities from turbine collision.

The consequence of impact to South-eastern Freetail Bat has been assessed as ‘Low’ given that repeated losses of this non-listed and locally abundant species is unlikely to lead to a reduction in population viability. To date, the species has recorded collision rates of 0.24 and 0.02 individuals per turbine per year respectfully, at the nearby Bodangora and Crudine Ridge Wind Farms (Nature Advisory 2024 and ELA 2024). There is the potential that losses within the Project Site and from other approved wind farms may contribute to a cumulative impact upon the species in a regional context, and so a robust operational monitoring program is proposed to collect data and inform adaptive management (see BBAMP).

6.6.8. Yellow-bellied Sheath-tailed Bat

Species description

A large tree-roosting microbat species that is wide-ranging across the Australian mainland and migrates to south-eastern Australia in summer (Churchill 2008). Occupies a broad range of habitats where they fly fast and straight, predominantly above the canopy but at lower heights in open areas and at the edge of woodland and forest foraging predominantly on beetles (Churchill 2008).

Listing status and population information

Yellow-bellied Sheath-tailed Bat is listed as vulnerable under the NSW BC Act. There is limited information on the species population size. The species generally roosts in small groups of two to six individuals (Churchill 2008). There are scattered records of the species in the central west NSW region (DCCEEW 2025) and based on call and harp trapping data collected by ELA in the region, the species is generally considered widespread but uncommon. The species has only been recorded during summer 2020/21 and summer 2025 BAS, at a very low call activity rate, of approximately 0.1 calls per night.

The species has recorded mortalities from operational wind farms in Australia in overall low numbers, which includes four individuals from the nearby Bodangora Wind Farm (Nature Advisory 2021; Nature Advisory 2024).

Likelihood and Consequence of impacts

The likelihood of impact to Yellow-bellied Sheath-tailed Bat has been assessed as 'Potential' given the species has a low quantity of definite calls within the RSA and is known to be at risk of turbine collision.

The consequence of impact to Yellow-bellied Sheath-tailed Bat has been assessed as 'Moderate' given the potential for loss of this Vulnerable (BC Act) listed species which utilises the Project Site for foraging, breeding and dispersal.

6.7. Risk Assessment for Individual WTG

A WTG risk assessment has been developed for the Project in order to identify an individual risk rating for each proposed WTG. The risk assessment has been developed in consultation with the CPHR of the NSW DCCEEW and has undergone an external review by a team of data scientists and ecological statisticians at Symbolix (see Symbolix 2025; Appendix I).

The WTG risk assessment framework utilises five measures/parameters related to the bird and bat species assemblages and activity recorded across the Project Site (Table 6-11), along with the abundance of woodland and forest habitat surrounding the proposed WTG locations, as follows:

- BUS - total flight activity within RSA
- BUS – Moderate/High risk rating species
- BAS - total call activity of at RSA height species
- BAS - Moderate/High risk rating species
- Woodland/forest habitat (200 m buffer surrounding WTG).

The score for each measure ranges from 0 – 2 and accumulate across the five measures to provide a total score of between 0 – 10 and a corresponding Risk Rating for each proposed WTG (Table 6-12). The five WTG risk rating categories (Very Low, Low, Moderate, High and Very High) reflect a proportionate categorisation of risk ratings across the potential accumulated scores. The following subsections summarise each of the five measures which comprise the WTG risk assessment.

Table 6-11: Risk Rating for individual WTG

1. BUS - total flight activity within RSA	Score	2. BUS – Moderate/High risk rating species	Score	3. BAS - total call activity of at RSA height species	Score	4. BAS - Moderate/High risk rating species	Score	5. Woodland/forest habitat (200 m buffer surrounding WTG)	Score
Very Low (<2.5%)	0	0 Moderate/High risk species	0	Very Low (<50 calls/night)	0	0 Moderate/High risk species	0	Absent (0%)	0
Low (2.5-5.0%)	0.5	1-2 Moderate/High risk species	0.5	Low (50-100 calls/night)	0.5	1-2 Moderate/High risk species	0.5	Fragmented (>0 - <25%)	0.5
Moderate (5.0-7.5%)	1	3-4 Moderate/High risk species	1	Moderate (100-300 calls/night)	1	3-4 Moderate/High risk species	1	Connected (>25% - <75%)	1
High (7.5-10.0%)	1.5	5-6 Moderate/High risk species	1.5	High (300-600 calls/night)	1.5	5-6 Moderate/High risk species	1.5	Intact (>75%)	2
Very High (>10.0%)	2	≥7 Moderate/High risk species	2	Very High (>600 calls/night)	2	≥7 Moderate/High risk species	2		

Table 6-12: WTG risk rating and scoring

WTG Risk Rating	Total Score
Very Low	0.00 - 1.99
Low	2.00 - 3.99
Moderate	4.00 - 5.99
High	6.00 - 7.99
Very High	8.00 - 10.00

6.8. BUS - total flight activity within RSA

This measure calculates the percentage of bird survey flights recorded within the proposed Rotor Swept Area (RSA – 65-250 m height), as a proportion of total recorded bird flights. The data input for this measure is derived from the BUS data from the adjacent impact and control bird and bat utilisation survey (BBUS) sites which have vantage coverage over the respective WTG. Table 6-19 lists the BBUS sites associated with each WTG and Table 6-13 below, provides a summary of the total proportion of flights within the RSA for each of the 11 impact and 8 control BBUS sites, recorded across autumn, winter and spring 2024 and summer and autumn 2025 surveys.

Given the continuous nature of the data utilised for this measure (the proportion of flights in RSA in percentage terms), scores have been scaled proportionally via a continuous linear scaling transformation. This was a key recommendation from the external review (Symbolix 2025) so as to provide a measure which was more reflective of the distribution of data and provided a more fine-grained analysis of relative risk amongst the WTGs.

Table 6-13: Proportion of flights in RSA for each BBUS site and associated flight activity score

Site	Total flights in RSA	Total flights	Proportion of flights in RSA (%)	RSA flight activity score
Control 1	11	197	5.58	0.86
Control 2	3	250	1.20	0.18
Control 3	15	237	6.33	0.97
Control 4	7	237	2.95	0.45
Control 5	6	170	3.53	0.54
Control 6	8	186	4.30	0.66
Control 7	11	161	6.83	1.05
Control 8	15	115	13.04	2.00
Impact 1	13	176	7.39	1.13
Impact 10	11	173	6.36	0.98
Impact 11	8	160	5.00	0.77
Impact 2	16	208	7.69	1.18
Impact 3	13	182	7.14	1.10
Impact 4	6	171	3.51	0.54
Impact 5	10	132	7.58	1.16
Impact 6	8	225	3.56	0.55
Impact 7	3	222	1.35	0.21
Impact 8	14	203	6.90	1.06
Impact 9	14	194	7.22	1.11

6.9. BUS - risk rating

The baseline bird risk assessment presented in Section 6.2 and Table 6-5 has assigned a collision risk rating for relevant at-risk bird species recorded or with the potential to occur in the Project Site. This

measure calculates the quantity of Moderate and High-risk rating bird species recorded from BUS at corresponding BBUS sites for each WTG. The measure recognises and in effect assigns a high weighting to the potential for collision impacts to these at-risk species, where they have been recorded flying within proximity of proposed WTGs.

Consistent with the other four measures, the scoring ranges from 0 – 2, with the scoring categories (Table 6-14) directly corresponding with the total quantity of Moderate and High risk rating bird species recorded in the Project Site (i.e. seven (7) bird species). Table 6-15 lists the bird species assessed as Moderate or High risk for the Project. As the data used for the risk rating measure is not continuous (categorical scoring) and of limited spread (i.e. a range of 1-5 Moderate/High risk bird species across all WTGs), continuous linear scaling transformation could not be applied to this measure (Symbolix 2025). The distribution of BUS risk rating scores were reviewed, however, and determined to reflect the underlying distribution of Moderate/High risk bird data (see Symbolix 2025; Appendix I).

Table 6-14: BUS risk rating measure scoring based on the quantity of Moderate/High risk species recorded for each BBUS site and associated WTGs

Moderate/High risk rating species	Score
0 Moderate/High risk species	0
1-2 Moderate/High risk species	0.5
3-4 Moderate/High risk species	1
5-6 Moderate/High risk species	1.5
≥7 Moderate/High risk species	2

Table 6-15: Moderate and High-risk rating bird species

Species	Risk rating
Brown Falcon (*Falco berigora*)	Moderate
Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)	Moderate
Little Eagle (*Hieraaetus morphnoides*)	Moderate
Nankeen Kestrel (*Falco cenchroides*)	Moderate
Peregrine Falcon (*Falco peregrinus*)	Moderate
Wedge-tailed Eagle (*Aquila audax*)	High
White-throated Needletail (*Hirundapus caudacutus*)	Moderate

6.10. BAS - total call activity of at RSA height species

Microbat call data has been reviewed from data collected from detectors installed on two project meteorological masts (BDG1 and BDG2) at 50 m and 100 m, corresponding approximately with the proposed lower RSA height, in order to determine the species and species complexes recorded 'at RSA height' to be included in this measure. This at height data set comprises a total of 9,856 microbat calls (Table 6-16) recorded across a minimum 376 nights during spring 2021, summer-autumn 2022, spring-summer 2024 and summer-autumn 2025 (see Table 4-10). Based on analysis of met mast microbat call data, the majority of species and species complexes have been recorded at detector heights of 50 m and

whilst many of these calls were likely recorded well below the RSA (recording range 20 m and 70 m) a small portion may have originated from within the RSA (corresponding to recording range 70 m - 80 m) as discussed in Section 4.6.2.2, a precautionary approach has been taken to include both 50 m and 100 m calls for the assessment of this measure (Table 6-16). Microbat species shown in bold in Table 6-16 have not been recorded at either 50 m or 100 m and have therefore been excluded from the assessment.

Table 6-16: Summary of at height microbat call data including excluded species (indicated in bold and with asterisk) not recorded at height

Species	Total calls 50 m	Total calls 100 m
Broad-nosed Bat species*	**0**	**0**
Chocolate Wattle Bat	25	0
Chocolate Wattle Bat / Little Forest Bat	4	3
Eastern Broad-nosed Bat*	**0**	**0**
Eastern Cave Bat*	**0**	**0**
Forest Bat species / Chocolate Wattle Bat	54	1
Forest Bat species / Large Bent-winged Bat	1476	414
Freetail Bat species	11	24
Gould's Wattle Bat	447	16
Gould's Wattle Bat / Freetail Bat species	133	5
Gould's Wattle Bat / Inland Broad-nosed Bat	4	1
Gould's Wattle Bat / Inland Broad-nosed Bat / Freetail Bat species	1	0
Gould's Wattle Bat / Ride's Freetail Bat	739	61
Gould's Wattle Bat / South-eastern Freetail Bat	34	5
Greater Broad-nosed Bat	14	0
Greater Broad-nosed Bat / Eastern False Pipistrelle / Broad-nosed Bat species	24	17
Inland Broad-nosed Bat	13	0
Large Bent-winged Bat	183	62
Large Forest Bat	15	7
Large Forest Bat / Southern Forest Bat / Little Forest Bat	77	19
Large-eared Pied Bat*	**0**	**0**
Little Bent-winged Bat*	**0**	**0**
Little Broad-nosed Bat*	**0**	**0**
Little Forest Bat	37	2
Little Pied Bat*	**0**	**0**
Long-eared Bat species	3	0
Ride's Freetail Bat	158	40
South-eastern Freetail Bat	2408	1137
South-eastern Freetail Bat / Yellow-bellied Sheath-tailed Bat	0	2
Southern Forest Bat	75	0

Species	Total calls 50 m	Total calls 100 m
Southern Forest Bat / Little Forest Bat	213	80
White-striped Freetail Bat	1048	727
White-striped Freetail Bat / Yellow-bellied Sheath-tailed Bat	21	8
Yellow-bellied Sheath-tailed Bat	7	1

As there are only two meteorological masts located across the proposed project site, the BAS data utilised for the assessment was recorded at the ground-based BBUS sites. These sites are the same associated BBUS sites for each WTG, consistent with Measure 1 above and as listed in Table 6-19. Given the higher number of BBUS sites and the greater survey effort completed at these sites (total survey nights), this assessment approach provides a more spatially and temporally appropriate and robust dataset for assessing this measure, compared to using the meteorological mast data alone. It is noted however, that given the BBUS data has been recorded at ground level, this measure takes a conservative approach as it represents the ground level recorded call activity of species recorded at 'RSA height' (from 50 m and 100 m detectors), as opposed to 'RSA height' call activity itself.

Table 6-17 below provides a summary of the total call activity of 'at RSA height' species recorded at each impact and control sites across autumn, winter and spring 2024, along with summer 2025 surveys. The associated risk score for each BBUS site, scaled proportionally via a continuous linear scaling transformation (see Symbolix 2025), is also presented in Table 6-17.

Table 6-17: Call activity of 'at RSA height' microbat species for each BBUS site and associated rating

Site	Total calls of 'at RSA height' species	Total survey nights	Call activity (calls/night)	Score
Control 1	3158	16	197.38	0.50
Control 2	7554	16	472.13	1.21
Control 3	2698	16	168.63	0.43
Control 4	7213	16	450.81	1.15
Control 5	2943	16	183.94	0.47
Control 6	10,613	16	663.31	1.69
Control 7	1552	12	129.33	0.33
Control 8	1877	12	156.42	0.40
Impact 1	3739	16	233.69	0.60
Impact 10	10,966	14	783.29	2.00
Impact 11	1440	8	180.00	0.46
Impact 2	1603	16	100.19	0.26
Impact 3	4027	12	335.58	0.86
Impact 4	4228	12	352.33	0.90
Impact 5	1070	12	89.17	0.23
Impact 6	2511	16	156.94	0.40
Impact 7	1132	12	94.33	0.24

Site	Total calls of 'at RSA height' species	Total survey nights	Call activity (calls/night)	Score
Impact 8	3444	16	215.25	0.55
Impact 9	2802	16	175.13	0.45

6.11. BAS - risk rating

This measure calculates the quantity of Moderate and High-risk rating microbat species (Table 6-18) recorded from BAS at corresponding BBUS sites for each WTG. Microbat risk ratings have been assessed in the baseline bat risk assessment presented in Section 6.6 and Table 6-10. The BAS risk rating measure recognises and in effect assigns a high weighting to the potential for collision impacts to these at-risk microbat species, where they have been recorded flying within proximity of proposed WTGs.

The scoring ranges for measure are consistent with the BUS risk rating measure as detailed in Section 6.9 above and presented in Table 6-14, given the consistency in the total quantity of Moderate and High risk rating microbat species recorded in the Project Site (i.e. seven (7) microbat species). Table 6-18 lists the microbat species assessed as Moderate or High risk for the Project. As was the case with the BUS risk rating measure (see Section 6.9), the BAS risk rating data is not continuous and of limited spread (i.e. a range of 4-7 Moderate/High risk bat species across all WTGs) and therefore, continuous linear scaling transformation could not be applied (Symbolix 2025). The distribution of BAS risk rating scores were also reviewed and determined to reflect the underlying distribution of Moderate/High risk bat data (see Symbolix 2025; Appendix I).

Table 6-18: Moderate and High-risk rating microbat species

Species	Risk rating
Eastern False Pipistrelle (*Falsistrellus tasmaniensis*)	Moderate
Gould's Wattle Bat (*Chalinolobus gouldii*)	Moderate
Greater Broad-nosed Bat (*Scoteanax rueppellii*)	Moderate
Large Bent-winged Bat (Miniopterus orianae oceanensis)	Moderate
South-eastern Freetail Bat (*Ozimops planiceps*)	Moderate
White-striped Freetail Bat (*Austronomus australis*)	High
Yellow-bellied Sheath-tailed Bat (*Saccolaimus flaviventris*)	Moderate

6.12. Woodland/forest bird and bat habitat (200m buffer surrounding WTG)

A 200 m buffer was created around each proposed WTG and the woodland/forest cover (%), representing high quality bird and bat habitat, calculated within this buffer. Field validated PCT mapping, along with aerial photo interpretation, was utilised to determine the woodland/forest habitat cover. Forest and woodland PCTs in Good condition were included, whilst cleared areas including non-native vegetation and Low and Derived Native Grassland condition vegetation were not included in the calculation of the woodland/forest habitat cover. Given the continuous nature of the habitat cover data utilised for this measure, it was also recommended to scale habitat risk scores proportionally via a continuous linear scaling transformation (Symbolix 2025).

Table 6-19 below details the woodland/forest habitat cover calculated for each WTG, along with the habitat score and the associated BBUS sites for each of the WTGs.

Table 6-19: Woodland/forest habitat cover and associated BBUS sites for each WTG

WTG number	Vegetation condition	Woodland/forest habitat cover (%)	Woodland/forest habitat score	Associated BBUS sites
1	Good	67	1.34	Impact_10
2	Good	71	1.42	Impact_10
3	Good	87	1.74	Impact_10
4	Good	89	1.78	Impact_10
5	Good	87	1.74	Impact_10
6	Good	98	1.96	Impact_10
7	Good	100	2.00	Impact_10
8	Good	92	1.84	Impact_10
9	Good	88	1.76	Impact_10
10	Good	79	1.58	Impact_9
11	Good	84	1.68	Impact_9
12	Good	73	1.46	Impact_9, Control_7
13	Good	85	1.70	Impact_9, Control_7
14	Good	55	1.10	Impact_8, Control_7
15	Good	78	1.56	Impact_8, Impact_6, Control_7
16	Good	78	1.56	Impact_8, Impact_6, Control_7
17	Good	93	1.86	Impact_8, Impact_6, Control_7
18	Good	93	1.86	Impact_8
19	Good	63	1.26	Impact_8
20	Good	97	1.94	Impact_8
21	Good	96	1.92	Impact_8, Impact_7
22	Good	86	1.72	Impact_7, Impact_9
23	Good	89	1.78	Impact_8, Impact_6
24	Good	91	1.82	Impact_8, Impact_6
25	Good	82	1.64	Impact_8, Impact_6
26	Good	31	0.62	Impact_8, Impact_6
27	Good	13	0.26	Impact_8, Impact_6
28	Good	100	2.00	Impact_8
29	Good	70	1.40	Control_8
30	Good	98	1.96	Control_8
31	Good	69	1.38	Control_8
32	Good	58	1.16	Impact_5, Impact_11, Control_8
33	Good	89	1.78	Impact_5, Impact_11, Control_8

WTG number	Vegetation condition	Woodland/forest habitat cover (%)	Woodland/forest habitat score	Associated BBUS sites
34	Good	88	1.76	Impact_5, Impact_11, Control_8
35	Good	68	1.36	Impact_5, Impact_11
36	Good	81	1.62	Impact_5, Impact_11, Control_8
37	Good	82	1.64	Impact_11
38	Good	55	1.10	Impact_11
39	Good	53	1.06	Impact_11
40	Good	98	1.96	Impact_4, Control_4
41	Good	83	1.66	Impact_4, Control_4
42	Good	99	1.98	Impact_4, Control_4
43	Good	91	1.82	Impact_3, Control_6
44	Good	97	1.94	Impact_11, Impact_3
45	Good	40	0.80	Impact_11, Impact_3
46	Good	46	0.92	Impact_11, Impact_3
47	Good	99	1.98	Impact_11
48	Good	53	1.06	Impact_11
49	Good	82	1.64	Impact_2
50	Good	45	0.90	Impact_2
51	Good	54	1.08	Impact_2
52	Good	61	1.22	Impact_2, Control_1
53	Good	77	1.54	Impact_2
54	Good	61	1.22	Impact_2
55	Good	54	1.08	Impact_2
56	Good	37	0.74	Impact_2
57	Low	0.00	0.00	Control_1, Control_3
58	Low	0.01	0.00	Control_1, Control_3
59	Low	0.67	0.01	Control_1, Control_3
60	Low	0.02	0.00	Control_1, Control_3
61	Low	0.01	0.00	Impact_1, Control_1
62	Good	55	1.10	Impact_1, Control_1
63	Good	58	1.16	Impact_1, Control_1
64	Good	42	0.84	Impact_1, Control_1
65	Good	67	1.34	Impact_1, Control_1
66	Good	40	0.80	Impact_1, Control_1
67	Good	34	0.68	Impact_1
68	Good	9	0.18	Impact_1
69	Good	48	0.96	Impact_1

WTG number	Vegetation condition	Woodland/forest habitat cover (%)	Woodland/forest habitat score	Associated BBUS sites
70	Good	32	0.64	Impact_1

6.13. WTG risk ratings and total scores

The WTG risk assessment methodology has been applied to all 70 proposed WTGs, with this data provided presented in Table 6-20 below and illustrated in Figure 6-14. Individual WTG risk ratings will be assessed on an ongoing basis through the implementation of the Project BBAMP with risk ratings revised as necessary, in line with the results of operational monitoring.

Table 6-20: Risk assessment data and scores for all five risk measures and total score and relative risk rating for each proposed WTG

WTG No.	BBUS Sites	BUS RSA flight activity (%)	BUS Activity Score	BUS Risk Rating score	BAS Mean Call Activity	BAS Activity Score	BAS Risk Rating score	Habitat Cover (%)	Habitat Score	Total Score	Risk Rating
37	Impact_11	5.00	0.77	0.5	180.00	0.46	1.5	81.65	1.63	4.86	Moderate
38	Impact_11	5.00	0.77	0.5	180.00	0.46	1.5	54.69	1.09	4.32	Moderate
39	Impact_11	5.00	0.77	0.5	180.00	0.46	1.5	53.44	1.07	4.30	Moderate
47	Impact_11	5.00	0.77	0.5	180.00	0.46	1.5	98.95	1.98	5.21	Moderate
48	Impact_11	5.00	0.77	0.5	180.00	0.46	1.5	52.54	1.05	4.28	Moderate
29	Control_8	13.04	2.00	0.5	156.42	0.40	1	69.74	1.39	5.29	Moderate
30	Control_8	13.04	2.00	0.5	156.42	0.40	1	97.85	1.96	5.86	Moderate
31	Control_8	13.04	2.00	0.5	156.42	0.40	1	68.55	1.37	5.27	Moderate
57	Control_1, Control_3	5.99	0.92	0.5	183.00	0.47	1.5	0.00	0.00	3.39	Low
58	Control_1, Control_3	5.99	0.92	0.5	183.00	0.47	1.5	0.01	0.00	3.39	Low
59	Control_1, Control_3	5.99	0.92	0.5	183.00	0.47	1.5	0.67	0.01	3.40	Low
60	Control_1, Control_3	5.99	0.92	0.5	183.00	0.47	1.5	0.03	0.00	3.39	Low
1	Impact_10	6.36	0.97	0.5	783.29	2.00	1.5	67.49	1.35	6.32	High
2	Impact_10	6.36	0.97	0.5	783.29	2.00	1.5	71.23	1.42	6.40	High
3	Impact_10	6.36	0.97	0.5	783.29	2.00	1.5	87.10	1.74	6.72	High
4	Impact_10	6.36	0.97	0.5	783.29	2.00	1.5	89.45	1.79	6.76	High
5	Impact_10	6.36	0.97	0.5	783.29	2.00	1.5	86.79	1.74	6.71	High
6	Impact_10	6.36	0.97	0.5	783.29	2.00	1.5	97.92	1.96	6.93	High
7	Impact_10	6.36	0.97	0.5	783.29	2.00	1.5	99.99	2.00	6.97	High

WTG No.	BBUS Sites	BUS RSA flight activity (%)	BUS Activity Score	BUS Risk Rating score	BAS Mean Call Activity	BAS Activity Score	BAS Risk Rating score	Habitat Cover (%)	Habitat Score	Total Score	Risk Rating
8	Impact_10	6.36	0.97	0.5	783.29	2.00	1.5	92.46	1.85	6.82	High
9	Impact_10	6.36	0.97	0.5	783.29	2.00	1.5	87.68	1.75	6.73	High
10	Impact_9	7.22	1.11	0.5	175.13	0.45	2	78.59	1.57	5.63	Moderate
11	Impact_9	7.22	1.11	0.5	175.13	0.45	2	84.27	1.69	5.74	Moderate
67	Impact_1	7.39	1.13	0.5	233.69	0.60	1.5	34.28	0.69	4.41	Moderate
68	Impact_1	7.39	1.13	0.5	233.69	0.60	1.5	9.50	0.19	3.92	Low
69	Impact_1	7.39	1.13	0.5	233.69	0.60	1.5	47.85	0.96	4.69	Moderate
70	Impact_1	7.39	1.13	0.5	233.69	0.60	1.5	32.43	0.65	4.38	Moderate
49	Impact_2	7.69	1.18	1	100.19	0.26	1	81.63	1.63	5.07	Moderate
50	Impact_2	7.69	1.18	1	100.19	0.26	1	44.56	0.89	4.33	Moderate
51	Impact_2	7.69	1.18	1	100.19	0.26	1	53.95	1.08	4.51	Moderate
53	Impact_2	7.69	1.18	1	100.19	0.26	1	76.92	1.54	4.97	Moderate
54	Impact_2	7.69	1.18	1	100.19	0.26	1	61.15	1.22	4.66	Moderate
55	Impact_2	7.69	1.18	1	100.19	0.26	1	54.27	1.09	4.52	Moderate
56	Impact_2	7.69	1.18	1	100.19	0.26	1	36.98	0.74	4.18	Moderate
44	Impact_11, Impact_3	6.14	0.94	1	273.35	0.70	1.5	97.48	1.95	6.09	High
45	Impact_11, Impact_3	6.14	0.94	1	273.35	0.70	1.5	40.40	0.81	4.95	Moderate
46	Impact_11, Impact_3	6.14	0.94	1	273.35	0.70	1.5	46.07	0.92	5.06	Moderate
32	Impact_5, Impact_11, Control_8	8.11	1.24	1	137.09	0.35	1.5	57.97	1.16	5.25	Moderate

WTG No.	BBUS Sites	BUS RSA flight activity (%)	BUS Activity Score	BUS Risk Rating score	BAS Mean Call Activity	BAS Activity Score	BAS Risk Rating score	Habitat Cover (%)	Habitat Score	Total Score	Risk Rating
33	Impact_5, Impact_11, Control_8	8.11	1.24	1	137.09	0.35	1.5	88.62	1.77	5.87	Moderate
34	Impact_5, Impact_11, Control_8	8.11	1.24	1	137.09	0.35	1.5	87.59	1.75	5.85	Moderate
35	Impact_5, Impact_11	6.16	0.94	1	125.50	0.32	1.5	67.73	1.35	5.12	Moderate
36	Impact_5, Impact_11, Control_8	8.11	1.24	1	137.09	0.35	1.5	81.02	1.62	5.71	Moderate
40	Impact_4, Control_4	3.19	0.49	1	408.61	1.04	1.5	97.95	1.96	5.99	Moderate
41	Impact_4, Control_4	3.19	0.49	1	408.61	1.04	1.5	83.36	1.67	5.70	Moderate
42	Impact_4, Control_4	3.19	0.49	1	408.61	1.04	1.5	99.04	1.98	6.01	High
43	Impact_3, Control_6	5.71	0.87	1	522.86	1.34	1.5	91.20	1.82	6.53	High
22	Impact_7, Impact_9	4.09	0.63	1	140.50	0.36	2	85.70	1.71	5.70	Moderate
18	Impact_8	6.90	1.06	1	215.25	0.55	1.5	92.70	1.85	5.96	Moderate
19	Impact_8	6.90	1.06	1	215.25	0.55	1.5	62.62	1.25	5.36	Moderate
20	Impact_8	6.90	1.06	1	215.25	0.55	1.5	97.47	1.95	6.06	High
21	Impact_8, Impact_7	4.00	0.61	1	163.43	0.42	1.5	95.62	1.91	5.44	Moderate

WTG No.	BBUS Sites	BUS RSA flight activity (%)	BUS Activity Score	BUS Risk Rating score	BAS Mean Call Activity	BAS Activity Score	BAS Risk Rating score	Habitat Cover (%)	Habitat Score	Total Score	Risk Rating
28	Impact_8	6.90	1.06	1	215.25	0.55	1.5	99.99	2.00	6.11	High
23	Impact_8, Impact_6	5.66	0.87	1	186.09	0.48	1.5	88.76	1.78	5.62	Moderate
24	Impact_8, Impact_6	5.66	0.87	1	186.09	0.48	1.5	91.44	1.83	5.67	Moderate
25	Impact_8, Impact_6	5.66	0.87	1	186.09	0.48	1.5	81.66	1.63	5.48	Moderate
26	Impact_8, Impact_6	5.66	0.87	1	186.09	0.48	1.5	30.83	0.62	4.46	Moderate
27	Impact_8, Impact_6	5.66	0.87	1	186.09	0.48	1.5	12.61	0.25	4.09	Moderate
61	Impact_1, Control_1	6.43	0.99	1	215.53	0.55	2	0.01	0.00	4.54	Moderate
62	Impact_1, Control_1	6.43	0.99	1	215.53	0.55	2	54.68	1.09	5.63	Moderate
63	Impact_1, Control_1	6.43	0.99	1	215.53	0.55	2	58.42	1.17	5.71	Moderate
64	Impact_1, Control_1	6.43	0.99	1	215.53	0.55	2	42.08	0.84	5.38	Moderate
65	Impact_1, Control_1	6.43	0.99	1	215.53	0.55	2	67.42	1.35	5.89	Moderate
66	Impact_1, Control_1	6.43	0.99	1	215.53	0.55	2	39.65	0.79	5.33	Moderate
52	Impact_2, Control_1	6.67	1.02	1.5	148.78	0.38	1.5	61.37	1.23	5.63	Moderate

WTG No.	BBUS Sites	BUS RSA flight activity (%)	BUS Activity Score	BUS Risk Rating score	BAS Mean Call Activity	BAS Activity Score	BAS Risk Rating score	Habitat Cover (%)	Habitat Score	Total Score	Risk Rating
12	Impact_9, Control_7	7.04	1.08	1.5	155.50	0.40	2	73.11	1.46	6.44	High
13	Impact_9, Control_7	7.04	1.08	1.5	155.50	0.40	2	84.80	1.70	6.67	High
14	Impact_8, Control_7	6.87	1.05	1.5	178.43	0.46	2	54.73	1.09	6.10	High
15	Impact_8, Impact_6, Control_7	5.60	0.86	1.5	170.61	0.44	2	78.32	1.57	6.36	High
16	Impact_8, Impact_6, Control_7	5.60	0.86	1.5	170.61	0.44	2	77.73	1.55	6.35	High
17	Impact_8, Impact_6, Control_7	5.60	0.86	1.5	170.61	0.44	2	93.06	1.86	6.66	High

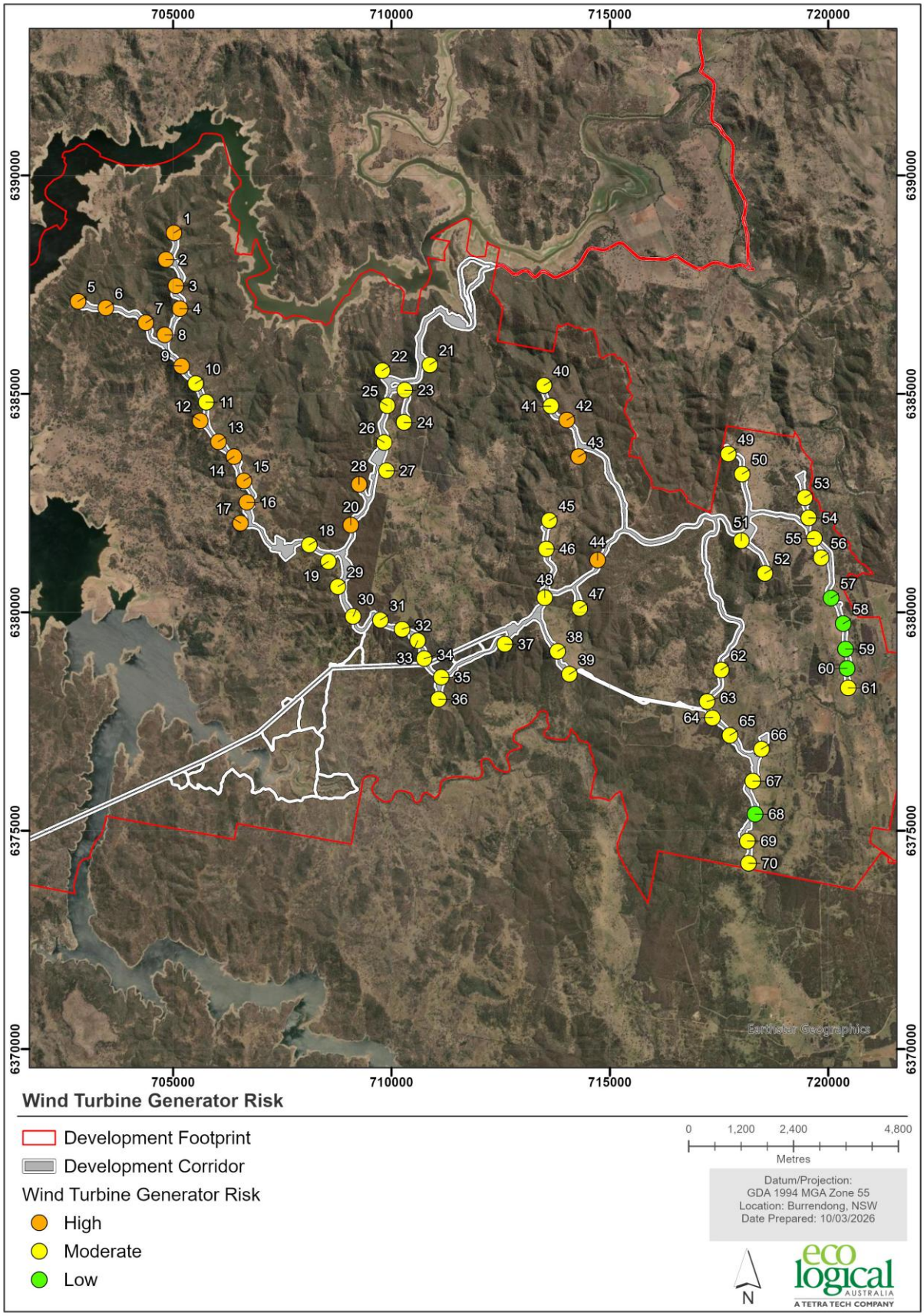


Figure 6-4: Relative risk rating for each proposed WTG

6.14. Flight Barrier and avoidance impact assessment

Avoidance of habitat by avifauna species, particularly birds, has been documented at operational wind farms globally (Smith and Dwyer 2016; Miao et al. 2019). Whilst contemporary WTGs and wind farm layouts comprise substantial structures spread across a landscape scale and therefore present some level of disturbance and barrier to avifauna movement, the placement and design of the Project seeks to minimise such impacts.

The Project WTG layout contains 70 WTGs, with an RSA range of 65-250 m. As detailed in Section 4.6.3.1, approximately 95% of bird flights recorded during BBUS were below 60 m, with 85% of flights recorded at 20 m or below, reflecting that most bird flights in the Project Site are undertaken below or just above canopy height. Accordingly, the majority of bird flights taken by the majority of bird species at this relatively low landscape level are not likely to be subject to any barrier or avoidance impacts resulting from proposed WTGs. Overall microbat call activity (Section 4.6.2.2), also indicates predominantly low flight heights, with a strong pattern of decreased microbat call activity at increased heights from 2 m, up to 50 m and 100 m. The design of the proposed WTGs is such that they are operating at a much higher airspace (65-250 m) than the predominant flight height of birds and bats and therefore expected impacts to flight behaviour, habitat utilisation and dispersal are negligible.

The minimum spacing between proposed WTG locations is 390 m, and most of the Project's 70 proposed WTGs are spaced >500 m apart. This inter-turbine spacing, with WTGs mainly distributed north-south along ridgelines, effectively maintains adequate gaps to facilitate ongoing east-west bird and bat dispersal across and through the Project Site. Additionally, the WTG layout maintains large gaps of between 1,341 m and 3,215 m (Figure 6-5) for birds flying on a north-south route, including the predominant north-south migratory pathway utilised by bird and bat species in eastern Australia. The recorded flight behaviour of bird and bat species within the Project Site, indicates their strong capacity for meso-avoidance of turbine collisions (see Smales 2023), in flying in the airspace between and below proposed WTG locations.

The WTG layout has been positioned atop hills and ridgetops to the south and east of Burrendong Dam and does not intersect the major river valleys in the region of the Macquarie, Meroo and Cudgegong Rivers (Figure 6-6). These river valleys likely form the predominant foraging, movement and dispersal corridors for bird and bat species, particularly those species which typically fly at low heights through the landscape (i.e. the majority of species, as indicated above). The WTG layout does not cross through these river valleys and therefore does not present barriers to movement of birds and bats throughout these habitat corridors. Both locally dispersive and wide-ranging (e.g. migratory) bird and bat species, are likely to demonstrate macro-avoidance of the WTG layout (see Smales 2023), in flying predominantly through the river valleys.

The landscape-scale siting of the Project Site has sought to further reduce the potential for barrier and avoidance impacts, with the Project located away from known microbat roosting sites, including maternity roosts of threatened cave-dwelling microbats, and mapped important habitat for migratory shorebirds, Regent Honeyeater and Swift Parrot (DCCEEW 2025). Whilst there are no cliffs, caves or potential breeding habitat within or adjacent (<2 km) to the Development Corridor, Large Bent-winged Bats are known to utilise the nearby Wellington Caves (21 km west; (Figure 6-7) as a non-breeding roost and Large-eared Pied Bat maternity roosts have been recorded near Ulan (65 km north).

Grey-headed Flying-foxes are nomadic bats that gather at roost sites, or camps, which can be permanent, seasonal, or temporary. These camps are usually located near waterways and in areas with large trees and in centra west NSW, are often found living in association with the non-threatened *Pteropus scapulatus* (Little Red Flying-fox). Several camps are present within the region including nearby camps in Mudgee and Wellington (Figure 6-8). Their wide distribution and episodic occurrences coincide with eucalypt flowering events particularly flowering of *Angophora floribunda* (Rough-barked Apple) and *Eucalyptus albens* (White Box). Although no Grey-headed Flying-fox or Little Red Flying-fox were recorded during field surveys, the Project Site contains both Rough-barked Apple and White Box and therefore, has the potential to provide foraging habitat for these species.

Both the Little Red Flying-fox and Grey-headed Flying-fox have recorded fatalities at the nearby Bodangora Wind Farm with a trigger investigation launched after several fatalities occurred. It was reported that Grey-headed Flying-fox using the site were attracted to the area due to flowering White Box during later-autumn to early-winter (Nature Advisory 2019, Nature Advisory 2021b). Monitoring from the Bodangora Wind Farm indicates that Grey-headed Flying-fox individuals from the Wellington camp typically fly northeast for nightly foraging, with only occasional flight paths recorded heading southeast towards Burrendong Dam (Nature Advisory 2021).

Monitoring of the Mudgee Grey-headed Flying-fox camp conducted in summer when the camp is typically at its peak in response to local Rough-barked Apple flowering events, indicates that the species typically flies south and southwest to Avisford Nature Reserve or west to northwest along the Cudgegong River (ELA pers. obs.) It is not clear what route individuals may take in transiting between the Mudgee and Wellington camps, however, the straight-line flight path between the camps runs north of the Project Site and, just north of the northern banks of Burrendong Dam (Figure 6-8).

The Project's BBUS program follows a Before-After-Control-Impact (BACI) design, incorporating both impact sites located within the development corridor and control sites located outside. The Project has been designed and located to minimise potential barrier and avoidance impacts, with any potential impacts to be assessed via comparison of baseline and operational BBUS data from both control and impact sites.

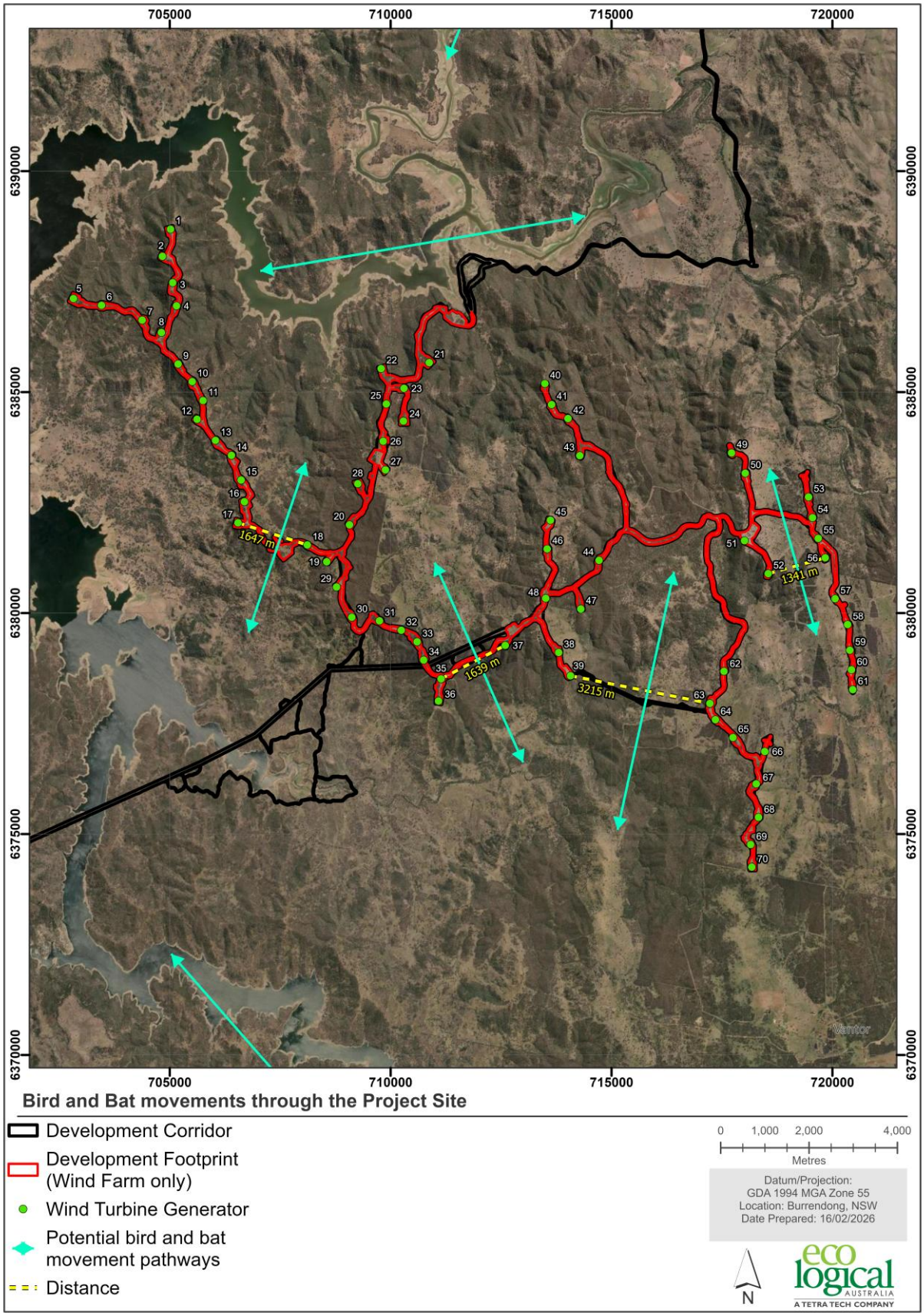


Figure 6-5: Bird and bat movement pathways through the Project Site turbine layout

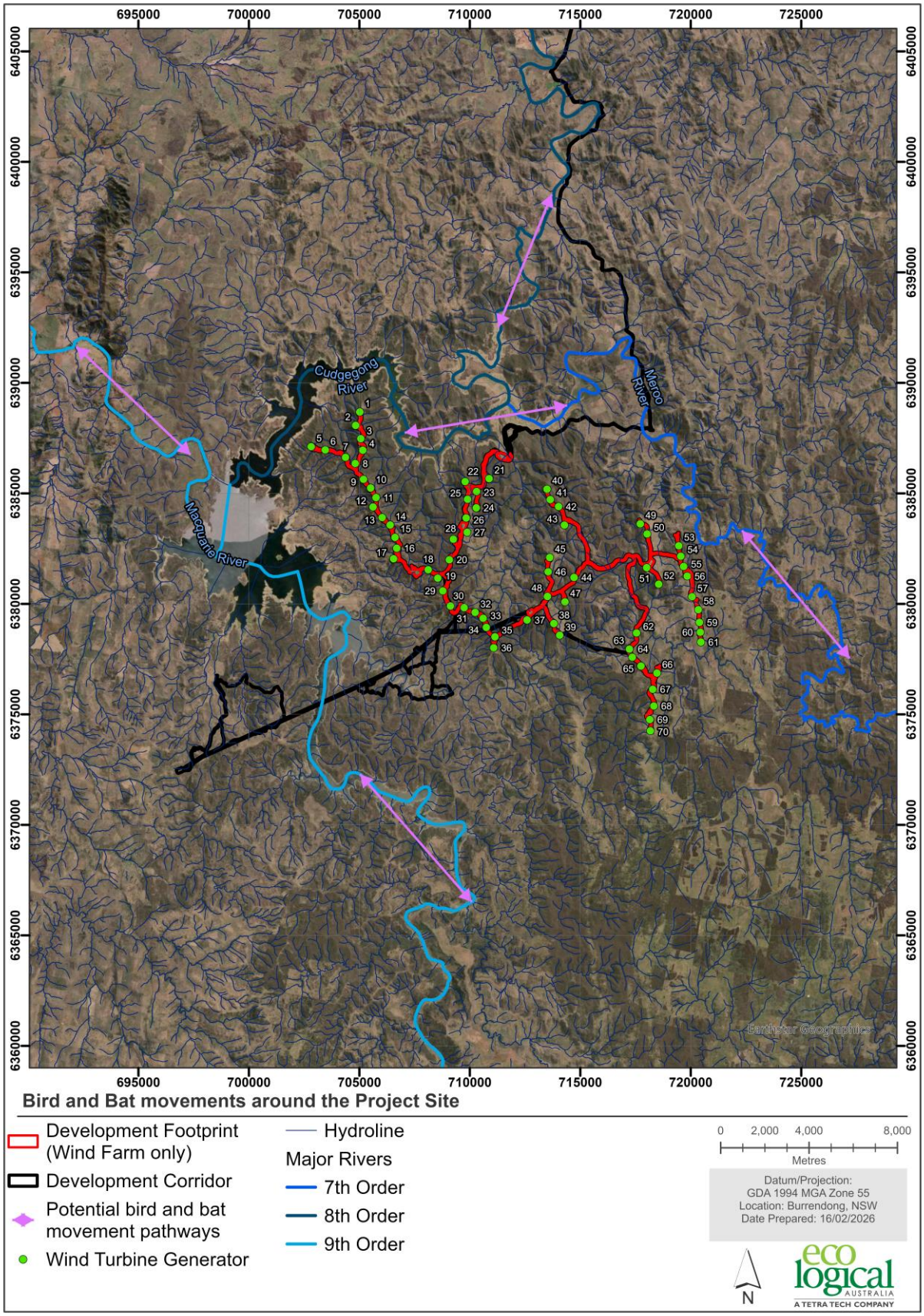


Figure 6-6: Bird and bat movement pathways through the major river valleys external to the Project Site turbine layout

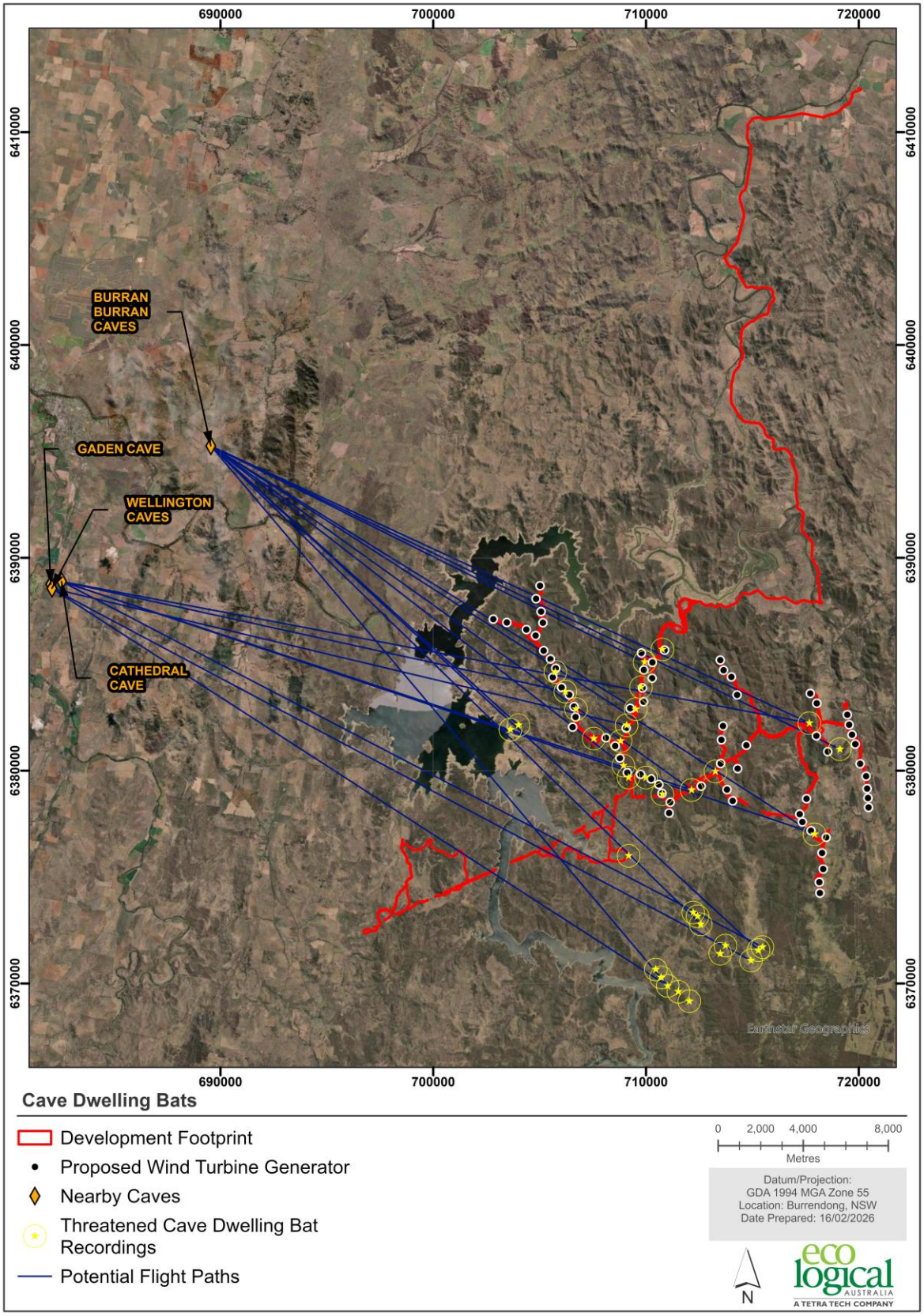


Figure 6-7: Indicative flight paths of cave dwelling bats from known roost caves to monitoring sites where these species were recorded within the Project Site. Please note that there is no evidence that cave dwelling microbats recorded within the Project Site were inhabiting these nearby caves at the time of recording

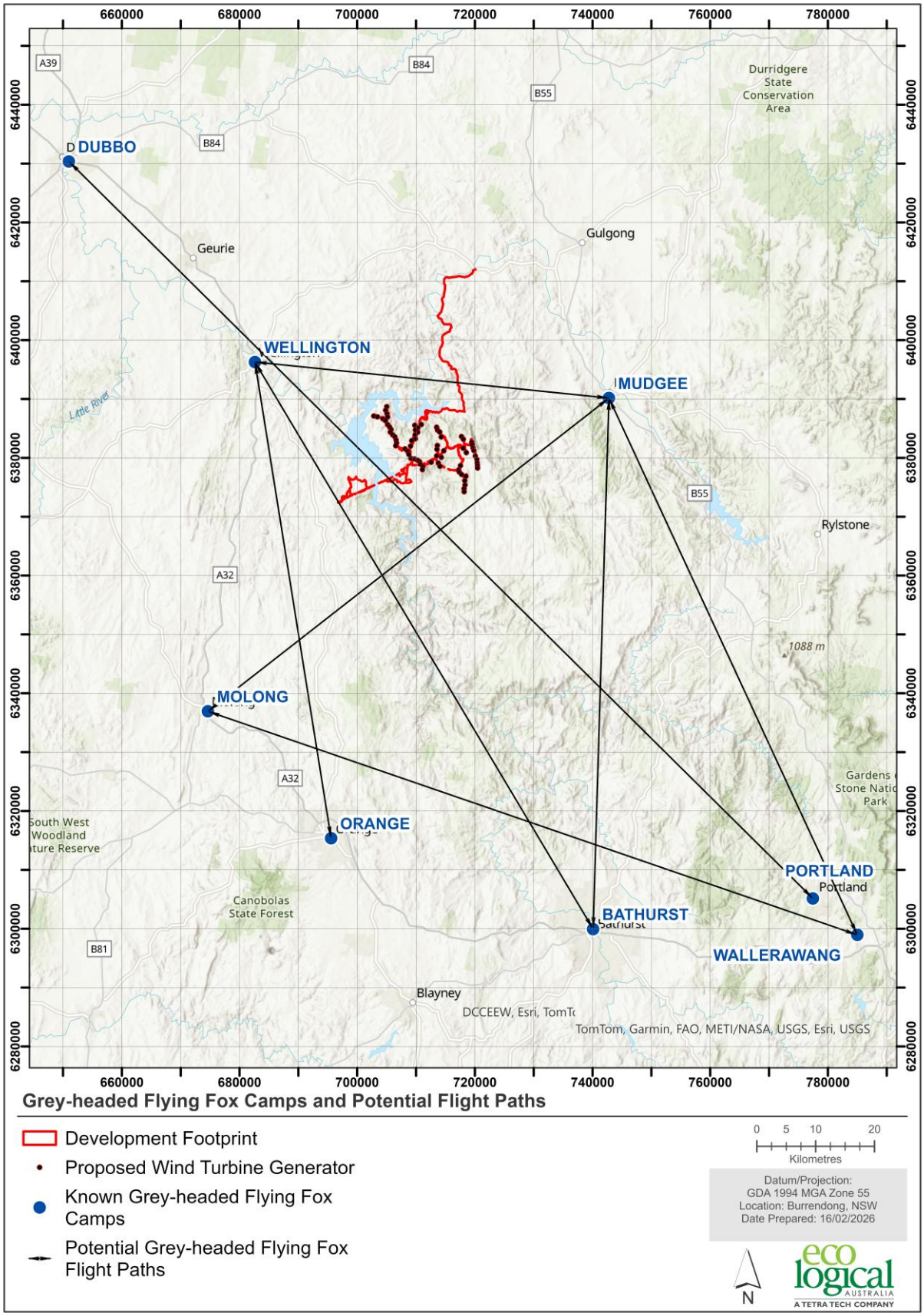


Figure 6-8: Indicative flight paths of Grey-headed Flying-fox connecting regional roost camps

6.15. Review of Bird and Bat Collision Risk at NSW Wind Farms

To inform the assessment of species collision risk at the proposed Project, a review of publicly available collision data was undertaken for operational wind farms in NSW from the following data sources:

- NSW Major Projects Website – to identify approved wind farms and access relevant project information
- Individual project websites – to extract species-specific turbine strike data from publicly released monitoring reports.

The review focused on approved and operational wind farms, as well as nearby proposed wind farms located in the Central West Orana Renewable Energy Zone (Figure 6-9). A total of 12 wind farms were the focus of the review (Table 6-21), seven of which are currently operational (58.3%), with collision data available for all seven operational wind farms.

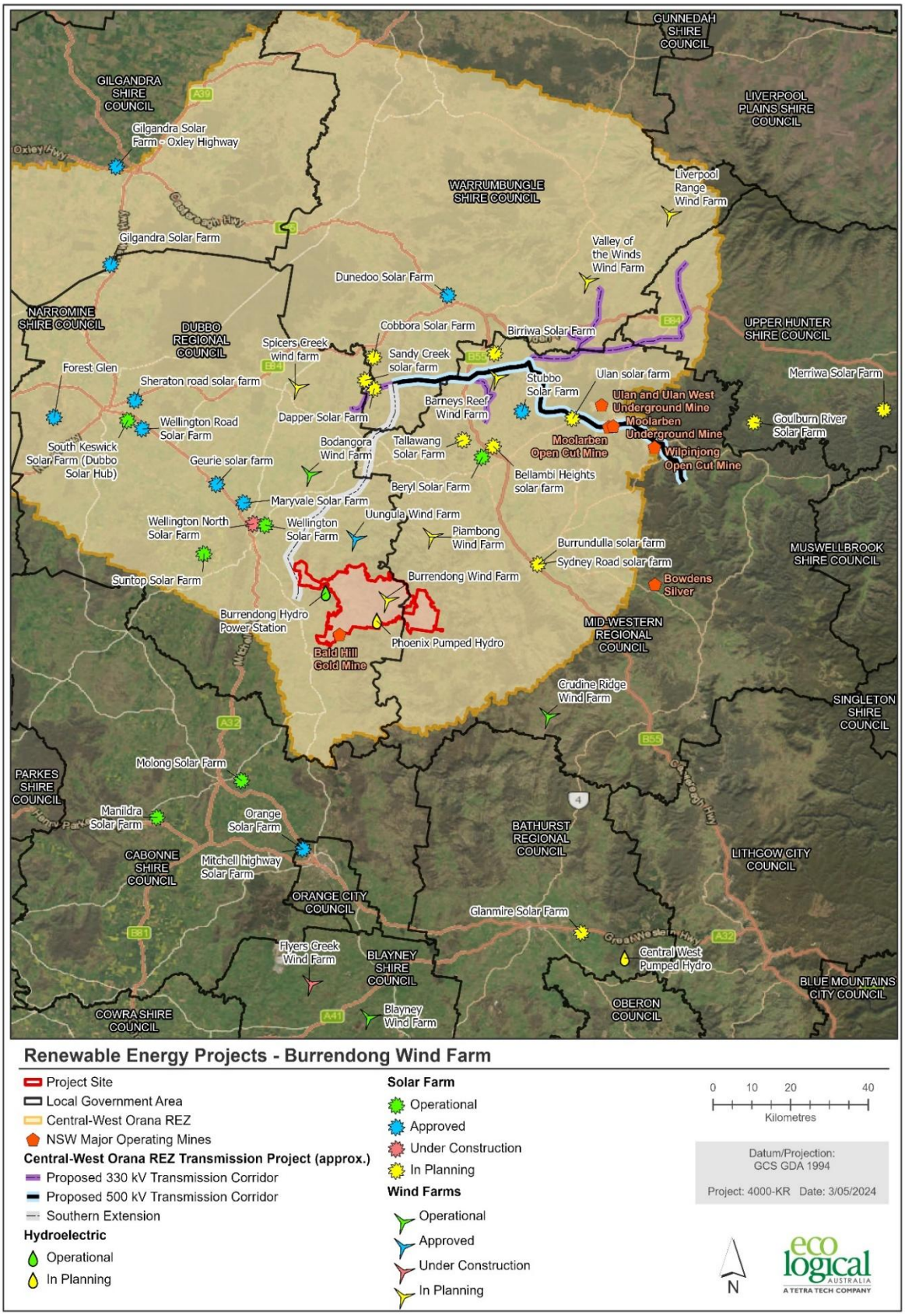


Figure 6-9: Renewable Energy Projects

Table 6-21: Operational and local wind farm review

Wind Farm	IBRA Region	Status	Number of turbines	Turbine brand/model	Rotor swept area (m max)	Nacelle height (m)	Rotor swept area (m min)	Distance to Project (km)	Strike Data Publicly Available?
Valley of the Winds	Brigalow Belt South, NSW South Western Slopes, Sydney Basin	Approved	131	Not yet selected	250	170	90	75	No
Sapphire	New England Tablelands	Operational	75	Vestas 3.6MW	200	137	74	225	Yes
Liverpool Range	Brigalow Belt South	Approved	185	Not yet selected	215	80-160	35-65	100	No
Uungula	NSW South Western Slopes	Approved / Under construction	69	Not yet selected	250	165	80	12	No
Bodangora	NSW South Western Slopes	Operational	33	GE 3.43-130	150	85	20	24	Yes
Crudine Ridge	South Eastern Highlands, NSW South Western Slopes	Operational	37	GE 3.63 MW	160	91.5	23	37	Yes
Spicers Creek	NSW South Western Slopes	Approved	117	Not yet selected	256	170	85	26	No
Flyers Creek	South Eastern Highlands	Operational	38	GE 3.8-137	160	91.5	23	110	Yes
Wallaby Creek	NSW South Western Slopes, Darling Riverine Plains	In planning	38	Not yet selected	N/A	N/A	N/A	79	No
White Rock S1	New England Tablelands	Operational	70	Goldwind 121 2.5MW	150	89.5	29	220	Yes
Gullen Range	South Eastern Highlands	Operational	73	GW100-2.5MW (56 WTGs), GW82-1.5MW (17 WTGs)	130 & 126	80 & 85	30 & 44	245	Yes
Silverton	Broken Hill Complex	Operational	58	GE 3.43-130	180	110	40	800	Yes

The review of bird and bat mortality data from the seven operational wind farms with publicly available data identified four bird and two microbat species of interest to the Project and with sufficient data to calculate = the number of collisions per turbine per year. These species included:

- Wedge-tailed Eagle (Figure 6-10)
- Nankeen Kestrel (Figure 6-11)
- Australian Magpie (Figure 6-12)
- White-throated Needletail (Figure 6-13)
- Gould's Wattled Bat (Figure 6-14)
- White-striped Freetail-bat (Figure 6-15).

Large Bent-winged Bat mortality has only been recorded from a single operational wind farm, Boco Rock Wind Farm in southern NSW, and with such low numbers (4 individuals total), this species has insufficient data to be included in the analysis.

Each of the analysed bird and bat species share distribution across all of the operational wind farms reviewed and have also been recorded within the Project Site. Across all species strike rates were found to be generally low, with less than 0.4 collisions per turbine per year (pt/py) for all species, except White-striped Freetail Bat at Flyer's Creek Wind Farm (Figure 6-15). White-throated Needletail has recorded the lowest collision rate, with collisions recorded from only two wind farms at the low rates of 0.01 pt/py (Figure 6-13), whilst both microbat species, the aforementioned White-striped Freetail Bat (Figure 6-15) and Gould's Wattle Bat (Figure 6-14) recorded the highest mean collision rates.

Across all six bird and bat species included in the review, a trend of lower collision rate with higher RSA is evident. Sapphire Wind Farm has the highest RSA (74-200 m) of all seven reviewed wind farms and has recorded the lowest collision rate for all bird and bat species assessed, with the exception of Nankeen Kestrel, for which Sapphire recorded the second lowest rate (Figure 6-11). Notably, White Rock and Sapphire Wind Farms, though located in similar agricultural and partly timbered landscapes and in close proximity to one another, have substantial differences in their respective collision rates. White Rock, with a substantially lower RSA (29-150 m) has recorded a higher rate of collision across all assessed microbat and bird species as demonstrated in Figure 6-10 to Figure 6-15 below.

Additionally, Bodangora, Flyers Creek and Crudine Ridge Wind Farms have recorded the highest bird and bat collision rates whilst at the same time having the lowest minimum RSA heights of 20 m and 23 m. These results further demonstrate the apparent relationship between RSA heights and bird and bat collision rates. With a proposed RSA of 65-250 m for the Project, it is anticipated that collision rates of at risk bird and bat species will more closely resemble Sapphire Wind Farm than the above three locally proximal wind farms, given the more consistent RSA heights installed at Sapphire and proposed for the Project, as well as the recorded pattern of decreased microbat and bird flight activity with increased height (see Section 4.6.2.2 and Section 4.6.3.1).

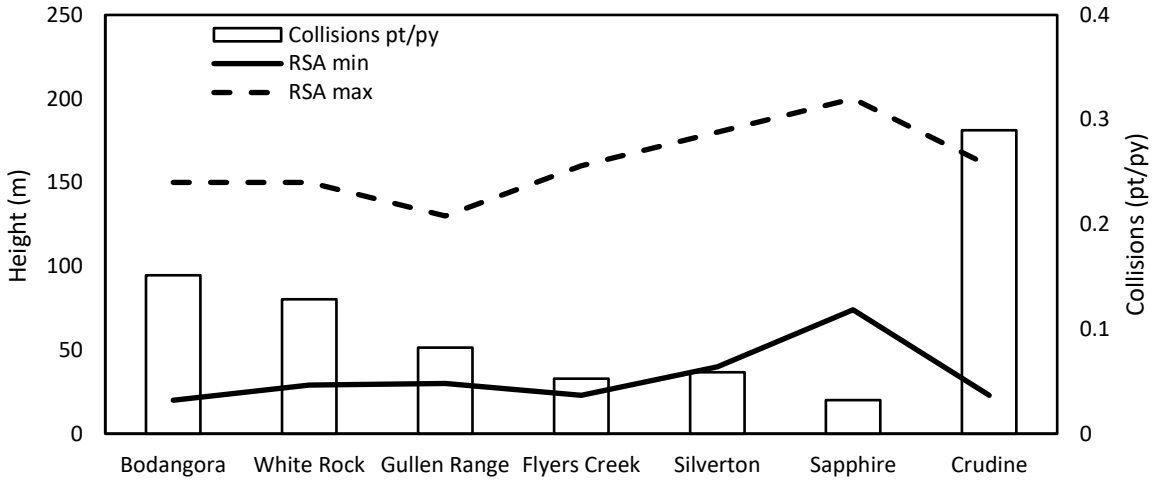


Figure 6-10: Wedge-tailed Eagle collision rate at NSW wind farms

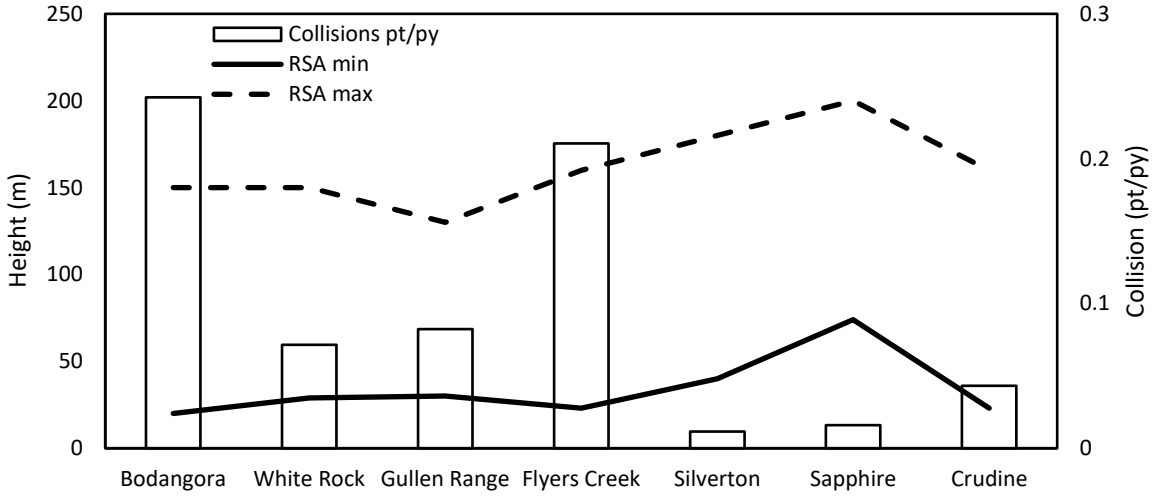


Figure 6-11: Nankeen Kestrel collision rate at NSW wind farms

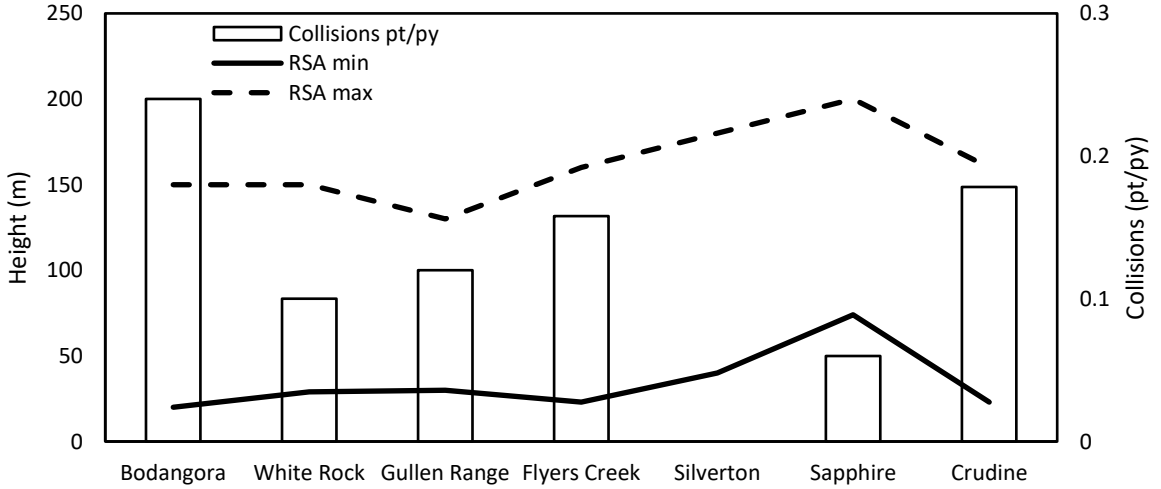


Figure 6-12: Australian Magpie collision rate in NSW wind farms

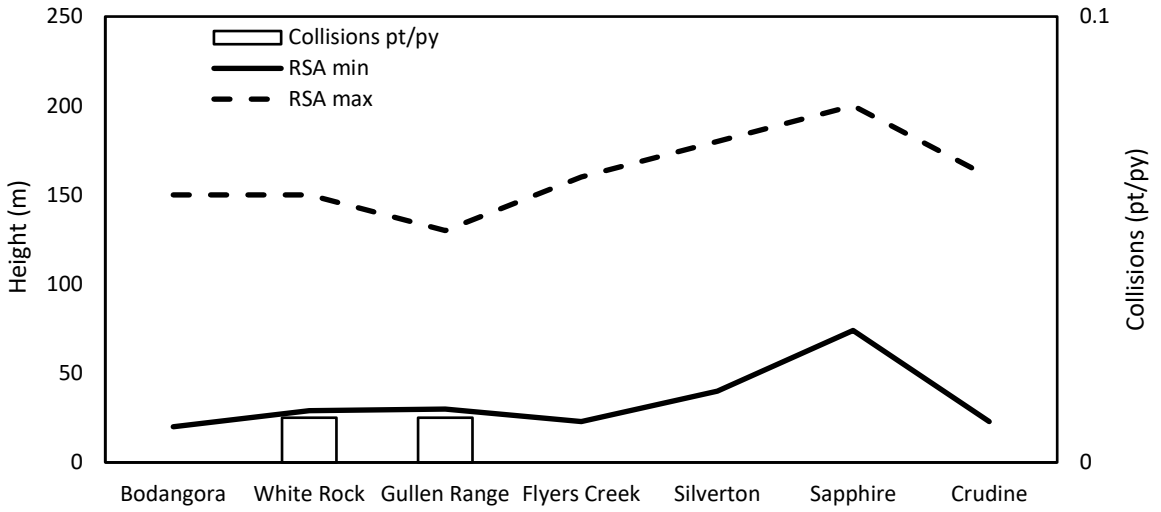


Figure 6-13: White-throated Needletail collision rate at NSW wind farms

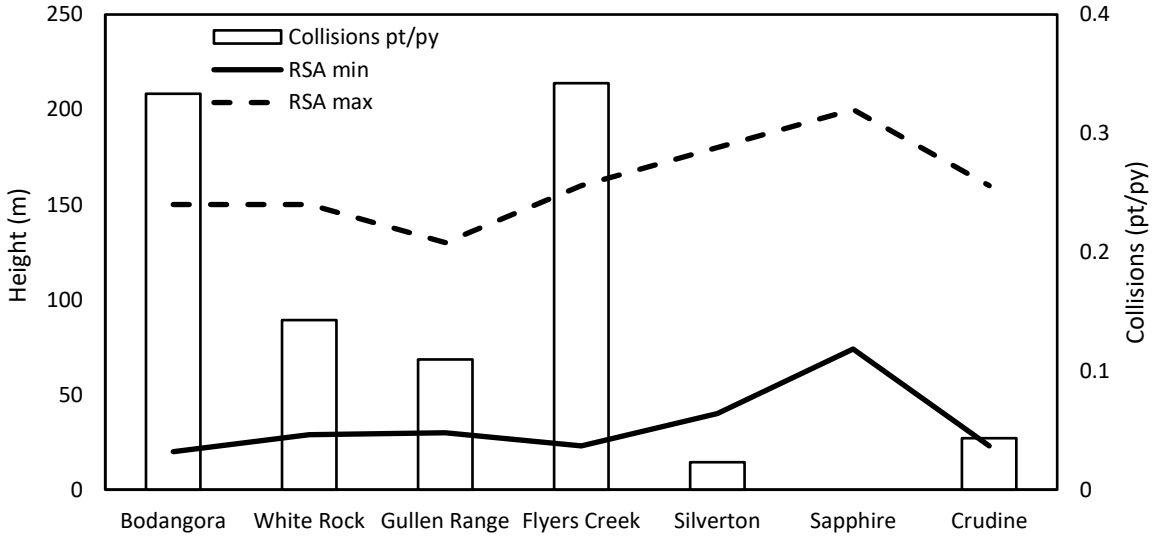


Figure 6-14: Gould's Wattled Bat collision rate at NSW wind farms

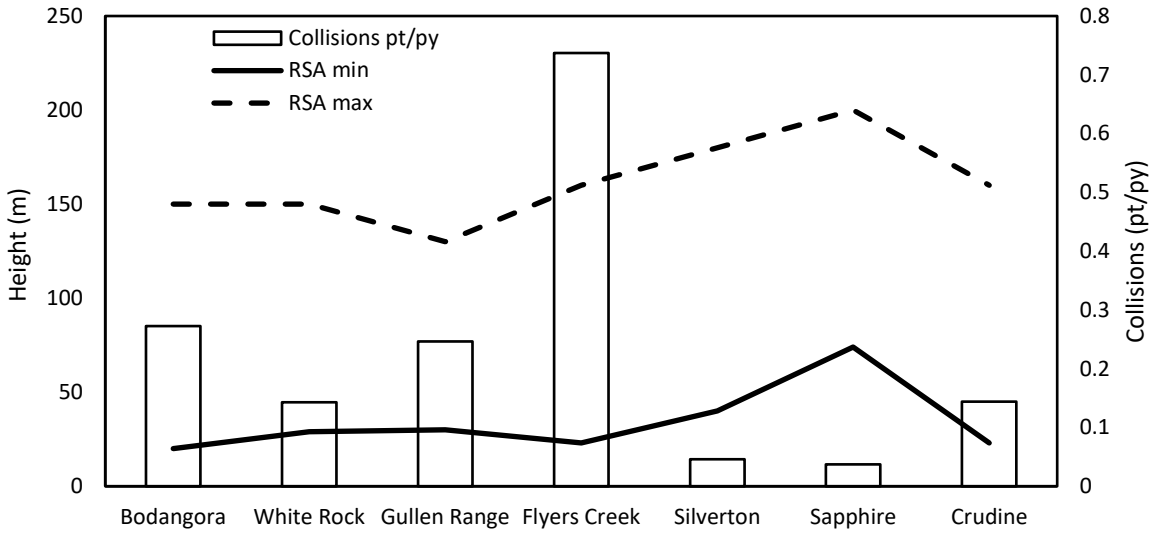


Figure 6-15: White-striped Freetail-bat collision rate at NSW wind farms

Whilst the majority of bird and bat species exhibit flight behaviour and local movement patterns that presents a low risk to turbine collision, the capacity of some species, including species assessed above, to disperse regionally and undertake these flights at RSA height, lends them subject to potential cumulative impacts from multiple wind farms. Eight of the twelve (12) wind farms reviewed above in Table 6-21 occur within the Central West Orana Renewable Energy Zone or in adjacent IBRA Regions, within 200 km of the Project Site. The two closest operational wind farms are Bodangora Wind Farm, located 24 km northwest and Crudine Wind Farm located 37 km southeast, whilst the approved and under construction Uungula Wind Farm is located 12 km north of the Project Site.

Combined the eight regional wind farms and the Project are anticipated to operate a total of 718 WTGs, of which the Project contributes 70 WTGs, or 9.7%. Collision rate analysis presented above shows variability across individual species and wind farms but overall, demonstrates that turbine collisions can be expected from multiple sites. Therefore, impacts at individual wind farms has the potential to contribute to cumulative impacts to regional populations of bird and bat species.

The Wedge-tailed Eagle for instance, has recorded mortalities from the three regionally located operational wind farms with available data (Bodangora, Flyers Creek and Crudine Ridge; Figure 6-10) and has recorded a mean collision rate of 0.16 pt/py from the three sites. Application of this mean collision rate to the Project Site equates to an estimate of 11.2 individuals, whilst the Project's CRM for Wedge-tailed Eagle estimated between 12.4 and 6.2 individuals per year, at 90% and 95% avoidance rates (Table 6-8). Estimated mortality to Wedge-tailed Eagle from the Project, therefore has the potential to contribute to cumulative impacts upon the species.

There are a range of environmental (e.g. season and climate), species specific and site-specific factors which are likely to contribute to turbine collision and the cumulative impacts of this, at a regional scale. Again, using Wedge-tailed Eagles as an example, juvenile and sub-adult birds appear at most risk from turbine collision and are over-represented in operational mortality data (ELA 2024). Moderate (4-10 individuals) to large (up to 40 individuals) groups of sub-adult Wedge-tailed Eagles are commonly recorded and appear to be mobile throughout the region (ELA pers. obs.). This increases the likelihood of sub-adult birds encountering multiple wind farms and therefore, contributing to the species

susceptibility to cumulative impacts. In contrast, adult birds appear less frequently in operational mortality data and given the extent of their typical breeding territories (see Section 6.3.1), resident adult birds are unlikely to occur and be subject to cumulative impacts across multiple wind farms.

Overall, the potential for cumulative impacts to regional populations of multiple bird and bat species and uncertainties regarding the scale and consequence of these impacts, requires ongoing collection of data and assessment, at both regional and wind farm site scales. The Project is committed to the implementation of a robust monitoring program and adaptive management through the Project BBAMP, which includes contributing to regional scale data provision and assessment.

Stage 2 Impact Assessment (biodiversity values and prescribed impacts)

The BC Act establishes a hierarchy for dealing with the impacts of development on biodiversity values, firstly by way of avoidance of impacts, secondly by minimisation of them and for offsets as a last resort. The Project will impact upon native vegetation through direct removal with the potential to impact threatened species through removal of habitat. The following measures will be undertaken to avoid and reduce these impacts.

7. Avoiding or minimising impacts on biodiversity values

The Development Footprint will be refined within the Development Corridor to maximize the avoidance of impacts to native vegetation and habitat for threatened species. The current locations of WTGs have been selected to preference areas that have previously been cleared along ridge tops devoid of trees.

Initially a much larger Development Corridor comprising of approximately 3,058 ha was investigated (see Figure 7-6). Undertaking these on-ground assessments over a larger area provided the proponent with options for avoiding impacts to native vegetation and minimising these impacts by locating associated infrastructure within areas of lower biodiversity values.

Various access routes, power connection corridors and easements were considered during the planning stage. The initial northern and central power connection had the potential to impact 250 ha of native vegetation that contained 12 ha of the endangered ecological community Inland Grey Box Grassy Woodland (PCT 76) and 95 ha of the critically endangered Box-Gum Woodland (PCT 266). The northern transmission line option is no longer considered minimising impacts by well over 250 ha. The southern power connection corridor and easement has been refined from impacting 33 ha down to 23.63 ha of Box-Gum woodland with most in its DNG form.

Table 7-1 highlights the reductions in impacts to vegetation during refinement of Project design.

Table 7-1: Reductions in impacts during Project Design

Vegetation	Year 2020	Year 2021	Year 2023	Year 2024	Year 2025	Current	% Reduction over time
Woodland (ha)	722.5	521.75	457.42	396.37	395.81	388.03	46
DNG (ha)	644.5	499.8	327.18	277.28	277.2	274.7	57
DNG_Low (ha)	-	21.45	22.97	19.26	19.26	19.26	16
Cleared (ha)	65.7	33.76	47.44	50.58	50.61	48.71	26
TOTAL (ha)	**1432.6**	**1076.8**	**855**	**743.48**	**742.88**	**730.73**	**49**

There has also been a substantial reduction to Box-Gum Woodland during Project refinement. This is shown in Figure 7-1 and an example of Box Gum Woodland reduction within the Development Footprint and Development Corridor is illustrated in Figure 7-2 below.

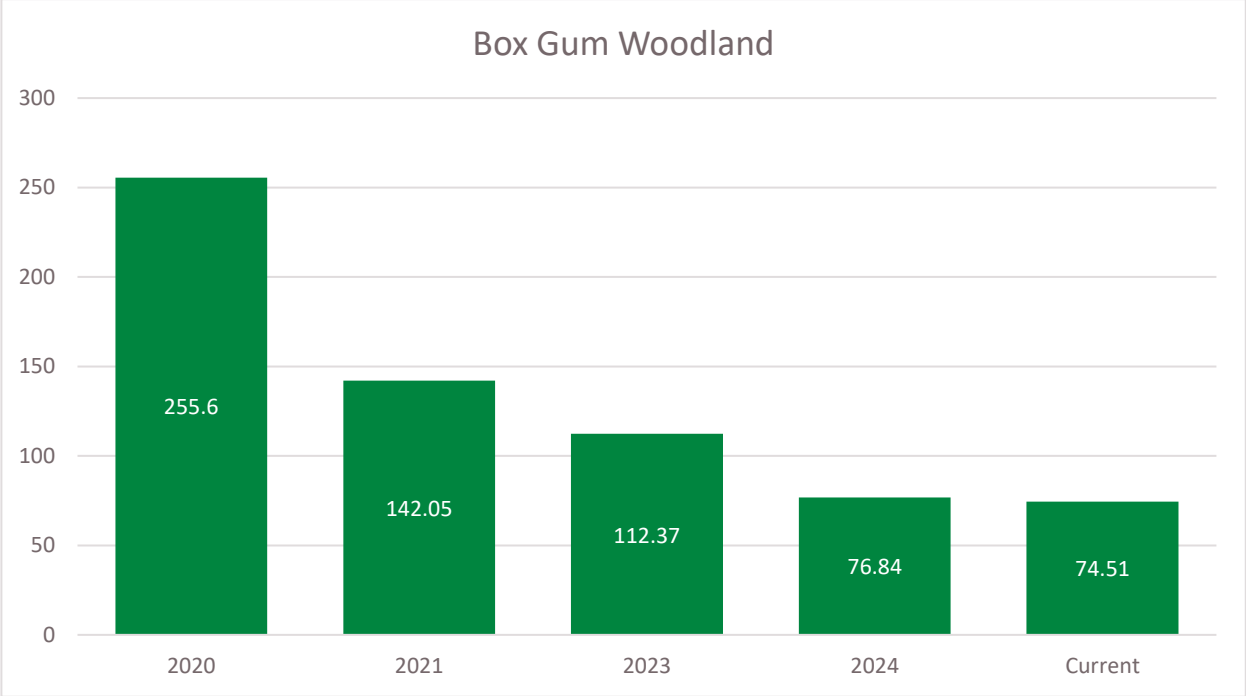


Figure 7-1: Impacts to Box-Gum Woodland from Project inception through to the current Development Footprint.

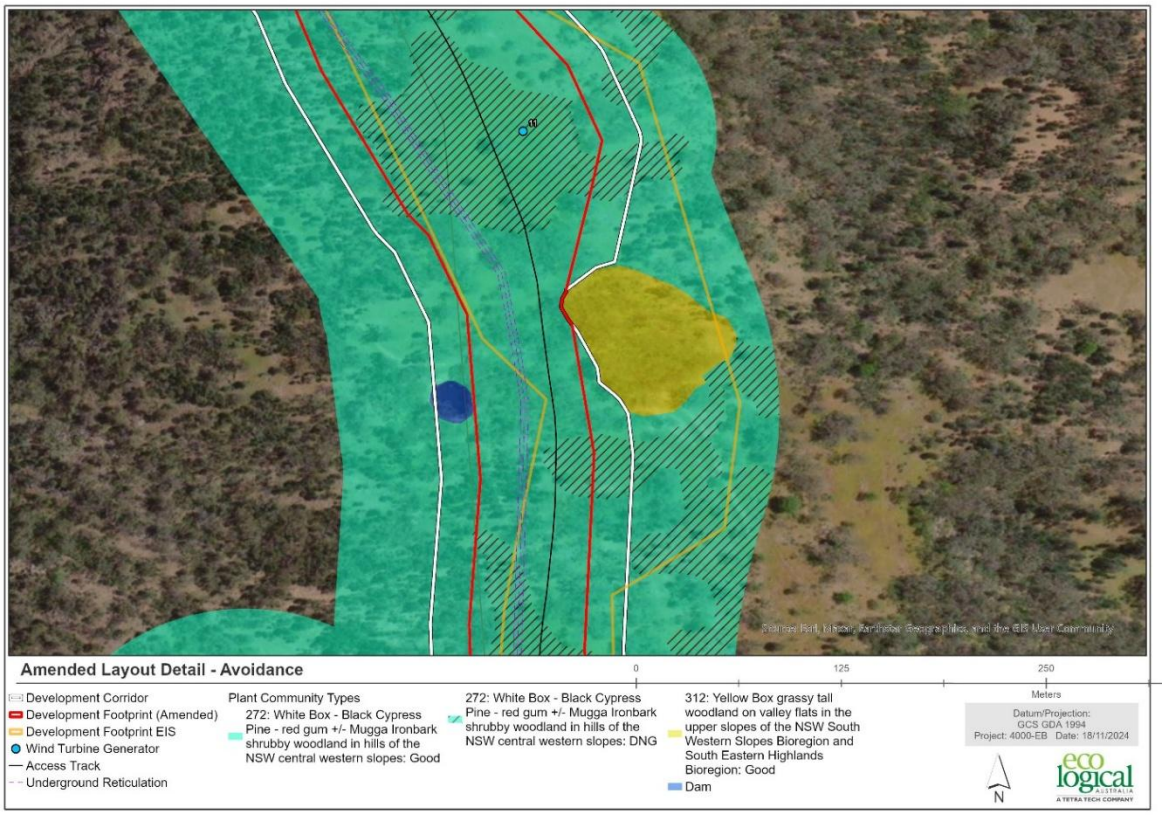


Figure 7-2: Avoidance of PCT 312 as associated with Box Gum Woodland

In May 2025 areas near WTG 49 and associated access track were refined to avoid culturally significant Grass Trees. Whilst the overall areas of PCT 272_DNG and 287_DNG increased, there was a reduction in impacts to woodland (see Table 7-1; Figure 7-3).

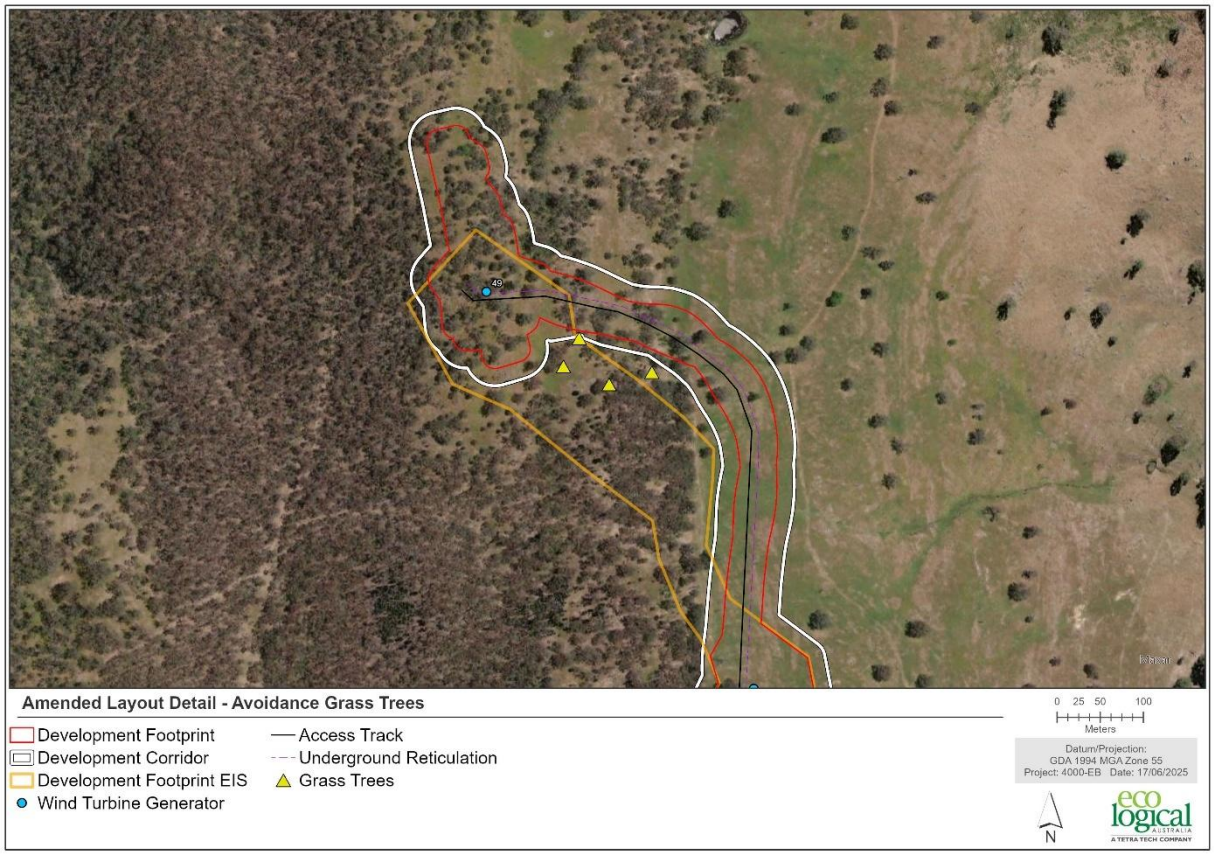


Figure 7-3: Avoidance of Grass Tress

The refinement of the southern powerline design included consideration of the power pole locations, powerline conductor profile and clearance to existing woodland vegetation to reduce the impact on that vegetation. To reduce unnecessary clearing during powerline installation, existing farm tracks will be used where possible when installing the foundations and power poles and no additional ongoing clearing under power lines will be required due to the span exceeding the height above the canopy. Figure 7-4 shows examples of the concept powerline design.

Disturbance footprint of 20 m radius has been assumed around each pole location and the assessment of impacts is based on this area of disturbance. Actual disturbance is expected to be less. Once the construction has been completed, the powerline will have a relatively small footprint on the ground, being mainly limited to the pole locations and maintenance assess tracks.

Power poles will not be located within the riparian corridor, resulting in no ground disturbance and the transmission line will span across the aquatic habitat.

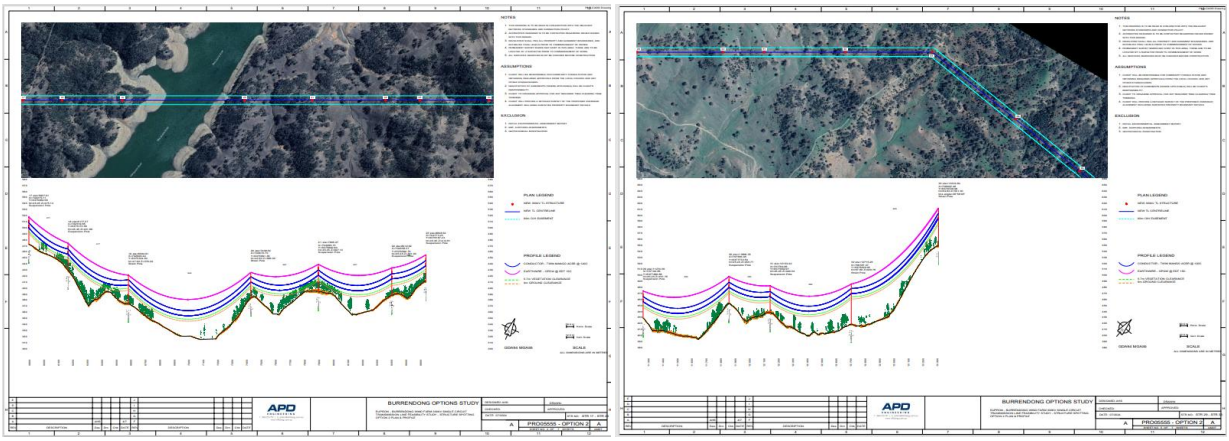


Figure 7-4: Transmission concept design showing span above canopy

Northern and eastern access road upgrades were investigated during the planning stage. Both routes to the Project Site would require road widening and realignment impacting roadside vegetation. Most threatened flora records were noted to occur along the eastern route (see Figure 4-2 - Castlereagh Highway, along Hill End Road and Yarrabin Road) and thereby removing this option has reduced the potential impact to threatened species. The northern option also has the potential to utilise other development activities that are occurring within the area to facilitate movement of oversize vehicles.

During the preliminary site investigation process, the windfarm conceptual layout was sectioned into 4 discrete areas (Figure 7-5) and entered into the BAM-C as separate components so that the proponent was well informed of potential impacts the construction of each section could have on native vegetation and upon threatened species (BAM-C SWS Assessment Revisions 3,5,6 and SEH Assessment Revision 3,4,5; Table 7-2 and detailed in Appendix M). Extra areas were also assessed that were lower quality (plots 83 – 86; PCT 266_Low) as alternative locations. All of this data has been fed into the process for refinement and modification of Project layout, aiming to avoid and minimise biodiversity where possible (Figure 7-6)

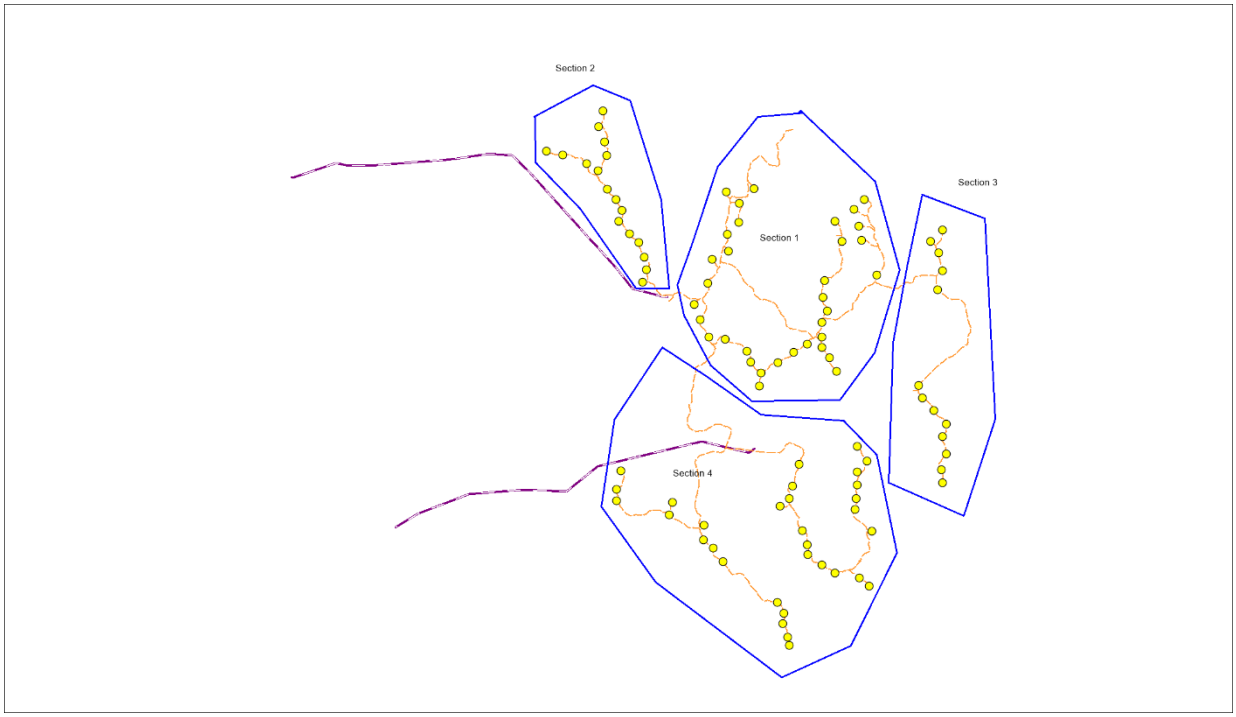


Figure 7-5: Sections of the windfarm investigated during conceptual layout process

Table 7-2: Example of credits required for each section within the windfarm.

Section	Credits SWS	Credits SEH	TOTAL Area (ha)	TOTAL Credits
1	2184	5336	374	7,520
2	3452		122	3,452
3		1862	125	1,862
4	5417	2223	354	7,640
TOTAL			**975**	**20,474**

THESE FIGURES ARE BASED ON PCT AREA AT THE PROJECT INCEPTION STAGE TO PROVIDE THE PROPONENT WITH A GUIDE TO OFFSET CREDIT OBLIGATIONS THAT MAY BE REQUIRED FOR EACH SECTION OF THE WINDFARM AND DO NOT REFLECT THE CURRENT CREDITS REQUIRED. ADDITIONAL WTGS HAVE BEEN ADDED TO SECTION 3 WITHIN PCT 266_LOW.

Existing farm tracks throughout the proposed windfarm consist of formed gravel roads (~ 5.5 m trafficable width and farm tracks (consisting of wheel tracks <3 m wide across ridgetops and 5 m wide narrowed formed roads, Plate 7-1 and Plate 7-2). When choosing the placement of proposed access tracks and wind farm infrastructure, the Proponent has, where possible, utilised these existing tracks to minimise ground disturbance, and there is scope to further reduce impacts during detailed design when the location of roads, tracks, placement of turbines and powerlines may be micro-sited within the Development Corridor thereby further reducing the offset obligation.



Plate 7-1: Examples of existing farm tracks



Plate 7-2: Yarrabin Road (site access)

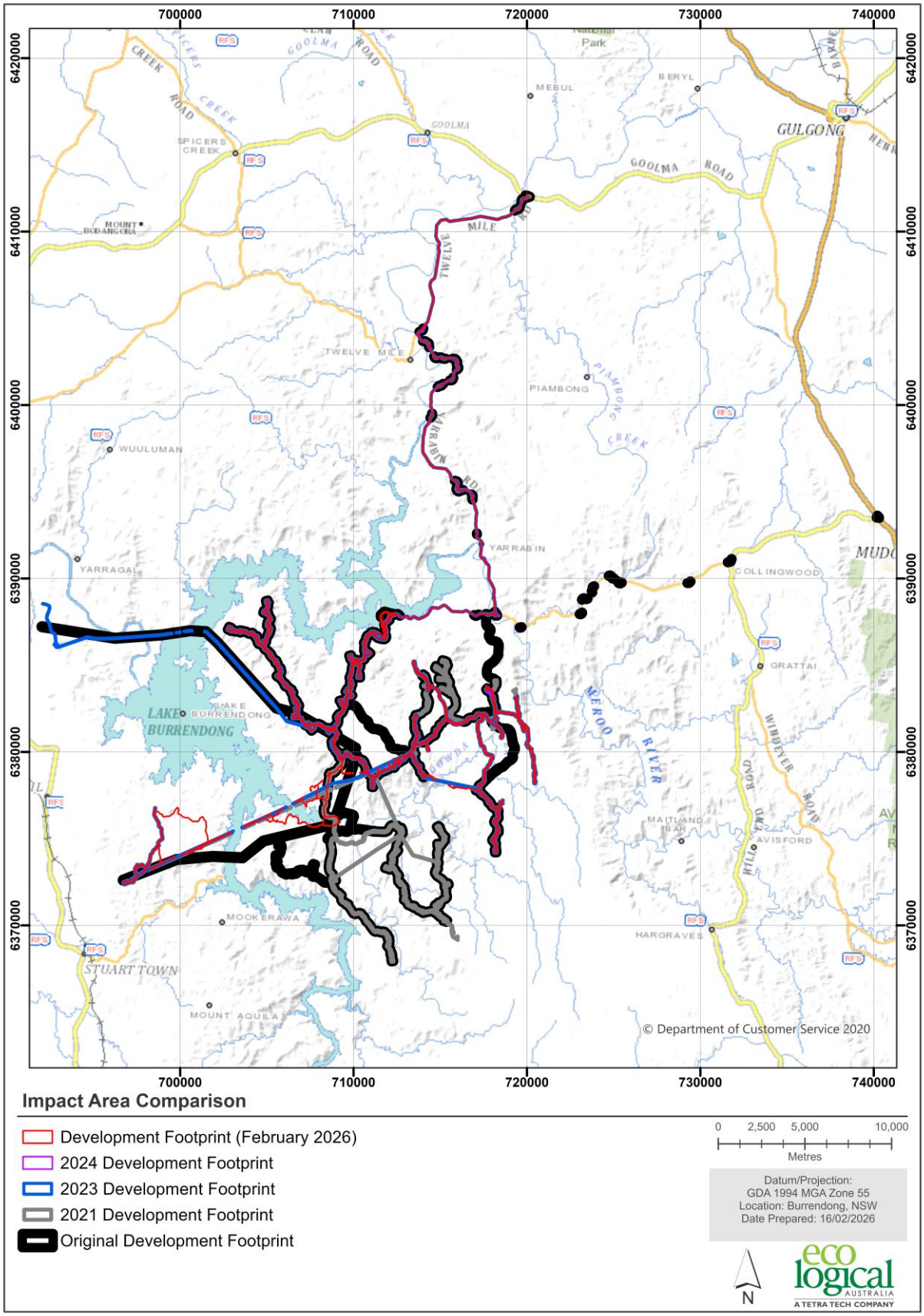


Figure 7-6: New and old Project Layout

A general summary of the key measures mitigating the impacts are provided in Table 7-3.

Table 7-3: Actions undertaken to avoid and minimise impacts

Approach	How addressed	Justification
Locating the project in areas where there are no biodiversity values	Areas of cleared land and low condition vegetation have been used for WTG locations where-ever possible. Access routes through the site will be on already formed roads especially through remnant woodland, but will need to be widened to facilitate movement of WTG and infrastructure.	The placement of WTG are located in areas that are predominately cleared and devoid of trees. This has ensured that areas where no or low biodiversity values are present have been prioritised over impacting higher value biodiversity. Access routes will utilise current roads and tracks to reduce the impacts to native vegetation and habitat.
Locating the project in areas where the native vegetation or threatened species habitat is in the poorest condition	The majority of WTG are located on ridgetops that have been previously cleared of trees and are modified due to past agricultural use. These areas are in lower quality than habitat within the surrounding landscape.	The Project is located in areas that have previously been cleared for agriculture. Some clearing of woodland is required but these areas are already impacted by current access road and tracks.
Locating the project in areas that avoid habitat for species and vegetation in high threat categories (e.g. an EEC or CEEC), indicated by the biodiversity risk weighting for a species	The detailed design will prioritise use of areas of lowest biodiversity value and avoid areas of good habitat. WTG will be micro sited on site to avoid impacting upon threatened species, during survey seasons for relevant threatened species. The Project has not been able to completely avoid impacts to areas providing species habitat and TEC, however significant work has been undertaken to minimise impacts to these areas. Several access routes will traverse though TEC with alternative access routes identified to determine which route will have the lesser impact on TEC. Access roads already exist but will need to be widened to facilitate the movement of oversize vehicles. In areas of TEC, these activities will be kept to a minimum, with widening only to occur to what is necessary.	The Project will minimise impacts to TECs by the process of micro siting the location of WTG and infrastructure on site and by investigating options to locate connection corridors and access routes that minimizes impacts to vegetation and EEC. Various options for access and connection corridors were investigated so that impacts to native vegetation could be avoided and minimized. The preferred options impact less native vegetation and less TEC.
Locating the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained	Most of the ridge tops are devoid of trees. Access tracks will need to be widened to facilitate movement of WTGs and infrastructure however clearing these woodland areas will not result in fragmentation nor restrict movement of species.	The Project Site contains large tracts of native vegetation that will not be impacted by the development. Connectivity will be retained in areas around the Project Site.

The Development Footprint has been selected with consideration given to limiting the amount of intact vegetation to be removed. This approach is summarised in Table 7-4.

Table 7-4: Actions undertaken to avoid and minimise impacts

Approach	How addressed	Justification
Reducing the clearing footprint of the project	WTG locations have been selected based on previously cleared ridges with access tracks.	The design has minimised vegetation clearing through strategic design. Various options for access and connection corridors were investigated to determine impacts to vegetation along each section. The preferred options have reduced impacts to native vegetation from an initial clearing footprint of 1,500 ha to the current 730.73 ha. Micro siting of WTG and infrastructure will further reduce the clearing footprint.
Locating ancillary facilities in areas where there are no biodiversity values	The location of ancillary facilities is within cleared grazing lands. Future micro siting will endeavour to avoid impacts to biodiversity values.	The placement of ancillary facilities has been designed to minimise impacts to biodiversity values by locating them in areas that have already been cleared of trees. Future micro-siting of ancillary infrastructure will endeavour to avoid impacts to TEC by being located on areas with high weed cover.
Locating ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a lower vegetation integrity score)	The design has endeavoured to locate ancillary facilities in areas of vegetation on the periphery of the cleared land that suffers from edge effects and disturbance from past clearing activities and current disturbance pressures.	The placement of ancillary facilities has been designed to minimise impacts to biodiversity values by locating them in areas of lower biodiversity value (cleared paddocks) within the Project Site boundary.
Locating ancillary facilities in areas that avoid habitat for species and vegetation in high threat status categories (e.g. an EEC or CEEC)	It has not been possible to completely avoid impacts to areas providing species habitat and EEC vegetation. The placement of the WTG, power poles and associated infrastructure will be micro-sited to minimise impacts as far as practicable to the EEC vegetation whilst maximising extent necessary for development.	The placement of ancillary facilities has been designed to work in and around areas of cleared land.
Providing structures to enable species and genetic material to move across barriers or hostile gaps	There is the potential for WTG to impact on migratory species through blade strike. A management plan will be implemented during operation to avoid impacts to species flying though the landscape. For non-flying local species the Project will not increase any hostile gaps or barriers.	Corridor movement will be retained for species within the Project area through project design and will be subject to ongoing monitoring and the implementation of the BBAMP and associated Trigger Action Response Plans (TARPs).
Making provision for the demarcation, ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on the Project Site.	Proponent to retain all remaining vegetation outside of the Development Footprint.	The proponent will demarcate all areas outside the Project Site boundary to be retained.

Approach	How addressed	Justification
Efforts to avoid and minimise impacts through design must be documented and justified	The proposed Project Site boundary has been refined from an original larger investigation area resulting in a Project Site that largely avoids intact native vegetation with majority of the proposed Project Site being located on lands previously cleared for agricultural activities.	The design has avoided and minimised vegetation clearing through strategic placement of WTG and ancillary infrastructure. Options have been provided for connection corridors and access routes to investigate which option will impact the least amount of native vegetation.

7.1 Avoiding and minimising impacts to birds and bats

7.1.1 Curtailment Strategies - Wind Turbine Generators

Wind turbine curtailment strategies implemented at operational wind farms have been shown to effectively reduce the risk of wildlife collisions (Adams et al. 2021; Bennett et al. 2022; Whitby et al. 2024). Two main approaches are commonly used: standard curtailment and smart curtailment. Standard curtailment typically involves applying fixed operational limits, such as increasing the cut-in speed of all turbines in a blanket approach, regardless of actual collision risk at the time. In contrast, smart curtailment is a more adaptive and data-driven approach that limits turbine operation only under conditions associated with high collision risk. This may include peak activity periods for threatened and at-risk bird and bat species, including real-time detection of bird and bat activity. Smart curtailment aims to achieve an effective balance between biodiversity protection and energy production by reducing both collision risk and unnecessary turbine downtime during the highest risk periods.

To inform an effective curtailment program to reduce turbine collision risk, analysis of microbat call data has been undertaken in the subsections below with reference to wind speed and both temporal and spatial patterns.

7.1.1.1 Wind speed and at-height microbat call activity

Wind speed data was collected at anemometers deployed at 110 m above ground level (Table 7-5) from two met mast locations (BDG1 and BDG2 – see Figure 4-5, Section 4.5.4) located within the Project Site. All wind speed data was recorded in 10-minute intervals. Microbat call data has also been collected from detectors positioned across heights of 2 m, 50 m, and 100 m on the same two met masts (BDG1 and BDG2). Table 7-5 below details the dates and duration of microbat call data collected from both met masts and the corresponding wind data used in the analysis presented below.

Table 7-5: Microbat survey effort for at-height meteorological mast call detection and corresponding wind speed data

Season	Site	Dates	Survey Nights	Wind Speed Data
Summer - Autumn 2022	BDG1 - 2 m	24 February - 25 March 2022	30	BDG1 - 110 m
	BDG1 - 50 m	24 February - 25 March 2022	30	
Spring - Summer 2024	BDG1 - 2 m	25 September - 5 December 2024	19	
	BDG1 - 50 m	25 September - 5 December 2024	17	
	BDG1 - 100 m	25 September - 5 December 2024	20	

Season	Site	Dates	Survey Nights	Wind Speed Data
	BDG2 - 2 m	6 September - 6 December 2024	57	
	BDG2 - 50 m	6 September - 6 December 2024	69	BDG2 - 110 m
	BDG2 - 100 m	6 September - 6 December 2024	84	
Summer - Autumn 2025	BDG1 - 2 m	10-15 February 2025	5	
	BDG1 - 50 m	23-27 March 2025	5	
	BDG1 - 100 m	22-26 March 2025	5	BDG1 - 110 m
	BDG2 - 100 m	20-24 March 2025	5	BDG2 - 110 m
Autumn 2025	BDG1 - 2 m	28 April – 1 May	4	BDG1 - 110 m
	BDG1 - 50 m	27 April – 1 May	5	
	BDG1 - 100 m	27 April – 1 May	5	
	BDG2 - 2 m	27 April – 1 May	5	BDG2 - 110 m
	BDG2 - 100 m	27 April – 1 May	5	

An analysis was conducted on the relationship between wind speed (within RSA) and positively identified microbat calls using 14,615 timestamped bat calls recorded between summer-autumn 2022 and autumn 2025 from the detectors and anemometers placed on the two met masts (BDG1 and BDG2). The analysis assesses total microbat call activity (all microbat species calls, per 10 minute interval) alongside the corresponding wind speed (metres per second; m/s) from the same 10 minute interval.

Overall, total microbat calls recorded at 2 m are relatively low at low to moderate wind speeds below 11 m/s and then substantially increase between 11 m/s and 16 m/s (Figure 7-7). The four highest call rates at 2 m were recorded at the four highest wind speed categories and suggests a trend of increased microbat call activity at low heights during high wind conditions, as recorded at the RSA (110 m anemometer) height.

Total microbat call data recorded at 50 m was highest at low wind speeds below 3 m/s, with a substantial reduction in calls recorded between 3 m/s and 4 m/s (Figure 7-7). 50 m call rates also recorded an increased trend at high wind speeds between 11 m/s and 16 m/s, though increases were much lower relative to that recorded for 2 m call data.

Call data recorded by the 100 m microphone was relatively low overall (<1.0 calls per 10-minute interval) and was highest at low wind speed categories of 4-5 m/s and below. Proportionally, 27.52% of microbat calls recorded at 100 m were recorded at wind speeds below 4.5 m/s. The wind speed and call activity analysis presented in Figure 7-7 suggests that microbat call activity recorded at 100 m within the RSA of proposed WTGs, is low when wind speeds at RSA height (110 m) are at moderate to high levels, which are suitable conditions for WTG operations.

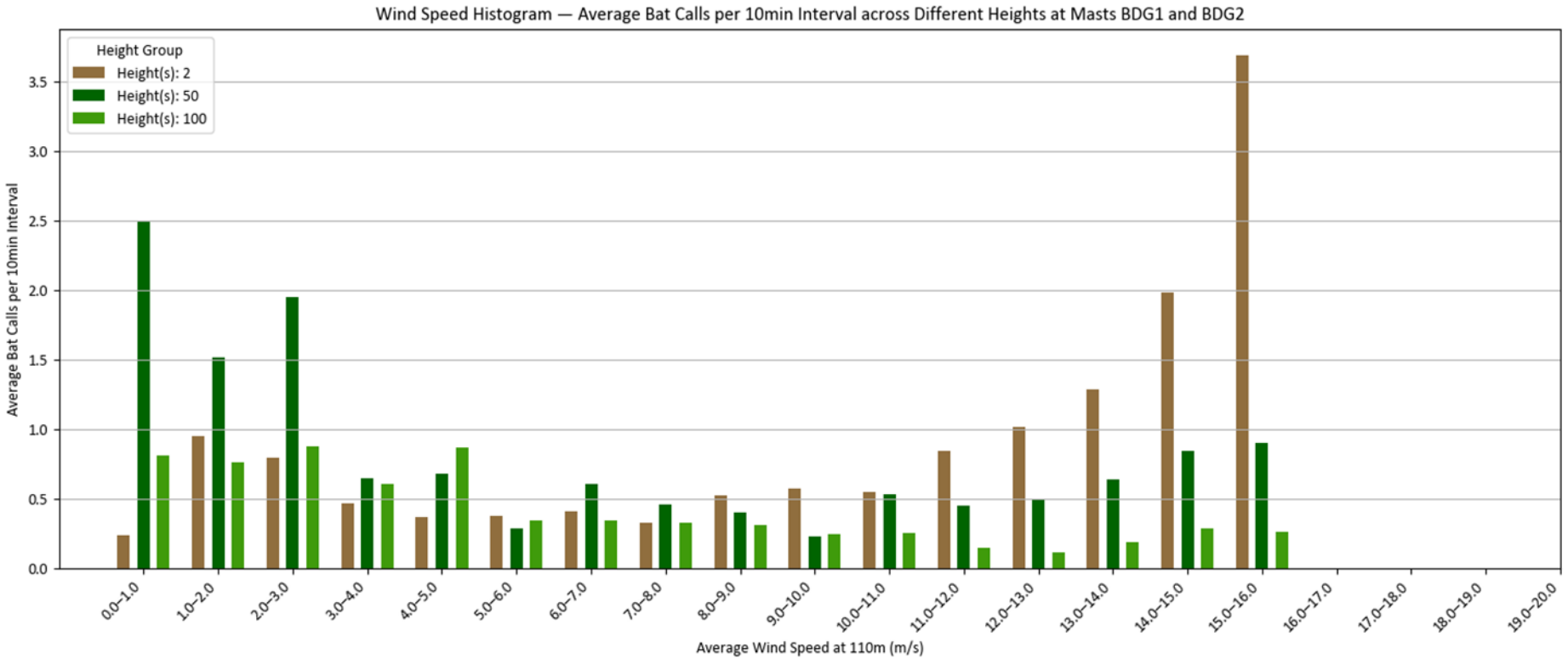


Figure 7-7: Average total bat calls (all microbat species) per 10 minute interval (recorded at 2 m, 50 m and 100 m at met masts BDG1 and BDG2 and the corresponding wind speeds recorded at 110 m)

The same analysis was undertaken for two species identified in the Project baseline bat risk assessment (see Section 6.5) as being at elevated risk of turbine collision. Definite calls of the Large Bent-winged Bat, listed as Moderate risk, Vulnerable under the NSW BC Act and classified as a SAII entity under the NSW Biodiversity Offset Scheme, were isolated from the broader met mast microbat call dataset to assess the species activity in relation to wind speed. White-striped Freetail Bat was also assessed for wind speed-related activity as the species has been assessed as High risk for the Project due to its frequent recording at heights relevant to the RSA (50 m and 100 m) and the high incidence of turbine collision fatalities recorded for the species (see Section 6.5).

Large Bent-winged Bat call activity at all heights was low overall, with fewer than 0.025 calls per 10-minute interval across all recorded wind speed categories (Figure 7-8). At 50 m, calls were highest at low wind speeds of 2-3 m/s and 4-5 m/s, with 100 m recorded calls also highest at these low wind speeds, as well as 0-1 m/s. Large Bent-winged Bat calls were recorded more frequently at 50 m and 100 m, compared to 2 m at the two met mast locations (Figure 7-8). This may reflect a combination of greater call activity and detectability at height compared to ground level at these locations, given the species call is often combined with three species of common and non-listed Forest Bat (*Vespadelus* spp.) species, particularly at ground level where vegetation clutter can affect call quality. It is noted that several ground-based Impact and Control BBUS sites recorded substantially higher Large Bent-winged bat call activity during seasonal BBUS (see Appendix K) to that recorded at 2 m, 50 m and 100 m met mast detectors. As such, the higher call activity recorded at 50 m and 100 m compared with 2 m at the two met mast sites may not be indicative of the general vertical pattern in the species activity.

White-striped Freetail Bat call data recorded at 50 m and 100 m was highest at low wind speed categories of 4-5 m/s and below (Figure 7-9). All five of the lowest call rates at 50 m and three of the lowest call rates at 100 m were recorded at the five lowest wind speed categories (Figure 7-9). These results demonstrate that overall, White-striped Freetail Bat call activity is highest at heights associated with the RSA, during low wind speeds. The species call activity at 2 m was variable, but overall, still highest at low to moderate wind speed categories of 6-7 m/s and below (Figure 7-9). Similar to total microbat call activity at 2 m and to a lesser extent 50 m (see Figure 7-7), White-striped Freetail Bat calls also demonstrate an increased trend at high wind speeds from 12-16 m/s, which may indicate that the species flies lower during high winds.

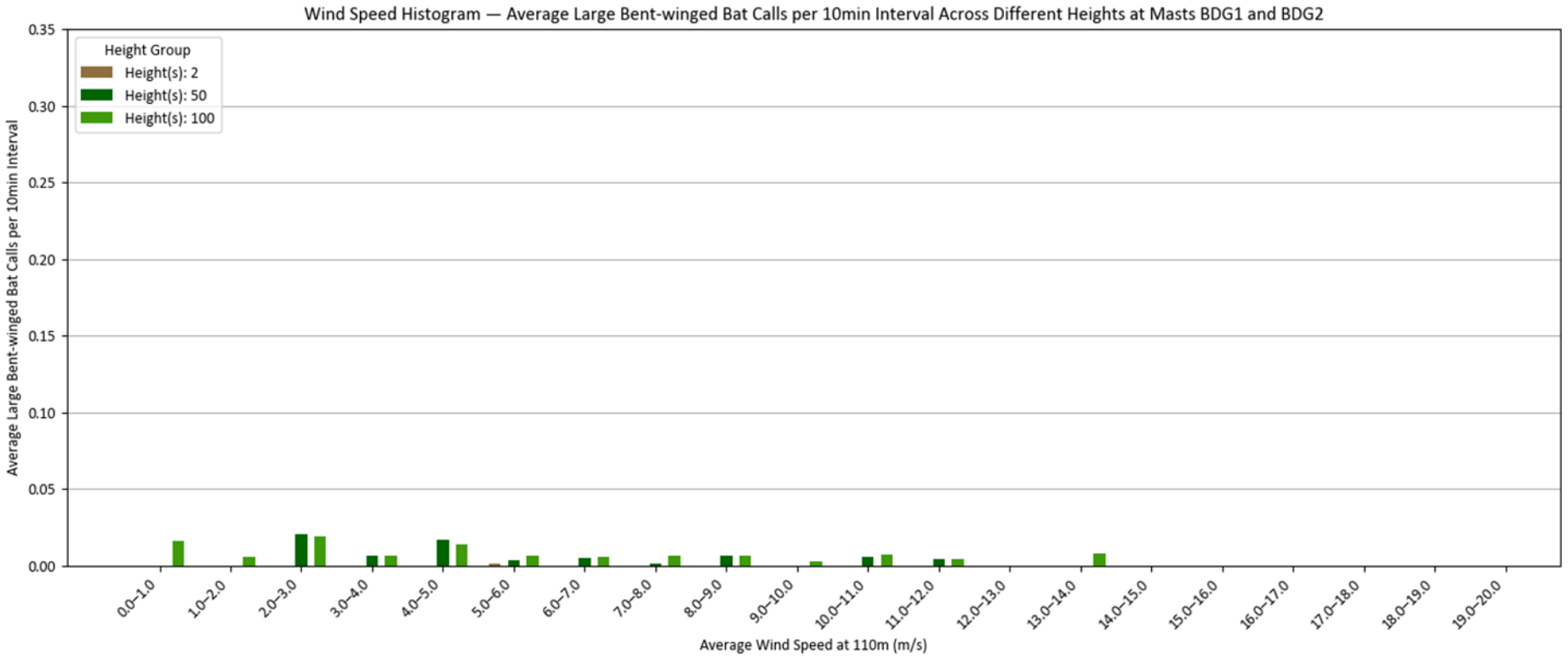


Figure 7-8: Average Large Bent-winged Bat calls per 10 minute interval, recorded at 2 m, 50 m and 100 m at met masts BDG1 and BDG2 and the corresponding wind speeds at 110 m

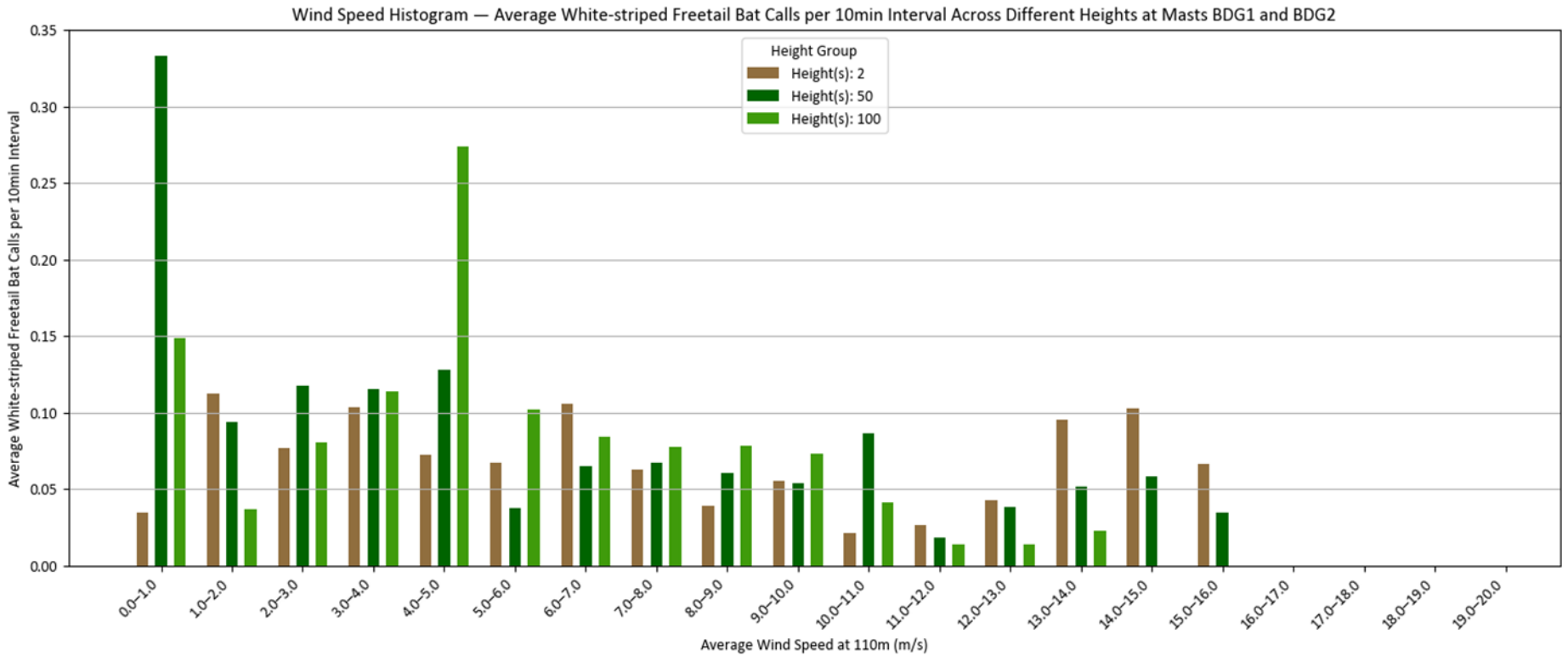


Figure 7-9: Average White-striped Freetail Bat calls per 10 minute interval, recorded at 2 m, 50 m and 100 m at met masts BDG1 and BDG2 and the corresponding wind speeds at 110 m

7.1.1.1. Temporal analysis of microbat call activity

Smart curtailment requires an understanding of peak periods of bird and bat activity to ensure that curtailment measures are targeted towards the time periods of heightened risk. Temporal patterns in microbat call activity were analysed using seasonal BBUS data collected from autumn 2024 to autumn 2025, with the objective of informing seasonally specific smart curtailment strategies. The analysis focused on:

- Large Bent-winged Bat
- White-striped Freetail Bat
- Total microbat activity (all species).

Spring 2024 recorded the highest mean call activity for both Large Bent-winged Bat (6.84 calls/night) and White-striped Freetail Bat (8.22 calls/night), while summer 2025 showed the highest activity for total microbat calls (495.22 calls/night) (Table 7-6). Summer 2025 also recorded the second highest activity for both species of concern.

Table 7-6: Large Bent-winged Bat, White-striped Freetail Bat and total microbat seasonal call activity

Season	Large Bent-winged Bat mean call activity	White-striped Freetail Bat mean call activity	Total microbat mean call activity
Autumn 2024	0.05 calls/night	0.08 calls/night	100.17 calls/night
Winter 2024	0.55 calls/night	1.53 calls/night	115.16 calls/night
Spring 2024	6.84 calls/night	8.22 calls/night	267.74 calls/night
Summer 2025	2.03 calls/night	5.03 calls/night	495.22 calls/night
Autumn 2025	0.37 calls/night	1.04 calls/night	226.41 calls/night

To better understand activity within the RSA, call data from detectors positioned at 100 m on meteorological masts BDG1 and BDG2 were analysed for data collected across the typical peak activity period of spring (September 2024) to early autumn (March 2025; Table 7-7). These results demonstrate that White-striped Freetail Bat activity is relatively high within RSA height during this period, and that Large Bent-winged Bat activity is low but detectable, representing approximately 2% of total call activity at 100 m during the peak activity season.

Table 7-7: Large Bent-winged Bat, White-striped Freetail Bat and total microbat call activity recorded at 100 m during spring to early-autumn (March)

Site	Large Bent-winged Bat Mean call activity	White-striped Freetail Bat Mean call activity	Total microbat mean call activity
BDG1 - 100 m	0.64 calls/night	6.36 calls/night	19.64 calls/night
BDG2 - 100 m	0.52 calls/night	6.08 calls/night	26.26 calls/night
Total 100 m	0.54 calls/night	6.14 calls/night	24.81 calls/night

The above temporal analysis indicates that spring and summer are the peak seasons for total microbat activity, as well as for activity of the Large Bent-winged Bat and White-striped Freetail Bat (Table 7-9). While peak microbat call activity in central west NSW can extend into early-autumn, call data collected

during March 2022 (98 calls/night) and March 2025 (106 calls/night) from met mast detectors were below or consistent with total call activity recorded during autumn and winter (Table 7-6). Therefore, initial curtailment measures may be limited to the spring–summer period without compromising effectiveness, however, additional seasonal data collected both at height and ground level will inform the finalised timing of the curtailment strategy, to be detailed within the Project BBAMP (see Section 7.2).

7.1.1.2. Spatial Distribution of microbat call activity

Spatial analysis was undertaken to identify areas within the Project development footprint with the highest levels of microbat activity for both Large Bent-winged Bat and the White-striped Freetail Bat. The objective was to support the development of turbine-specific smart curtailment strategies based on species activity patterns. Data were drawn from all BBUS impact sites and both met masts (BDG1 and BDG2; see Figure 4-6; Section 4.5.4) located across the Project development footprint. Relative activity levels were assessed using timestamped call detections from these monitoring locations (Table 7-8). Whilst the use of this full dataset provides spatially relevant data in two-dimensions (horizontally relevant data), only a minor proportion of the data was collected at and adjacent to RSA heights (met mast data at 50 m and 100 m) and so is of limited relevance in three-dimensions (vertically relevant data).

Table 7-8: Sites with the highest recorded Large Bent-winged Bat and White-striped Freetail Bat call activity and adjacent WTGs

Site	Large Bent-winged Bat Mean call activity	White-striped Freetail Bat Mean call activity	Associated adjacent WTGs
BDG1 - 2 m (Impact 5)	0.22 calls/night	7.44 calls/night	WTG 32, 33, 34, 35, 36
BDG1 - 50 m (Impact 5)	1.94 calls/night	7.18 calls/night	WTG 32, 33, 34, 35, 36
Impact 4	3.50 calls/night	3.42 calls/night	WTG 40, 41, 42
Impact 5	2.69 calls/night	3.19 calls/night	WTG 32, 33, 34, 35, 36
Impact 8	0.31 calls/night	10.50 calls/night	WTG 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28
Impact 10	4.44 calls/night	11.94 calls/night	WTG 1, 2 ,3, 4, 5, 6, 7, 8, 9

Impact 10 recorded the highest mean call activity for both White-striped Freetail Bat (11.94 calls/night) and Large Bent-winged Bat (4.44 calls/night; Table 7-8). Met mast BDG1 detectors at 2 m and 50 recorded the third and fourth highest mean call activity for White-striped Freetail Bat. The co-located BBUS site Impact 5 also recorded the third highest call activity for Large Bent-winged Bat (Table 7-8) and collectively indicates a relatively high area of microbat activity for both species. Table 7-8 also details the WTGs associated with highest call activity for both species, which totals 31 individual WTGs. With the exception of BDG1 - 50 m (Impact 5), this call activity has been recorded at ground level and so the call activity for the associated WTGs has been extrapolated and should be considered in a relative sense only. Within this list of associated 31 WTGs of relatively high call activity, are 18 of the 20 WTGs assessed as High risk in the WTG risk assessment (see Section 6.13), and so collectively, they indicate appropriate WTGs for implementing curtailment measures.

7.2. Wind turbine curtailment strategy

A wind turbine curtailment strategy has been developed to reduce turbine collision risk, with the strategy comprising three components. The curtailment strategy will be implemented proactively upon commencement of full operation of the Project, following the required turbine testing and commissioning.

7.2.1. Turbine feathering

The blades of WTGs can continue to rotate at low wind speeds below the rated cut-in speed of the WTG model (generally 3.0 m/s) and have the potential to strike bats, despite no electricity being generated from the turbine. Feathering of WTG blades involves adjusting the turbine settings to prevent or limit the rotation of blades below the cut-in speed and has proven effective at reducing microbat mortality (Arnett et al. 2013 and Arnett 2017), whilst minimising loss of electricity generation. WTG blades will therefore be feathered below the rated cut-in speed (to be confirmed upon specification of turbine models, however, a minimum of 3.0 m/s is proposed) year-round from 30 minutes before sunset to 30 minutes after sunrise for all 70 WTGs.

To reduce collision risk for birds and assess the effectiveness of turbine feathering on this species group, all assessed High risk WTGs (20 WTGs total; see Section 6.13) will also be feathered year round for the remaining diurnal period (30 minutes after sunrise to 30 minutes before sunset i.e. 24 hours per day). Combined with a robust carcass monitoring (see BBAMP), this strategy will provide comparative data to assess the effectiveness of turbine feathering in reducing both microbat and bird collision and identify any apparent temporal or spatial patterns.

7.2.2. Increased cut-in wind speed

A low wind speed curtailment strategy will be applied by increasing the cut-in speed to 4.5 m/s nightly from 30 minutes before sunset to 30 minutes after sunrise, during the spring and summer period (September to February) of highest recorded microbat activity (see Section 7.1.1). As part of the Project BBAMP, this strategy will be implemented for a subset of the 70 WTG to enable comparative analysis of its effectiveness via carcass monitoring. For example, for all high risk WTGs (n = 20), 50% of moderate risk turbines (n = 23) and 40% of low risk turbines (n = 2).

Arnett et al. (2013) and Arnett (2017) reviewed ten low wind speed curtailment studies of which the majority demonstrated a reduction in bat mortality of at least 50% when WTG cut-in speed was increased by at least 1.5 m/s (e.g. 3.0 m/s to 4.5 m/s, as proposed). Bennett et al. (2022) also recorded a 54% reduction in bat mortality where WTG cut-in speed was raised from 3.0 m/s to 4.5 m/s at a wind farm in south-west Victoria. Additionally, Bennett et al. (2022) recorded a two-fold decrease in Southern Bent-winged Bat mortality (a closely related species to Large Bent-winged Bat) and a three-fold decrease in White-striped Freetail Bat mortality post curtailment, when increasing turbine cut-in speeds to only 4.5 m/s. Combined, this result and the wind speed call activity analysis demonstrate the potential for the proposed low wind speed curtailment strategy to reduce turbine collision risk.

Reduced turbine operations from 30 minutes before sunset to 30 minutes after sunrise as a result of increased cut-in speeds is also likely to reduce potential collision risk for White-throated Needletail, given the risk turbine of strike when flying in these low light conditions to and from roost sites (Tarburton 2021).

7.2.3. Smart curtailment

A smart curtailment approach is proposed to investigate and trial technologies to further reduce collision risk to microbat species at specific WTGs of relatively high risk. The smart curtailment approach involves the use of systems such as the Wildlife Acoustic's Song Meter with Analysis and Remote Transfer monitoring system (Wildlife Acoustics 2025) which provides remote call detection, analysis and acoustically triggered curtailment in real time.

Initially, the smart monitoring system will be installed on one of the two of the temporary met masts during the pre-operation period (12-18 months) at a height within the RSA (>65 m). The smart monitoring system will collect additional at-height baseline microbat call data to better understand the range and temporal patterns of call activity within the RSA, along with the species-specific call parameters at height and confirm the suitability of the technology in an operational Australian context. The key outcome of the met mast smart monitoring system trial is to define microbat call activity thresholds which will trigger operational carcass monitoring. This will be documented in the Project BBAMP prior to the commencement of operations.

Operationally, the smart monitoring system is proposed to be implemented for smart curtailment at a subset (minimum of five) of the 33 WTGs associated with relatively high at risk microbat activity (see Table 7-8; Section 7.1.1.2). The smart monitoring system's real time call detection and analysis software will be used to trial and develop the following two components of the smart curtailment approach:

Carcass monitoring trigger: microbat call activity recorded by the smart monitoring system on operational WTGs which is above the defined threshold in the Project BBAMP, will result in the carcass monitoring trigger being activated. Upon activation of the trigger, a carcass search will be undertaken within the defined search zone of the WTG as soon as possible following the trigger. The results of the carcass search (i.e. microbat carcass detection or absence, species identification and carcass age), along with any relevant environmental, spatial or temporal factors at the time of the trigger, will be recorded and actioned as necessary, within the adaptive management framework of the Project BBAMP. This monitoring trigger and response seeks to increase understanding of the relationship between microbat call activity and turbine fatality rates (Solick et al. 2020) and improve the accuracy of the Project's mortality estimates.

Acoustically triggered smart curtailment: the smart monitoring system's built-in call analysis capability allows for WTG operation to be paused in response to defined microbat call parameters and activity levels (Wildlife Acoustics 2025). This technology has been successfully deployed in Europe and the United Kingdon (Wildlife Acoustics 2025) and Ark Energy proposes to contribute to its development here in Australia.

Where the results of carcass monitoring triggers and subsequent carcass searches identify a relationship between microbat call activity and confirmed fatalities, smart curtailment trials will be implemented. The specific details of the smart curtailment trial will be developed in consultation with State and/or Commonwealth agencies and other relevant parties, and implemented within the adaptive management framework of the Project BBAMP, however, will include the following example components:

- A defined total microbat and/or species-specific call activity trigger for the immediate pause in WTG operation

- A defined time period of microbat call absence or low activity threshold before re-instating WTG operation
- Carcass search to be undertaken within the defined search zone of the WTG as soon as possible following the acoustic curtailment trigger
- Documentation and review of the results of carcass searches, along with any relevant environmental, spatial or temporal factors at the time of the trigger.

The smart curtailment strategy will be implemented through the Project BBAMP and as such, an adaptive approach will be taken with the curtailment trigger metrics updated, should additional microbat call data or other relevant information (e.g. published scientific literature) suggest is necessary. Likewise, the curtailment strategy will be adapted through the operation of the Project in line with the results of operational monitoring. Details of the proposed curtailment strategy are summarised in the Table 7-9 below.

Table 7-9: Low wind speed curtailment strategy

Strategy	Parameters	Timing	Applicable WTGs
Turbine feathering - bats	Restrict blade rotation <3.0 m/s (minimum)	All year	All WTGs
Turbine feathering - birds	Restrict blade rotation <3.0 m/s (minimum)	All year	High risk WTGs (n = 20)
Increased cut-in wind speed curtailment	Increase cut-in speed to 4.5 m/s	Spring - Summer (September - February)	100% High risk WTGs (n = 20) 50% Moderate risk WTGs (n = 23) 40% Low risk WTGs (n = 2)
Smart curtailment	Call activity threshold for carcass monitoring trigger to be determined in the pre-operational BBAMP. Smart curtailment trigger (acoustically triggered) to be determined where results of the carcass monitoring trigger identify a relationship between microbat call activity and confirmed fatalities.	To be determined	Subset of High risk and High activity WTGs (n = 5)

7.1.2 Transmission Lines

The wind farm transmission infrastructure poses a risk to birds, particularly through collision and electrocution. These risks are most significant for large-bodied raptors (e.g. White-bellied Sea Eagle, Wedge-tailed Eagle, Little Eagle, Whistling Kite), which are known to occur in the region. Raptors are disproportionately affected due to their large wingspans, tendency to perch or nest on poles, and lower manoeuvrability in flight (Biasotto & Kindel 2018, 2021; Dwyer et al. 2015). A literature review by Biasotto et al. (2021) found that raptors are 76% more likely to be electrocuted than other bird species.

Highly mobile threatened species are likely to be at more risk of collision. The species considered most at risk include:

- Little Eagle
- White-bellied Sea Eagle
- Wedge-tailed Eagle
- Grey-headed Flying Fox.

Bird surveys conducted at BUS Impact 5 and BUS Control 8 were the closest survey points to the transmission line. Wedge-tailed Eagles were recorded at both locations, and it is also considered likely that White-bellied Sea Eagles would also be observed in lower flight zones within the area, particularly where the transmission line crosses the Macquarie River.

It is well documented that transmission lines, especially close to wetlands, forests or over floodplains, are a significant cause of mortality of many bird species (Baker et al., 1998; Clancy, 2010; Loss et al., 2014). Many birds which are strongly tied to woodland habitat and shrubby vegetation below the top of canopy height will rarely fly to the height of transmission lines and when they do, it is to perch and there is no risk of transmission line strike, since flights are made at relatively slow speeds and transmission lines represent part of the habitat within their known territories. Generally, it is those groups of birds which are likely to fly at heights where transmission lines are located, and are not familiar with local habitat attributes, which have the most potential to encounter transmission line infrastructure. Such birds include, raptors, owls, cockatoos, and waterbirds, many of which move in response to changing distributions of resources. Many species within the waterbird groups are unlikely to fly at elevations of transmission lines, unless making local movements. This risk of collision is likely to reduce over time as animals acclimatise to the presence of the transmission line structures and the lines themselves.

Movement of birds and bats along the riparian zone (see Figure 1-1Figure 6-6) particularly along the Macquarie River are likely to come into contact with the transmission line and therefore mitigation measures at this location will be required.

Forest owls, which are likely to occur in adjacent habitat, are also susceptible due to nocturnal flight patterns and low-altitude hunting behaviour. Grey-headed Flying-foxes, recorded in the broader landscape, may also be at risk of wire collision during commuting flights between foraging and roosting sites. Grey-headed Flying-fox are often found injured or entangled within existing transmission lines, particularly within urban areas associated with low voltage transmission lines with line spacings of 600 mm. There is a risk of electrocution from short circuit associated with these lines where the species has potential to contact more than one line with their feet or wings.

There is little information on impacts upon microbats in relation to transmission line developments. However, it is likely that there is a degree of collision risk during migration movements. Large Bent-winged Bat and Little Bent-winged Bat are known to forage above the canopy and in open spaces (Churchill, 2009), and therefore more susceptible to collision strike. Other species, such as Large-eared Pied Bat, Eastern False Pipistrelle and Southern Myotis show strong roost fidelity and will occupy those multiple roosts sites within their range, year after year. These species tend to be low to mid-canopy flyers, and therefore, are less likely to be susceptible to transmission line collision.

To mitigate impacts, a combination of evidence-based design and retrofitting measures is proposed. These include:

- the installation of line markers (e.g. bird diverters, spirals or flappers) on earth wires and conductors to increase visibility—an action shown to reduce collision rates by 50–95**%** (Prinsen et al. 2011). This is particularly critical in valley crossing and near waterbodies. Positioning and exact diverter model would be finalised during design refinement. At a minimum these would be used within 1 km of riverine habitats to reduce impacts on aerial fauna species form collision and allow safer passage within these areas.
- Avian-safe pole designs, incorporating insulated components, increased conductor separation.
- Use of anti-perch devices in poles in nesting territories.
- Minimum spacing of transmission lines to exceed potential wingspan of the species

These mitigation actions will reduce the likelihood of significant impacts on threatened species. These strategies are consistent with best practice.

7.3. Bird and Bat Adaptive Management Plan

A comprehensive and Project specific BBAMP is a requirement of both NSW and Commonwealth conditions of consent and has a primary objective to document, monitor, mitigate and manage potential impacts to birds and bats from the Project. The details of the comprehensive BBAMP are to be developed prior to operation of the Project in conjunction with the relevant State and Commonwealth agencies (i.e. CPHR and DCCEEW), however, a framework for the BBAMP is provided below (Table 7-10) and contains relevant commitments to components of the BBAMP including monitoring, impact triggers and mitigation.

Table 7-10: BBAMP Framework

Description	BBAMP Framework	BBAMP Content
Objectives and consent conditions	Briefly define the overall objectives for the BBAMP and strategies to avoid and mitigate residual prescribed impacts.	Purpose and objective of the BBAMP: to effectively document, monitor, mitigate and manage potential impacts to birds and bats from the Project Conditions of consent relevant to bird and bat impacts, reporting and management; and Any relevant commitments identified in the BDAR, not included in the conditions of consent.
BDAR summary information	Summarise the survey methodology and results of baseline site utilisation data for birds and bats i.e., baseline data that can be used to detect change in site usage pre- and post-construction and during operation. Provide a review and summary of baseline bird and bat risk assessment and WTG risk assessment.	Summary of baseline survey methodology and results and risk assessments outcomes, including, but not limited to: • A description of survey method and effort; • Species detection survey results, including the relevant location, timing and season/s detected. • Reference to Site and Location maps that identify the coordinates for survey i.e., BBUS point surveys, elevation and arrangement of ultrasonic detectors etc.; • Risk assessment outcomes for each species; and • Maps of proposed WTGs and associated risk ratings. Baseline bird and bat utilisation data collection has been designed within a Before-After Control-Impact (BACI) framework which helps to detect changes attributable to the Project while accounting for natural environmental variability (e.g. seasonal and climate factors). Systematic seasonal data has been collected at 11 impact and 8 control BBUS sites established over five seasons to date (autumn 2024 to autumn 2025), with a commitment to analyse and incorporate an additional three seasons of data (winter 2025, spring 2025, summer 2026) to provide a full 24 months of pre-operational baseline bird and bat utilisation data. Microbat call detection at met masts BDG1 and BDG2 will also continue seasonally via deployed ultrasonic detectors at 2 m, 50 m and 100 m. Additional baseline data will be utilised to inform and update where necessary, baseline bird and bat risk assessment and WTG risk assessment, curtailment and mitigation strategies and development of the overall Project BBAMP.
Monitoring Program – Operational Bird and Bat Utilisation Surveys (BBUS)	Provide an overview of the monitoring methodology for operational BBUS including: Monitoring site quantity and locations – of both control and impact sites, including maps and coordinates. Monitoring methodology – for both bird and bat species groups.	Operational BBUS within the BACI framework will be undertaken consistent with baseline monitoring as follows: Sites and locations: 11 impact and 9 control sites (see Figure 4-4). BUS methodology: 4x 20-minute surveys per site per season. All raptor and threatened bird species flights tracked and mapped using geo-referenced spatial software.

Description	BBAMP Framework	BBAMP Content
	Monitoring frequency and duration – propose a monitoring frequency and duration that is ecologically defensible and will accurately capture species distribution and fluctuation across climatic conditions and seasons, which may vary across several years.	BAS methodology: 4x night microbat call detection per site per season, from 30 minutes prior to sunset until 30 minutes after sunrise. The operational BBUS monitoring program duration will mirror the baseline monitoring duration and be undertaken for a minimum 24-month period (eight seasons in total) and will be reviewed in conjunction with State and Commonwealth agencies at the completion of this initial 24-month (two-year) operational period, line with the adaptive management framework of the BBAMP.
Monitoring Program – Targeted Monitoring of 'High' risk bird and bat species	Provide an overview of the targeted monitoring program for the following bird and bat species assessed as 'High' risk in the baseline bird and bat risk assessment (see Section 6.1 and Section 6.5): Wedge-tailed Eagle (*Aquila audax*) White-striped Freetail Bat (*Austronomus australis*)	<u>Wedge-tailed Eagle</u> Targeted monitoring of Wedge-tailed Eagle flight activity, breeding behaviour and nest locations will be undertaken across three key periods; commencement of breeding season (June-July), conclusion of breeding season (September-October), juvenile independence/departure (February-March) for a minimum of two days per period/season. Monitoring will be undertaken at all previously identified nests and areas of high activity (e.g. NW ridgeline between WTGs 9-17; see Figure 6-1) and searches for new nest locations will also be completed via focal-follow surveys of adult birds within the Project Site and accessible surrounds. Active nests will be monitored to record breeding and fledgling success rates and provide input for any required operational or management response. Focal-follow surveys of post-fledgling juvenile birds will also take place during their expected independence/dispersal period to record their flight behaviour and movements during this high-risk period. Flight tracking and nest locational data will be recorded on mobile devices in geo-referenced software (e.g. ESRI Field Maps) to provide real-time and spatially accurate data collection. Targeted Wedge-tailed Eagle monitoring will be undertaken during the initial two-year operational monitoring period and will then be reviewed in conjunction with State and Commonwealth agencies. <u>White-striped Freetail Bat</u> Installation of Wildlife Acoustics Song Meter with Analysis and Remote Transfer (SMART) monitoring system (or similar technology) (Wildlife Acoustics 2025) is proposed for two met masts during the pre-operation period (12-18 months) at heights within the RSA (>65 m). The SMART system allows remote monitoring and download of microbat call data via dual sensor ultrasonic microphones connected to a SMART controller with network connectivity. Initially the SMART systems installed on met masts will collect additional at height baseline data for White-striped Freetail Bat during the pre-operational period. The aim of this

Description	BBAMP Framework	BBAMP Content
		additional data collection is to better understand temporal patterns in the species activity in the RSA, along with the species-specific call parameters at height, this survey will serve a dual purpose by both further informing the BBAMP with additional data, as well as testing the merit of the emerging technology for use in an operational Australian context. Ark Energy proposes to investigate the installation of SMART systems (or similar technology) on a subset (minimum of five) of 'High' risk/activity WTGs (see Table 7-8). The SMART system includes built-in call analysis software to detect microbat activity in real time (Wildlife Acoustics 2025) and allow the development, trial and implementation of the following monitoring and mitigation measures: Carcass monitoring trigger: where White-striped Freetail Bat call activity recorded by the SMART system deployed on an operational WTG exceeds a defined threshold, a carcass search will be undertaken within the defined search zone of the WTG as soon as possible following the trigger. This monitoring trigger and response seeks to increase understanding of the relationship between microbat call activity and turbine fatality rates (Solick et al. 2020) and improve the accuracy of the Project's mortality estimates. Acoustically triggered curtailment: the SMART system's built-in call analysis capability allows for WTG operation to be paused in response to defined microbat call parameters and activity levels (Wildlife Acoustics 2025). This technology has been successfully deployed in Europe and the United Kingdom and Ark Energy proposes to contribute to its development here in Australia, through implementation of trials for at risk microbat species including the White-striped Freetail Bat. The specific White-striped Freetail Bat call parameters and activity levels would be identified through both pre-operational and operational data collection where results of carcass monitoring trigger identify a relationship between call activity and confirmed fatalities. The carcass monitoring trigger and acoustic triggered curtailment trials would be developed and implemented in consultation with State and/or Commonwealth agencies and other relevant parties within the adaptive framework of the Project BBAMP.
Monitoring Program – Operational Carcass Monitoring Program	Provide an outline of the operational carcass monitoring methodology including: An overview of WTGs, their associated risk ratings and turbine selection protocol. Monitoring frequency and duration.	The results of the WTG risk assessment as presented in Table 6-20 provides the following breakdown of WTG 'risk ratings': • 'Low' risk: 5x WTGs • 'Moderate' risk: 45 x WTGs • 'High' risk: 20 WTGs. Whilst the finalised WTG selection for inclusion in the carcass search monitoring program will be detailed in the Project BBAMP prior to operation, it is important that a representative

Description	BBAMP Framework	BBAMP Content
		subsample of WTGs across all risk categories are randomly selected for inclusion. The following provides an indicative turbine selection protocol: • 40% of WTGs in the 'Low' risk category = 2x WTGs • 33% of WTGs in the 'Moderate' risk category = 15x WTGs • 66% of WTGs in the 'High' risk category = 13x WTGs. Carcass searches would be implemented on a monthly basis for the initial five years of operations to cover the expected range of environmental conditions and variability (e.g. seasonal and climatic variations) which have the potential to influence bird and bat activity during this initial monitoring period. During spring and summer months (September to February), each WTG would also undergo a pulse search within the 60 m radius Inner Search Zone (see below). The pulse search is to be completed 2-4 days following the standard monthly search, to increase detectability of microbat carcasses (which are prone to scavenging; Symbolix 2020) during the months of highest microbat activity (see Section 4.6.2). The operational carcass monitoring program would be implemented through the adaptive framework of the BBAMP and reviewed and on an annual basis.
Calculate carcass fall zone	The potential fall zone of bird and bat carcasses post turbine collision is required to be calculated to inform appropriate search zones for carcass monitoring.	Given the substantial size difference between the Project's two 'High' risk bird (Wedge-tailed Eagle) and bat (White-striped Freetail Bat) species, along with the proposed WTG RSA of 65-250 m, carcass fall zones are likely to be variable. The maximum carcass fall zone for the largest taxa of interest (Wedge-tailed Eagle) is likely to extend beyond 120 m from the WTG base, and for White-striped Freetail Bat, extend beyond 60 m from the WTG base (Hull and Muir 2010). Carcass fall zones and associated carcass search zones will be calculated prior to operations and detailed in the Project BBAMP, however, based on the proposed WTG dimensions and the bird and bat species of key interest, indicative carcass search zones are as follows: • Inner Search Zone: 80 m – 6 m spaced transects; • Outer Search Zone: 160 m – 12 m spaced transects.
Carcass search method	Provide an outline of the carcass search methodology.	Canine detection dogs have proven effective at detecting bird and bat carcasses at operational wind farms in Australia (Bennet et al. 2022). As such, detection dogs will be utilised for carcass searches where possible and when available, with particular focus on their involvement during the spring and summer months of highest microbat activity (see Section 4.6.2), given their increased capacity to detect bat carcasses compared to human searches (Symbolix 2020). Where dogs are unsuitable or unavailable, suitably trained and

Description	BBAMP Framework	BBAMP Content
		qualified ecologists and environmental officers / technicians will undertake carcass searches. Both canine and human searches will record their survey tracks via GPS and the resume and credentials of the searchers (dog and/or human) is to be included in annual BBAMP reporting. For each carcass search undertaken, the following data will be recorded: • Date, time, and duration of the survey • WTG identifier • Detection method (i.e. human searcher or dog searcher) • Prevailing weather conditions (e.g. temperature, wind speed and wind direction) • Description of groundcover (e.g. grass, concrete) • GPS tracklog of search path. • Where carcasses, feather-spots or an injured bird or bat are found, the following data will be recorded within a designated carcass storage register: • Unique carcass identification number • Species name • Age and sex (where possible) • Description of injury(ies) • Signs of scavenging • Estimate of carcass age (e.g. days or weeks) • Date and time of discovery • GPS coordinates • Distance and direction to associated turbine • Photograph • Qualifications of the person identifying the specimen.
Carcass persistence trials	Provide an outline of the carcass persistence trials to be implemented to provide a correction factor input for annual mortality estimates.	For each carcass used in the trial, record the following data:

Description	BBAMP Framework	BBAMP Content
		• Carcass unique identification number • Species • Carcass size class (e.g. microbat, small/medium bird, large bird – approximately 10 replicates per size class are recommended for a statically robust trial) • Date and time of placement • GPS coordinates • WTG ID and distance and direction to the WTG • Groundcover and vegetation formation surrounding the WTG. • Remote motion sensitive cameras are to be placed in front of each carcass throughout the duration of the trial period to record: • Date and time of the scavenger visit(s) • Presence or absence of the carcass • Carcass condition (intact, partially scavenged, heavily scavenged) • Scavenger species • Signs of scavengers in the area (e.g., tracks, scats) • Any changes to habitat or visibility. Carcass persistence trials will be completed across a 30-day period, with a minimum of two trials to be during different seasons (e.g. winter/early-spring and summer/early-autumn) in the initial five year operational monitoring period.
Searcher efficiency trials	Provide an outline of the searcher efficiency trials to be implemented to provide a correction factor input for annual mortality estimates.	For each searcher efficiency trial, record the following data for inclusion in annual BBAMP reporting:

Description	BBAMP Framework	BBAMP Content
		• Date, time and duration of survey • Name and description of searcher(s) (dog and/or human) • GPS tracklog of search path. • Prevailing weather conditions (e.g., temperature, wind speed and direction) • For each trial carcass used: • Carcass unique identification number • Species • Carcass size class (e.g. microbat, small/medium bird, large bird) • Date and time of placement • GPS coordinates • WTG ID and distance and direction to the WTG • Groundcover and vegetation formation surrounding the WTG • Found or missed by the searcher. Searcher efficiency trials will be completed at least twice during different seasons (e.g. winter/early-spring and summer/early-autumn) in the initial five-year operational monitoring period. Provided a third party separate from the monthly carcass searches is available to run the trial efficiently and independently, both searcher efficiency trials and carcass persistence trials can be undertaken concurrently and can utilise the same bird and bat carcasses in most instances (i.e. subject to timing and scavenging).
Turbine strike notification	Provide an overview of the information that will be documented following a bird or bat strike event, and the process for notifying relevant agencies.	Description of the approach for turbine strike notification. Suggested data metrics include, but are not limited to:

Description	BBAMP Framework	BBAMP Content
		• Monitoring category (e.g. incidental or formal monitoring, human or canine searcher) • Detection date and time • Turbine number • Distance from tower base • Coordinates • Species • Age (juvenile or adult) and sex • Number of carcasses detected • Map showing the strike location in relation to turbine • Photographs of the carcass • Description of the operational, land management, environmental and seasonal conditions which could have contributed to the strike • Any associated TARP triggers or required notification of government agencies, wind farm personnel or project ecologist.
Calculate mortality rates	Outline of the requirement and inputs for calculating annual mortality rates for birds, bats and individual at risk species.	Statistical analysis of carcass monitoring results will be undertaken to provide an estimate of bird and bat mortality resulting from turbine collision. Overall mortality estimates will be provided for total birds, bats, and where necessary, individual species with recorded direct impacts. Statistical estimates of total mortality will be undertaken via the combined use of carcass monitoring data and carcass persistence trial and searcher efficiency trial data. Estimates will also take into account the limitations of the data inputs, with regards to the turbine search zone and number and frequency of turbines searched as part of the monitoring program.
Trigger Action Response Plan (TARP)	Outline the TARP which indicates the proposed triggers for adaptive management in the event of bird and bat turbine collision. The TARP framework follows a tiered approach allowing for commensurate adaptive management responses reflective of the scale and consequence of impacts. As an example, and as detailed adjacent, separate indicative impact triggers (to be finalised in the Project BBAMP prior to operations) are provided for Threatened or migratory species, Non-threatened	**Tier 1 Impact Triggers** Threatened or migratory species: any carcass, feather spot or injured individual threatened and/or migratory species (listed under NSW BC Act and/or Commonwealth EPBC Act) recorded under or adjacent to a WTG during carcass searches or incidentally. Non-threatened 'Moderate' or 'High' risk species: a total of four or more carcasses, feather spots or injured individuals recorded under or adjacent to a WTG during two successive carcass searches or incidentally during this period.

Description	BBAMP Framework	BBAMP Content
	'Moderate' or 'High' risk species and Non-threatened 'Negligible' or 'Low' risk species.	Non-threatened 'Negligible' or 'Low' risk species: a total of eight or more carcasses, feather spots or injured individuals recorded under or adjacent to a WTG during two successive carcass searches or incidentally during this period. **Tier 1 Impact Action and Response** Threatened or migratory species / Non-threatened 'Moderate' or 'High' risk species / Non-threatened 'Negligible' or 'Low' risk species: Notify relevant operational and Project staff, along with State (i.e. CPHR) and Commonwealth (i.e. DCCEEW) agencies within three business days. Undertake inspections at the impact WTG and any other WTG deemed necessary, which at a minimum is to include the two adjacent WTGs (minimum three turbines in total), for a period of three consecutive working days. If additional carcasses are recorded, inspections are to continue until a time that is agreed upon between Ark Energy, the Project ecologist, relevant agencies, and other relevant parties. Instigate a desktop investigation as soon as possible and within five working days to confirm the cause of impact and any likely contributing factors or circumstances. The desktop investigation will review existing monitoring data and ecological information for the species, will document consultation with State and/or Commonwealth agencies and other relevant parties and be completed within twelve working days following the impact trigger. Accounting for the outcomes of the additional monitoring and report, as well as any other relevant recently available information (e.g. data from other wind farms, scientific literature), the risk assessment for the species will be reviewed. If the risk assessment determines that an updated risk level is required or is likely to eventuate through repeated impact triggers, additional species-specific monitoring and mitigation will be required to be undertaken in consultation with State and/or Commonwealth agencies and other relevant parties. **Tier 2 Impact Triggers** Threatened or migratory species: direct annual recorded mortality of threatened or migratory species (listed under NSW BC Act and/or Commonwealth EPBC Act) which exceeds or is likely to exceed 0.1% of the species total population over a two year period. Non-threatened 'Moderate' or 'High' risk species: direct annual recorded mortality which exceeds or is likely to exceed 1% of the species total population over a two year period.

Description	BBAMP Framework	BBAMP Content
		Non-threatened 'Negligible' or 'Low' risk species: a total of 96 or more carcasses, feather spots or injured individuals recorded under or adjacent to a WTG over a two year period. **Tier 2 Impact Action and Response** Threatened or migratory species / Non-threatened 'Moderate' or 'High' risk species / Non-threatened 'Negligible' or 'Low' risk species: Immediate notification of relevant operational and Project staff, along with State (i.e. CPHR) and Commonwealth (i.e. DCCEEW) agencies within three business days. If additional carcasses are recorded, inspections are to continue until a time that is agreed upon between Squadron, the Project ecologist, relevant agencies, and other relevant parties. Instigate a desktop investigation as soon as possible and within five working days to confirm the cause and extent of the impact and any likely contributing factors or circumstances. The desktop investigation will review existing monitoring data and ecological information for the species, will document consultation with State and/or Commonwealth agencies and other relevant parties and be completed within ten working days following the impact trigger. Subject to the results of the desktop assessment and if the cause and extent of the impact remains unclear, implement targeted monitoring as soon as possible and within ten working days at the impact turbine and any subsequent turbines where impacts are recorded, along with relevant locations where the target species has been previously recorded. Targeted monitoring methodology and timing should be specific to the impacted species, however, monitoring should continue for a minimum of three consecutive working days. Within 20 working days of the completion of targeted monitoring, a report will be prepared for State and/or Commonwealth agencies confirming the cause of impact and any likely contributing factors or circumstances. The report will also detail the results of targeted monitoring and increased carcass inspections. Accounting for the outcomes of the targeted monitoring and report, as well as any other relevant recently available information (e.g. data from other wind farms, scientific literature), the risk assessment for the species will be updated. The updated risk assessment will re-assess the risk level for the species and determine whether the impact trigger has resulted in a significant impact to the species or is likely to result in a significant impact if repeated. If the risk assessment determines a significant impact has occurred or is likely to occur through repeated impact triggers, additional species-specific monitoring, mitigation and

Description	BBAMP Framework	BBAMP Content
		offsets will be required and will be determined by Ark Energy and the Project ecologist in consultation with State and/or Commonwealth agencies and other relevant parties.
Mitigation measures to minimise bird and bat risk	A key component of the BBAMP is the detailing of mitigation measures which will be proactively implemented and adapted to throughout the project lifecycle as required.	A range of mitigation measures are proposed to reduce risks to bird and bats resulting from the Project, including: • Proposed layout of WTGs to reduce barrier and avoidance impacts to resident and migratory birds and bats (see Section 6.15). • Minimise options for raptor perching and nesting on WTGs. • Minimisation of lighting on WTGs and other WF infrastructure through the use of red light rather than white light, synchronise flashing of aviation safety lights and where possible baffle lighting towards the ground. • Habitat clearing and retention measures including WTG micro-siting and development of best practice habitat removal through pre-clearing surveys and clearing supervision (see Table 10-3). • Low wind speed curtailment: WTG blade feathering to prevent blade rotation at wind speeds below the WTG rated cut-in speed; low wind speed curtailment at wind speeds <4.5 m/s. • Operational monitoring and impact TARP monitoring. • Additional conservation actions and offsets. • Feral animal control (particularly the removal of European Rabbits to lower raptor prey activity and Red Fox, which may scavenge and remove bird and bat carcasses from WTGs. • Carrion removal and stock control to reduce scavenger and raptor activity (e.g. Red Fox and Wedge-tailed Eagle).
Offsetting and additional conservation actions	Outline potential offsetting and conservation actions relevant to the project in the event of prescribed impact triggers being exceeded.	Whilst it is noted that no specific mechanism currently exists to facilitate offsets in response to the prescribed impacts of turbine strike on bird and bat species, Ark Energy is committed to engaging with State and Commonwealth agencies as to the requirement and appropriateness of offset options in the event of an impact trigger occurring and subsequent investigations indicating a significant impact has occurred or is likely to occur. The NSW Biodiversity Conservation Regulation 2017 provides provisions for non-credit offsets which may be appropriate, including funding of additional and appropriate conservation actions. A suitable additional conservation action could involve the GPS tagging and tracking of Large Bent-winged Bats from the species Wellington Caves roost site, located approximate 21 km

Description	BBAMP Framework	BBAMP Content
		west of the Project Site. A recent study successfully utilised GPS tagging to track the flight distances, heights and patterns of the closely related Southern Bent-winged Bat in southern Victoria and South Australia (Bush et al. 2025). A similarly designed capture-mark-re-capture study for Large Bent-winged Bat, utilising stationary receivers positioned at varying distances (e.g. 2 km, 10 km, 25 km) and landscape positions (e.g. valley and ridgetop) from the roost cave, including within the Project Site, would provide an increased understanding of the species flight behaviours and patterns in the context of wind farm development in the Central West Orana Renewable Energy Zone.
Operational risk assessment – bird and bat species	Provide an outline of the operational bird and bat risk assessment as detailed in Section 2.1 (bird risk assessment) and Section 4.1 (bat risk assessment), including the scope for review and revision during the operational phase of the project.	The bird and bat risk assessment will be reviewed and updated as required, subject to the results of the operational monitoring program, should monitoring results suggest that the likelihood and/or consequence of impacts require re-assessment. Both annual reporting and BBAMP review provides the scope for updating the operational bird and bat risk assessment. Updates to the risk assessment may require associated updates to monitoring methodologies and curtailment strategies and is to be implemented through the adaptive management framework of the BBAMP.
Operational risk assessment – turbine locations	Provide an outline of the operational WTG risk assessment as detailed in Section 5, including the scope for review and revision during the operational phase of the project.	The WTG risk assessment is able to be revised via the input of additional data recorded during the operational monitoring program. Both annual reporting and BBAMP review provides the scope for updating the operational WTG risk assessment. Updates to the risk assessment may require associated updates to monitoring methodologies and curtailment strategies and is to be implemented through the adaptive management framework of the BBAMP.
Annual reporting requirements	Annual reporting is required to document monitoring, mitigation and management measures undertaken throughout the year and to meet project approval conditions of consents.	Annual reporting should include the following components:

Description	BBAMP Framework	BBAMP Content
		• Annual strike reports for each turbine • Detected strike mortality data • Actual mortality estimates from statistical analysis • Offsetting outcomes from the previous reporting year • Details of all strike notifications completed to date • Methodology of mortality monitoring • Results of carcass persistence trials • Results of searcher efficiency • Whether any triggers were reached and action taken; and • Data or information to support changing turbine risk ratings. The Project recognises the importance of ongoing collection and provision of data, and assessment and adaptive management at a regional (and wider) scale and so commits to making data and reports available to contribute to increased understanding of bird and bat risk from wind energy projects.
BBAMP review	Annual reporting also provides an opportunity for documenting suggested updates to the Project BBAMP and recommending specific adaptive management measures informed by the results of operational monitoring.	The BBAMP should be reviewed on an annual basis in line with the project approval conditions consent and should consider: • Ongoing process improvement and incorporation of new technology • An analysis of flight paths, at height data and relevant habitat information, in the context of collisions to date, with bird and bat risk assessment updated as required • Individual turbine risk • Revision of the operational monitoring program • Adjustments to impact thresholds and adaptive management strategies, including curtailment strategies • Unforeseen limitations and issues encountered during operations; and • Matters requested by State and Commonwealth agencies.

8 Assessment of Impacts

8.1 Direct impacts

The construction and operational phases of the Project have the potential to impact biodiversity values through clearing of native vegetation and threatened species habitat that cannot be avoided.

The direct impacts of the development on:

- native vegetation and threatened ecological communities are outlined in Table 8-1
- threatened species and threatened species habitat is outlined in Table 8-2
- prescribed biodiversity impacts are outlined in Section 5 and Section 6.

Direct impacts have been calculated on the current Development Footprint being impacted however, it is likely that upon final design impacts will be less than are shown in Table 8-1. Areas of impact to non-native vegetation have not been included in the tables below.

Table 8-1: Direct impacts to native vegetation

Vegetation Zone	PCT Name	Condition Class	TEC Association	Impact Area (ha)
SWS Bioregion				
1	76- Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	DNG	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes	0.77
2	84 – River Oak – Rough barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Good		1.21
3	84 – River Oak – Rough barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	DNG		1.9
4	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	3.57
5	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	23.79
6	272 – White box – black cypress pine – red gum +/- Mugga Ironbark shrubby woodland in the hills of the NSW central western slopes	Good		173.19

Vegetation Zone	PCT Name	Condition Class	TEC Association	Impact Area (ha)
7	272 – White box – black cypress pine – red gum +/- Mugga Ironbark shrubby woodland in the hills of the NSW central western slopes	DNG		64.92
8	274 – White Box -Rough barked apple alluvial woodland of the NSW central western slopes including in the Mudgee region	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.07
9	277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	1.92
10	277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	13.25
11	281 – Rough Barked Apple – red gum – yellow box woodland on alluvial clay to loam soils on the valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	4.24
12	331 – Red Stringybark woodland on hillslopes northern NSW South Western Slopes Bioregion	DNG		0.48
13	331 – Red Stringybark woodland on hillslopes northern NSW South Western Slopes Bioregion	Good		1.07
14	461 – Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion	DNG		0.57
15	76- Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Good	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes	0.06
16	281 – Rough Barked Apple – red gum – yellow box woodland on alluvial clay to loam soils on the valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.34
17	274 – White Box -Rough barked apple alluvial woodland of the NSW central western slopes including in the Mudgee region	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.83
Total SWS Bioregion				**292.18 ha**

Vegetation Zone	PCT Name	Condition Class	TEC Association	Impact Area (ha)
SEH Bioregion				
1	84 – River Oak – Rough barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Good		0.32
2	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	5.09
3	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Low	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	19.26
4	270 – White Box Tumbledown Red Gum – Long-leaved Box shrub/grass woodland on fine grained sediments of the upper Macquarie River	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.15
5	272 – White box – black cypress pine – red gum +/- Mugga Ironbark shrubby woodland in the hills of the NSW central western slopes	Good		56.62
6	272 – White box – black cypress pine – red gum +/- Mugga Ironbark shrubby woodland in the hills of the NSW central western slopes	DNG		41.39
7	277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	1.26
8	287 – Long-leaved Box – Red Box – Red stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	DNG		102.07
9	287 – Long-leaved Box – Red Box – Red stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	Good		111.55
10	331 – Red Stringybark woodland on hillslopes northern NSW South Western Slopes Bioregion	Good		37.21
11	331 – Red Stringybark woodland on hillslopes northern NSW South Western Slopes Bioregion	DNG		14.12
12	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and	0.74

Vegetation Zone	PCT Name	Condition Class	TEC Association	Impact Area (ha)
			Derived Native Grassland	
Total SEH Bioregion				389.78
TOTAL				**681.96 ha**

Table 8-2: Direct impacts on threatened species and threatened species habitat

Scientific Name	Common Name	BC Act listing	EPBC Act listing	Loss of area (ha)	Biodiversity Risk weighting
SWS Bioregion					
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V	51.4	2
Cercartetus nanus	Eastern Pygmy Possum	V	NL	50.03	2
Diuris tricolor	Pine Donkey Orchid	V	NL	0.50	2
Keyacris scurra	Key's Matchstick Grasshopper	E	E	5.67	2
Ninox connivens	Barking Owl	V	NL	45.22	2
Ninox strenua	Powerful Owl	V	NL	1.58	2
Petaurus norfolcensis	Squirrel Glider	V	NL	45.22	2
Phascogale tapoatafa	Brush-tailed Phascogale	V	NL	80.76	2
Phascolarctos cinereus	Koala	E	E	255.8	2
Prasophyllum petilum	Tarengo Leek Orchid	E	E	8.08	2
Swainsona recta	Small Purple-pea	E	E	15.58	2
Swainsona sericea	Silky Swainson-pea	V	NL	19.14	2
Tylophora linearis		V	NL	0.57	1.5
Tyto novaehollandiae	Masked Owl	V	NL	45.22	2
SEH Bioregion					
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V	13.42	2
Burhinus grallarius	Bush Stone-curlew	E	NL	18.78	2
Cercartetus nanus	Eastern Pygmy Possum	V	NL	8	2
Grevillea divaricata		E	NL	5.54	3
Keyacris scurra	Key's Matchstick Grasshopper	E	E	5.83	2
Ninox connivens	Barking Owl	V	NL	8.92	2
Ninox strenua	Powerful Owl	V	NL	1.6	2
Persoonia marginata	Clandulla Geebung	V	V	47.51	2
Petaurus norfolcensis	Squirrel Glider	V	NL	8.92	2
Phascogale tapoatafa	Brush-tailed Phascogale	V	NL	7.32	2
Phascolarctos cinereus	Koala	E	E	389.79	2

Scientific Name	Common Name	BC Act listing	EPBC Act listing	Loss of area (ha)	Biodiversity Risk weighting
Swainsona recta	Small Purple-pea	E	E	26.5	2
Swainsona sericea	Silky Swainson-pea	E	E	77.69	2
Tyto novaehollandiae	Masked Owl	V	NL	8.92	2

8.2 Change in vegetation integrity

The change in vegetation integrity as a result of the proposed development is outlined in Table 8-3. For the purpose of this BDAR, it is assumed that there will be total removal /modification of all vegetation zones within the Development Footprint resulting in future scores of zero.

Table 8-3: Change in vegetation integrity

Veg Zone	PCT ID	Condition	Area (ha)	Composition Condition Score	Structure Condition Score	Function Condition Score	Current vegetation integrity score	Change in VI Score
SEH Bioregion								
1	84	Good	0.32	86.8	63.1	63.7	70.4	-70.4
2	266	DNG	5.09	70.8	70.2	28.4	52	-52
3	266	Low	19.26	40.4	75.9	5.5	25.6	-25.6
4	270	Good	0.15	69.5	33.3	99.6	61.3	-61.3
5	272	Good	56.62	98.3	68.5	98.1	87.1	-87.1
6	272	DNG	41.39	76.6	42.2	37.2	49.4	-49.4
7	277	DNG	1.26	76.5	81.1	35	60.1	-60.1
8	287	DNG	102.07	56.4	30	6.1	21.8	-21.8
9	287	Good	111.55	76.4	25.4	96.3	57.2	-57.2
10	331	Good	37.21	69.6	34.9	84.5	59	-59
11	331	DNG	14.12	50.9	29.7	13.7	27.5	-27.5
12	266	Good	0.74	100	100	100	100	-100
SWS Bioregion								
1	76	DNG	0.77	72	45.9	65	59.9	-59.9
2	84	Good	1.21	77.8	45	68	62	-62
3	84	DNG	1.9	33.2	39.2	25.2	32	-32
4	266	Good	3.57	85	60.4	17.6	44.8	-44.8
5	266	DNG	23.79	77	65.6	7.3	33.3	-33.3
6	272	Good	173.19	99.9	98.9	86.4	94.8	-94.8
7	272	DNG	64.92	79	64.5	28.1	52.3	-52.3
8	274	Good	0.07	91.9	17.6	83.5	51.3	-51.3
9	277	Good	1.92	93.5	93.1	86.7	91.1	-91.1

Veg Zone	PCT ID	Condition	Area (ha)	Composition Condition Score	Structure Condition Score	Function Condition Score	Current vegetation integrity score	Change in VI Score
10	277	DNG	13.25	81.6	75.3	25.8	54.1	-54.1
11	281	DNG	4.24	79.2	77.4	24	52.8	-52.8
12	331	DNG	0.48	51.2	17	30.1	29.7	-29.7
13	331	Good	1.07	83.7	55.2	45.7	59.6	-59.6
14	461	DNG	0.5	100	100	100	100	-100
15	76	Good	0.06	84.4	49.1	15.2	39.8	-39.8
16	281	Good	0.34	100	100	100	100	-100
17	274	DNG	0.83	69.2	65.5	35	54.1	-54.1

8.3 Loss of hollow bearing trees

There are numerous HBTs within the Development Corridor (Figure 8-1). Over 1,500 trees were assessed and recorded. Nearly 50% of these trees were greater than benchmark DBH (>50cm) with 209 HBTs exceeding >80cm DBH. Research has shown that DBH which is an index of age (Lindenmayer et al 1991), is also a strong predictor of occupancy by vertebrate fauna (Smith and Lindenmayer 1988).

Whilst many of the hollows recorded were small (1,361 trees with hollows <10cm), there were 90 trees that contained hollows greater than 20cm. Of these, 56 were deemed to be suitable for forest owls (hollows more than 4 m above the ground) and a further 48 HBTs were deemed suitable for Glossy Black Cockatoos (hollows >15cm diameter, located 8m above the ground on stems at 45 -180 degree angle). No forest owls or Glossy Black Cockatoos were recorded breeding within the Development Corridor.

This diversity of hollow size and location provide shelter for a variety of birds, mammals and reptiles, many of which are threatened. Any decrease in the availability and diversity of tree hollows can lead to a significant loss of species diversity and abundance. The NSW Scientific Committee determined that the loss of HBTs is a key threatening process.

The majority of the WTGs have been located along cleared ridges. A few WTG locations (i.e. WTG 41, WTG 5 WTG 11, and WTG 13) have more than 7 HBT's within the 50 m buffer zone. Mitigation measures may include:

- Maintaining flexibility in orientating the hardstand and alignment of access tracks
- Avoiding impacts to HBTs where possible – marking trees that can be retained
- Retaining trunks and stems with hollows to be installed on other trees within the Project Site
- Installing nest boxes or chainsaw-carved cavities to supplement hollows within the Project Site.

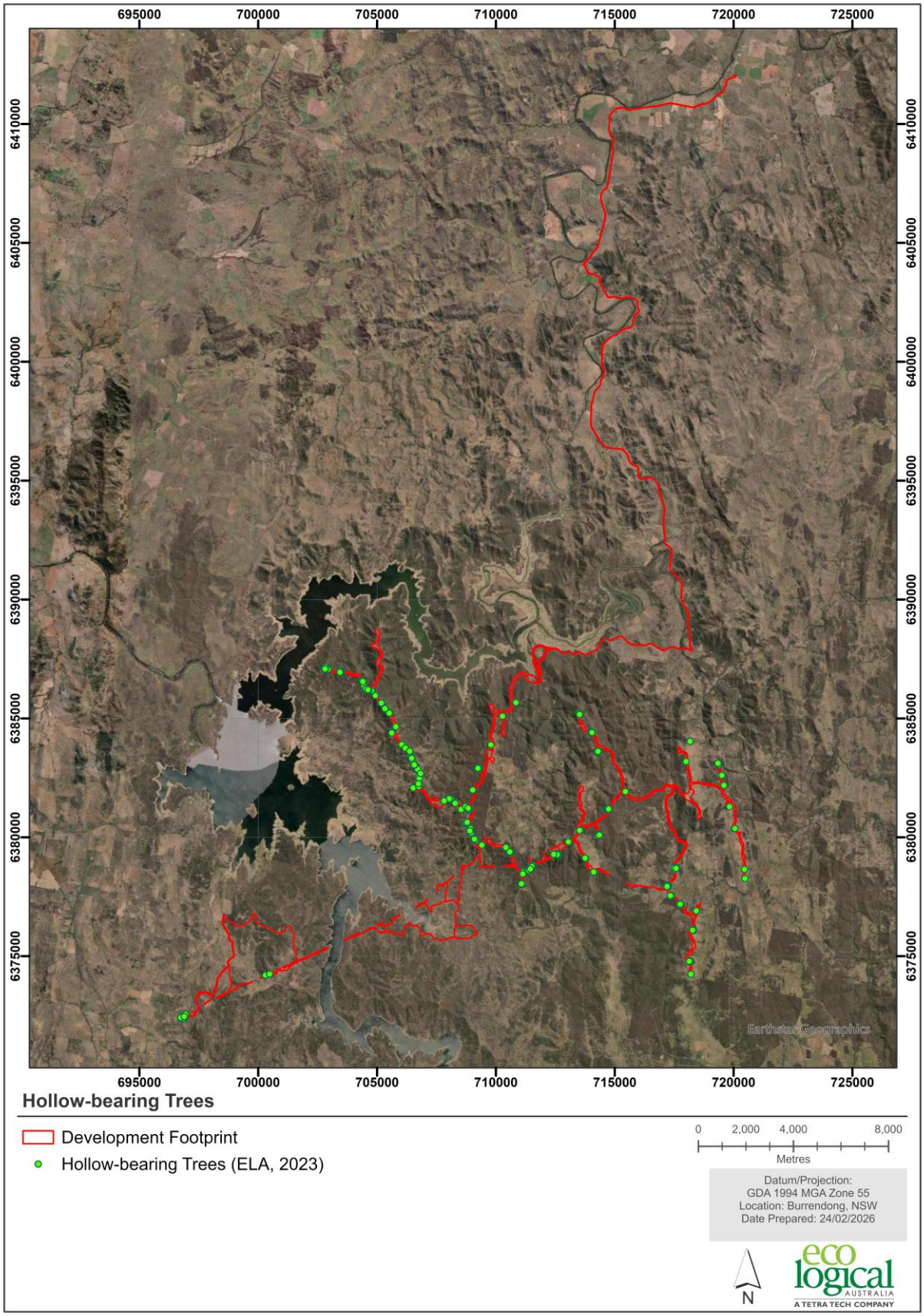


Figure 8-1: HBTs within the Development Footprint and within 50m of WTG location

8.4 Indirect impacts

Indirect impacts of the Project include soil and water contamination, creation of barriers to fauna movement, and generation of excessive dust, light and noise. The indirect impacts of the Project are outlined in Table 8-4.

Table 8-4: Indirect impacts

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
sedimentation and contaminated and/or nutrient rich run-off	Construction	Runoff during construction works	10 m from Project Site boundary	During heavy rainfall or storm events	During rainfall events	Short-term impacts
noise, dust or light spill	Construction	Noise and dust created from machinery (no night works proposed therefore no light spill)	Noise and dust likely to carry further than 10 m from Development boundary	Daily, during construction works Nightly during operation of development	Sporadic throughout construction period	Short-term impacts
inadvertent impacts on adjacent habitat or vegetation	Construction	Damage to native vegetation with machinery (demarcation no-go zones)	Development boundary	Potential at any time.	Potential at any point during construction	Potential at any point during construction
transport of weeds and pathogens from the site to adjacent vegetation	Construction / operation	Spread of weed seed or pathogens	Potential for spread into adjacent habitat	Daily, during construction works	Sporadic throughout construction period	Short-term impacts
vehicle strike	Construction / operation	Increased traffic movements have potential to increase impacts to fauna species	Adjoining roads.	Potential at any time.	Potential at any point during construction and operation of the development	Potential at any point during construction and operation of the development
trampling of threatened flora species	Construction / operation	Increased traffic movements have potential to increase impacts to fauna species	Adjoining roads.	Potential at any time.	Potential at any point during construction and operation of the development	Potential at any point during construction and operation of the development
rubbish dumping	Construction / operation	Illegal dumping by construction crews.	Potential for rubbish to spread via wind into	Potential to occur at any time throughout construction	During working hours for construction	During working hours for construction

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
			adjacent vegetation	or operational phases	Potential at any point during operation of the development	Potential at any point during operation of the development
increase in predatory species populations	Construction / operation	Potential for an increase in predatory species in the locality through disturbance to vegetation.	Throughout adjacent vegetation	Likely to occur gradually after disturbance to habitat and vegetation takes place	For a period after clearing works take place	At any point once clearing and disturbance to habitat take place
increase in pest animal populations	Construction / operation	Potential for an increase in pest animal populations in the locality through disturbance to vegetation.	Throughout adjacent vegetation	Likely to occur gradually after disturbance to habitat and vegetation takes place	For a period after clearing works take place	At any point once clearing and disturbance to habitat take place
increased risk of fire	Construction / operation	Potential for fire to spark during construction works especially any electrical or machinery works.	Throughout adjacent vegetation	Potential to occur at any time throughout construction or operational phases	During working hours for construction Potential at any point during operation of the development	During working hours for construction Potential at any point during operation of the development

8.5 Avoid and minimise prescribed impacts

Section 5 and Section 6 have described in detail prescribed impacts associated with Wind Farm Developments.

8.5.1 Karst, caves, crevices, cliffs, rocks, and other geological features of significance

There are no karst, caves, cliffs, rocks, or other geological features of significance within the Development Corridor, nor within 2 km of the Development Corridor, however, there is potential for these features to be within the broader Project Site (29,000 ha). Small boulders and rocky slopes were identified using binoculars across the landscape but these were not within 2 km of the Development Corridor. Nevertheless, these areas could potentially be used as diurnal roosting sites. These areas are not within the Development Corridor and will not be impacted.

There are areas of surface rocks that could provide habitat for threatened reptiles such as Pink-tailed Legless Lizard. Targeted surveys were not undertaken for this species and an expert report was sought to determine habitat suitability. Based on this assessment credits have been calculated for this species

relating to direct impacts within the Development Footprint. There are numerous surface rocks within the broader Project Site and no rocks outside the Development Corridor will be disturbed.

8.5.2 Human-made structures and non-native vegetation

There are no human-made structures such as culverts, abandoned buildings and non-native vegetation that provide habitat for threatened species within the Development Corridor. No impacts are likely to occur.

8.5.3 Habitat connectivity

Major habitat features within the Project Site include:

- Woodland and steep upper slope vegetation
- Box Gum Woodland and derived native grassland found on the alluvial plains.

The vegetation within the Development Corridor is a mix of woodland and previously cleared agricultural land where treed areas are connected to other woodland patches. Most of the woodland areas have access roads or tracks throughout but these areas will need to be widened to facilitate movement of oversize vehicles. Upgrade of these roads will not affect connectivity.

Box Gum Woodlands are highly fragmented throughout the Project Site due to historical land use, clearing and current agricultural practices with only small clumps and isolated paddock trees remaining. The loss of paddock trees and smaller patches within the Project Site would result in a minor loss of connectivity for more transient species, however the lack of complex vegetative structure would be unlikely to impact threatened species. Paddock trees that contain hollows are key breeding habitat opportunities for threatened birds, including Gang-gang Cockatoo, Glossy Black Cockatoos Barking Owl, Powerful Owl, Masked Owl, and for threatened arboreal mammals such as squirrel glider. None of these species were observed within the Development Corridor and it is therefore unlikely that habitat connectivity will be impacted by the proposed wind farm development.

DNG that are considered low value (i.e. 266_Low) and cleared areas (roads, tracks and dams) cover 47% of the of the Development Footprint (342 ha). These areas have been subjected to intensive farming disturbances such as regular grazing by sheep, and cattle. Feral goats and pigs are also commonly observed throughout the Project Site. Whilst the ground cover contains native grasses and herbs there is also substantial covers of exotic flora in many areas. As such the removal of native groundcover in the context of impacting upon large quantities of DNG is considered negligible.

The Project Site contains several 1st, 2nd, 3rd and 4th order streams and up to 7th order with riparian vegetation in various states of condition. These areas could provide corridors and habitat connectivity to facilitate the movement of threatened species such as koalas particularly along the Macquarie River, Oakey Creek and the Cudgegong River. However, the removal of a small number of trees within these riparian zones are unlikely to impact upon connectivity.

8.5.4 Water bodies, water quality and hydrological processes

There are a number of drainage lines, ephemeral creeks and rivers that run through the Project Site. Burrendong Dam was built across the Macquarie River upstream of Wellington in 1950 to create Lake Burrendong which fills by flows from the Macquarie and Cudgegong Rivers as well as Meroo Creek.

At the time of inspection in July 2020 through to October 2024 many of the creeks and smaller tributaries were often dry and only after rain did water flow through the streams located within the Project Site. The Development Corridor crosses a number of ephemeral drainage lines, and creeks. Given the degraded nature of the crossings the designated 40 m buffer zone on either side of the centreline of these creeks and the implementation of erosion and sediment controls it is unlikely that hydrological process and water quality will be impacted.

The soils within the Project Site consist of a mix of deep alluvial loams and shallow sandy loams that are often stony. The productive soils have been extensively cleared of native vegetation and any potential impacts to water bodies are likely to occur during the construction of new roads or during road widening and realignment over streams and creeks. Erosion and sediment controls will be installed and maintained to minimise the velocity of surface water and prevent erosion to the surrounding landscape.

8.5.5 Wind farm developments

A detailed assessment of the prescribed impacts from wind farm developments is provided in Section 6 and is summarised in Table 8-5 below, as per the requirements of Section 8.3.5 of the BAM (DPIE 2020). Measures to avoid, minimise, mitigate and offset impacts form the proposed development will be detailed in the Project BBAMP (see Section 7.2), to be prepared in accordance with best practice guidelines in consultation with State and/or Commonwealth agencies.

Table 8-5: Wind farm developments – summary of prescribed impact assessment

Prescribed impact consideration	Assessment of Impacts - Justification
Predict the impact on species living in, or likely to fly over, the proposed Development Footprint, including bat or bird strike and barotrauma	A program of BUS and BAS has been undertaken within the Project Site and surrounds (including the proposed development footprint), with the survey methodology provided in Section 4.5 and results provided in Section 6.4 and Section 6.5. Baseline bird and bat risk assessment, inclusive of collision risk assessment, has been undertaken to predict impacts on bird and bat species and are detailed in Section 6.1 and Section 6.5. The risk of impacts to a total of 30 bird and 19 bat species has been assessed. A total of six bird and seven bat species have been predicted to be at moderate risk of impact and one bird and one bat species has been predicted to be at high risk of impact.
Predict the rate and timing of impact per turbine per year for species likely to be affected	The rate and timing of collisions with turbines has been modelled for moderate (excluding Little Eagle due to absence of flights within RSA) and high-risk bird species within a project-specific CRM, the methodology of which is detailed in Section 6.2 and results are provided in Section 6.4. The timing of impact is accounted for in the CRM given that the number of flights at risk is calculated seasonally, which translates into a seasonal collision risk. Modelled collision estimates at 90% and 95% avoidance rates were generally low, ranged from 0.04 to 0.02 for Peregrine Falcon, to 12.4 to 6.2 for Wedge-tailed Eagle (Table 6-8). As individual bat flights are not able to be quantified, CRM is not possible for this species group, however, a qualitative collision risk assessment has been completed and is detailed in

Prescribed impact consideration	Assessment of Impacts - Justification
	Section 6.5. White-striped Freetail Bat has been assessed as the most at risk bat species for the Project given its recording at heights (50 m and 100 m) near to and within the lower turbine Rotor Swept Area (RSA; 65-250 m) and its known susceptibility to turbine strike (Section 6.6.1). A WTG risk assessment has also been completed, which assesses relative risk of each of the 70 individual WTGs. The WTG risk assessment is detailed in Section 6.7. Five WTGs have been assessed as low risk, 45 WTGs as moderate risk and 20 WTGs as high risk.
Predict the consequences of impacts for the persistence of populations	The consequence of predicted impacts has been assessed for all relevant bird and bat species within the bird and bat risk assessments provided in Section 6.1 and Section 6.5. Population information for all moderate and high-risk bird and bat species is provided in the risk assessments, including the number of records of the species local population recorded in the Project Site and total population estimates (where available). The quantity of known mortalities of species from operational Wind Farms in Australia is also presented in the bird and bat risk assessments (see Table 6-5 and Table 4-1). Overall, the predicted consequence of impacts to bird and bat population viability is considered negligible to low, however, given the potential for impacts to local and regional populations of moderate and high-risk species, a range of mitigation measures and a robust monitoring program is proposed to be implemented through the Project BBAMP.
Predict the cumulative impacts of the proposed development alongside existing wind farms, on species mortality, movement patterns and use of adjacent habitat	Potential cumulative impacts to at risk bird and bat species are described in the bird (Section 6.2) and bat (Section 6.6) risk assessments and in the review of operational and approved wind farms in the region (Section 6.15). Section 8.5.9 also assesses potential cumulative impacts from the proposed development. The Project is not co-located with any other existing wind farms locally, with the nearest existing wind farm, Bodangora Wind Farm, located approximately 24 km northwest of the Project and the nearest approved wind farm is Uungula, located 12 km northwest. Eight operational or approved wind farms occur within the Central West Orana Renewable Energy Zone and adjacent IBRA subregions (within 200 km). Turbine collision predicted for the project has the potential to contribute to cumulative impacts at a regional scale, with the Project committed to the implementation of a robust monitoring program and adaptive management through the Project BBAMP (see Section 7.2), to contribute relevant data and increase understanding of cumulative impacts at a regional scale.
Predict the likelihood and nature of impacts on aerial species living in, or likely to fly over, the proposed Development Footprint, including barriers to migratory pathways, and breeding, feeding and resting resources	The likelihood of impact is assessed as a key component of the baseline bird and bat risk assessments (see Table 6-2) and the impacts have been assessed for species assessed as being

Prescribed impact consideration	Assessment of Impacts - Justification
	'Potential', 'Likely' or 'Almost certainly' at risk of impact (Table 6-5 and Table 6-10). A project-specific flight barrier impact assessment has been completed and is detailed in Section 6. Due to the predominant low flight height (20 m and below) and behaviour (flying below or just above the canopy) of recorded bird and bat flights, combined with the WTG design (RSA of 65-250 m) and layout (mean distance between WTGs >500 m), the impacts to aerial species has been assessed as low. The WTG layout does not intersect the major regional river valleys which likely form and contain the main movement, breeding, foraging and resting pathways for locally dispersive and wide-ranging (e.g. migratory) bird and bat species.
Predict the impact of avoidance behaviour for migratory species relative to migration distances, and the availability of suitable habitat for breeding, feeding and resting over the migration route	A project-specific avoidance impact assessment has been completed and is detailed in Section 6.14. Given the typical low flight height and behaviour of most of the bird and bat movements recoded from the Project Site, combined with the WTG design and layout, negligible avoidance impacts are expected. The Project Site does not contain and is not located adjacent to any specialist bird and bat breeding, feeding, or resting areas, including maternity roosts for cave-dwelling microbat species or mapped important habitat areas for migratory shorebirds or the migratory Swift Parrot (NSW DCCEEW 2025). Avoidance impacts to the one listed migratory species recorded within the Project Site, White-throated Needletail, are likely to be negligible. Given the species wide-range and high mobility, it has the capacity to demonstrate both meso- and macro-avoidance (see Smales 2023) and fly both around (Figure 6-5) and through (Figure 6-6) the WTG layout where required.
Justify predictions with reference to data, collision risk modelling (if available), relevant literature or other published sources including any publications by the Department	A project-specific CRM has been completed for bird species (Section 6.2) and a qualitative risk assessment completed for bat species (Section 6.5) informed by baseline data, relevant literature (see Section 13) and mortality data from operation wind farms, including the two proximally located wind farms to the Project Site (Bodangora Wind Farm – 24 km northwest, and Crudine Ridge Wind Farm – 37 km southeast).
Map the disturbance zone around wind turbines, and the significant landscape and habitat features within that zone, for species likely to be affected, e.g. hollow bearing trees and important habitat for migratory species.	The disturbance zone of WTGs is a key component of the CRM completed for moderate and high-risk bird species (Section 6.2). Disturbance zones around wind turbines have been incorporated into the development footprint which allows for an area of additional impact (50 m) around each turbine. No hollow-bearing trees or other significant bird and bat habitat features outside of this zone are to be impacted. The development footprint does not contain and is not located adjacent to any specialist bird and bat breeding, feeding, or resting areas, including maternity roosts for cave-dwelling microbat species (see Figure 6-7) or mapped important habitat areas for migratory shorebirds or the migratory Swift Parrot (NSW DCCEEW 2025).

8.5.6 Transmission Lines

The installation of Transmission Lines and electrical infrastructure are known to be a risk to birds, particularly large bodied species such as raptors. Most above ground powerlines present potentially fatal risks for birds through risk of collision with overhead wires and the risk of electrocution. Electrocution of a bird occurs when it bridges the gap between the two energised components or an energised and an earthed component of the pole structure. The result is a short circuit with electrical current flowing through the bird's body. Whilst data is limited, research has tended to focus on migratory flocks particularly across the African-Eurasian Flyways (Prinsen *et al* 2012).

Surveys have been undertaken across the Project Site focusing on raptors and their flight paths. The following species are at a potential risk of collision and electrocution based on their size morphology and behaviour:

- White-bellied Sea Eagle
- Little Eagle
- Wedge-tailed Eagle
- Whistling Kite
- Grey-headed Flying-fox
- Threatened Forest Owls (assumed present).

To reduce the risk of electrocution, the options of mitigation strategies are limited. Industry recognised methods are proposed. The use of bird-friendly power line designs by deterring perching and nesting, using insulated components, and providing sufficient separation between conductors to accommodate for the size of the largest raptor being the Wedge Tailed eagle will be integrated into the design of the powerline.

To reduce the risk of collision, installing line markers and using bird and bat divertors will make the wires more visible. Divertors that contain reflective markers or those that emit ultraviolet light would increase visibility in low light conditions.

8.5.7 Vehicle strikes

An increase in vehicle traffic during construction and required maintenance may slightly increase the risk of vehicle strike on threatened species occurring within or near the Project Site. Mitigation measures will be implemented to enforce a site speed limit. With the recommended mitigation measures it is unlikely that vehicles will have a substantial impact on any species.

8.5.8 Summary of measures to avoid and minimise impacts

In addition to the curtailment strategies identified in Section 7.2, the following measures will be implemented to avoid and minimise impacts:

- Retain woodland vegetation as far as practicable by micro-siting WTG to avoid the removal of trees
- Avoid the removal of hollow bearing trees where possible
- Only clearing around power poles during the construction of the transmission line and where possible use of existing tracks to access poles
- Spanning the powerline wires well above canopy to avoid clearing of an easement
- Use bird friendly powerline designs to reduce electrocution

- Install bird divertors of wires to improve visibility to reduce the risk of collision
- Develop and implement a Biodiversity Management Plan (BMP) to address management of weeds, habitat corridors, riparian areas and water quality
- Develop and implement a BBAMP to identify triggers and actions to reduce the risk of blade strike and barotrauma.

Measures proposed to mitigate and manage impacts at the Project Site before, during and after construction are outlined in Table 8-6.

8.5.9 Cumulative Impacts

The Central West – Orana Renewable Energy Zone (CWO-REZ) spans approximately 20,000 km², centred around Dubbo and Dunedoo, and serves as a hub for renewable energy generation, storage, and transmission. This designation has driven numerous renewable energy projects, including recent approvals for the Spicers Creek and Liverpool Ranges Modification and the Birriwa Solar Farm (see Figure 8-2). The cumulative effects of multiple developments in the REZ pose significant risks to ecosystems and biodiversity, extending beyond the immediate footprint of individual projects. Within 100 km of the Project, eight wind farm projects, either approved, under construction, or under assessment, could introduce up to 626 wind turbines into the landscape.

The Phoenix Pumped Hydro project, in the planning phase, is adjacent to Burrendong Dam and the Project's southern transmission line. This development may attract additional bird populations, including waterbird flocks and White-bellied Sea Eagles, necessitating further mitigation measures. Cumulative impacts associated with multiple projects include:

- Direct mortality to birds and bats as there is a greater risk of collision as more wind farms are built in areas used by as fly ways especially for species that are long-lived or have low reproductive rates. Increase WTG numbers raise the risk of collisions. This is particularly true for Wedge-tailed Eagles and White-striped Freetail Bats who are over-represented in mortalities at windfarms across the region
- Loss of critical habitat such as nesting, roosting or foraging areas, and the disruption of wildlife corridors reducing species ability to move across the landscape
- Increased edge effects from roads, transmission lines and WTGs which can degrade adjacent habitat
- Noise, vibration, shading, increased human presence and the visual presence of WTGs can displace sensitive species, particularly raptors
- Overlapping disturbance zones from multiple projects can create a landscape of exclusion for certain species and creating barriers to movement.

Addressing biodiversity impacts in the CWO-REZ requires a regional coordinated approach to planning and management. This approach must avoid an overabundance of renewable projects in sensitive areas to minimize cumulative impacts on biodiversity. Such strategies can include:

- a coordinated approach of pooling resources from multiple projects to achieve meaningful biodiversity gains such as enhancing habitat connectivity and restoration of degraded ecosystems
- working in collaboration with researchers to provide information on species ecology, movement and impacts by WTGs and ensuring that this information is shared across projects.

This approach safeguards biodiversity while supporting the region's renewable energy goals.

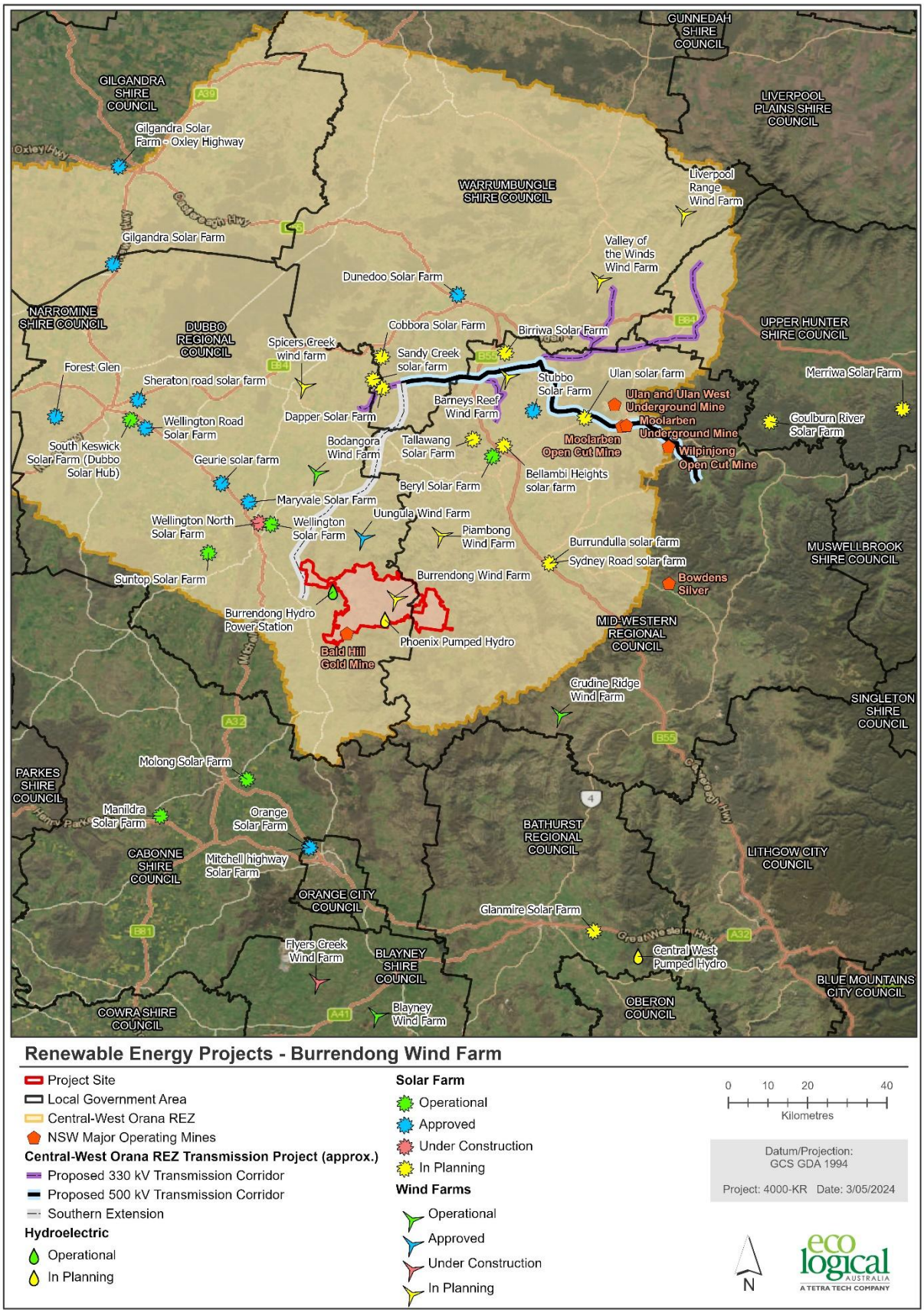


Figure 8-2: Renewable Energy Projects within the CWO-REZ

Table 8-6: Measures proposed to mitigate and manage impacts

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Timing works to avoid critical life cycle events such as breeding or nursing	Moderate	Minor	Develop BMP to outline actions. Active breeding or nesting identified during pre-clearance surveys will be avoided in August, September and October which is the breeding/nesting period for most fauna species.	Impacts to fauna during nesting/nursing avoided	Construction	Site manager
Instigating clearing protocols including pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecological or licensed wildlife handler during clearing events	Major	Minor	Pre-clearance surveys will be undertaken prior to tree clearing. A qualified ecologist/licenced wildlife handler will supervise tree removal in accordance with best practise methods.	Any fauna utilising habitat within the Project Site will be identified and managed to ensure clearing works minimise the likelihood of injuring resident fauna	Prior to construction	Site ecologist
Clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance; for example, removal of native vegetation by chain-saw, rather than heavy machinery, is preferable in situations where partial clearing is proposed	Moderate	Minor	Clearing protocols will be developed that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance (e.g. removal of native vegetation by chainsaw instead of heavy machinery where only partial clearing is proposed). Fencing (or other barriers as required) and signage will be placed around those areas of vegetation to be maintained to prevent any accidental construction damage and provide a permanent barrier between the development footprint and retained areas. The type of fencing during construction may be of a temporary nature and scale that is robust enough to withstand damage during this stage of work. Use of appropriate machinery for vegetation removal adjacent to retained areas.	Vegetation to be retained outside of the Project Site boundary will not be disturbed	Construction	Site manager

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment	Minor	Negligible	Appropriate controls will be implemented to manage exposed soil surfaces and stockpiles to prevent sediment discharge into waterways. All works within proximity to the drainage lines will have adequate sediment and erosion controls (e.g. sediment barriers, sedimentation ponds). Revegetation will also commence as soon as is practicable to minimise risks of erosion. Suitable species will be used as ground cover species in any revegetation areas.	Erosion and sedimentation will be controlled	Construction and decommissioning	Site manager
Noise barriers or daily/seasonal timing of construction and operational activities to reduce impacts of noise	Minor	Negligible	Construction works will only be undertaken during daylight hours.	Noise impacts associated with the development will be managed	Construction / operation /decommissioning	Site manager
Light shields or daily/seasonal timing of construction and operational activities to reduce impacts of light spill	Minor	Negligible	Construction works will only be undertaken during daylight hours and night lights will not be used. Lights associated with operation will be directional to avoid unnecessarily shining light into adjacent retained vegetation where possible.	Light impacts of construction will be avoided as all works will occur during daylight hours. Light spill into adjacent vegetation is reduced	Construction / operation /decommissioning	Site manager
Adaptive dust monitoring programs to control air quality	Minor	Negligible	Dust suppression measures will be implemented to limit dust on site. Revegetation will also be commenced as soon as practicable to minimise areas likely to create dust. Suitable species will be used as ground cover species in any revegetation areas.	Mitigate dust created during construction activities	Construction and decommissioning	Site manager
Temporary fencing to protect significant environmental features such as riparian zones	Moderate	Minor	All waterway crossings will be designed in accordance with *Policy and Guidelines for Fish Friendly Waterway Crossing* (DPI, n.d.) where appropriate.	Crossing constructed with negligible impacts to aquatic habitats	Detailed design	Site manager

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas	Minor	Negligible	All machinery will be cleaned prior to entering and exiting the Project Site to minimise the transport of weeds to vegetated areas to be retained. Weeds that are present within the Project Site that are listed under the *NSW Biosecurity Act 2015* will be managed.	Weed impacts managed	Construction	Site manager
Staff training and site briefing to communicate environmental features to be protected and measures to be implemented	Minor	Negligible	All personnel working on the project will undertake an environmental induction as part of their site familiarisation. This will include: • site environmental procedures (vegetation management, sediment and erosion control, exclusion fencing and noxious weeds) • what to do in case of environmental emergency (e.g. chemical spills, fire, injured fauna) key contacts in the case of an environmental emergency.	Staff trained and aware of environmental issues and responsibilities on site	Construction	Site manager
Development control measures to regulate activity in vegetation and habitat adjacent to residential development including controls on pet ownership, rubbish disposal, wood collection, fire management and disturbance to nests and other niche habitats	Minor	Negligible	A strategy will be developed and implemented to protect vegetation and habitat adjacent to the project. This will outline the following: • rubbish disposal guidance • prohibition of wood collection • prohibition of lighting of fires • no-go-zones for native vegetation outside the Development Footprint speed limits on the surrounding road network	Adjacent habitat protected	Construction	Site manager

9 Serious and Irreversible Impacts

The concept of SAII is a central component of the NSW BOS. It is fundamentally about protecting threatened species and threatened ecological communities that are most at risk of extinction from potential development impacts or activities. Clause 6.7 (2) of the Biodiversity Conservation Regulation 2017 (BC Reg) provides:

"*An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct…*"

The Guidance to assist a decision-maker to determine a serious and irreversible impact (DPIE, 2019) is provided to ensure assessments of SAII are consistent across NSW.

Four principles are set out in clause 6.7 of the BC Reg:

1 The impact will cause a further decline of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline.
2 The impact will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size.
3 The impact is made on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution.
4 The impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.

Candidate SAII entities with regards to the Project are:

- White Box- Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box Gum Woodland)
- *Grevillea divaricata*
- Large-eared Pied Bat
- Large Bent-winged Bat
- Eastern Cave Bat.

Section 9.1.1 of the BAM requires additional impact assessment for entities at risk of SAII.

9.1 Box Gum Woodland

Box Gum Woodland is considered an SAII entity. An assessment of Box Gum Woodland against the assessment criteria is provided in Table 9-1 and Table 9-2 below. Evaluations are presented in Table 9-3.

Table 9-1: SAII Summary

Species / Community	Principle	Direct impact individuals / area (ha)	Threshold
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland	Principle 1 and 2	There is 74.51 ha of this TEC within the Development Footprint.	No listed threshold
PCT 266 – 52.45 ha		Windfarm = 28.53 ha	

Species / Community	Principle	Direct impact individuals / area (ha)	Threshold
PCT 270 – 0.15 ha PCT 274 – 0.9 ha PCT 277 – 16.43 ha PCT 281 – 4.58 ha		Powerline = 23.63 ha Access Road upgrade = 22.35 ha	

Table 9-2: Determining which Principles apply to serious and irreversible candidate entities

Determining whether impacts are serious and irreversible	Assessment
Principle 1	
Does the proposal impact on a species, population or ecological community that is a candidate entity because it is in a rapid rate of decline?	Yes, the White Box Yellow Box Blakely's Red Gum Woodland is identified as potentially being SAII.
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	There is no threshold for impacts that may trigger a serious and irreversible impact. Therefore, the determination of a serious and irreversible impact is to be assessed on a case-by-case basis
Principle 2	
Does the proposal impact on a species that is a candidate entity because it has been identified as having a very small population size?	Yes
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	No threshold is identified, and the community is widespread in several bioregions NSW. Further consideration of potential serious and irreversible impacts to this entity is outlined in Table 9-3 below
Principle 3	
Does the proposal impact on the habitat of a species or an area of an ecological community that is a candidate entity because it has a very limited geographic distribution?	No
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	N/A
Principle 4	
Does the proposal impact on a species, a component of species habitat or an ecological community that is a candidate entity because it is irreplaceable?	No
b. If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	N/A

Table 9-3: Evaluation of an impact on a TEC consistent with 9.1.1 of the BAM

Impact Assessment Provisions	Assessment
1. the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII	Direct impacts could remove up to 74.51 ha of the TEC: PCT 266 – 52.45 ha PCT 270 – 0.15 ha PCT 274 – 0.9 ha PCT 277 – 16.43 ha PCT 281 – 4.58 ha

Impact Assessment Provisions	Assessment
	The proposed Development Footprint has been modified and evaluated numerous times to avoid Box Gum Woodland. A hierarchy approach was applied: Avoid woodland Avoid DNG that conforms to the EPBC listing criteria Avoid DNG The current design and layout impacts less native vegetation and less TEC.

Vegetation	2020	2021	2023	2024	Current
BGW	**255.6**	**142.05**	**112.37**	**76.8**	**74.51**
Total	**1432.6**	**1076.8**	**855**	**743.5**	**681.96**

Additionally, areas along ridge lines were added to the survey effort in 2022 to determine whether impacts to this TEC could be reduced. WTGs were relocated to vegetation zones associated with a low condition:

- 19.26 ha of low condition DNG (VI 25.6) present as scattered paddock trees among exotic pasture
- 28.88 ha of 266_DNG of native pastures with a VI Score of 33.3
- 3.57 ha of 266 Good with canopy (VI Score 44.8).
- 84% of the Powerline development is located within 266_DNG (VI Score 33.3).

88% of the Yarrabin Road Upgrade areas is located with PCTs in the DNG form. PCT 277_DNG is the largest area with a VI Score of 52.3. It is potentially less than this due to the inclusion of a benchmark plot to make up for a shortfall in VI plots.

The Project will minimise impacts to TECs by the process of micro siting the location of WTG and infrastructure on site and by investigating options to locate connection corridors and access routes that minimizes impacts to vegetation and CEEC.

Various options for access and connection corridors were investigated so that impacts to native vegetation could be avoided and minimized. The preferred options impact less native vegetation and less TEC.

The proponent has avoided the best areas of this TEC (highest VI and most intact patches) within the Project Site and has sought to minimise impacts to this TEC as far as possible. Given the abundance of Box Gum Woodland within the subregion and the design measures already taken to reduce impacts by nearly 52 % to the TEC, there is no practical way to deliver the project while avoiding all impacts. Within NSW, after development of the project there will remain over 1.8 million ha (99.99% remaining).

2a. evidence of reduction in geographic distribution (Principle 1, clause 6.7(2)(a) BC Regulation) as the current total geographic extent of the TEC in NSW AND the estimated reduction in geographic extent of the TEC since 1970 (not including impacts of the proposal)	In the absence of accurate and detailed mapping of the TEC in the region, an assessment of the extent of the TEC has been difficult to predict. It is likely that the condition of the CEEC within the areas surrounding the Project Site varies. Higher quality remnants are likely to be present. The best estimate of the extent of occurrence (EOO) is 70.28 million ha based on a polygon containing the likely community. The best estimate of the area of occupancy (AOO) is 15.1 million ha. However, not all areas occupied by the community are covered by maps and there may by an underestimate of the true value. For example many areas mapped as PCT 0 (cleared) on the SVTM are DNGs associated with Box Gum Woodland.

Impact Assessment Provisions	Assessment
	It is estimated that the TEC has declined by 90% since pre 1750 distribution. The Threatened Species Scientific Committee (TSSC) (2006) estimate that less than 5% of the original distribution remain. There is no estimate of vegetation extent as of 1970.
2b. extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes (Principle 2, clause 6.7(2)(b) BC Regulation) indicated by: i. change in community structure ii. change in species composition iii. disruption of ecological processes iv. invasion and establishment of exotic species v. degradation of habitat, and vi. fragmentation of habitat	Threats to the TEC include habitat loss, degradation and fragmentation from agriculture, forestry, mining and residential development. Additional threats include overgrazing, cropping, weed invasion, feral pests, removal of ground layer and altered fire regimes (OEH 2023). These factors can degrade the ecological function of the TEC leading to condition states that vary depending upon the severity and mechanism of disturbance. Whether the resulting impacts represent a permanent or temporary loss depends on the extent of disturbance and the effectiveness of measures implemented to reverse the decline. Currently the extent of reduction in ecological function is unknown. Measures will be implemented during pre-construction and construction phases to control potential impacts, such as the spread of invasive weed species ensuring the adjacent vegetation remains unaffected. Furthermore, the Project will not lead to additional impacts on the quality or integrity of Box Gum Woodland outside of the proposed impact area. The development is not expected to cause direct or indirect fragmentation or isolation of Box Gum Woodland due to its already patchy distribution of this TEC within the landscape. Additionally, the Project Site does not serve as a critical linkage between habitats or vegetation areas. Consequently, the Project will not disrupt connectivity or contribute to habitat isolation. This consideration demonstrate that the Project has been designed to minimise impacts on the TEC both within and surrounding the Project Site.
2c. evidence of restricted geographic distribution (Principle 3, clause 6.7 (2) (c) BC Regulation), based on the TECs geographic range in NSW according to the: i. extent of occurrence ii. area of occupancy, and iii. number of threat-defined locations.	Detailed mapping of the local occurrence of the CEEC is not available. Much of the landscape consists of lands similar to that of the Project Site. These areas have been highly disturbed/grazed and have not been mapped by any vegetation mapping programs as a native vegetation community. Considering the characteristics of the surrounding lands are very similar to that of the Development Site, there is the potential that the occurrence of this CEEC could be extensive in its derived form. (i) EOO is estimated 70.28 million ha (ii) AOO is estimated 15.1 million ha (iii) The BAM (2020) defines threat locations in terms of threatened species but does not mention TECs. According to the IUCN Red List of Ecosystem Categories and Criteria (IUCN 2017), a defined threat location is: *a geographically or ecological distinct area in which a single threatening event can rapidly affect all occurrences of an ecosystem type.* Land clearing for agriculture and development, conversion from native pastures to intensified cropping are likely to be the biggest factors defining the locations for threats to the TEC. This includes all leasehold and freehold land in the SWS Bioregion.
2d. evidence that the TEC is unlikely to respond to management (Principle 4, clause 6.7 (2) (d) BC Regulation).	The TEC is currently grazed by stock. It is unlikely that this activity will change if the proposed development does not go ahead. The impact design has been altered prioritise impacts to areas of TEC that are weedy and in low quality.

Impact Assessment Provisions	Assessment
3. Where the TBDC indicated that data is 'unknown' or 'data deficient' for a TEC for a criterion listed in subsection 9.1.1(2), the assessor must record this in the BDAR or BCAR.	No thresholds have been identified.
4a. the impact on the geographic extent of the TEC (Principles 1 and 3) by estimating the total area of the TEC to be impacted by the proposal: i. in hectares, and ii. as a percentage of the current geographic extent of the TEC in NSW.	Detailed mapping of the local occurrence of the CEEC is not available. Much of the landscape consists of lands similar to that of the Project Site. These areas have been highly disturbed/grazed and have not been mapped by any vegetation mapping programs as a native vegetation community. The Project will impact on 74.51 ha of the TEC which accounts for 0.000005 % of its current extent.
4b. the extent that the proposed impacts are likely to contribute to further environmental degradation or the disruption of biotic processes (Principle 2) of the TEC by: i. estimating the size of any remaining, but now isolated, areas of the TEC; including areas of the TEC within 500 m of the development footprint or equivalent area for other types of proposals ii. describing the impacts on connectivity and fragmentation of the remaining areas of TEC measured by: • distance between isolated areas of the TEC, presented as the average distance if the remnant is retained AND the average distance if the remnant is removed as proposed, and • estimated maximum dispersal distance for native flora species characteristic of the TEC, and • other information relevant to describing the impact on connectivity and fragmentation, such as the area to perimeter ratio for remaining areas of the TEC as a result of the development iii. describing the condition of the TEC according to the vegetation integrity score for the relevant vegetation zone(s) (Section 4.3). The assessor must also include the relevant composition, structure and function condition scores for each vegetation zone.	Detailed mapping of the local occurrence of the CEEC is not available. Much of the landscape consists of lands similar to that of the Project Site. These areas have been highly disturbed/grazed and have not been mapped by any vegetation mapping programs as a native vegetation community. Within the Project the TEC is associated with five (5) PCTs. The remaining connected local occurrence of the TEC includes remnant woodland retained within the Project Site connected to adjacent woodland by DNG. The average distance of the retained woodland TEC to other patches in the landscape is approximately 300 m. The dispersal ability of characteristic *Eucalyptus* spp. associated with the TEC is estimated to be 1km although most seeds are distributed within 200 m from nearby trees (Booth 2017). Grasses can disperse by wind exceeding 1km particularly within fragmented landscapes (Heydel et al 2014). The Project is unlikely to significantly increase the edge to area ratio of the remaining TEC given that these areas are already exposed to edge effects including weed encroachment. Table 9-4 shows the VI of the TEC within the Development Footprint.

Table 9-4: VI of Box Gum Woodland

Veg Zone	PCT ID	Condition	Area (ha)	Composition Condition Score	Structure Condition Score	Function Condition Score	Presence of Hollow bearing trees	Current vegetation integrity score
SEH Bioregion								
2	266	DNG	5.09	70.8	70.2	28.4	No	52
3	266	Low	19.26	40.4	75.9	5.5	No	25.6
4	270	Good	0.15	69.5	33.3	99.6	Yes	61.3
7	277	DNG	1.26	76.5	81.1	35	No	60.1
12	266	Good	0.74	100	100	100	Yes	100
SWS Bioregion								
4	266	Good	3.57	85	60.4	17.6	No	44.8
5	266	DNG	23.79	77	65.6	7.3	No	33.3
8	274	Good	0.07	91.9	17.6	83.5	Yes	51.3
9	277	Good	1.92	93.5	93.1	86.7	Yes	91.1
10	277	DNG	13.25	81.6	75.3	25.8	Yes	54.1
11	281	DNG	4.24	79.2	77.4	24	Yes	52.8
16	281	Good	0.34	100	100	100	Yes	100

9.1.1 Additional SAII Mitigation Measures

At the request of CPHR the proponent has investigated options to provide additional mitigation measures to further minimise impacts to Box Gum Woodland. The proponent proposes to provide for a 1:1 protection (measured by area) and enhancement of Box Gum Woodland within the locality, such that the impacts of the project are minimised in a local context. A site-based option has been proposed to achieve additional measures to compensate for the loss of Box Gum Woodland within the locality. A summary of the consultation regarding Box-Gum Woodland is presented in Appendix Q.

In response to the most recent advice from CPHR, a two staged approach is proposed to mitigate the potential SAII associated with Box-Gum Woodland, including:

- Stage 1 – reducing the Box-Gum Woodland through refinements of the Development Footprint and Development Corridor
- Stage 2 –proposed establishment of a land-based offset to further mitigate residual impacts and address the SAII through long-term conservation and rehabilitation measures.

9.1.1.1 Stage 1 – Reducing impacts to Box-Gum Woodland

The Project has undergone progressive refinements to the Development Footprint and Development Corridor through the EIS process and the subsequent Response to Submissions phase of the Project. The potential impacts to Box-Gum Woodland has been significantly reduced throughout the Project's evolution:

- 2020 Preliminary design: 255.6 ha

- 2023 Scoping Report: 112.37 ha
- 2024 EIS: 76.84 ha
- 2025 Amended Project: 74.51 ha

The amended Project is now expected to impact:

- 6.79 ha of good condition,
- 48.46 ha of derived native grassland and
- 19.26 ha of low condition derived native grassland.

During the detailed design phase post-approval, roads, tracks, turbines and powerlines will be micro-sited within the approved Development Corridor to further reduce impacts to Box-Gum Woodland. Final impact areas will inform offset requirements and will be confirmed prior to the commencement of construction.

9.1.1.2 Stage 2 – Land-based Offset

Once final impacts have been established, the Proponent proposes to provide for a 1:1 protection (measured by area) and enhancement of Box-Gum Woodland within the locality, such that the impacts of the Project are minimised in a local context. A site-based option has been proposed to achieve additional mitigation measures to compensate for the loss of Box-Gum Woodland within the locality. This offset will be managed to increase the future Vegetation Integrity Score of Box Gum Woodland PCTs. The site will be secured post-approval under a Biodiversity Stewardship Site (BSS) Agreement.

Two suitable offset properties (Option A and Option B) have been identified, both within the South Western Slopes Bioregion. Details are summarised in Table 9-5 below with additional PCT detail provided in Table 9-6 and shown on Figure 9-1 and Figure 9-2. Both Options are within the Project Site (Figure 9-3) and within areas mapped as Box Gum Woodland (Figure 9-4).

This commitment is additional to the mandatory requirement for offsets under the BOS. To avoid confusion with any offsetting obligation, the additional mitigation measures will be provided under an in-perpetuity agreement (preferably a Conservation Agreement) enforceable under the BC Act. Should the proponent secure the additional mitigation measures under a Stewardship Agreement, no ecosystem credits will be generated over the section of land that contributes to the additional mitigation measures.

Table 9-5: Summary details of offset properties Options A and Options B.

Parameter	Option A	Option B
Location	Adjacent to riparian corridor	Within south Western Slopes Bioregion
Total Area	126.3 ha	140.4 ha
Validated BoX-Gum Woodland	3.6 ha	5.5 ha
SVTM Mapped Box-Gum Woodland	5.2 ha	68.2 ha
Potential Rehabilitation Area	99.3 ha (cleared / not classified)	45.4 ha (cleared / not classified)
Connectivity Potential	High – adjacent to riparian areas	Moderate – dispersed patches
Preferred Option	Yes	Backup / contingency

Table 9-6: PCTs within Offset Properties Option A and Option B.

Option	Lot/DP	PCT	PCT Name	Validated Vegetation Area (ha)	SVTM Mapped Vegetation (ha)	Area* (ha)
A	1/28009	266	White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	3.59 (DNG)	1.3	4.89
		461	Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion		0.03	0.03
		78	River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion		18.22	18.22
		277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion		3.9	3.9
		0	Cleared / Not Classified		99.26	99.26
		Total		3.59	122.71	126.3
B	7/756903	281	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion		0.98	0.98
		266	White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	0.63 (Good) 0.58 (DNG)	3.66	4.87
		279	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion		0.55	0.55
		461	Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion		11.33	11.33
		268	White Box - Blakely's Red Gum - Long-leaved Box - Nortons Box - Red Stringybark grass-shrub woodland on shallow soils on hills in the NSW South Western Slopes Bioregion		7.89	7.89
		277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	0.8 (Good) 2.15 (DNG)		2.95
		0	Cleared / Not Classified		10.89	10.89
	4/756915	281	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion		4.27	4.27
		185	Dwyer's Red Gum - White Cypress Pine - Currawang shrubby woodland mainly in the NSW South Western Slopes Bioregion		3.18	3.18
		266	White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion		37.28	37.28
		461	Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion		6.79	6.79
		268	White Box - Blakely's Red Gum - Long-leaved Box - Nortons Box - Red Stringybark grass-shrub woodland on		8.77	8.77

Option	Lot/DP	PCT	PCT Name	Validated Vegetation Area (ha)	SVTM Mapped Vegetation (ha)	Area* (ha)
			shallow soils on hills in the NSW South Western Slopes Bioregion			
		279	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion		1.11	1.11
		277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	0.95 (Good) 0.38 (DNG)	3.66	4.99
		0	Cleared / Not Classified		34.54	34.54
		Total		5.49	134.9	140.39

*Highlighted cells can be attributed to Box-Gum woodland CEEC.

The two options proposed have areas of validated Box-Gum Woodland CEEC in varying condition classes (Option A -3.59 ha; Option B – 5.49 ha), and areas of Box-Gum Woodland CEEC mapped via the SVTM mapping (Option A -5.2 ha; Option B – 68.17 ha).

Option A is currently the preferred site due to its larger potential area for rehabilitation (99.26 ha) and its location adjacent to a riparian corridor, providing potential connectivity to other areas of vegetation and connectivity to Box Gum Woodland (Figure 9-4). However, given the potentially long timeframe required to establish a Biodiversity Stewardship Agreement (BSA), and risks of unforeseen circumstances such as changes in land ownership or access constraints, **Option B has also been considered as a contingency**.

Option B includes a larger area of CEEC based on SVMT mapping and provides a viable contingency should Option A become unfeasible. Both options will remain under consideration until on-ground investigations are undertaken post-approval.

Validation of the remaining vegetation within the preferred site will occur post-approval, and the site will be divided into management zones according to its current condition.

9.1.1.3 Proposed Commitments to Box-Gum Woodland Mitigation Measures

To address the potential SAII impacts to Box-Gum Woodland, the Proponent commits to a suite of additional mitigation measures, to be implemented post-approval of the Project. These measures are aimed at ensuring long-term ecological improvement and the successful establishment of Box-Gum Woodland within the offset site.

The Proponent commits to the following measures post-approval:

- Validate vegetation and condition class mapping by carrying out comprehensive on-ground surveys to confirm vegetation extent, PCTs and condition zones.
- Undertake a soil assessment of the proposed land-based offset area to validate the soil types are suitable for Box-Gum Woodland restoration.
- Establish management zones based on condition and restoration potential to guide targeted management interventions. This will include the preparation of a Restoration Management Plan to be developed by a qualified person (Restoration Ecologist).

- Securing the offset site in perpetuity under a Biodiversity Stewardship Agreement (BSA) in accordance with the NSW BC Act.
- Rehabilitation of up to 74.51 ha (equivalent to the impact area subject to detailed design and/or micro-siting), with potential for additional restoration to improve connectivity and expand habitat corridors within the BSS.
- Establishment of a Total Fund Deposit (TFD) to support all required activities throughout the life of the BSA.
- Precluding the trading of ecosystem credits generated from the BSS associated with 74.51 (or actual impacts based on micro-siting) Box Gum Woodland PCTs to further ensure conservation outcomes.
- If Option A or Option B fail to meet the measures outlined above or become unavailable post-approval due to factors outside of the control of the Proponent, the Proponent commits to finding a similar land-based offset property in consultation with CPHR.

Rehabilitation and Management Activities

The following restoration and land management activities represent examples of actions that may be implemented to support the establishment and long-term improvement of Box-Gum Woodland CEEC condition within the offset site, subject to site-specific requirements and the outcomes of vegetation validation:

- Site protection by maintaining the boundary fencing to exclude livestock, feral animals and manage access.
- Implementation of strategic grazing (if appropriate) to encourage native understorey regeneration.

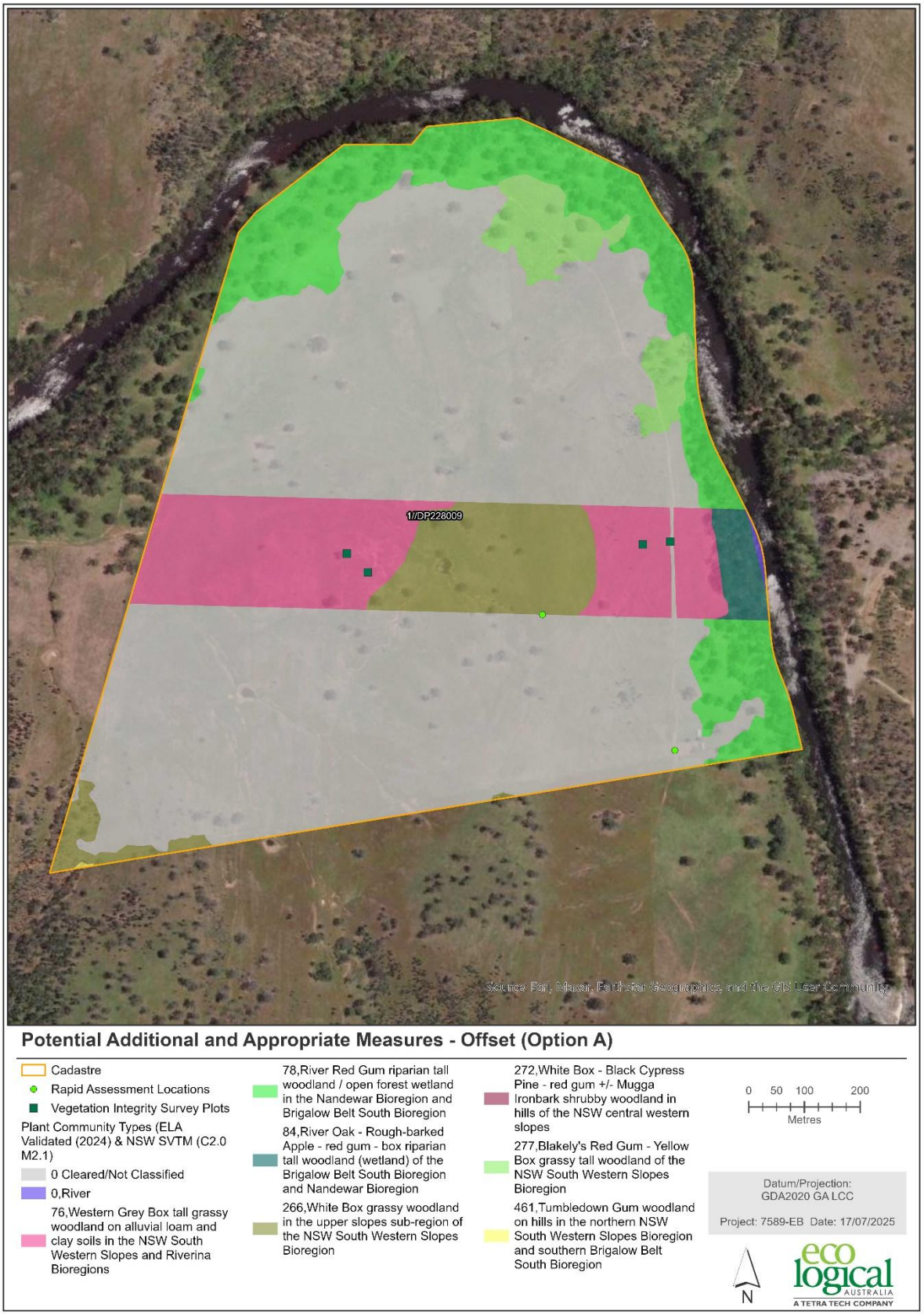


Figure 9-1: Offset Property – Option A

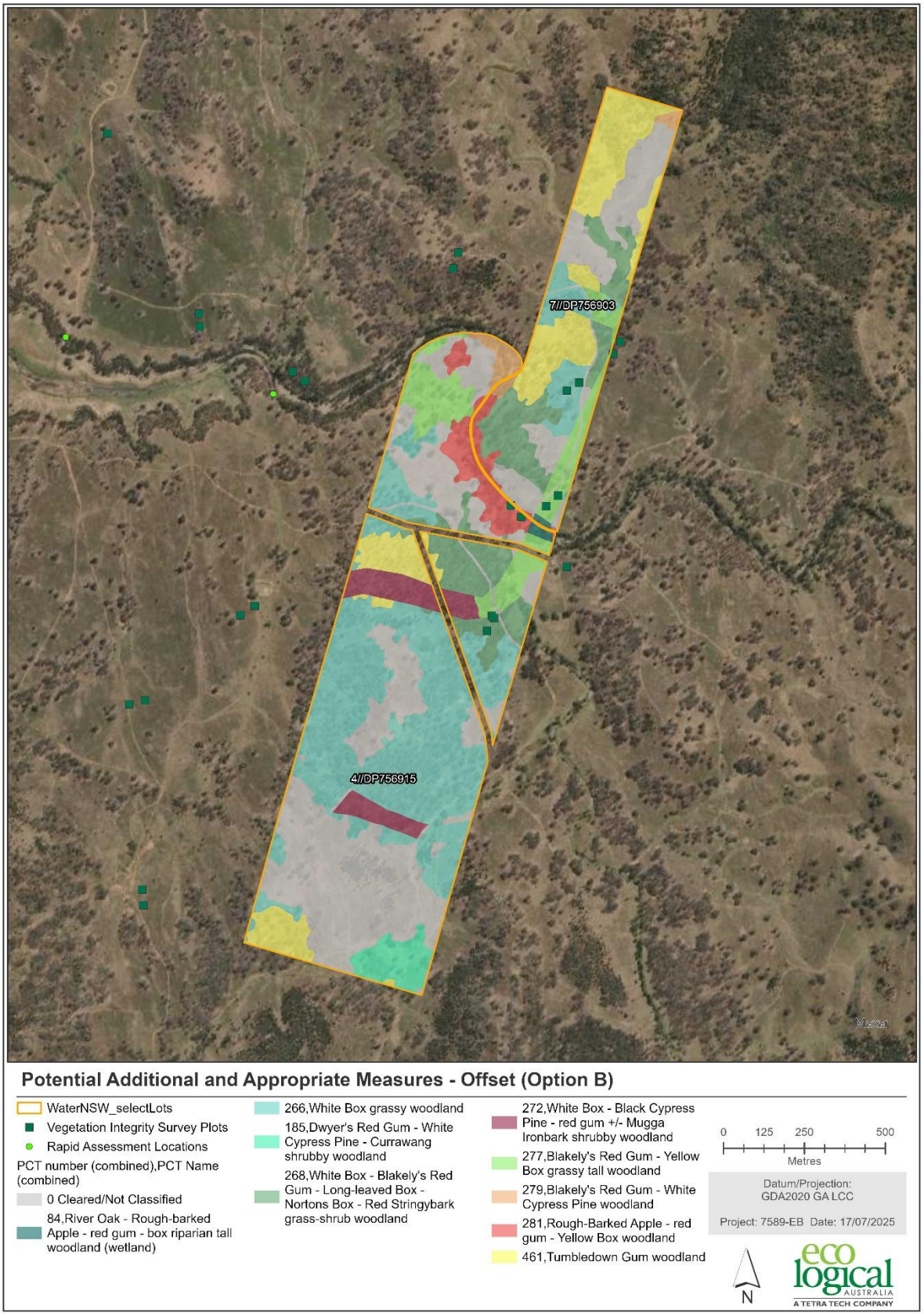


Figure 9-2: offset Property - Option B.

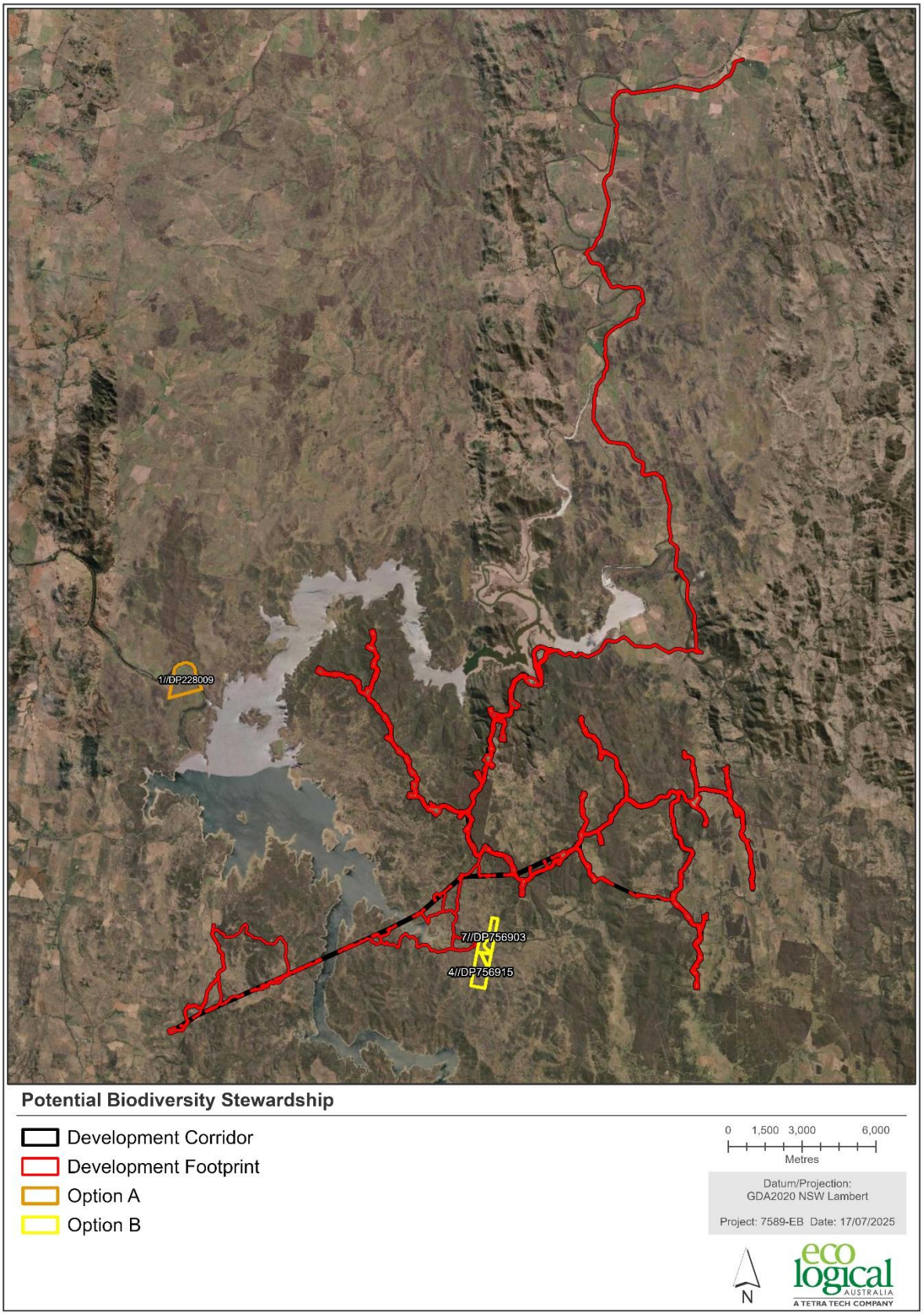


Figure 9-3: Location of Potential Offset Properties

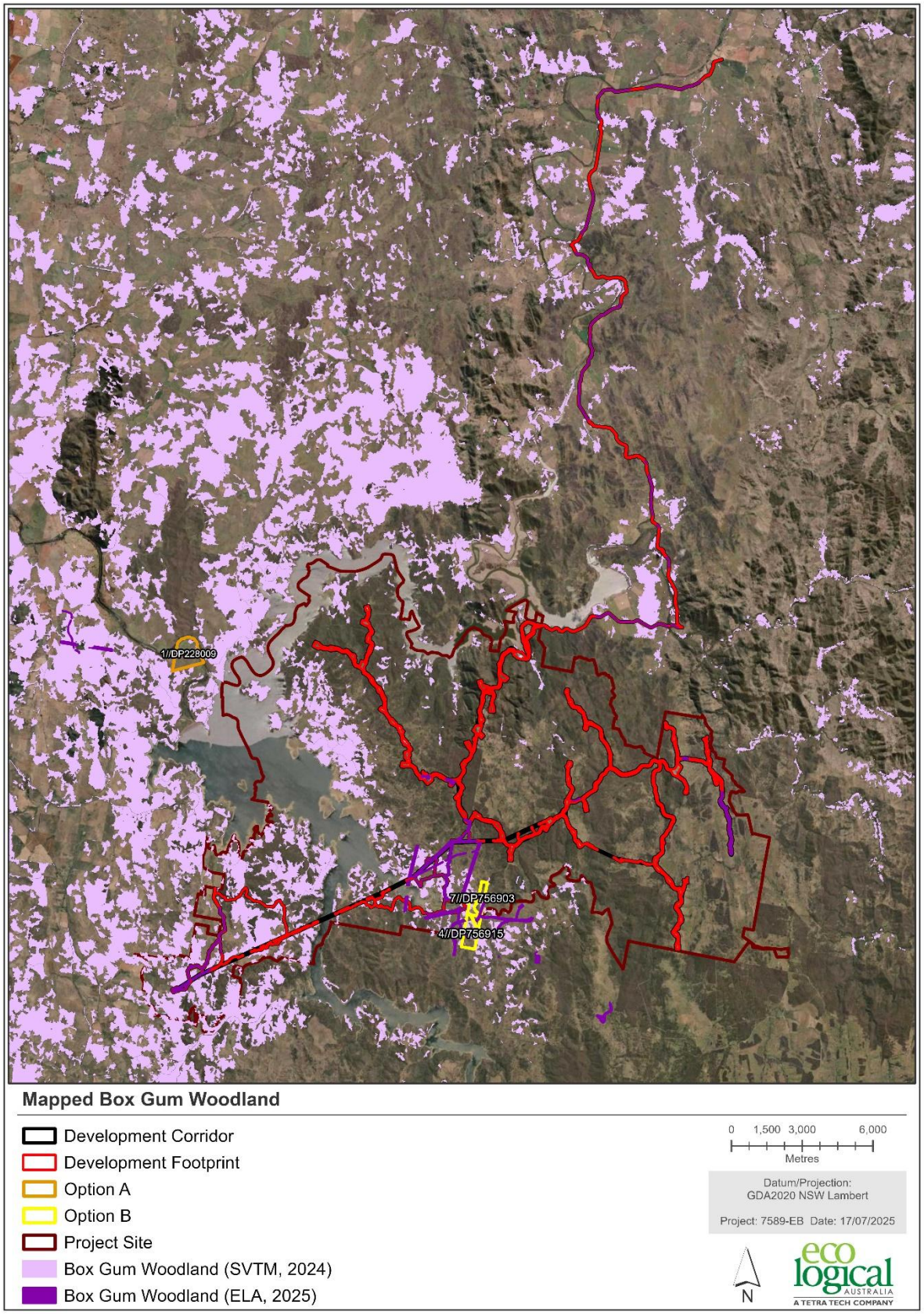


Figure 9-4: Mapped Box-Gum Woodland

9.2 Cave Dwelling Bats

The Large-eared Pied Bat, Large Bent-winged Bat, Little Bent-winged Bat and Eastern Cave Bat are all listed as SAII entities under Principle 4 as impacts on breeding habitat could be considered potentially serious and irreversible and the species are unlikely to respond to measures to improve their habitat. In August 2024, the TSSC made a Final Determination to upgrade the listing of Large-eared Pied Bat from vulnerable to endangered. The Commonwealth EPBC Act also lists the species as being endangered. The Large Bent-winged Bat and Eastern Cave Bat are listed as vulnerable under the NSW BC Act only. Table 9-7 and Table 9-8 summarises the SAII entities and assessment criteria, whilst the evaluation is presented in Table 9-9.

Table 9-7: SAII Summary

Species	Principle	SAII Assessment Summary	Threshold
Large-eared Pied Bat	Principle 4	The Project has been located to avoid direct and indirect impacts on the species breeding habitat, which is the focus of the species listing as a SAII candidate entity under Principle 4. There is no breeding habitat present within the Development Corridor or within a 100 m or 2 km buffer. The species was not recorded flying at RSA and it is unlikely that this species will be significantly impacted by blade strike or barotrauma. This species was not identified in any of the carcass monitoring reports reviewed in Section 6 of this BDAR. To monitor any potential impacts to this species, a BBAMP framework has been prepared to ensure that any unforeseen impacts are recorded, managed, and mitigated through the adaptive plan described in Section 7.2.	No listed threshold
Large Bent-winged Bat	Principle 4	The Project has been designed to avoid direct and indirect impacts on the species breeding habitat, which is the focus of the species listing as a SAII candidate entity under Principle 4. There is no breeding habitat present within the Development Corridor or within a 100 m buffer. This species has wide dispersal over the non-breeding period and is widely known across eastern NSW. The majority of activity for this species is east of the Great Dividing Range, however, a non-breeding roost for the species is located at Wellington Caves, 21 km west of the Development Corridor. During met mast monitoring, this species was definitively recorded at both 50 m and 100 m, although at low levels and relatively infrequently when compared to ground level detectors at BBUS impact and control sites (Appendix K). This species has the potential to be impacted by blade strike or barotrauma, however, only four known fatalities have been recorded from a single operational wind farm, despite the species range coinciding with the majority of operational wind farms in QLD, NSW and VIC.	No listed threshold

Species	Principle	SAII Assessment Summary	Threshold
		The BBAMP framework (Section 7.2) is designed to monitor the species ongoing utilisation of the Project Site and any potential impacts during the operational phase of the project. Low wind speed curtailment, turbine feathering and smart curtailment trials are to be implemented as part of the Project BBAMP to specifically reduce the risk of turbine strike to this and other species known to fly at RSA heights.	
Little Bent-winged Bat	Principle 4	The Project has been designed to avoid direct and indirect impacts on the species breeding habitat, which is the focus of the species listing as a SAII candidate entity under Principle 4. There is no breeding habitat present within the Development Corridor or within a 100 m buffer. The species was not recorded flying at or near RSA height and only three definite calls of the species has been recorded. It is unlikely that this species will be significantly impacted by blade strike or barotrauma. This species was not identified in any of the carcass monitoring reports reviewed in Section 6 of this BDAR. To monitor any potential impacts to this species, a BBAMP framework has been prepared to ensure that any unforeseen impacts are recorded, managed, and mitigated through the adaptive plan described in Section 7.2.	No listed threshold
Eastern Cave Bat	Principle 4	The Project has been designed to avoid direct and indirect impacts on the species breeding habitat, which is the focus of the species listing as a SAII candidate entity under Principle 4. There is no breeding habitat present within the Development Corridor or within a 100 m or 2 km buffer. No individuals have been recorded flying at or near RSA height and very few definite calls were recorded overall. Accordingly, the species is unlikely to be impacted by blade strike or barotrauma and the species was not identified in any of the carcass monitoring reports reviewed in Section 6 of this BDAR. To monitor any potential impacts to this species, a BBAMP framework has been prepared to ensure that any unforeseen impacts are recorded, managed, and mitigated through the adaptive plan described in Section 7.2.	No listed threshold

Table 9-8: Determining which Principles apply to SAII candidate entities

Determining whether impacts are SAII entities	Assessment
Principle 1	
Does the proposal impact on a species, population or ecological community that is a candidate entity because it is in a rapid rate of decline?	The cave-dwelling microbats are not considered SAII candidate entities under Principle 1. There is insufficient data assessing population trends for individual species and there is no relevant information

Determining whether impacts are SAII entities	Assessment
	provided in the TBDC indicating that the species are in a rapid rate of decline (DPIE 2025b). It is noted that the Large-eared Pied Bat is listed as endangered under both State and Commonwealth legislation on the basis of population decline. Roost counts of Large Bent-winged Bat at the Church Cave maternity roost in Wee Jasper, NSW, indicate that the species has increased from 16,900 in 2020-21 to 28,200 in 2024-25 (NSW DCCEEW pers. comm; NSW Saving Our Species 2022).
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	There is no threshold for impacts that may trigger a serious and irreversible impact. Therefore, the determination of a serious and irreversible impact is to be assessed on a case-by-case basis.
Principle 2	
Does the proposal impact on a species that is a candidate entity because it has been identified as having a very small population size?	The cave-dwelling microbats are not considered SAII candidate entities under Principle 2. Population estimates for Large-eared Pied Bat are within the range of 10,000 - 20,000 individuals (TSSC 2024). Historical records of individuals roosts of the Large Bent-winged Bat range from 100 - 150,000 individuals (DPIE 2025b). Based on contemporary maternity roost counts, the NSW population of the species alone is likely to exceed 50,000 individuals (NSW DCCEEW pers. comm; NSW Saving Our Species 2022). There are no population estimates for Eastern Cave Bat or Little Bent-winged Bat.
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	No threshold is identified.
Principle 3	
Does the proposal impact on the habitat of a species or an area of an ecological community that is a candidate entity because it has a very limited geographic distribution?	The cave-dwelling microbats are not considered SAII candidate entities under Principle 3. The distribution of the Large-eared Pied Bat ranges from Rockhampton in QLD, south to Bungonia NSW. There are scattered records from the New England Tablelands and North Western Slopes. The species was recently listed as endangered due to the highly restricted known maternity roost (AOO < 500 km^2). The Large Bent-winged Bat and Little Bent-winged Bat are both widely distributed across the eastern Australian coastline and extending to just west of the Great Dividing Range (ABS 2025). The distribution of both species is wide spread and not geographically limited. The population can disperse within 300 km from maternity caves. The distribution of the Eastern Cave Bat ranges from a broad band on both sides of the Great Dividing Range from Cape York to Kempsey with records from the New England Tablelands and Central Tablelands, the Sydney Basin and the upper north coast of NSW.

Determining whether impacts are SAII entities	Assessment
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	No threshold is identified.
Principle 4	
Does the proposal impact on a species, a component of species habitat or an ecological community that is a candidate entity because it is irreplaceable?	The cave-dwelling microbats are considered SAII candidate entities under Principle 4 due to potential impacts to the species breeding habitat. Suitable caves, cliffs and rocky escarpment utilised for breeding by cave dwelling bats are limited within the landscape and difficult to replicate or replace. The Large-eared Pied Bat has very specific requirements for maternity roosts, which must include domed indentations within the roof of the cave to allow juvenile bats to learn to fly. This feature has also been noted in sandstone roost caves occupied by the Eastern Cave Bat (Law et al 2005). These roosting habitats must also be in close association with foraging habitat in fertile valley and plains that provide adequate foraging habitat. Due to these highly specific physical characteristics, such habitats are uncommon in the landscape, which restricts the distribution of cave dwelling bats, including the Large-eared Pied Bat. The Large and Little Bent-winged Bat requires large and somewhat complex-structured limestone caves for use as maternity roosts. Importantly, there is no suitable breeding habitat within the Development Corridor nor within 100 m or 2 km. Accordingly, the Project is not likely to significantly contribute to the risk of extinction of these species as defined under SAII Principle 4.
b. If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	No threshold is identified. Further consideration of potential serious and irreversible impacts to these entities under Principle 4 is outlined in Table 9-9 below.

Table 9-9: Evaluation of an impact Large-eared Pied Bat, Large Bent-winged Bat, Little Bent-winged Bat and Eastern Cave Bat.

Impact Assessment Provisions	Assessment
1. the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII	The Project has been located to avoid direct and indirect impacts on the species breeding habitat, which is the focus of the species listing as a SAII candidate entity under Principle 4. There are no breeding roosts within the Development Corridor nor within 100 m or 2 km of the Development Corridor that will be directly or indirectly impact by the Project. The nearest known breeding population of Large-eared Pied Bat is at Ulan (70 km north). The nearest known breeding location for Large Bent-winged Bat is 240 km south of the Project Site at Drum Cave in Bungonia, however, non-breeding roosts are located at Wellington Caves (21 km west). The nearest known breeding location for Little Bent-winged Bat is 290 km northeast of the Project Site at Willi Willi Cave, near Kempsey. The location of the nearest Eastern Cave Bat breeding habitat cave is not known, however, the species has been recorded roosting in sandstone cliff lines near Ulan, and a maternity roost has been recorded near

Impact Assessment Provisions	Assessment
	Muswellbrook in the Upper Hunter Valley, approximately 165 km northeast of the Project Site (L McRae pers. comm.). The proposed Development Footprint has been modified and evaluated to avoid the removal of woodland and better-quality grasslands where possible and the final WTG locations and related infrastructure will be micro-sited to further reduce impacts to potential foraging habitat. Much of the DNG has been extensively modified due to grazing, with these areas likely to represent low quality foraging habitat. Large-eared Pied Bat, Little Bent-winged Bat and Eastern Cave Bat were not recorded from 50 m and 100 m at height detectors positioned on the two project met masts and overall, have been recorded in very low quantities (see Section 6.5). The Large Bent-winged Bat was recorded from 50 m and 100 m at height detectors and therefore has the potential to be impacted by turbine strike. Detailed mitigation measures will be implemented through the Project BBAMP to avoid and minimise the risk of turbine strike on this species including low wind speed curtailment, turbine feathering and smart curtailment trials (see Section 7.1) and a robust operational monitoring program (see Section 7.2).
2. The assessor must consult the TBDC and/or other sources to report on the current population of the species including: 2a. evidence of rapid decline in geographic distribution (Principle 1, clause 6.7(2)(a) BC Regulation) presented by an estimate of the i) decline in population of the species in NSW in the past 10 years or three generations ii) decline in population of the species in NSW in the past 10 years or 3 generations as indicated by and index of abundance appropriate to the species, decline in geographical distribution and or habitat quality, exploitation, effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites.	The cave-dwelling microbats are not considered SAII candidate entities under Principle 1. The conservation status for the Large-eared Pied Bat was recently reassessed and evaluated from vulnerable to endangered under the EPBC Act (DCCEEW 2023) and the BC Act (TSSC 2024). This reassessment reflects the species restricted geographic distribution which is largely dependent on the limited number of known maternity roosts. The Project will not directly or indirectly impact breeding habitat and so is unlikely to contribute to the rapid decline in geographic distribution of the four SAII entity cave-dwelling microbat species. Although the distribution range for Large-eared Pied Bats is extensive, extending from central-eastern NSW to central Queensland, north of Rockhampton, and south into Victoria, its occurrence within this range is highly fragmented with populations consisting of small, isolated subpopulations (TSSC 2024). The Eastern Cave Bat which shares similar habitat requirements is subject to the same limitations, whilst the Large Bent-winged Bat and Little Bent-winged Bat also have extensive ranges across the eastern Australian coastline (ABS 2025), however, their breeding habitat is limited to few (<10) maternity caves across this wide distribution (DPIE 2025b). All four species rely on the availability of caves and/or rocky outcrops for roosting, located near foraging habitat such as woodlands and fertile valleys. The absence of either habitat component limits their presence and may cause the species to decline. The restricted combination of habitat factors has been further exacerbated by the extensive land clearing of woodland on fertile soils within the species known range (Pennay 2008). Given the Project has been located <2 km away from potential breeding habitat, the Project site is not likely to constitute core foraging habitat for the four cave-dwelling microbat species and therefore, contribute to declines in the NSW populations of the species.
2b. Evidenced by small population size (Principle 2) presented by: i) Estimate of current population size	The cave-dwelling microbats are not considered SAII candidate entities under Principle 2.

Impact Assessment Provisions	Assessment
ii) Estimate of the decline in the species population in NSW in three years or 1 generation iii) Estimate of the number of mature individuals in each subpopulation or a percentage.	Population estimates for the Large-eared Pied Bat are between 10,000 - 20,000 individuals (TSSC 2024). There are no population estimates for the Eastern Cave Bat or Little Bent-winged Bat. Populations of individual roosts for Large Bent-winged Bats have been recorded to exceed 150,000 individuals. Based on contemporary maternity roost counts, the NSW population of the species is likely to exceed 50,000 individuals (NSW DCCEEW pers. comm; NSW Saving Our Species 2022). Data on population trends is limited, however, the Large-eared Pied Bat is inferred to have undergone significant historical declines in population numbers due to the loss of suitable roosting habitat. This is likely also true for the Eastern Cave Bat and Large and Little Bent-winged Bat, given the shared reliance on similar habitat types. Available monitoring data from roost counts of Large Bent-winged Bat at the Church Cave maternity roost during the last three years, indicate that the species has increased from 16,900 in 2020-21 to 28,200 in 2024-25 (NSW DCCEEW pers. comm; NSW Saving Our Species 2022). The population of mature individuals within a subpopulation is unknown and is expected to be significantly lower than the overall population size. Given the low quantity of definite total calls recorded from Large-eared Pied Bat (30 calls), Eastern Cave Bat (15 calls) and Little Bent-winged Bat (3 calls) the local subpopulation is likely to be low. The Large Bent-winged Bat has recorded a higher quantity of definite calls (3,010 calls) and so the local subpopulation of this species is likely to be much higher.
2c. evidence of limited geographic range (Principle 3) presented by: i) Extent of occurrence ii) Area of occupancy iii) Number of threat defined locations Whether the species is likely to undergo extreme fluctuations.	The cave-dwelling microbats are not considered SAII candidate entities under Principle 3. The distribution of the Large-eared Pied Bat ranges from Rockhampton in QLD, south to Bungonia NSW. There are scattered records from the New England Tablelands and North Western Slopes. The distribution of the Eastern Cave Bat ranges from a broad band on both sides of the Great Dividing Range from Cape York to Kempsey with records from the New England Tablelands and the upper north coast of NSW. The Large-eared Pied Bat was recently listed as endangered due to the restricted distribution of known maternity roost (Area of Occupancy (AOO) <500 km^2; TSSC 2024). The best estimate of the Extent of Occupancy (EOO) for the Large-eared Pied Bat is between 276,333-279,734 km^2. The best estimate of the AOO is 22,000 km^2 of which <500 km^2 is considered critical habitat (TSSC 2024). There is no data available for Eastern Cave Bat, but the AOO and EOO are likely to be similar. Threat-defined locations are geographically or ecologically distinct areas in which a single threatening event may rapidly affect species occurrences. The Large-eared Pied Bat is considered to occur in five threat-defined locations (TSSC 2024) due to loss of destruction of maternity roosts, either thought mining, subsidence, human interference, impacts by goats, fire and or vegetation clearing in the proximity to roosts. Several of these locations are threatened due to drought which can disrupt reproductive rates and survivability at maternity roosts. It is likely that this is the same for the Eastern Cave Bat and Large and Little Bent-winged Bat given the species reliance on few known maternity roosts, surrounded by suitable foraging habitat.

Impact Assessment Provisions	Assessment
	Given the widespread distribution of drought and its increasing frequency along the east coast of Australia, combined with the likelihood of exacerbation due to climate change driving more extreme weather events and increase fire, there is a risk that subpopulations of all four species could experience extreme fluctuations. Maternity roosts may be impacted by these drought conditions due to a change in the thermal conditions of roosts causing stress in individuals and potentially resulting in lower birth rates and higher mortality. Drought may also impact on foraging areas with fewer insects emerging and less surface water availability and ground cover.
2d. Evidence that the species is unlikely to respond to management (Principle 4) because: i) Known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat. ii)The species is reliant on abiotic habitats which cannot be restored or replaced. iii) Life history traits and or ecology is known but the ability to control key threatening processes is negligible.	The cave-dwelling microbats are considered SAII candidate entities under Principle 4. Breeding within Large-eared Pied Bats is sporadic, with some populations breeding in certain years whilst others may not breed for up to two years (Dwyer 1966). Female Large-eared Pied Bats are capable of breeding at 1 year of age and often exhibit site fidelity, returning to the same maternity sites in successive years (Pennay 2008). Both Large and Little Bent-winged Bats also exhibit strong maternity roost site fidelity (DPIE 2025b). Additionally, all four cave-dwelling microbat species have low fecundity, typically birthing 1-2 young per year, which may the species ability to increase the existing population (Churchill 2008). Despite their wide distributions, all four species are highly dependent on a limited number of known maternity roosts which limits the species ability to increase the existing population on or occupy new habitat. These natural cave systems are irreplaceable due to their complex structural and environmental attributes which are extremely challenging to replicate. As the proposed Project will not impact breeding habitat, it is not likely to contribute to SAII Principle 4.
3a. the impact on the geographic extent of the species (Principles 1 and 3) by estimating the total area to be impacted by the proposal: i. in hectares, and ii. as a percentage of the current geographic extent.	The cave-dwelling microbats are not considered SAII candidate entities under Principle 1 or Principle 3. There is potential for the Project to impact upon individuals of all species due to blade strike and /or barotrauma. Whilst all species have been identified as being potentially present at neighbouring windfarms, they are rarely recorded during carcass monitoring, indicating that blade strike or barotrauma is not occurring regularly. It is likely that the species forage above the canopy but below RSA, reducing the risk of blade strike and / or barotrauma. The Project Site does not include any areas identified as critical habitat (i.e. maternity roosts), nor will there be any indirect impacts to critical habitat. However. there will be a reduction in 690.8 ha of native vegetation which is potential foraging habitat.
3b. Impact on geographic range (Principles 1 and 3) presented by: i) Percentage of AOO or EOO to be impacted, ii) Impact on subpopulation, iii) Determine if the persisting subpopulation will remain viable,	The cave-dwelling microbats are not considered SAII candidate entities under Principle 1 or Principle 3. The proposed Project involved native vegetation clearing which will result in a loss of 690.8 ha of potential foraging habitat. There is no data on AOO or EOO for the Eastern Cave Bat, nor for Large or Little Bent-winged Bat, however, for Large-eared Pied Bat a reduction in 690.8 ha of foraging habitat accounts for 0.0025% of the species EOO of 27 million ha (or276,333 km^2), or 0.03% of the species AOO of 2.2 million ha.

Impact Assessment Provisions	Assessment
iv) Determine changes in threats to the subpopulation and habitat.	The Project Site does not include and is not adjacent to any areas identified as critical habitat (i.e. maternity roosts) for the four cave-dwelling species. Given the substantial distance of the Project Site from known breeding habitat and the high mobility of the species, the proposed Project is unlikely to fragment foraging habitat such that their population viability will be impacted. There is potential for the Project to impact upon individuals due to blade strike and/or barotrauma. The risk to Large-eared Pied Bat, Eastern Cave Bat and Little Bent-winged Bat has been assessed as Low due to the absence of records at heights within and near the RSA and the low overall quantity of records, combined with the absence of mortality records of these species from operational wind farms within their distribution (see Section 6.5). The risk to Large Bent-winged Bat has been assessed as Moderate as the species has been recorded within and near the RSA and has four recorded fatalities from a single operational wind farm in southern NSW. It is noted however, that the species has not been recorded in mortality monitoring form the two nearest operational wind farms (Bodangora and Crudine Ridge Wind Farms). Detailed mitigation measures will be implemented through the Project BBAMP to avoid and minimise the risk of turbine strike on this species, including low wind speed curtailment, turbine feathering and smart curtailment trials (see Section 7.1) and a robust operational monitoring program (see Section 7.2). Low wind speed curtailment to be implemented during Project operations have proven effective at reducing turbine strike related impacts on the closely related Southern Bent-winged Bat at an operational wind farm facility in southern Victoria (see Bennett et al 2022).

9.2.1 Additional and Appropriate Measures

Whilst the above SAII assessment for cave-dwelling microbats indicates that the Project is unlikely to constitute a SAII, relevant additional and appropriate measures have been developed should impacts upon these be recorded. The proposed measures would involve commitment from the Proponent to contribute up to $200,000 of funding over five years to a local research project GPS tag and track Large Bent-winged Bats from the species Wellington Caves roost site, located approximate 21 km west of the Project Site, with the aim of increasing knowledge regarding their flight behaviour and roost utilisation in the region.

The research would mirror a recent study which successfully utilised GPS tagging to track the flight distances, heights and patterns of the closely related Southern Bent-winged Bat in southern Victoria and South Australia (Bush et al. 2025). The proposed research project at Wellington Caves would include a similarly designed capture-mark-re-capture study for Large Bent-winged Bat, utilising stationary receivers positioned at varying distances (e.g. 2 km, 10 km, 25 km) and landscape positions (e.g. valley and ridgetop) from the roost cave. Receivers would ideally be deployed within the Project Site and near to other planned or operational wind farm developments in the Central West Orana Renewable Energy Zone, to increase understanding of the species flight behaviours and patterns in the context of wind farm operations.

This proposed additional and appropriate measure would be implemented through the Project BBAMP and demonstrates an effort by the proponent to support evidence-based assessment and adaptive management. The outcomes of this research are expected to inform ongoing monitoring and mitigation measures, such as those outlined in the BBAMP Framework (Section 7.2), and may contribute to improved conservation outcomes for microbat species across the wider renewable energy sector.

9.3 Grevillea divaricata

Grevillea divaricata is listed as an SAII entity. Table 9-10 and Table 9-11 summarises the SAII entity and assessment criteria, whilst the evaluation is presented in Table 9-12.

Table 9-10: SAII summary

Species	Principle	Direct impact individuals / area (ha)	Threshold
Grevillea divaricata	Principle 2 Principle 3	5.54 ha	No listed threshold

Table 9-11: Determining which Principles apply to serious and irreversible candidate entities (Clause 6.7 of the BC Regulation)

Determining whether impacts are serious and irreversible	Assessment
Principle 1	
Does the proposal impact on a species, population or ecological community that is a candidate entity because it is in a rapid rate of decline?	Not listed under Principle 1.
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	N/A - There is no threshold for impacts that may trigger a serious and irreversible impact. Therefore, the determination of a serious and irreversible impact is to be assessed on a case-by-case basis
Principle 2	
Does the proposal impact on a species that is a candidate entity because it has been identified as having a very small population size?	*Grevillea divaricata* is listed as Principle 2. This species has a very small population size with fewer than 50 individuals or fewer than 250 individuals where threats are known.
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	No threshold is identified. Further consideration of potential serious and irreversible impacts to this entity is outlined in Table 9-12 below
Principle 3	
Does the proposal impact on the habitat of a species or an area of an ecological community that is a candidate entity because it has a very limited geographic distribution?	*G. divaricata* is listed under Principle 3 known from <3 locations or AOO < 10 km^2 or EOO < 100 km^2 with very limited distributions. *G. divaricata* is only known from a type specimen collected in 1823 from “north of Bathurst” and is likely to be extinct.
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	N/A
Principle 4	

Determining whether impacts are serious and irreversible	Assessment
Does the proposal impact on a species, a component of species habitat or an ecological community that is a candidate entity because it is irreplaceable?	No
b. If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	N/A

Table 9-12: Evaluation of flora SAII entities

Impact Assessment Provisions	Assessment
1. the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII	Direct impacts could remove up to: *G. divaricata* = 5.54 ha The proposed Development Footprint has been modified and evaluated to avoid the removal of woodland and better-quality grasslands where possible. Much of the DNG has been extensively modified due to grazing. *G. divaricata* is associated with PCT 331 within the Hill End subregion. No individuals were recorded during surveys; however, 5.54 ha of potential habitat was not surveyed due to being inaccessible or surveys were inadequate and hence the species has been included as present in these areas. Given the large extent of PCT 331 across the Development Corridor (87 ha) and given that it hasn't been found elsewhere it is unlikely to be present within these un-surveyed areas.
2a. The assessor must consult the TBDC and/or other sources to report on the current population of the species including: a. evidence of rapid decline in geographic distribution (Principle 1, clause 6.7(2)(a) BC Regulation) presented by an estimate of the i) decline in population of the species in NSW in the past 10 years or three generations ii) decline in population of the species in NSW in the past 10 years or 3 generations as indicated by and index of abundance appropriate to the species, decline in geographical distribution and or habitat quality, exploitation, effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites.	*G. divaricata* is only known from a type specimen collected in 1823 from "north of Bathurst" and is likely to be extinct. *G. divaricata* has a very small population size with fewer than 50 individuals or fewer than 250 individuals where threats are known. Very little is known about the species, however habitat loss due to grazing and inappropriate fire regimes are listed as key threats. Due to the small population size, lack of knowledge, and restricted distributions, the species is likely to decline due to on going threats.
2b. Evidenced by small population size (Principle 2) presented by: i) Estimate of current population size ii) Estimate of the decline in the species population in NSW in three years or 1 generation iii) Estimate of the number of mature individuals in each subpopulation or a percentage.	Insufficient data exists to provide an accurate or current assessment of population size for *G. divaricata*. The best estimate of the EOO is < 100 km^2 with a best estimate of the AOO is < 10 km^2 (TBCD 2024).
2c. evidence of limited geographic range (Principle 3) presented by: i) Extent of occurrence	The best estimate of the EOO for the species is < 100 km^2 with a best estimate of the AOO is < 10 km^2 (TBCD 2024).

Impact Assessment Provisions	Assessment
ii) Area of occupancy iii) Number of threat defined locations iv) Whether the species is likely to undergo extreme fluctuations.	There are no 'threat defined locations' listed, however, given the small population sizes and restricted geographical range it is likely that all known populations are threat defined locations. Given the widespread distribution and frequency of droughts on the east coast of Australia it is likely that drought could result in a rapid decline in population. Droughts are likely to increase in the future due to climate change.
2d. Evidence that the species us unlikely to respond to management (Principle 4) because: i) Known reproductive characteristics severely limit the ability to increase the existing population on or occupy new habitat. ii)The species is reliant on abiotic habitats which cannot be restored or replaced. iii) Life history traits and or ecology is known but the ability to control key threatening processes is negligible.	The ecological understanding of *G divaricata* is limited, complicating efforts to manage threats and our understanding is based on its closet relative, *G. rosmarinifolia*. Studies are being conducted on germination requirements such as smoke and fire. The lack of knowledge about life history traits and ecological requirements poses significant challenges to implementing management actions.
3a. Impact on species population. i) estimate number of individuals with the subject land, ii) estimate number of individuals to be impacted by the proposal,	It is unlikely that the proposal will directly impact upon individuals. No individuals were recorded across the Development Corridor, where surveys have been conducted to date, nor have there been records within 10 km of the Project Site. Direct impacts could remove up to: *G. divaricata* = 5.54 ha Based on a EOO of 100 km^2 (10,000 ha) there could be a potential loss of *G. divaricata* = 0.0005%,
3b. Impact on geographic range (Principles 1 and 3) presented by: v)Percentage of AOO or EOO to be impacted, vi) Impact on subpopulation, vii) Determine if the persisting subpopulation will remain viable, viii) Determine changes in threats to the subpopulation and habitat.	The best estimate of the EOO is < 100 km^2 with a best estimate of the AOO is < 10 km^2 (TBCD 2024). Targeted surveys were conducted across most of the Development Corridor (87 ha), with some inaccessible areas left unsurveyed where their presence was assumed. However, given the extensive coverage of surveyed areas, it is considered unlikely that this species occur in the unsurveyed areas. This assumption is based on the comprehensive nature of the completed surveys and the absence of detected occurrences in similar habitats. The Project Site comprises of large tracts of woodland. Project design refinement will avoid many of these patches particularly on the slopes. If present it is unlikely that the proposed development will fragment the population.

While it is highly unlikely that *G. divaricata* is present within the Project Site additional surveys will be undertaken in the 5.54 ha of suitable habitat.

10 Impact Summary

10.1 Impacts not requiring offsets

All impacts to native vegetation require offsetting. In accordance with Section 9.3 BAM (2020) areas not requiring assessment, and therefore no offsets required, include:

- Existing roads
- Cleared and exotic land
- Water courses and dams.

Within the Development Footprint these areas cover 50.6 ha.

10.2 Determining an offset requirement for impacts

The impacts of the development requiring offset for native vegetation (total of 681.96 ha) are outlined in Table 10-1. The impacts of the development requiring offsets for species credit species and their habitat are outlined in Table 10-2. A total of 18,268 ecosystem credits are required to offset the Project.

The Proponent has engaged environmental consultants to investigate the most appropriate biodiversity offset strategy for the Project. This process includes consideration of both land-based offsets through a Biodiversity Stewardship Site within the locality of the Project and Strategic Biodiversity Offset Delivery Agreements, as provided under the BC Act (as amended in 2025).

While the offset strategy is yet to be finalised, the Proponent is committed to delivering an approach that appropriately compensates for the unavoidable loss of biodiversity values and residual Project impacts.

The final strategy will be developed in consultation with DPHI and will be consistent with the mechanisms available under the BC Act and BC Act Regulations.

Table 10-1: Summary of residual impacts to native vegetation that require offsets

Vegetation Zone	PCT Name	Condition Class	TEC Association	Impact Area (ha)	Ecosystem Credits
SWS Bioregion					
1	76- Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	DNG	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes	0.77	23
2	84 – River Oak – Rough barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Good		1.21	30
3	84 – River Oak – Rough barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	DNG		1.9	23

Vegetation Zone	PCT Name	Condition Class	TEC Association	Impact Area (ha)	Ecosystem Credits
4	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	3.57	100
5	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	23.79	495
6	272 – White box – black cypress pine – red gum +/- Mugga Ironbark shrubby woodland in the hills of the NSW central western slopes	Good		173.19	7,184
7	272 – White box – black cypress pine – red gum +/- Mugga Ironbark shrubby woodland in the hills of the NSW central western slopes	DNG		64.92	1,333
8	274 – White Box -Rough barked apple alluvial woodland of the NSW central western slopes including in the Mudgee region	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.07	2
9	277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	1.92	69
10	277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	13.25	448
11	281 – Rough Barked Apple – red gum – yellow box woodland on alluvial clay to loam soils on the valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	4.24	98
12	331 – Red Stringybark woodland on hillslopes northern NSW South Western Slopes Bioregion	DNG		0.48	5
13	331 – Red Stringybark woodland on hillslopes northern NSW South Western Slopes Bioregion	Good		1.07	24
14	461 – Tumbledown Gum woodland on hills in the northern NSW South	DNG		0.57	25

Vegetation Zone	PCT Name	Condition Class	TEC Association	Impact Area (ha)	Ecosystem Credits
	Western Slopes Bioregion and southern Brigalow Belt South Bioregion				
15	76- Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Good	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes	0.06	1
16	281 – Rough Barked Apple – red gum – yellow box woodland on alluvial clay to loam soils on the valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.34	15
17	274 – White Box -Rough barked apple alluvial woodland of the NSW central western slopes including in the Mudgee region	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.83	28
Total SWS Bioregion				**292.18**	**9,903**
SEH Bioregion					
1	84 – River Oak – Rough barked Apple – red gum – box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Good		0.32	8
2	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	5.09	166
3	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Low	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	19.26	308
4	270 – White Box Tumbledown Red Gum – Long-leaved Box shrub/grass woodland on fine grained sediments of the upper Macquarie River	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.15	6
5	272 – White box – black cypress pine – red gum +/- Mugga Ironbark shrubby woodland in the hills of the NSW central western slopes	Good		56.62	2157
6	272 – White box – black cypress pine – red gum +/- Mugga Ironbark	DNG		41.39	894

Vegetation Zone	PCT Name	Condition Class	TEC Association	Impact Area (ha)	Ecosystem Credits
	shrubby woodland in the hills of the NSW central western slopes				
7	277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	DNG	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	1.26	47
8	287 – Long-leaved Box – Red Box – Red stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	DNG		102.07	975
9	287 – Long-leaved Box – Red Box – Red stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	Good		111.55	2790
10	331 – Red Stringybark woodland on hillslopes northern NSW South Western Slopes Bioregion	Good		37.21	823
11	331 – Red Stringybark woodland on hillslopes northern NSW South Western Slopes Bioregion	DNG		14.12	145
12	266 – White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Good	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.74	46
Total SEH Bioregion				**389.76**	**8,365**
TOTAL				**681.96**	**18,268**

Impacts to threatened species requiring offsets are outlined in Table 10-2. A total of 36,185 species credits are required to offset the residual impacts of the Project.

Table 10-2: Species credit species that require offsets

Scientific Name	Common Name	BC Act listing	EPBC Act listing	Loss of area (ha)	Biodiversity Risk weighting	Number of species credits
SWS Bioregion						
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V	51.4	2	1,687
Cercartetus nanus	Eastern Pygmy Possum	V	NL	50.03	2	1,666
Diuris tricolor	Pine Donkey Orchid	V	NL	0.50	2	11

Scientific Name	Common Name	BC Act listing	EPBC Act listing	Loss of area (ha)	Biodiversity Risk weighting	Number of species credits
Keyacris scurra	Key's Matchstick grasshopper	V	NL	5.67	2	99
Ninox connivens	Barking Owl	E	E	45.22	2	1,229
Ninox strenua	Powerful Owl	E	NL	1.58	2	49
Petaurus norfolcensis	Squirrel Glider	E	E	45.22	2	1,229
Phascogale tapoatafa	Brush-tailed Phascogale	E	E	80.76	2	2,271
Phascolarctos cinereus	Koala	V	NL	255.8	2	9,927
Prasophyllum petilum	Tarengo Leek Orchid	V	NL	6.08	2	218
Swainsona recta	Small Purple-pea	V	V	15.58	2	340
Swainsona sericea	Silky Swainson-pea	V	NL	19.14	2	442
Tylophora linearis		V	NL	0.57	1.5	29
Tyto novaehollandiae	Masked Owl	E	E	45.22	2	1,229
TOTAL						**20,426**
SEH Bioregion						
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V	13.42	2	428
Burhinus grallarius	Bush Stone-curlew	E	NL	18.78	2	616
Cercartetus nanus	Eastern Pygmy Possum	V	NL	8	2	260
Grevillea divaricata		E	NL	5.54	3	245
Keyacris scurra	Key's Matchstick Grasshopper	E	E	5.83	2	167
Ninox connivens	Barking Owl	V	NL	8.92	2	295
Ninox strenua	Powerful Owl	V	NL	1.6	2	22
Persoonia marginata	Clandulla Geebung	V	V	47.51	2	1,062
Petaurus norfolcensis	Squirrel Glider	V	NL	8.92	2	295
Phascogale tapoatafa	Brush-tailed Phascogale	V	NL	7.32	2	273
Phascolarctos cinereus	Koala	E	E	389.79	2	9,549
Swainsona recta	Small Purple-pea	E	E	26.5	2	458
Swainsona sericea	Silky Swainson-pea	E	E	77.69	2	1,744
Tyto novaehollandiae	Masked Owl	V	NL	8.92	2	295

Scientific Name	Common Name	BC Act listing	EPBC Act listing	Loss of area (ha)	Biodiversity Risk weighting	Number of species credits
Total						**15,709**
TOTAL						**36,133**

Offsets will be provided in accordance with the BOS. A biodiversity credit report and a Like for Like Credit report describing credit classes are included in Appendix G.

10.3 Summary of Mitigation and Management Measures

Table 10-3 summarises mitigation and management measures to be implemented throughout the Project.

Table 10-3 Summary of mitigation and management measures

Environmental Aspect	Mitigation Measure
General	The Project will be designed and constructed in a manner as to minimise or mitigate harm to the environment during the Project construction, operation or decommissioning through the implementation of all reasonable and feasible mitigation measures (see Table 8-6). An Environmental Management Strategy (EMS) will be developed to guide activities associated with construction, operation and decommissioning and rehabilitation of the Project. All site workers will be trained to ensure awareness of the EMS and site-specific training would be provided when specific work activities were taking place near areas of identified biodiversity values that are to be protected. Additional details on mitigation measures for impacts relating to noise, traffic, heritage, waste and visual are provided in the EIS.
BOS	A BOS will be prepared and implemented in accordance with the requirements of the BC Act and the EPBC Act Offsets Policy, which may include Establishment of Biodiversity Stewardship Sites on neighbouring properties.
Biodiversity	A BMP will be prepared in consultation with CPHR and for approval by DCCEEW, including an unexpected finds procedure. The BMP will include: • A BBAMP that will be prepared in consultation with BCS and approved by DCCEEW prior to construction (see Section 7.2) • A Weed Management Plan in accordance with Biosecurity protocols • Pre-clearing protocols, including pre-clearing inspections, establishment of exclusion zones and management of specific habitat features that are to be retained and/or relocated • An Erosion and Sediment Control Plan • Vegetation clearing protocols, including staged habitat removal and specified seasonal limits on clearing activities • Protocols for the salvage and relocation of woody debris, tree hollows and bush rock • Requirements for establishment of temporary fencing and demarcation of no-go zones • Monitoring during construction and post-construction • Adaptive measures if monitoring indicates unexpected adverse impacts – TARPs. • Biodiversity mitigation measures will include Project refinement to further minimise the clearing of native vegetation within the Development Footprint and the continuation of assessment of biodiversity impacts on detailed design. Opportunities will be continued to be explored to: • Minimise Development Footprint • Protection of HBTs • Minimise impacts to fauna movement corridors

Environmental Aspect	Mitigation Measure
	• Maintaining isolated paddock trees • Identify rehabilitation areas Pre-construction surveys will be conducted to confirm presence or absence of threatened flora within lands that were deemed inaccessible within and adjacent to the Development Footprint to ensure compliance with worst case assessment undertaken as reported in this BDAR. During construction, the placement of WTGs will be micro-sited to minimise interactions with threatened and protected species and ecological communities. During operation the following ongoing mitigation measures may be implemented: • Avoid placing WTGs within 300 m of active raptor nests – one active Wedge-tailed Eagle nest was found outside the Development Corridor, approximately 1.3 km south west of WTG 30 (see Figure 6-1) • Removal of carrion to prevent raptors being attracted near WTGs • Restricting lambing to paddocks at least 200 m away from WTGs • Rabbit control program to reduce site attractiveness to raptors Identification of impact triggers that may necessitate specific WTG shutdown.
Soils and Water	All water way crossing will be constructed in accordance with the guidelines (Section 4.1.3). Appropriate sediment and erosion controls will be implemented as per the BMP. This will include any exposed soil in stockpiles, temporary works, or permanent works such as covering vegetation or permanent capping. Runoff from fill batters facing towards Burrendong Dam will be retained as sheet flows using vegetation filter strips or concentrated in collection drains diverted via culverts or to enhanced sediment controls prior to release. Detailed design will assess the need for the use of cut/fill batter protection and effective site surface water management and drainage techniques to prevent the mobilisation of sediments to natural water courses. Cut and fill slopes and batters will be vegetated with grass as soon as possible following construction and be protected from overland surface water flows by the construction of surface drainage measures.
WTG - Collision Risk	Operational management and mitigation measures specific to the WTGs will be implemented to ensure impacts associated with bird and bat blade strike are minimised. These measures will be outlined in the BBAMP (see Section 7.3) in consultation with CPHR. This will include: • Regular monitoring / mortality surveys at frequencies based on findings of each survey and adaptive management strategies outlined in the BBAMP • Implementation of appropriate low wind speed curtailment strategies that include measures such as prevention of blade rotation prior to electricity generation cut-in speeds (turbine feathering), and increased cut-in speeds during high risk periods (see Section 7.2) • Research and trial smart bird and bat detection, curtailment and deterrent systems and effectiveness (see Section 7.2) • Commitment to collecting and providing data from ongoing bird and bat monitoring surveys to increase knowledge and success of adaptive management procedures.
SAII – Box Gum Woodland	Measures to avoid impacting Box Gum Woodland will include Project refinement to further minimise the clearing of this CEEC within the Development Footprint and the continuation of assessment of the CEEC within the Development Corridor. Opportunities will be continued to be explored to reduce impacts to the CEEC. Additional and appropriate measures are currently being considered in consultation with the CPHR. Details are provided in Section 9.1.1. This may include supporting local agencies to undertake restoration activities or alternative programs to improve and increase Box Gum Woodland in the community.

Environmental Aspect	Mitigation Measure
SAII – Cave Dwelling Bats	Operational management measures specific to the WTGs will be implemented to ensure impacts associated with bat blade strike and barotrauma are minimised. These measures will be outlined in the BBAMP (see Section 7.2) in consultation with CPHR.
Bushfire	A Bush Fire and Emergency Management and Operation Plan will be prepared that will detail procedures, process, and mitigations to manage potential fires on site during construction, operation and decommissioning in consultation with the Rural Fire Service. A minimum of 10m APZs will be established around each WTG comprising of a concrete foundation with additional 20m APZs around buildings and substations. All WTG will be made of non-combustible construction materials.

11 Consistency with legislation and policy

11.1 Environment Protection and Biodiversity Conservation Act (1999)

In accordance with the EPBC Act, a referral for the Project was submitted to the Commonwealth Department of Agriculture, Water and Environment (formally DAWE, now DCCEEW).

Under the Under the Bilateral agreement made under section 45 of the EPBC Act relating to environmental assessment (the bilateral agreement; DotE 2015), a proposed action does not require assessment under Part 8 of the EPBC Act, if the action is to be assessed under Part 4 Division 4.1 or Part 5.1 of the EP&A Act, provided the assessment:

- contains an assessment of all impacts the action has on each MNES (which will be specifically included in our BDAR)
- contains enough information about the controlled action and its relevant impacts to allow the Commonwealth Minister to make an informed decision whether or not to approve the action
- addresses all matters outlined in Schedule 4 of the Environment Protection and Biodiversity Conservation Regulations 2000 (EPBC Regs; DotE 2000).

Under the Amending Agreement No1 issued on 24 March 2020 between the NSW and Commonwealth Governments, the bilateral agreement will now apply to State Significant Development assessments carried out under the BAM and would apply to the assessment phase of the project. The Commonwealth government would still retain authority to issue their own approval under the bilateral agreement. The Project was referred to the DAWE and was considered a Controlled Action on 2 June 2021 (2021/8916).

A PMST was conducted at Project conception and at multiple times throughout the field assessments with the latest search conducted on the 3 October 2024. A likelihood of occurrence assessment was undertaken to assess the likelihood that these MNES could occur within or adjacent to the subject land. The criteria for assessing the MNES predicted by the PMST is listed below:

- Known – The species has been recorded during current surveys
- Potential – The species is known to occur in the locality and the subject land provides some habitat value for the species. Habitat values are somewhat degraded and suboptimal
- Likely – The species is known to occur within the locality and the subject land supports optimal habitat features for the species
- Unlikely – based on data collected during field investigations it was considered that the species was unlikely to occur within the subject land or use habitats within the subject land.

The PMST predicted three (3) threatened communities, 33 threatened fauna and 14 threatened flora that could occur within the Project Site. The likelihood of occurrence Table is included in Appendix F, with the results summarised in Table 11-1 below. Only species that were recorded or considered potential to occur within the Project Site are considered below.

Five PCTs were associated with Box Gum Woodland CEEC and 1 PCT (PCT 76) was consistent with Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived native grasslands of SE Australia. The EPBC listing for Box Gum Woodland is dependent upon condition, patch size and presence of important species. Section 3.1.3 provides justification of assessment under the EPBC Act.

Table 11-1: Assessment of potential impacts to MNES under the EPBC Act

MNES	Occurrence	Significant assessment
Threatened ecological communities	Two TECs is present within the Project Site. White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Potential Unlikely
Threatened species	Threatened species listed as MNES recorded include: • White-throated Needletail • Koala • Brown Treecreeper • Large-eared Pied Bat • Corben's Long-eared Bat • Diamond Firetail • Hooded Robin The following species were considered to have potential to occur: • Pink-tailed Legless Lizard • Key's Matchstick Grasshopper • *Prasophyllum petilum* / P.sp. Wybong • *Swainsona recta* • Painted Honeyeater • Regent Honeyeater – not on mapped important areas • Superb Parrot • Grey-headed Flying-fox • Grey Falcon • Diamond Firetail • *Dichanthium setosum* • *Persoonia marginata*	Potential Potential
Migratory species	One migratory species was recorded: White-throated Needletail One migratory species was considered to have the potential to occur: Satin flycatcher	Potential
Wetlands of International Importance	No Wetlands of National Importance are present within or in proximity to the Project Site.	Significant impact unlikely

Significant impact assessments have been completed for the above species and included in Appendix N and is summarized in Table 11-2 below.

Table 11-2: Impacts to MNES – summary table

Name of MNES	PCTs associated with the species	Likelihood of occurrence	Area of predicted impact (ha)	Consequence	Offsetting Approach	Credits Required	Significance?
THREATENED ECOLOGICAL COMMUNITIES							
White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and DNG	PCT 266 PCT 270 PCT 274 PCT 277 PCT 281	Present	32.02 ha	The Project has been designed to avoid and minimise the impacts to Box Gum Woodland, by avoiding woodland areas and higher quality grassland areas using the hierarchy approach outlined in Section 7 of this BDAR. Whilst up to 32.02 ha of the EPBC listed Box Gum Woodland has the potential to be impacted, mitigation measures during the proposed works will be implemented to prevent significant impacts. Current national extent is estimated to be 416,000 ha. The amount of this community to be impacted is small.	Retirement of credits through: Land based offsets through establishment of new stewardship site. Purchasing credits through the open market. Paying into the Biodiversity Conservation Fund. Additional offsets are being investigated in conjunction with CPHR. These additional measures are discussed in Appendix Q.	TOTAL=1,828*	Potential
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and DNG	PCT 76	Present	0.83 ha	This EEC is located along the road corridor along Yarrabin Road with a small area within the Transmission line. Most of this EEC will be impacted by widening the road which is already influenced by the existing road design.	Retirement of credits through: Land based offsets through establishment of new stewardship site. Purchasing credits through the open market. Paying into the Biodiversity Conservation Fund.	TOTAL = 24	No significant residual impacts are likely
FAUNA							

Name of MNES	PCTs associated with the species	Likelihood of occurrence	Area of predicted impact (ha)	Consequence	Offsetting Approach	Credits Required	Significance?
Anthochaera phrygia (Regent Honeyeater)	PCT 331 PCT 461 PCT 277 PCT 281 PCT 287	Potential – Not recorded during 483 independent bird surveys.	152.09 ha	The proposal will remove up to 152.09 ha of potential foraging habitat. This area has been subject to previous disturbance and is not an important mapped area for the Regent Honeyeater. Therefore, it is unlikely to reduce the AOO for this species. It will still be able to use the Study Area after construction of the WGTs, road upgrades and transmission lines. Records are known from west of Lake Burrendong, however the last known sighting was in 2001 (BioNet Atlas 2025).	Will be offset through ecosystem credit requirements		No significant residual impacts are likely
Aphelocephala leucopsis (Southern Whiteface)	All PCTs	Not recorded		Due to the narrow and linear nature of the proposed works, the abundance of suitable habitat in adjacent lands and the highly mobile nature of the Painted Honeyeater, the Project is unlikely to impact this species. 483 independent bird surveys were conducted across the Project Site over various season and across years, and no individuals were recorded.	Will be offset through ecosystem credit requirements		
Calyptorhynchus lathami lathami (Glossy Black Cockatoo)	PCT 76 PCT 266 PCT 270 PCT 331 PCT 461	Present		Species was not observed within the Development Corridor.. No breeding activity was detected. Potential to remove foraging habitat.	Will be offset through ecosystem credit requirements		

Name of MNES	PCTs associated with the species	Likelihood of occurrence	Area of predicted impact (ha)	Consequence	Offsetting Approach	Credits Required	Significance?
Climacteris picumnus victoriae (Brown Treecreeper)	All PCTs	Present	681.96 ha	Approximately 681.96 ha of the current Development Footprint contains vegetation which may be considered suitable foraging habitat for this species. The Brown Treecreeper should still be able to use the broader landscape after construction of the WGTs, road upgrades and transmission lines	Will be offset through ecosystem credit requirements		No significant residual impacts are likely
Grantiella picta (Painted Honeyeater)	All PCTs	Not recorded	388.02 ha	Due to the narrow and linear nature of the proposed works, the abundance of suitable habitat in adjacent lands and the highly mobile nature of the Painted Honeyeater, the Project is unlikely to impact this species. 483 independent bird surveys were conducted across the Project Site over various season and across years, and no individuals were recorded.	Will be offset through ecosystem credit requirements		
Euphrasia arguta	PCT 84 PCT 266 PCT 270 PCT 274 PCT 277 PCT 281 PCT 287	Not recorded		In February 2025 40 m grid surveys were overlaid across all associated PCTs. No individuals were recorded. Given the vast area survey it is unlikely that the species will occur in inaccessible areas as per agreed advice received from CPHR.	No offset credits required	-	No significant residual impacts are likely
Lathamus discolor (Swift Parrot)	All PCTs	Not recorded	388.02ha	Not identified on important area mapping. No impact to breeding habitat and only impacts to potential foraging habitat. 483 independent bird surveys	Will be offset through ecosystem credit requirements		No significant residual

Name of MNES	PCTs associated with the species	Likelihood of occurrence	Area of predicted impact (ha)	Consequence	Offsetting Approach	Credits Required	Significance?
				were conducted across the Project Site over various season and across years, and no individuals were recorded.			impacts are likely
Prasophyllum sp. Wybong* / *Prasophyllum petilum* (Tarengo Leek Orchid)	PCT 277 PCT 281	Assumed present in areas not surveyed	8.07 ha	The proposed development will remove up to 6.08 ha of potential habitat for *P. petilum*. The species has not been recorded and the species was assumed present in areas not suitably surveyed. *P.*sp Wybong* is also associated with PCT 84, 266, 272, 274 & 461. The proposal has the potential to remove 235.72 ha and will be offset through ecosystem credits.	Retirement of credits through: Land based offsets through establishment of new stewardship site. Purchasing credits through the open market. Paying into the Biodiversity Conservation Fund.	TOTAL = 218	No significant residual impacts are likely
Phascolarctos cinereus (Koala)	All PCTs	Present	645.59 ha	Although the proposed works will reduce the extent of Koala habitat by 645.59 ha, this removal is linear in nature and will not fragment potential habitat. Suitable habitat is present within the subject land and the broader surrounds. There are several corridors that are present throughout the site that will not be impacted by the proposed works. The population which occurs within this area is likely to be relatively mobile, and traverse throughout the suitable habitat within the broader landscape.	Retirement of credits through: Land based offsets through establishment of new stewardship site. Purchasing credits through the open market. Paying into the Biodiversity Conservation Fund.	TOTAL = 19,476	No significant residual impacts are likely

Name of MNES	PCTs associated with the species	Likelihood of occurrence	Area of predicted impact (ha)	Consequence	Offsetting Approach	Credits Required	Significance?
Swainsona recta (Small purple-pea)	PCT 76 PCT 270 PCT 266 PCT 277	Assumed present	42.08 ha	There is approximately 42.08 ha of potential habitat present for *S. recta* within the Development Corridor. The majority of the Development Footprint has been positioned in predominately cleared land along ridgelines that are used for farming and grazing operations. The species has not been recorded within the Project Site, however this remaining area has not yet been surveyed.	Retirement of credits through: Land based offsets through establishment of new stewardship site. Purchasing credits through the open market. Paying into the Biodiversity Conservation Fund.	TOTAL = 798	No significant residual impacts are likely
Tylophora linearis	PCT 272	Assumed present in areas not surveyed	0.57 ha	There is approximately 0.57 ha of potential habitat that remains to be surveyed for *T. linearis* along Burrendong Road. The species has not been recorded within the Project Site, however this remaining area has not yet been surveyed.	Retirement of credits through: Land based offsets through establishment of new stewardship site. Purchasing credits through the open market. Paying into the Biodiversity Conservation Fund	TOTAL = 29	No significant residual impacts are likely
Aprasia parapulchella (Pink-tailed Legless Lizard)	PCT 266 PCT 272 PCT 277 PCT 461	Expert report. Determined potential suitable habitat on site	64.82 ha	The Project will remove up to 64.82 ha of potential rocky habitat for this species. Whilst the species is highly fragmented across its range across the Central and Southern Tablelands and the Southwestern Slopes its distribution is not fully known. The Project Site contains areas of partially embedded rocks on well drained mid-slopes. Microhabitats such as rockiness and the	Retirement of credits through: Land based offsets through establishment of new stewardship site. Purchasing credits through the open market. Paying into the Biodiversity Conservation Fund	TOTAL = 2,115	No significant residual impacts are likely.

Name of MNES	PCTs associated with the species	Likelihood of occurrence	Area of predicted impact (ha)	Consequence	Offsetting Approach	Credits Required	Significance?
				presence of native grass cover are the principal determinants of occurrence.			
Apus pacificus (Fork-tailed Swift)	All PCTs	Not Recorded	681.96 ha	The Project will remove up to 681.96 ha of what is considered to be fly-over habitat. The species can fly within RSA and have the potential to be a collision risk with WTG. A TARP will be within the BBAMP to mitigate and manage impacts to this species.	Will be offset through ecosystem credit requirements	-	No significant residual impacts are likely.
Chalinolobus dwyeri (Large-eared Pied Bat)	PCT 270 PCT 274 PCT 277 PCT 281 PCT 331 PCT 461	Present	75.51 ha	There is no loss of breeding areas within the Development Corridor but there is the potential for loss of foraging area due to the loss of native vegetation (up to 75.51 ha) associated with PCTs. However, this species feeds on insects in flight and there is large tracts of woodland and DNG to support insects. This species has the potential to be impacted by blade strike or barotrauma, however, the species is likely to forage above the canopy and not within RSA. No individuals have been reported as a collision risk on operating windfarms.	Will be offset through ecosystem credit requirements	-	No significant residual impacts are likely.
Falco hypoleucos (Grey Falcon)	All PCTs	Not recorded	681.96 ha	The Grey Falcon is endemic to Australia and all individuals are in one population due to the highly mobile nature of this species. Suitable habitat includes grassland, shrubland and woody water courses in semi-arid and arid areas. 483	No offsets required	-	No significant residual impacts are likely.

Name of MNES	PCTs associated with the species	Likelihood of occurrence	Area of predicted impact (ha)	Consequence	Offsetting Approach	Credits Required	Significance?
				independent bird surveys were conducted across the Project Site over various season and across years, and no individuals were recorded.			
White-throated Needletail	All PCTs	Present	681.96 ha	This species is aerial and has been observed flying at RSA across the Project Site. WTGs can pose a threat to individuals due to collision. The risk rating was deemed to be moderate with an estimate strike rate of 3.27 individuals per year (based on 95% avoidance).	Will be offset through ecosystem credit requirements	-	No significant residual impacts are likely.
Keyacris scurra (Key's Matchstick Grasshopper)	PCT 266	Expert report identified potential habitat	11.5 ha	The Project has the potential to remove up to 11.5 ha of suitable grassland habitat. The species has not been recorded within the Project Site, however this remaining area has not yet been surveyed.	Retirement of credits through: Land based offsets through establishment of new stewardship site. Purchasing credits through the open market. Paying into the Biodiversity Conservation Fund	TOTAL = 266	No significant residual impacts are likely.
Melanodryas cucullata cucullata (Hooded Robin)	All PCTs – woodland form	Present	388.02 ha	Due to the narrow and linear nature of the proposed works, the abundance of suitable habitat in adjacent lands, the Project is unlikely to significantly impact this species. The species was recorded on site.	Will be offset through ecosystem credit requirements	-	No significant residual impacts are likely.

Name of MNES	PCTs associated with the species	Likelihood of occurrence	Area of predicted impact (ha)	Consequence	Offsetting Approach	Credits Required	Significance?
Nyctophilus corbeni (Corben's Long-eared Bat)	PCT 84 PCT 266 PCT 270 PCT 274 PCT 331 PCT 461 Woodland forms	Potentially Recorded	44.34 ha	The species occurs throughout much of inland NSW with the Pilliga scrub region a distinct stronghold for this species. It is difficult to separate the call of this species from others that call within the same range and based on its potential to exist in the locality the species was deemed likely to be present. The species is found in a wide range of inland woodland vegetation communities including Box-Ironbark woodlands which are found across the Project Site. The Project will remove up to 45 ha of potential woodland habitat. However, given the amount of habitat that will be retained within the Project Site, the Project is unlikely to significantly impact the species. This species has the potential to be impacted by blade strike or barotrauma, however, the species is likely to forage above the ground and not within RSA. No individuals have been reported as a collision risk on operating windfarms.	Will be offset through ecosystem credit requirements	-	No significant residual impacts are likely.
Persoonia marginata (Clandulla Geebung)	PCT 287	Assumed present in inaccessible areas	47.51	No individuals have been recorded and the species is generally associated with flat land supporting shrubby woodland on sandy loams (NPWS 2000). PCT 287 is associated with ridge lines and is rocky shallow soils. The species is unlikely with be within the Development Corridor and	Retirement of credits through: Land based offsets through establishment of new stewardship site.	TOTAL = 1,062	No significant residual impacts are likely

Name of MNES	PCTs associated with the species	Likelihood of occurrence	Area of predicted impact (ha)	Consequence	Offsetting Approach	Credits Required	Significance?
				surveys throughout PCT 287 did not record the species. Assumed present in areas that were inaccessible and not surveyed. The closed records are at Kandos approximately 60 km southeast.	Purchasing credits through the open market. Paying into the Biodiversity Conservation Fund		
Polytelis swainsonii (Superb Parrot)	All PCTs	Not recorded	681.96 ha	Due to the narrow and linear nature of the proposed works, the abundance of suitable habitat in adjacent lands and the highly mobile nature of the Superb parrot, the Project is unlikely to significantly impact this species. 483 independent bird surveys were conducted across the Development Corridor over various season and across years, and no individuals were recorded. The species was recorded within the Project Site near Wellington.	Will be offset through ecosystem credit requirements.	-	No significant residual impacts are likely.
Pteropus poliocephalus (Grey-headed Flying Fox)	All PCTs	Not recorded		Not identified during field surveys. Potential foraging habitat exists and the area could be a potential fly way between camps. No camps were identified within the Development Corridor or in the immediate surrounds.	Will be offset through ecosystem credit requirements.	-	No significant residual impacts are likely.
Stagonopleura guttata (Diamond Firetail)	All PCTs	Present	681.96 ha	The removal of up 681.96 ha of habitat is considered unlikely to significantly impact the availability or quality of habitat to the extent that the species is likely to decline due to the linear nature of the development. Additionally,	Will be offset through ecosystem credit requirements.	-	No significant residual impacts are likely.

Name of MNES	PCTs associated with the species	Likelihood of occurrence	Area of predicted impact (ha)	Consequence	Offsetting Approach	Credits Required	Significance?
				suitable, higher-quality habitat is available in the wider landscape.			
*credits required to offset 74.51 ha of NSW listed Box Gum Woodland							

MNES that have the potential to be significantly impacted by the Project are shown in Table 11-3. Mitigation measures and offsets liability have been included.

Table 11-3: Mitigation measures for MNES

MNES	Mitigation	Offsets
White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and DNG	Measures to avoid impacting Box Gum Woodland will include Project refinement to further minimise the clearing of this CEEC within the Development Footprint and the continuation of assessment of the CEEC within the Development Corridor. Opportunities will be continued to be explored to reduce impacts to the CEEC. Additional and appropriate measures if required will be determined in consultation with the CPHR and outlined in the BMP. This may include supporting local agencies to undertake restoration activities or alternative programs to improve and increase Box Gum Woodland in the community.	Credits under the BAM have been calculated for direct impacts relating to this CEEC. 1,828 credits
Prasophyllum sp. Wybong	Additional surveys are required and will be undertaken prior to construction	No offset credits have been calculated for this species. However offset credits have been calculated for *P. petilum* (the NSW State equivalent). 218 credits
Swainsona recta	Additional surveys are required and will be undertaken prior to construction	Offset credits under BAM have been calculated for this species. 798 credits
Tylophora linearis	Surveys were undertaken in February 2025 across the Development Corridor with only 0.5 ha not surveyed for this species. This section is along the Burrendong Road. Given the extensive nature of the surveys completed to date it is highly unlikely that this species occurs here.	Offset credits under BAM have been calculated for this species. 29 credits
Pink-tailed Legless Lizard	An expert report was prepared for this species to determine whether the species is likely to be present within the Development Corridor and its extent.	Offset credits under BAM have been calculated for this species. 2,115 credits
Key's Matchstick Grasshopper	An expert report was prepared for this species to determine whether the species is likely to be present within the Development Corridor and its extent. Surveys were planned prior to May 2025 focusing within these areas (11.5 ha), however response from the BOS Helpdesk on our survey methodology was received after the survey window had closed	Offset credits under BAM have been calculated for this species. 266 credits
White-throated Needletail	Operational management measures specific to the wind turbines will be implemented to ensure impacts associated with bird and bat blade strike are minimised. These measures will be outlined in the BBAMP in consultation with BCS. This will include: Regular monitoring / mortality surveys at frequencies based on findings of each survey and adaptive management strategies outlined in the BBAMP.	No credits have been calculated for this species

MNES	Mitigation	Offsets
	Investigate the need for, and the effectiveness, of appropriate low wind speed curtailment strategies that may include measures such as prevention of blade rotation prior to electricity generation cut-in speeds, and/or increase nighttime cut-in speeds. Research bird and bat deterrent systems and effectiveness. Commitment to collecting and providing data from ongoing bird and bat monitoring surveys to increase knowledge and success of adaptive management procedures.	

11.2 Mining and Exploration

Within the Project Site there are two Exploration Licences (EL) as available via MinView (NSW Geoscience, 2021). EL9032 and EL8967 lie within the bounds on the Project site and appear to be non-commercial operations. On the Western flank of Burrendong Dam, there are multiple Exploration Licences.

At the South Western extremity of the Project site, there is an operational Mining Lease - ML1035. The hobby mine is named Bald Hill, which is not to be confused with the historic Bald Hill mine located at Hill End. The ML mines an estimated 100 oz of gold annually, from an extrusive volcanic basalt from the Cenozoic Igneous Province of Serravallian age (13.82-11.63 ma). The area was mined for alluvial gold from 1850-1870 and has been mined via a tunnel with a crusher and sluice since the 1980's.

12 Conclusion

The Project Site is approximately 29,000 ha with a proposed Development Footprint of less than 730.73 ha. To provide flexibility in design all targeted surveys and assessments were undertaken within a wider Development Corridor (approximately 1,322 ha). The majority of this Development Corridor is located within predominately cleared land along ridgelines that are currently being used for farming and grazing operations surrounded by woodland. The detailed project design is currently in preparation and the final Development Footprint will be micro-sited within the broader Development Corridor.

This BDAR assesses that impacts of the Project according to the NSW BAM under the BC Act and has been applied to the current Development Corridor within which all direct impacts (both construction and operation) will occur.

Biodiversity impacts have been assessed through comprehensive survey, mapping and assessment completed in accordance with the BAM. Seven species of threatened bats, and fourteen threatened birds were detected during field surveys however, no breeding habitat for bats were within the Development Corridor and therefore species credits are not required. Koalas were heard calling on site during surveys with an individual sighting made during the February BBUS surveys. Species credits have been calculated for seven threatened species, four of which are assumed to be on site due to inability to survey during the required survey period (*Prasophyllum petilum, Diuris tricolor, Swainsona recta and Swainsona sericea*). Due to updates with the BAM-C and the release of survey guidelines species credits have also been calculated for eleven additional species to ensure all potential impacts have been accounted for.

Once a detailed design has been confirmed additional surveys may be undertaken and an amendment will be added to this BDAR with the final Offset Credits obligation calculated. The retirement of these credits will be carried out in accordance with the NSW BOS.

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Appendix A : Definitions

The following terminology has been used throughout this report for the purposes of describing the impacts of the proposal in the context of a biodiversity assessment in accordance with the NSW Biodiversity Assessment Method 2020. This terminology may or may not align with other technical documents associated with the proposed development.

Terminology	Definition
Ancillary Infrastructure	All wind farm infrastructure with the exception of The WTGs, Substation and Transmission Connections, Electrical Connections and Road Upgrades, including but not limited to, the onsite operations building, equipment storage facilities, concrete batching plant facilities, rock crushing, temporary and permanent laydown pads, construction compounds, access tracks to each turbine, temporary and permanent wind monitoring masts, communications equipment and other related facilities.
Biodiversity credit report	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a Project Site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site.
BioNet Atlas	The BioNet Atlas (formerly known as the NSW Wildlife Atlas) is the OEH database of flora and fauna records. The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails) and some fish
Broad condition state:	Areas of the same PCT that are in relatively homogenous condition. Broad condition is used for stratifying areas of the same PCT into a vegetation zone for the purpose of determining the vegetation integrity score.
Connectivity	The measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.
Credit Calculator	The computer program that provides decision support to assessors and proponents by applying the BAM, and which calculates the number and class of biodiversity credits required to offset the impacts of a development or created at a biodiversity stewardship site.
Development	Has the same meaning as development at section 4 of the EP&A Act, or an activity in Part 5 of the EP&A Act. It also includes development as defined in section 115T of the EP&A Act.
Development footprint	The area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials.
Ecosystem credits	A measurement of the value of EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur with a PCT. Ecosystem credits measure the loss in biodiversity values at a Development Site and the gain in biodiversity values at a biodiversity stewardship site.
Extent of occurrence (EOO)	Measures the spatial spread of a species to determine the degree to which risks from threatening factors could impact an entire population and is not intended to be an estimate of the amount of occupied or potential habitat.
High threat exotic plant cover	Plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species.
Hollow bearing tree	A living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the minimum entrance width is at least 5 cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1 m above the ground. Trees must be examined from all angles.

Terminology	Definition
Important wetland	A wetland that is listed in the Directory of Important Wetlands of Australia (DIWA) and SEPP 14 Coastal Wetlands
Linear shaped development	Development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length
Local population	The population that occurs in the Project Site. In cases where multiple populations occur in the Project Site or a population occupies part of the Project Site, impacts on each subpopulation must be assessed separately.
Local wetland	Any wetland that is not identified as an important wetland (refer to definition of Important wetland).
NSW (Mitchell) landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.
Multiple fragmentation impact development	Developments such as wind farms and coal seam gas extraction that require multiple extraction points (wells) or turbines and a network of associated development including roads, tracks, gathering systems/flow lines, transmission lines
Operational Manual	The Operational Manual published from time to time by DPIE, which is a guide to assist assessors when using the BAM
Patch size	An area of intact native vegetation that: a) occurs on the Project Site or biodiversity stewardship site, and b) includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems). Patch size may extend onto adjoining land that is not part of the Project Site or stewardship site.
Proponent	A person who intends to apply for consent to carry out development or for approval for an activity. Burrendong Wind Farm Pty Ltd
Reference sites	The relatively unmodified sites that are assessed to obtain local benchmark information when benchmarks in the Vegetation Benchmarks Database are too broad or otherwise incorrect for the PCT and/or local situation. Benchmarks can also be obtained from published sources.
Regeneration	The proportion of over-storey species characteristic of the PCT that are naturally regenerating and have a diameter at breast height <5 cm within a vegetation zone.
Residual impact	An impact on biodiversity values after all reasonable measures have been taken to avoid, minimise or mitigate the impacts of development. Under the BAM, an offset requirement is determined for the remaining impacts on biodiversity values.
Retirement of credits	The purchase and retirement of biodiversity credits from an already-established biobank site or a biodiversity stewardship site secured by a biodiversity stewardship agreement.
Riparian buffer	Riparian buffers applied to water bodies in accordance with the BAM
Sensitive biodiversity values land map	Development within an area identified on the map requires assessment using the BAM.
Site attributes	The matters assessed to determine vegetation integrity. They include: native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.
Site-based development	a development other than a linear shaped development, or a multiple fragmentation impact development

Terminology	Definition
Species credits	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
Project Site	The broader area of land including all private and crown land surrounding the development site. Approximately 29,000 ha.
Threatened Biodiversity Data Collection	Part of the BioNet database, published by DPIE and accessible from the BioNet website.
Threatened species	Critically Endangered, Endangered or Vulnerable threatened species as defined by Schedule 1 of the BC Act, or any additional threatened species listed under Part 13 of the EPBC Act as Critically Endangered, Endangered or Vulnerable.
Vegetation Benchmarks Database	A database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by OEH and is part of the BioNet Vegetation Classification.
Vegetation zone	A relatively homogenous area of native vegetation on a Project Site, land to be biodiversity certified or a biodiversity stewardship site that is the same PCT and broad condition state.
Wetland	An area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle. Wetlands may exhibit wet and dry phases and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water
Woody native vegetation	Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs

Appendix B : BAM-C Plot Data

Plot	PCT	IBRA	Patch Size	Cond Class	Zone	Easting	Northing	Bearing	Composition						Structure						Fun Large Tree	Fun Hollow tree	Fun Litter Cover	Fun Len Falle	Fun Tree Ste						Fun Tree Reg	Fun High Threat Exotic
									Tree	Shrub	Grass	Forbs	Ferns	Other	Tree	Shrub	Grass	Forbs	Ferns	Other	Large Tree	Hollow Tree	Litter Cover	Fallen								
Plot 1	84	NSW South Western Slopes - Inland Slopes	101	Good	55	711857.5	6386575	300	4	2	15	16	1	2	9.6	0.2	3.4	1.9	0.1	0.2	3	1	70	29	0	1	1	0	1	1	30.3	
Plot 10	331	South Eastern Highlands - Hill End	101	Good	55	709501.3	6380538	181	4	6	7	18	1	1	23.1	2.6	3.4	4.1	0.5	0.1	3	2	82	130	1	1	1	1	1	1	0.0	
Plot 100	331	NSW South Western Slopes - Inland Slopes	101	DNG	55	697520	6372890	179 S	1	3	14	12	1	2	1.0	0.1	53.7	2.1	0.1	0.2	0	0	27	11	1	0	0	0	0	1	6.2	
Plot 101	281	NSW South Western Slopes - Inland Slopes	101	DNG	55	698543	6376585	358 N	2	1	13	18	1	2	20.1	0.1	49.3	1.9	0.1	0.2	2	2	40	12	0	0	0	1	1	1	0.2	
Plot 102	272	NSW South Western Slopes - Inland Slopes	101	DNG	55	701588	6374698	107 E	0	0	17	12	0	1	0.0	0.0	53.5	1.2	0.0	0.1	0	0	44	45	0	0	0	0	0	0	5.1	
Plot 103	277	NSW South Western Slopes - Inland Slopes	101	DNG	55	717882	6387915	130 SE	2	0	15	11	0	0	8.0	0.0	54.1	1.1	0.0	0.0	1	0	10	0	0	0	0	1	1	1	0.4	
Plot 104	312	NSW South Western Slopes - Inland Slopes	101	Good	55	705804	6384666	95 E	2	1	15	11	0	3	25.1	0.2	25.3	1.2	0.0	0.3	2	0	42	25	1	1	1	1	1	1	0.1	
Plot 105	266	South Eastern Highlands - Hill End	101	DNG	55	709258	6379627	91 E	0	0	12	10	0	1	0.0	0.0	34.1	1.0	0.0	0.1	0	0	41	5	0	0	0	0	0	0	35.1	
Plot 106	84	NSW South Western Slopes - Inland Slopes	101	DNG	55	719327	6411220	213 SW	0	1	5	3	0	0	0.0	0.1	15.4	1.2	0.0	0.0	0	0	7	0	0	0	0	0	0	0	0.1	
Plot 107	277	NSW South Western Slopes - Inland Slopes	101	DNG	55	718623	6410817	198	1	3	7	6	0	2	20.0	1.1	25.1	0.8	0.0	0.2	2	0	11	2	1	1	0	1	1	0	0.5	
Plot 108	272	NSW South Western Slopes - Inland Slopes	101	DNG	55	714789	6410249	161 S	2	1	16	12	1	0	7.1	0.1	18.7	1.2	0.1	0.0	0	0	6	3	0	1	1	1	0	0	10.2	
Plot 11	331	South Eastern Highlands - Hill End	101	DNG	55	709631.5	6380494	295	0	2	13	14	1	3	0.0	0.4	62.9	2.2	0.5	4.0	0	0	23	0	0	0	0	0	0	0	10.2	
Plot 12	84	NSW South Western Slopes - Inland Slopes	101	Good	55	709738	6375700	310	3	2	19	8	1	3	6.2	0.3	32.2	1.0	0.1	0.4	5	2	52	15	1	0	1	0	1	1	5.5	
Plot 13	277	NSW South Western Slopes - Inland Slopes	101	Good	55	709971.5	6376233	24	4	2	16	15	0	3	9.1	0.3	38.4	2.5	0.0	0.4	3	1	24	15	1	1	1	1	1	1	0.7	
Plot 14	277	NSW South Western Slopes - Inland Slopes	101	DNG	55	709874.7	6376134	228	0	1	17	11	0	1	0.0	0.1	37.0	1.2	0.0	0.1	2	1	22	0	0	0	0	0	0	0	5.5	
Plot 15	266	NSW South Western Slopes - Inland Slopes	101	Good	55	709459.9	6376500	193	1	1	9	14	2	1	15.0	0.2	32.7	2.6	0.2	0.1	1	1	41	25	1	1	1	1	1	1	0.7	
Plot 16	84	NSW South Western Slopes - Inland Slopes	101	Good	55	708984.2	6376078	120	1	2	9	5	0	1	20.0	0.3	44.6	1.0	0.0	1.0	0	0	28	15	0	1	1	1	0	0	0.6	
Plot 17	287	South Eastern Highlands - Hill End	101	DNG	55	715650.2	6382374	292	0	2	9	10	2	3	0.0	5.1	29.4	1.1	0.3	0.3	0	0	48	3	0	0	0	0	0	0	3.0	
Plot 18	287	South Eastern Highlands - Hill End	101	Good	55	715698.6	6381948	95	3	6	8	14	1	1	10.5	10.5	10.2	1.4	0.1	0.1	0	2	54	30	1	1	1	1	0	1	0.5	
Plot 19	287	South Eastern Highlands - Hill End	101	Good	55	715958.9	6382659	30	4	5	10	9	1	2	20.1	0.9	1.1	1.7	0.1	0.2	2	0	80	38	1	1	1	1	0	1	0.0	

Plot	PCT	IBRA	Patch Size	Cond Class	Zone	Easting	Northing	Bearing	Composition						Structure						Fun Large Tree	Fun Hollow tree	Fun Litter Cover	Fun Len Falle	Fun Tree Ste						Fun Tree Reg	Fun Threat Exotic	High
									Tree	Shrub	Grass	Forbs	Ferns	Other	Tree	Shrub	Grass	Forbs	Ferns	Other	Large Tree	Hollow Tree	Litter Cover	Fallen									
Plot 2	272	NSW South Western Slopes - Inland Slopes	101	Good	55	710670.4	6385849	74	2	4	7	12	1	4	26.0	1.5	16.1	6.8	0.1	1.0	1	1	67	43	1	1	1	1	1	1	0.0	
Plot 20	287	South Eastern Highlands - Hill End	101	Good	55	715350	6385150	215	4	5	8	11	1	3	15.1	5.4	6.4	1.1	0.1	0.3	1	4	72	100	1	1	1	1	1	1	0.1	
Plot 21	287	South Eastern Highlands - Hill End	101	DNG	55	711099.5	6378008	180	0	0	6	10	0	1	0.0	0.0	7.2	11.1	0.0	0.1	0	0	18	0	0	0	0	0	0	0	0.3	
Plot 22	331	South Eastern Highlands - Hill End	101	Good	55	711103.2	6378380	174	5	2	11	15	1	0	21.1	10.3	2.2	2.7	0.2	0.0	0	5	64	150	1	1	1	1	0	0	0.1	
Plot 23	331	South Eastern Highlands - Hill End	101	DNG	55	711136.7	6378390	165	0	1	4	12	0	0	0.0	0.1	21.4	2.0	0.0	0.0	0	0	50	0	0	0	0	0	0	0	0.5	
Plot 24	287	South Eastern Highlands - Hill End	101	DNG	55	711795.1	6378936	56	0	0	8	16	1	1	0.0	0.0	56.1	3.0	0.2	0.1	0	0	13	0	0	0	0	0	0	0	1.1	
Plot 25	287	South Eastern Highlands - Hill End	101	Good	55	711804.6	6378901	240	4	4	9	11	1	2	28.0	15.4	2.7	2.0	0.1	0.3	0	4	81	75	1	1	1	1	1	0	0.0	
Plot 26	287	South Eastern Highlands - Hill End	101	DNG	55	712546.4	6379385	250	1	3	15	17	1	2	0.2	0.8	29.9	3.3	0.5	0.2	0	0	1.6	2	0	0	0	0	0	1	0.5	
Plot 27	287	South Eastern Highlands - Hill End	101	Good	55	712418.6	6379292	217	4	5	6	9	1	0	18.6	0.5	1.3	1.0	0.2	0.0	0	2	47	70	1	1	1	1	1	0	0.0	
Plot 28	287	South Eastern Highlands - Hill End	101	DNG	55	713415.3	6380010	332	1	4	9	13	1	1	0.1	0.4	67.0	7.5	0.1	0.1	0	0	4.8	0	0	0	0	0	0	1	0.1	
Plot 29	331	South Eastern Highlands - Hill End	101	DNG	55	713498.2	6380448	267	0	1	8	16	1	1	0.0	0.1	75.5	1.7	0.1	0.1	0	0	4.2	1.5	0	0	0	0	0	1	1.5	
Plot 3	272	NSW South Western Slopes - Inland Slopes	101	DNG	55	710804.5	6385681	275	0	1	9	19	1	2	0.0	0.1	29.7	5.9	0.3	0.2	0	0	30	9	0	0	0	0	0	0	0.8	
Plot 30	270	South Eastern Highlands - Hill End	101	Good	55	713794.6	6380539	60	4	2	11	15	1	2	9.1	20.1	6.4	1.7	0.1	0.2	9	6	56	85	1	1	1	1	1	1	0.1	
Plot 31	287	South Eastern Highlands - Hill End	101	DNG	55	714092.4	6380568	246	2	3	8	8	1	2	2.5	1.2	65.4	5.8	0.1	0.2	0	0	7.4	5	0	0	0	0	0	1	1.0	
Plot 32	287	South Eastern Highlands - Hill End	101	Good	55	714741.2	6381247	198	4	3	13	9	1	1	14.0	1.2	12.1	5.8	0.1	0.1	2	3	69	95	1	1	1	1	1	1	0.1	
Plot 33	287	South Eastern Highlands - Hill End	101	Good	55	717741.8	6382264	348	5	4	11	14	1	2	15.1	5.3	8.7	2.3	0.1	0.2	3	2	53	72	1	1	0	1	1	1	0.0	
Plot 34	287	South Eastern Highlands - Hill End	101	DNG	55	717970.8	6381737	352	0	2	11	9	1	2	0.0	0.2	55.9	0.9	0.1	0.2	0	0	17	4	0	0	0	0	0	0	1.0	
Plot 35	287	South Eastern Highlands - Hill End	101	DNG	55	719130	6380980	171	0	3	10	11	1	0	0.0	0.3	36.4	1.1	0.2	0.0	0	0	3.6	1	0	0	0	0	0	0	0.1	
Plot 36	287	South Eastern Highlands - Hill End	101	DNG	55	718696	6379195	329	0	2	16	5	1	1	0.0	0.2	56.4	0.6	3.0	0.1	0	0	8	0	0	0	0	0	0	0	0.1	
Plot 37	287	South Eastern Highlands - Hill End	101	DNG	55	717993.1	6376861	24	0	3	15	8	1	1	0.0	0.4	71.9	0.8	5.0	0.1	0	0	3.8	48	0	0	0	0	0	0	0.2	
Plot 38	272	South Eastern Highlands - Hill End	101	Good	55	713450	6371120	335	3	2	11	14	1	1	13.1	15.1	11.3	3.7	0.2	0.1	1	8	65	35	1	1	1	1	1	0	0.0	

Plot	PCT	IBRA	Patch Size	Cond Class	Zone	Easting	Northing	Bearing	Composition						Structure						Fun Large Tree	Fun Hollow tree	Fun Litter Cover	Fun Len Falle	Fun Tree Ste						Fun Tree Reg	Fun Threat Exotic	High
									Tree	Shrub	Grass	Forbs	Ferns	Other	Tree	Shrub	Grass	Forbs	Ferns	Other	Large Tree	Hollow Tree	Litter Cover	Fallen									
Plot 39	272	South Eastern Highlands - Hill End	101	DNG	55	712611	6372510	187	0	1	7	10	1	0	0.0	0.2	37.2	12.7	5.0	0.0	0	0	3.8	4	0	0	0	0	0	0	1.2	
Plot 4	272	South Eastern Highlands - Hill End	101	DNG	55	709835.3	6383909	88	0	1	10	11	0	0	0.0	0.3	11.3	1.8	0.0	0.0	0	0	52	14	0	0	0	0	0	0	5.1	
Plot 40	272	NSW South Western Slopes - Inland Slopes	101	Good	55	712188	6373380	181	2	2	6	9	1	1	10.0	15.1	12.3	2.8	5.0	0.1	0	12	70	110	1	1	1	1	0	0	0.2	
Plot 41	270	NSW South Western Slopes - Inland Slopes	101	Good	55	712277	6373780	121	2	4	9	14	1	3	10.0	5.3	20.6	21.3	0.1	0.3	0	5	57	22	1	1	1	0	0	1	0.4	
Plot 42	272	NSW South Western Slopes - Inland Slopes	101	DNG	55	708829.5	6372612	306	0	0	5	2	1	0	0.0	0.0	1.1	0.2	0.5	0.0	0	0	51	4	0	0	0	0	0	0	35.8	
Plot 43	272	NSW South Western Slopes - Inland Slopes	101	Good	55	708803.6	6372729	90	2	3	5	9	0	0	11.0	2.7	6.4	1.3	0.0	0.0	0	4	43	80	0	0	0	0	8	0	1.0	
Plot 44	266	NSW South Western Slopes - Inland Slopes	101	DNG	55	708687.5	6374378	350	0	0	10	6	1	0	0.0	0.0	19.9	0.7	0.5	0.0	0	0	32	0	0	0	0	0	0	0	20.5	
Plot 45	266	NSW South Western Slopes - Inland Slopes	101	DNG	55	708580.5	6374997	71	0	1	9	5	0	2	0.0	0.1	3.6	0.6	0.0	0.2	0	0	28	0	0	0	0	0	0	0	50.7	
Plot 46	266	NSW South Western Slopes - Inland Slopes	101	DNG	55	708939.4	6375341	233	0	0	10	9	1	3	0.0	0.0	12.8	1.4	0.5	0.3	0	0	26	0	0	0	0	0	0	0	27.6	
Plot 47	272	NSW South Western Slopes - Inland Slopes	101	Good	55	706573	6381990	308	3	2	7	15	1	1	10.1	30.1	41.1	7.3	0.1	0.1	0	5	47	25	0	1	1	1	0	1	0.0	
Plot 48	272	NSW South Western Slopes - Inland Slopes	101	DNG	55	705622	6384340	87	0	2	6	13	1	0	0.0	0.3	40.2	7.4	0.1	0.0	0	0	46	20	0	0	0	0	0	0	0.3	
Plot 49	272	NSW South Western Slopes - Inland Slopes	101	Good	55	705609	6385000	200	4	4	8	17	0	4	8.0	6.2	30.6	24.4	0.0	0.4	0	1	44	30	1	1	1	1	0	1	0.2	
Plot 5	272	South Eastern Highlands - Hill End	101	Good	55	709774.2	6384352	95	3	4	10	25	1	2	27.1	2.2	12.2	5.6	0.4	0.3	0	0	42	70	1	1	1	1	0	1	0.2	
Plot 50	272	NSW South Western Slopes - Inland Slopes	101	DNG	55	705625.6	6385052	308	0	2	15	17	1	2	0.0	0.2	27.9	6.8	1.0	0.2	0	0	22	10	0	0	0	0	0	0	0.2	
Plot 51	266	NSW South Western Slopes - Inland Slopes	101	DNG	55	707594	6381480	216	0	1	14	11	1	1	0.0	0.1	80.8	1.1	0.1	0.1	0	0	9	7	0	0	0	0	0	0	1.0	
Plot 52	287	South Eastern Highlands - Hill End	101	Good	55	715493	6384160	304	3	4	11	13	1	1	15.0	1.3	3.8	2.2	0.1	0.1	0	2	70.2	100	1	1	1	1	0	1	0.0	
Plot 53	287	South Eastern Highlands - Hill End	101	Good	55	712940	6379600	87	3	4	6	6	1	1	22.1	0.4	0.6	0.6	0.2	0.1	0	0	97.6	35	1	1	1	1	0	1	0.0	
Plot 54	277	NSW South Western Slopes - Inland Slopes	101	Good	55	709675	6375390	190	2	2	9	14	1	2	20.1	0.2	1.7	2.2	0.1	0.2	0	0	95.8	20	1	1	1	1	1	0	0.2	
Plot 55	266	NSW South Western Slopes - Inland Slopes	101	Good	55	708336	6376760	280	2	1	16	12	2	4	5.1	0.1	62.2	2.5	0.3	0.4	0	0	26	10	0	0	0	1	0	1	5.4	
Plot 56	266	NSW South Western Slopes - Inland Slopes	101	Good	55	697182	6372620	99	1	1	12	4	1	3	2.0	0.3	70.8	1.4	0.3	0.3	0	0	18	0	1	0	0	0	0	0	0.5	
Plot 57	266	NSW South Western Slopes - Inland Slopes	101	DNG	55	697870	6373040	315	0	1	7	12	0	1	0.0	0.2	53.1	22.4	0.0	0.1	0	0	21	0	0	0	0	0	0	0	0.5	

Plot	PCT	IBRA	Patch Size	Cond Class	Zone	Easting	Northing	Bearing	Composition						Structure						Fun Large Tree	Fun Hollow tree	Fun Litter Cover	Fun Len Falle	Fun Tree Ste						Fun Tree Reg	Fun Threat Exotic	High
									Tree	Shrub	Grass	Forbs	Ferns	Other	Tree	Shrub	Grass	Forbs	Ferns	Other	Large Tree	Hollow Tree	Litter Cover	Fallen								
Plot 58	272	NSW South Western Slopes - Inland Slopes	101	DNG	55	711868	6369482	135	0	1	5	9	1	0	0.0	0.1	6.0	0.9	2.0	0.0	2	0	19	11	0	0	0	0	0	1	45.7	
Plot 59	266	NSW South Western Slopes - Inland Slopes	101	DNG	55	698271	6373200	61	0	2	14	22	1	2	0.0	0.4	60.3	4.8	5.0	0.2	0	0	25	29	0	0	0	0	0	0	1.4	
Plot 6	331	South Eastern Highlands - Hill End	101	Good	55	709142.5	6381998	355	4	6	8	15	1	2	25.5	2.7	3.1	4.0	0.1	0.3	1	2	80	91	1	1	1	1	1	1	0.0	
Plot 60	277	NSW South Western Slopes - Inland Slopes	101	Good	55	709684.7	6375378	220	2	2	7	13	1	2	10.1	0.2	3.4	2.2	0.1	0.2	2	0	78	20	1	1	1	1	1	1	0.2	
Plot 61	277	NSW South Western Slopes - Inland Slopes	101	DNG	55	709894.1	6375559	135	0	0	11	10	1	0	0.0	0.0	83.7	1.4	0.1	0.0	0	0	8.8	0	0	0	0	0	0	0	0.2	
Plot 62	277	NSW South Western Slopes - Inland Slopes	101	DNG	55	709845.5	6375778	223	0	0	10	6	0	0	0.0	0.0	68.6	0.6	0.0	0.0	0	0	4.6	0	0	0	0	0	0	0	20.8	
Plot 63	287	South Eastern Highlands - Hill End	101	DNG	55	718356.4	6376624	308	0	1	11	14	1	3	0.0	0.1	52.1	1.8	1.0	0.3	0	0	9	20	0	0	0	0	0	0	0.7	
Plot 64	84	South Eastern Highlands - Hill End	101	Good	55	718127.8	6378842	318	2	10	16	19	1	1	5.1	3.0	50.6	2.4	0.2	0.1	0	0	33	35	1	1	1	0	0	1	0.7	
Plot 65	461	NSW South Western Slopes - Inland Slopes	101	Good	55	713793	6380550	58	3	2	12	13	1	3	7.1	0.2	43.6	1.3	0.1	0.4	0	1	33	20	1	1	1	0	0	1	5.1	
Plot 66	461	NSW South Western Slopes - Inland Slopes	101	Good	55	695570	6386620	237	3	0	11	6	1	2	5.6	0.0	25.8	0.6	1.0	0.3	0	3	30	50	1	1	1	0	0	1	20.3	
Plot 67	84	NSW South Western Slopes - Inland Slopes	101	Good	55	696525	6386560	352	1	0	9	11	0	3	5.0	0.0	58.4	2.9	0.0	0.3	2	1	31	0	0	0	0	0	1	1	1.5	
Plot 68	76	NSW South Western Slopes - Inland Slopes	101	DNG	55	708676	6376230	172	2	1	14	18	1	2	5.1	0.5	51.7	9.4	0.2	0.3	1	1	11.2	15	0	0	0	0	0	1	0.4	
Plot 69	76	NSW South Western Slopes - Inland Slopes	101	DNG	55	697794	6386700	257	0	1	12	4	1	0	0.0	0.1	57.6	0.9	0.1	0.0	0	0	42	0	0	0	0	0	0	0	6.1	
Plot 7	331	South Eastern Highlands - Hill End	101	Good	55	708905.5	6381289	109	3	5	4	7	1	0	25.1	0.5	1.6	2.0	0.2	0.0	1	2	90	72	1	1	1	1	1	1	0.0	
Plot 70	76	NSW South Western Slopes - Inland Slopes	101	DNG	55	697255	6386590	306	0	1	10	5	1	0	0.0	5.0	40.4	1.5	0.1	0.0	0	0	17	0	0	0	0	0	0	0	16.0	
Plot 71	0	NSW South Western Slopes - Inland Slopes	101	EXOTIC	55	731650.2	6390950	256	1	0	3	1	0	0	15.0	0.0	0.5	0.2	0.0	0.0	0	0	40	6	0	0	1	1	0	0	35.0	
Plot 72	281	NSW South Western Slopes - Inland Slopes	101	Good	55	729405.2	6389775	35	3	2	8	13	0	2	22.2	0.2	12.6	4.4	0.0	0.5	0	0	51	5	1	1	1	1	0	1	5.3	
Plot 73	84	NSW South Western Slopes - Inland Slopes	101	DNG	55	717847.2	6387918	37	2	0	11	3	0	0	0.3	0.0	51.2	0.3	0.0	0.0	0	0	30	6	1	0	1	0	0	1	10.2	
Plot 74	270	NSW South Western Slopes - Inland Slopes	101	Regen	55	718373.6	6386048	350	1	4	11	18	1	2	15.0	9.2	27.5	3.5	0.3	0.3	1	0	37	15	1	1	0	0	1	0	0.3	
Plot 75	270	NSW South Western Slopes - Inland Slopes	101	Regen	55	718349.1	6385790	162	1	3	13	15	1	2	7.0	5.1	25.4	5.8	0.8	0.3	0	0	32	38	1	1	1	1	0	0	0.2	
Plot 76	281	NSW South Western Slopes - Inland Slopes	101	DNG	55	714734.5	6402725	102	0	0	10	2	0	0	0.0	0.0	81.7	0.2	0.0	0.0	0	0	18.4	0	0	0	0	0	0	0	0.1	

Plot	PCT	IBRA	Patch Size	Cond Class	Zone	Easting	Northing	Bearing	Composition						Structure						Fun Large Tree	Fun Hollow tree	Fun Litter Cover	Fun Len Falle	Fun Tree Ste						Fun Tree Reg	Fun Threat Exotic	High
									Tree	Shrub	Grass	Forbs	Ferns	Other	Tree	Shrub	Grass	Forbs	Ferns	Other	Large Tree	Hollow Tree	Litter Cover	Fallen									
Plot 77	281	NSW South Western Slopes - Inland Slopes	101	DNG	55	719542.3	6411336	16	0	0	9	4	0	1	0.0	0.0	46.5	0.8	0.0	0.1	0	0	15	0	0	0	0	0	0	0	3.1	
Plot 78	281	NSW South Western Slopes - Inland Slopes	101	DNG	55	715143.5	6402702	111	0	1	12	2	1	0	0.0	0.1	52.2	1.2	0.5	0.0	0	0	14	0	0	0	0	0	0	0	0.5	
Plot 79	277	NSW South Western Slopes - Inland Slopes	101	Good	55	714496.8	6399357	216	1	0	13	11	1	1	25.0	0.0	17.2	1.3	0.1	0.1	2	1	21.6	2	0	0	1	1	1	1	0.3	
Plot 8	331	South Eastern Highlands - Hill End	101	Good	55	709065.5	6379981	144	2	2	6	17	1	0	30.0	0.6	1.1	2.6	0.1	0.0	0	2	85	119	1	1	1	1	0	1	0.0	
Plot 80	274	NSW South Western Slopes - Inland Slopes	101	Good	55	716827.7	6394851	148	2	2	6	8	1	1	5.1	0.6	2.1	20.7	0.3	0.2	2	1	43	53	1	1	1	0	1	1	0.7	
Plot 81	274	NSW South Western Slopes - Inland Slopes	101	Good	55	723762.1	6389299	170	3	4	5	7	2	2	24.0	20.3	1.4	2.6	0.4	0.2	0	0	43	56	1	1	1	1	0	1	0.3	
Plot 82	281	NSW South Western Slopes - Inland Slopes	101	Good	55	729236.1	6389742	84	3	0	2	3	0	0	30.2	0.0	2.1	0.7	0.0	0.0	0	2	48	27	1	1	1	1	1	1	50.7	
Plot 83	266	South Eastern Highlands - Hill End	101	Low	55	720437	6378576	0	0	0	8	5	1	0	0.0	0.0	55.5	2.4	0.1	0.0	0	0	32	0	0	0	0	0	0	0	0.1	
Plot 84	266	South Eastern Highlands - Hill End	101	Low	55	720406	6379074	90	0	0	4	5	0	0	0.0	0.0	20.2	1.5	0.0	0.0	0	0	10.6	0	0	0	0	0	0	0	0.1	
Plot 85	266	South Eastern Highlands - Hill End	101	Low	55	720360	6379685	90	0	1	8	6	0	0	0.0	0.2	55.8	0.6	0.0	0.0	0	0	5	0	0	0	0	0	0	0	0.0	
Plot 86	266	South Eastern Highlands - Hill End	101	Low	55	720061	6380681	180	0	1	6	4	1	0	0.0	0.1	77.2	10.3	0.1	0.0	0	0	5.8	1	0	0	0	0	0	0	0.0	
Plot 87	272	NSW South Western Slopes - Inland Slopes	101	Good	55	713504	6385049	355 N	4	3	9	12	1	3	29.0	15.1	29.5	2.5	0.1	0.8	0	0	34	20	0	1	1	0	0	1	15.1	
Plot 88	272	South Eastern Highlands - Hill End	101	Good	55	714905	6383527	274 W	5	4	11	10	1	2	24.1	4.6	10.7	1.0	0.1	0.2	0	0	49	26	1	1	1	1	0	1	15.0	
Plot 89	272	South Eastern Highlands - Hill End	101	DNG	55	713594	6380832	326 NW	4	0	15	9	1	2	1.1	0.0	40.7	0.9	0.1	0.2	0	0	32	5	0	0	0	0	0	1	10.0	
Plot 9	331	South Eastern Highlands - Hill End	101	DNG	55	709704	6379874	150	0	0	9	15	0	2	0.0	0.0	17.2	7.8	0.0	0.2	0	0	50	0	0	0	0	0	0	0	0.6	
Plot 90	266	South Eastern Highlands - Hill End	101	DNG	55	708682	6381271	141 SE	0	0	14	8	1	2	0.0	0.0	62.2	0.8	0.1	0.2	0	0	22	27	0	0	0	0	0	0	2.0	
Plot 91	272	South Eastern Highlands - Hill End	101	Good	55	707509	6381172	290 W	2	1	7	11	0	2	28.0	0.2	35.5	1.1	0.0	0.2	4	1	66	68	1	0	1	1	1	1	0.6	
Plot 92	266	South Eastern Highlands - Hill End	101	DNG	55	708572	6381370	325 NW	0	0	11	9	1	2	0.0	0.0	52.8	0.9	0.1	0.2	0	0	49	12	0	0	0	0	0	1	20.2	
Plot 93	272	South Eastern Highlands - Hill End	101	Good	55	707939	6381618	74 E	5	4	15	9	1	4	36.2	3.5	26.6	0.9	0.1	0.4	2	2	74	38	1	1	1	1	1	1	0.2	
Plot 94	331	NSW South Western Slopes - Inland Slopes	101	Good	55	707694	6381616	341 N	4	4	10	16	1	4	25.1	5.3	31.5	1.6	0.1	0.4	0	2	69	45	0	1	1	1	0	0	0.1	
Plot 95	331	NSW South Western Slopes - Inland Slopes	101	DNG	55	707693	6381467	216 SW	2	0	15	6	0	0	0.2	0.0	46.3	0.6	0.0	0.0	0	0	22	32	0	0	0	0	0	1	20.1	

Plot	PCT	IBRA	Patch Size	Cond Class	Zone	Easting	Northing	Bearing	Composition						Structure						Fun Large Tree	Fun Hollow tree	Fun Litter Cover	Fun Len Falle	Fun Tree Ste						Fun Tree Reg	Fun Threat Exotic	High
									Tree	Shrub	Grass	Forbs	Ferns	Other	Tree	Shrub	Grass	Forbs	Ferns	Other	Large Tree	Hollow Tree	Litter Cover	Fallen									
Plot 96	272	NSW South Western Slopes - Inland Slopes	101	Good	55	707145	6381607	328 NW	5	5	13	16	1	3	23.1	10.4	19.9	1.6	0.1	0.3	4	3	47	3	1	1	1	1	1	1	0.0	
Plot 97	272	South Eastern Highlands - Hill End	101	DNG	55	707795	6381425	250 W	0	1	12	14	1	2	0.0	1.0	22.9	1.4	0.1	0.2	0	0	40	82	0	0	0	0	0	0	40.2	
Plot 98	272	South Eastern Highlands - Hill End	101	DNG	55	708864	6380706	233 SW	0	1	13	9	1	1	0.0	0.1	29.1	0.9	0.1	0.1	0	0	51	47	0	0	0	0	0	0	35.1	
Plot 99	266	NSW South Western Slopes - Inland Slopes	101	DNG	55	698908	6375568	150 SE	0	0	14	5	0	0	0.0	0.0	69.1	0.5	0.0	0.0	0	0	16.2	0	0	0	0	0	0	0	0.2	
Plot 1	84	NSW South Western Slopes - Inland Slopes	101	Good	55	711857.5	6386575	300	4	2	15	16	1	2	9.6	0.2	3.4	1.9	0.1	0.2	3	1	70	29	0	1	1	0	1	1	30.3	
Plot 10	331	South Eastern Highlands - Hill End	101	Good	55	709501.3	6380538	181	4	6	7	18	1	1	23.1	2.6	3.4	4.1	0.5	0.1	3	2	82	130	1	1	1	1	1	1	0.0	
Plot 100	331	NSW South Western Slopes - Inland Slopes	101	DNG	55	697520	6372890	179 S	1	3	14	12	1	2	1.0	0.1	53.7	2.1	0.1	0.2	0	0	27	11	1	0	0	0	0	1	6.2	

Appendix C : Vegetation Integrity Plot Data

Plot	PCT	Condition	Zone	Easting	Northing	Bearing
1	84	Good	55	711857.5	6386575	300
2	272	Good	55	710670.4	6385849	74
3	272	DNG	55	710804.5	6385681	275
4	272	DNG	55	709835.3	6383909	88
5	272	Good	55	709774.2	6384352	95
6	331	Good	55	709142.5	6381998	355
7	331	Good	55	708905.5	6381289	109
8	331	Good	55	709065.5	6379981	144
9	331	DNG	55	709704	6379874	150
10	331	Good	55	709501.3	6380538	181
11	331	DNG	55	709631.5	6380494	295
12	84	Good	55	709738	6375700	310
13	277	Good	55	709971.5	6376233	24
14	277	DNG	55	709874.7	6376134	228
15	266	Good	55	709459.9	6376500	193
16	84	Good	55	708984.2	6376078	120
17	287	DNG	55	715650.2	6382374	292
18	287	Good	55	715698.6	6381948	95
19	287	Good	55	715958.9	6382659	30
20	287	Good	55	715350	6385150	215
21	287	DNG	55	711099.5	6378008	180
22	331	Good	55	711103.2	6378380	174
23	331	DNG	55	711136.7	6378390	165
24	287	DNG	55	711795.1	6378936	56
25	287	Good	55	711804.6	6378901	240
26	287	DNG	55	712546.4	6379385	250
27	287	Good	55	712418.6	6379292	217
28	287	DNG	55	713415.3	6380010	332
29	331	DNG	55	713498.2	6380448	267
30	270	Good	55	713794.6	6380539	60
31	287	DNG	55	714092.4	6380568	246
32	287	Good	55	714741.2	6381247	198
33	287	Good	55	717741.8	6382264	348
34	287	DNG	55	717970.8	6381737	352

Plot	PCT	Condition	Zone	Easting	Northing	Bearing
35	287	DNG	55	719130	6380980	171
36	287	DNG	55	718696	6379195	329
37	287	DNG	55	717993.1	6376861	24
38	272	Good	55	713450	6371120	335
39	272	DNG	55	712611	6372510	187
40	272	Good	55	712188	6373380	181
41	270	Good	55	712277	6373780	121
42	272	DNG	55	708829.5	6372612	306
43	272	Good	55	708803.6	6372729	90
44	266	DNG	55	708687.5	6374378	350
45	266	DNG	55	708580.5	6374997	71
46	266	DNG	55	708939.4	6375341	233
47	272	Good	55	706573	6381990	308
48	272	DNG	55	705622	6384340	87
49	272	Good	55	705609	6385000	200
50	272	DNG	55	705625.6	6385052	308
51	266	DNG	55	707594	6381480	216
52	287	Good	55	715493	6384160	304
53	287	Good	55	712940	6379600	87
54	277	Good	55	709675	6375390	190
55	266	Good	55	708336	6376760	280
56	266	Good	55	697182	6372620	99
57	266	DNG	55	697870	6373040	315
58	272	DNG	55	711868	6369482	135
59	266	DNG	55	698271	6373200	61
60	277	Good	55	709684.7	6375378	220
61	277	DNG	55	709894.1	6375559	135
62	277	DNG	55	709845.5	6375778	223
63	287	DNG	55	718356.4	6376624	308
64	84	Good	55	718127.8	6378842	318
65	461	Good	55	713793	6380550	58
66	461	Good	55	695570	6386620	237
67	84	Good	55	696525	6386560	352
68	76	DNG	55	708676	6376230	172
69	76	DNG	55	697794	6386700	257
70	76	DNG	55	697255	6386590	306

Plot	PCT	Condition	Zone	Easting	Northing	Bearing
71	0	Exotic	55	731650.2	6390950	256
72	281	Good	55	729405.2	6389775	35
73	84	DNG	55	717847.2	6387918	37
74	270	Regen	55	718373.6	6386048	350
75	270	Regen	55	718349.1	6385790	162
76	281	DNG	55	714734.5	6402725	102
77	281	DNG	55	719542.3	6411336	16
78	281	DNG	55	715143.5	6402702	111
79	277	Good	55	714496.8	6399357	216
80	274	Good	55	716827.7	6394851	148
81	274	Good	55	723762.1	6389299	170
82	281	Good	55	729236.1	6389742	84
83	266	Low	55	720437	6378576	0
84	266	Low	55	720406	6379074	90
85	266	Low	55	720360	6379685	90
86	266	Low	55	720061	6380681	180
87	272	Good	55	713504	6385049	355
88	272	Good	55	714905	6383527	274
89	272	DNG	55	713594	6380832	326
90	266	DNG	55	708682	6381271	141
91	272	Good	55	707509	6381172	290
92	266	DNG	55	708572	6381370	325
93	272	Good	55	707939	6381618	74
94	331	Good	55	707694	6381616	341
95	272	Good	55	707145	6381607	328
96	272	DNG	55	707795	6381425	250
97	272	DNG	55	708864	6380706	233
98	266	DNG	55	698908	6375568	150
99	272	Good	55	713504	6385049	355
100	331	DNG	55	697520	6372890	179
101	281	DNG	55	698543	6376585	358
102	272	DNG	55	701588	6374698	107
103	277	DNG	55	717882	6387915	130
104	312	Good	55	705804	6384666	95
105	266	DNG	55	709258	6379627	91
106	84	DNG	55	719327	6411220	213

Plot	PCT	Condition	Zone	Easting	Northing	Bearing
107	277	DNG	55	718623	6410817	198
108	272	DNG	55	714789	6410249	161

Plot Composition Data – excel spread sheet Export CSV to BAMC

Appendix D : PCT Mapping and VI plot locations



Plant Community Types (Page 1 of 62)

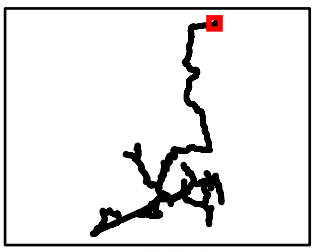
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
- Road/Track

0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
Date Prepared: 26/02/2026



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Plant Community Types (Page 2 of 62)

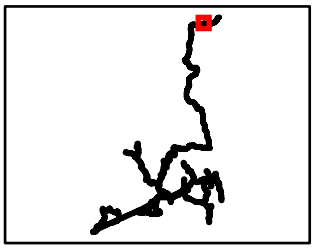
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- Development Footprint
- IBRA Subregions

Plant Community Types

- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
- Exotic
- Road/Track

0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
Date Prepared: 26/02/2026



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Plant Community Types (Page 3 of 62)

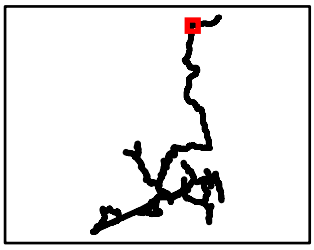
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- Development Footprint
- IBRA Subregions

Plant Community Types

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
- Exotic
- Road/Track

0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
Date Prepared: 26/02/2026



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Plant Community Types (Page 4 of 62)

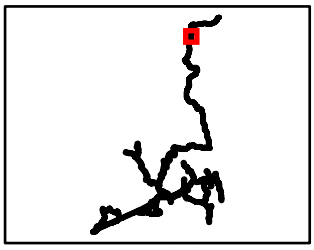
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
- Exotic
- Road/Track

0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
Date Prepared: 26/02/2026



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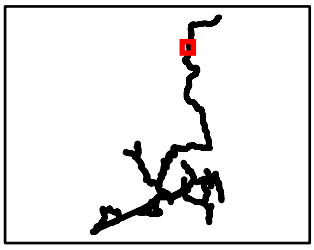
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
- Exotic
- Road/Track

0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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Plant Community Types (Page 6 of 62)

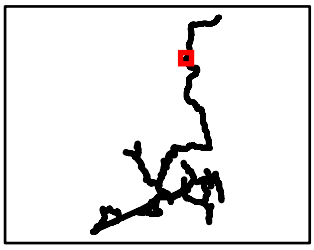
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- 461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion
- Exotic
- Road/Track

0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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Plant Community Types (Page 7 of 62)

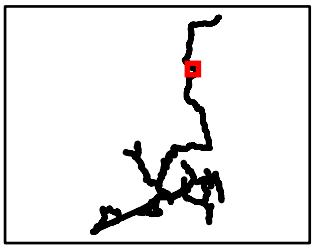
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
- 461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion
- Exotic
- Dam
- Road/Track
- Cleared

0 75 150 300
Metres

Datum/Projection:
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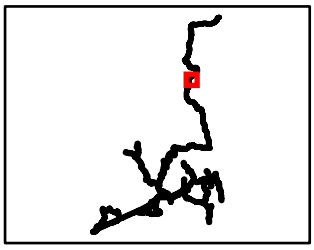
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- Exotic
- Road/Track
- Cleared

0 75 150 300
Metres

Datum/Projection:
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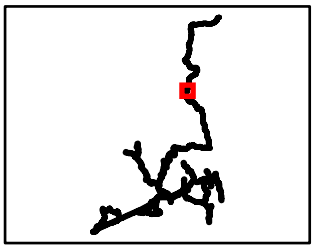
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- Drainage
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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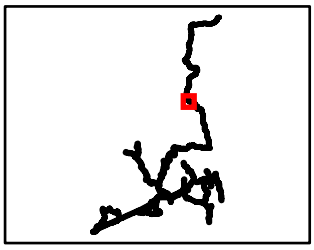
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 11 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Road/Track

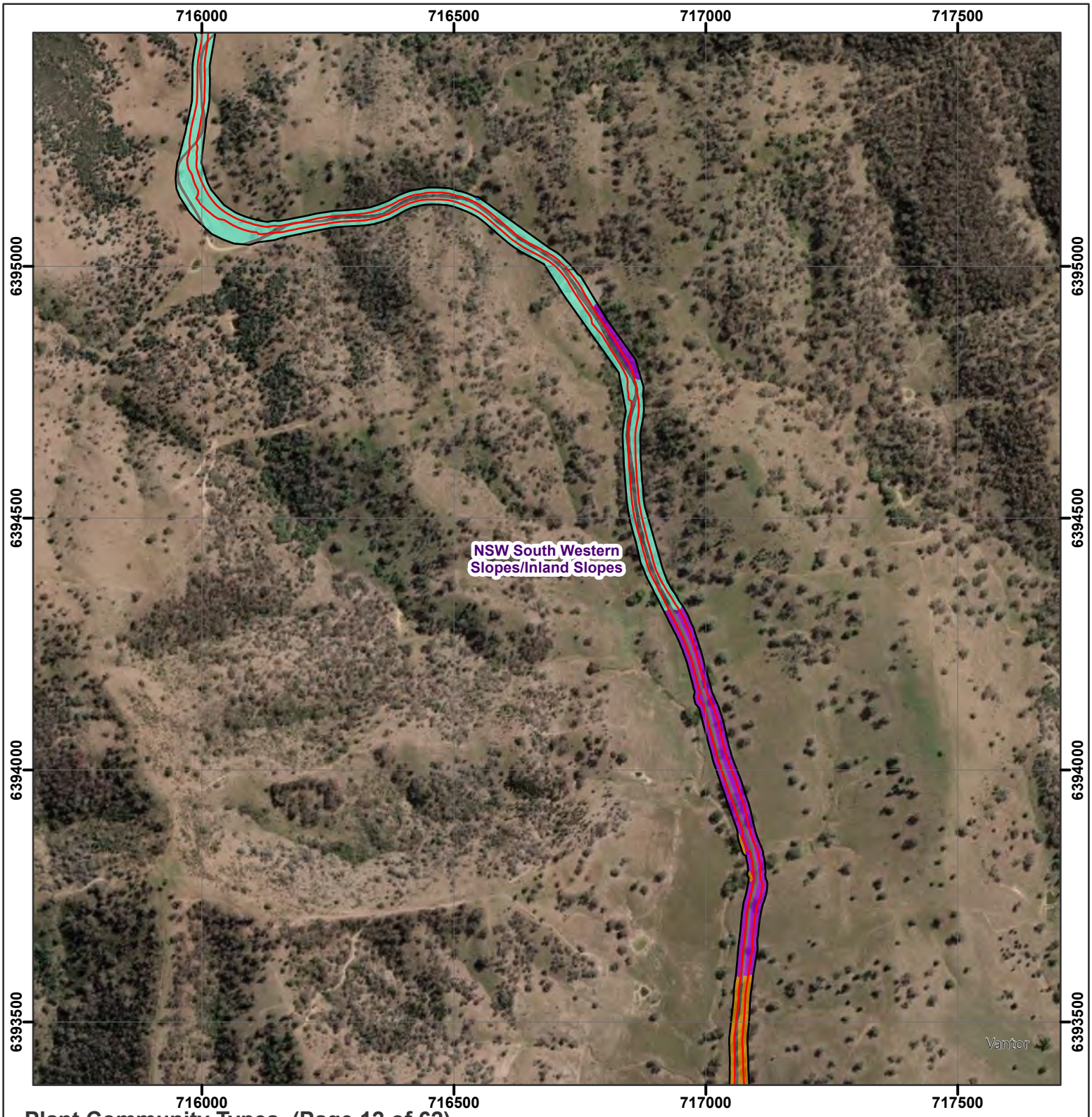
0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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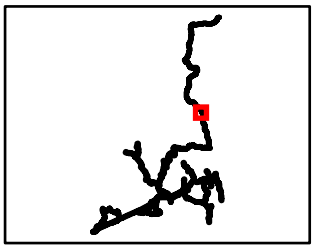
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 274: White Box - Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee region
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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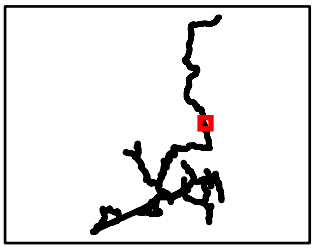
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 274: White Box - Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee region
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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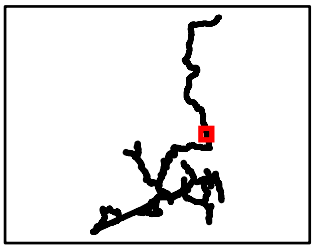
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 15 of 62)

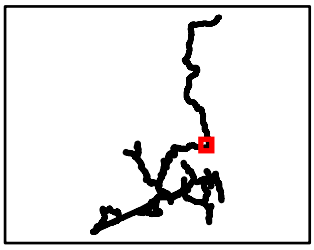
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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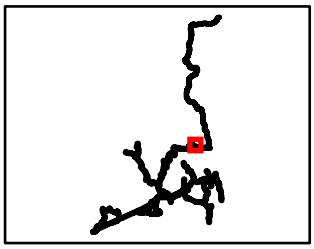
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Exotic
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 17 of 62)

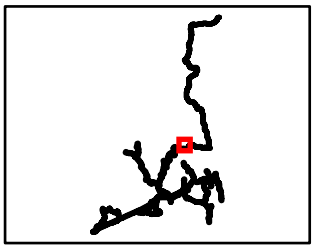
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Road/Track
- Cleared

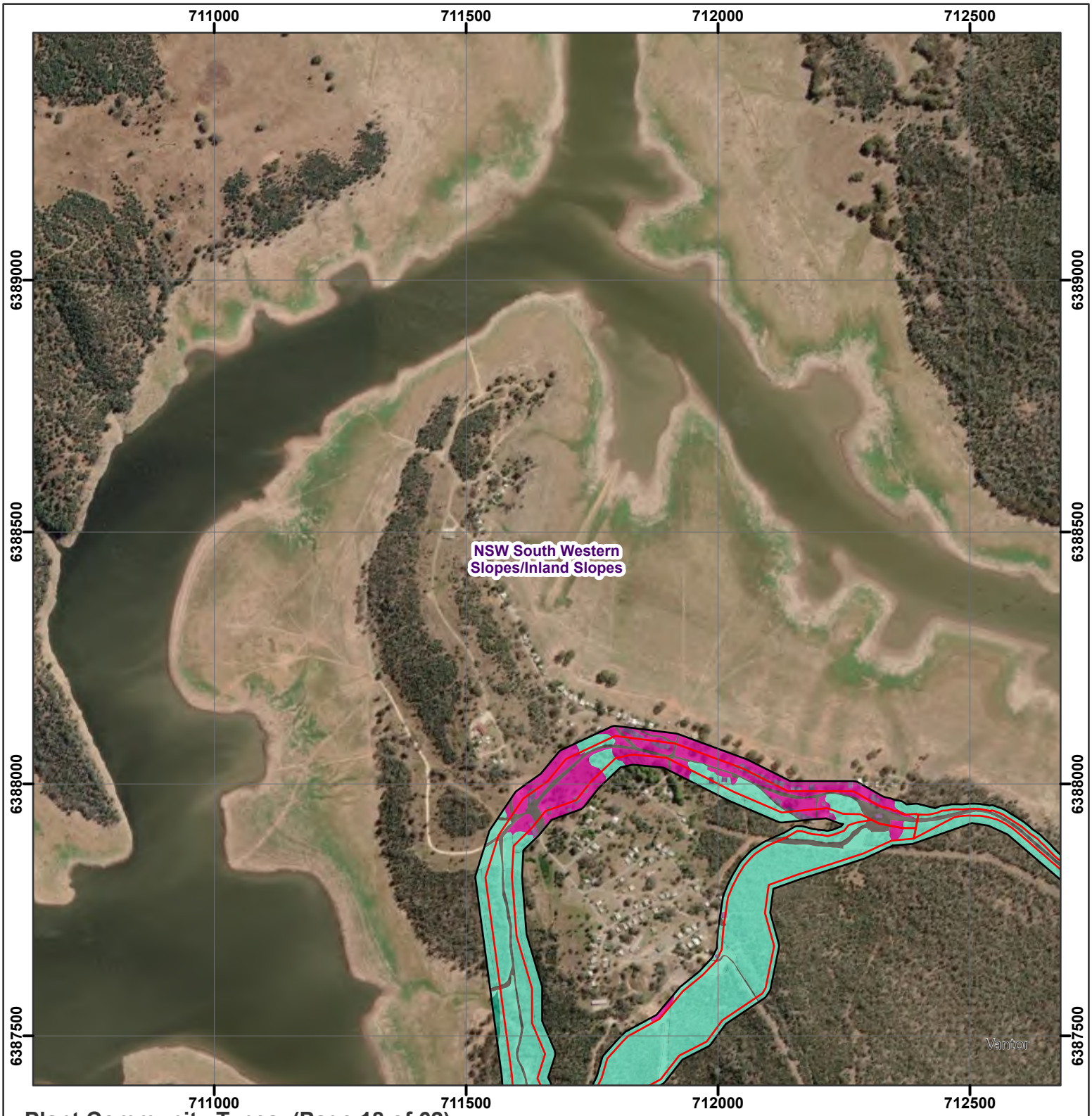
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Datum/Projection:
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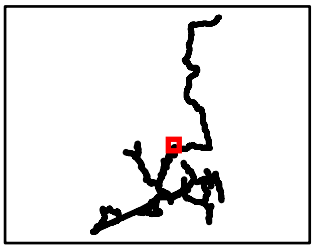
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Exotic
- Built
- Road/Track

0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
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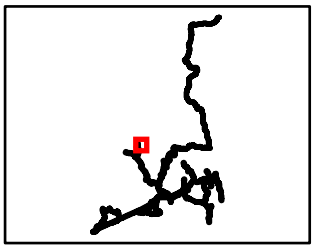
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes

0 75 150 300
Metres

Datum/Projection:
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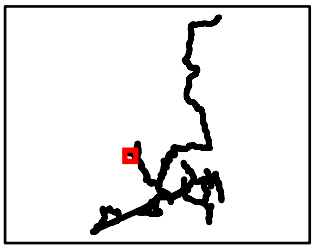
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes

0 75 150 300
Metres

Datum/Projection:
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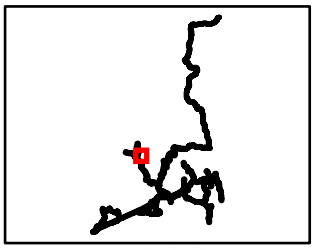
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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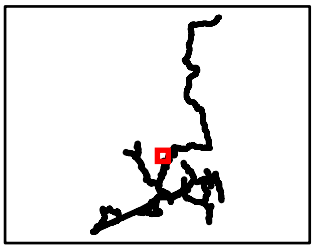
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Road/Track
- Cleared

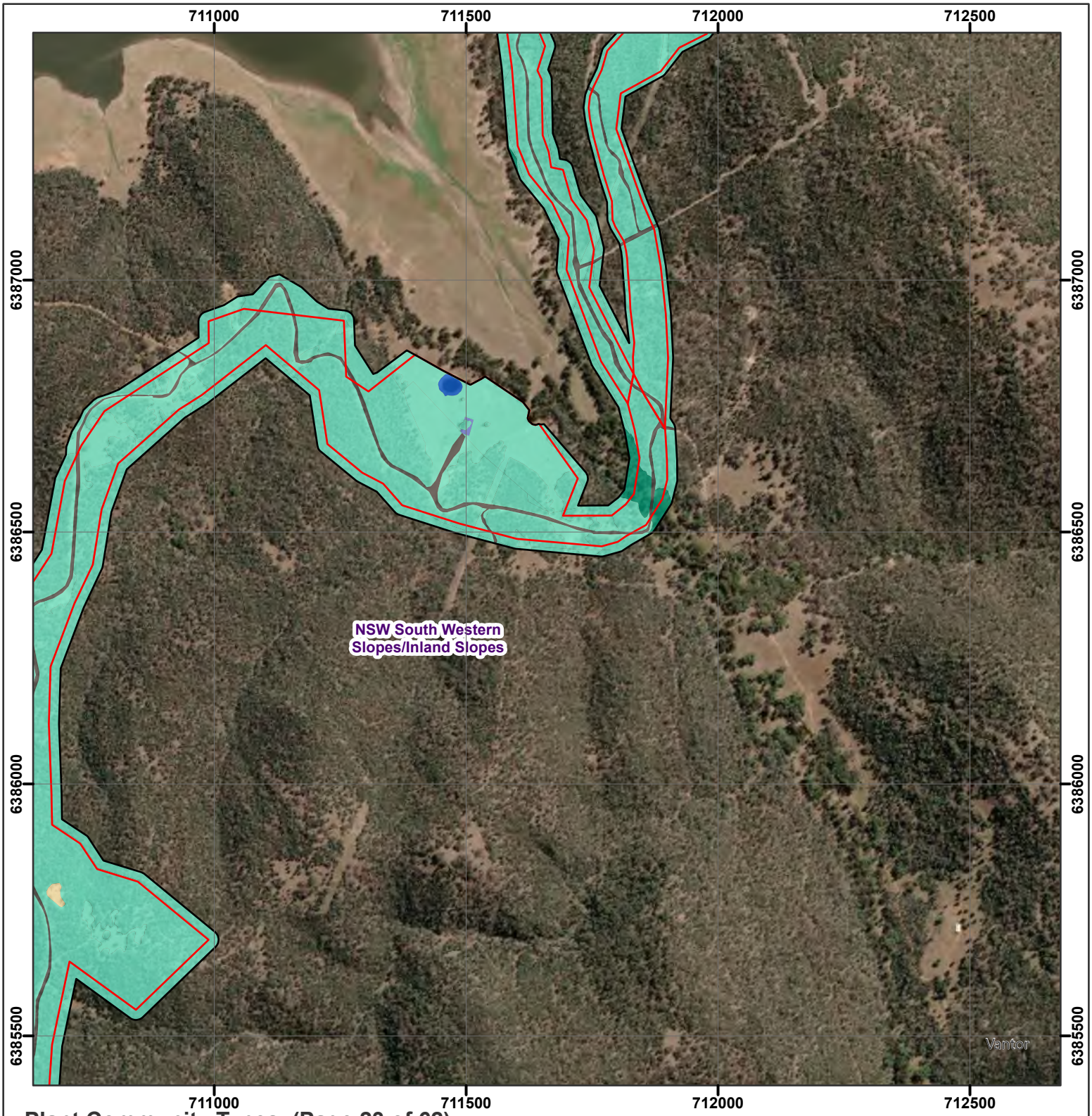
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Metres

Datum/Projection:
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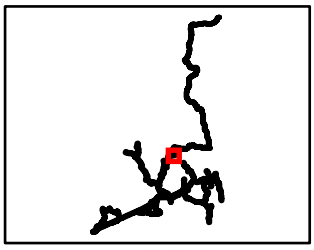
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Cattleyard
- Dam
- Road/Track
- Cleared

0 75 150 300
Metres

Datum/Projection:
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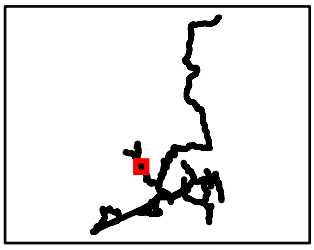
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Dam
- Road/Track

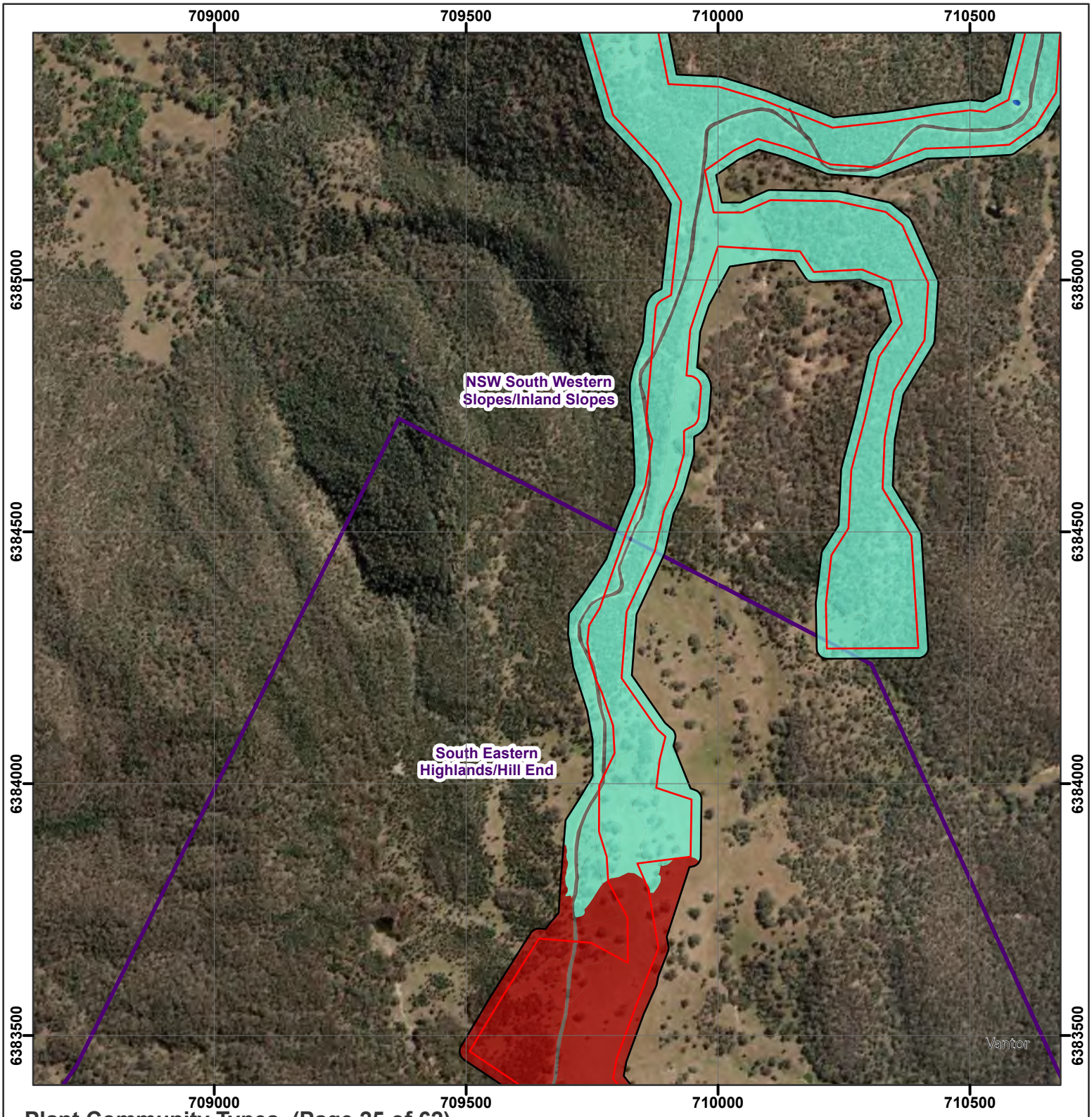
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Metres

Datum/Projection:
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Plant Community Types (Page 25 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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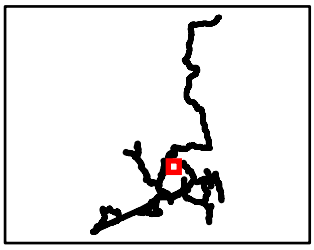
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Road/Track

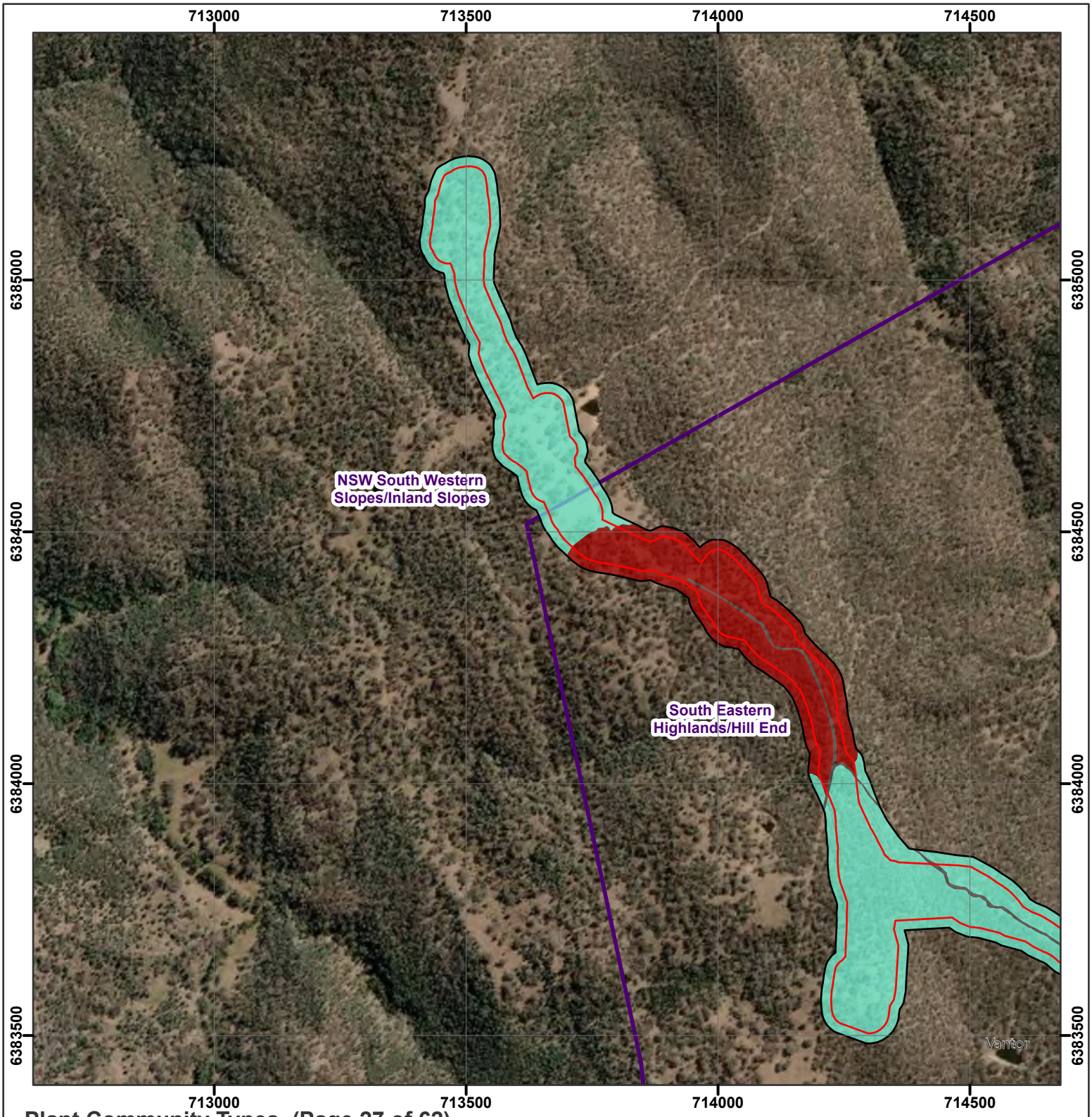
0 75 150 300
Metres

Datum/Projection:
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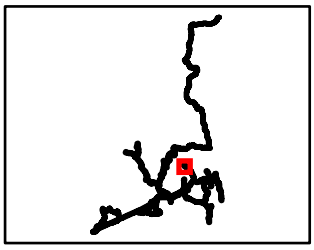
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- Road/Track

0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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Plant Community Types (Page 28 of 62)

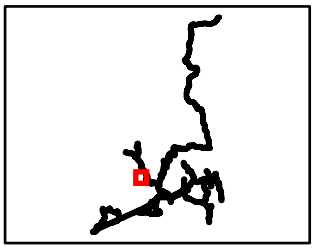
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Road/Track

0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
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Plant Community Types (Page 29 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion
- Dam
- Road/Track

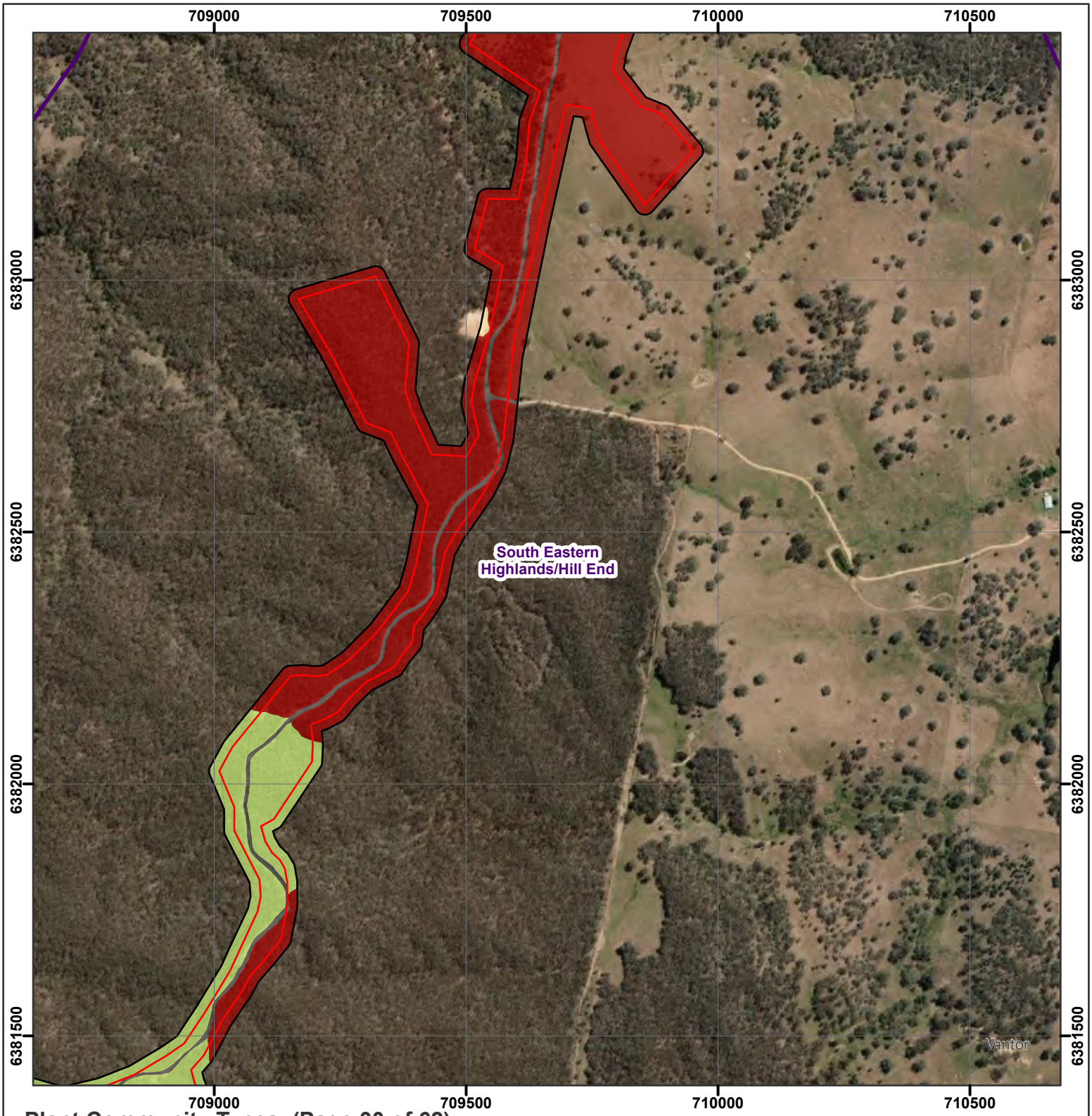
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Datum/Projection:
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Plant Community Types (Page 30 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion
- Road/Track
- Cleared

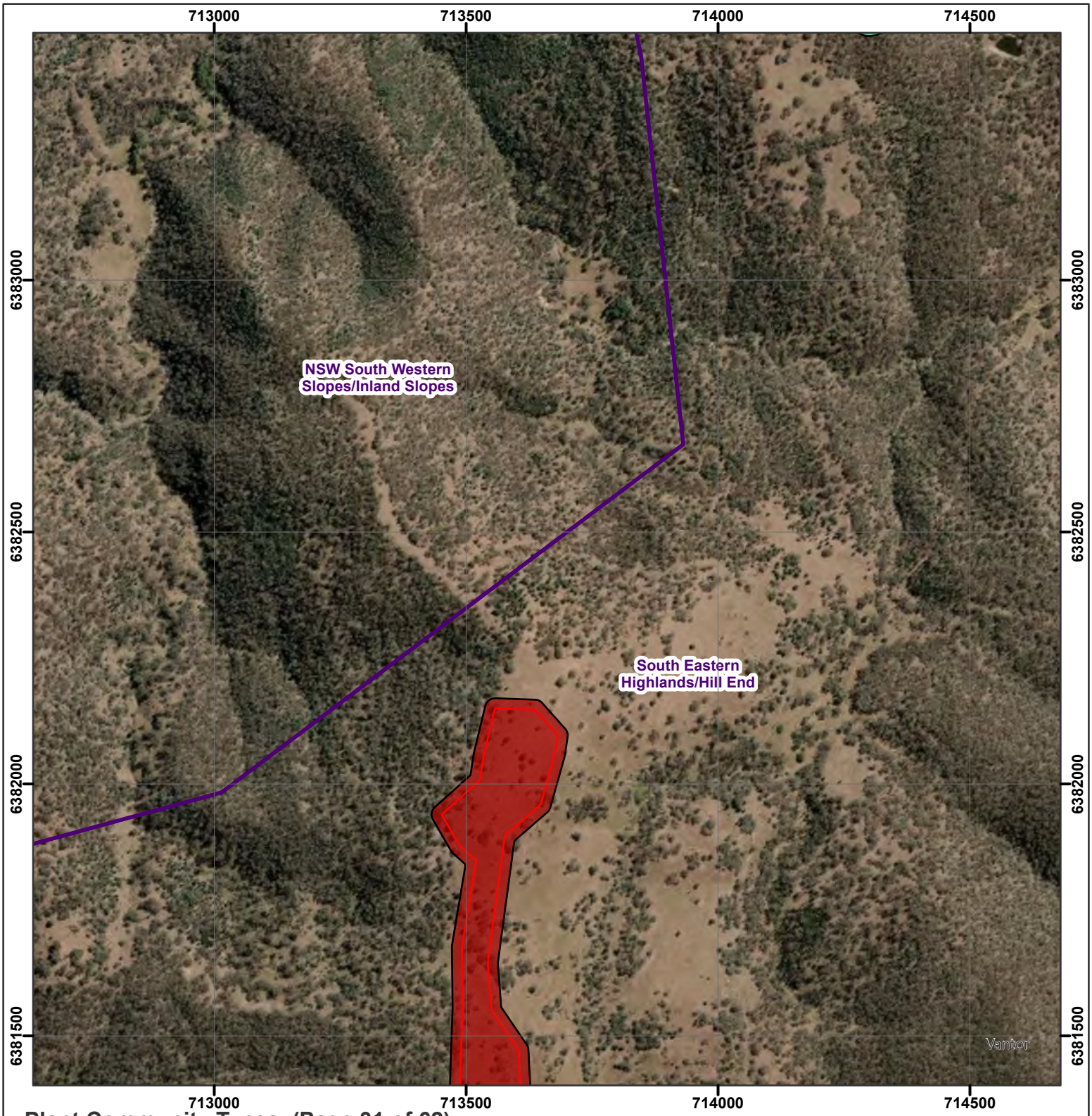
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Datum/Projection:
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Plant Community Types (Page 31 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion

0 75 150 300
Metres

Datum/Projection:
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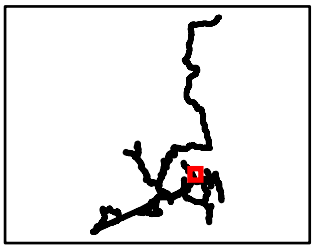
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- Dam
- Built
- Road/Track

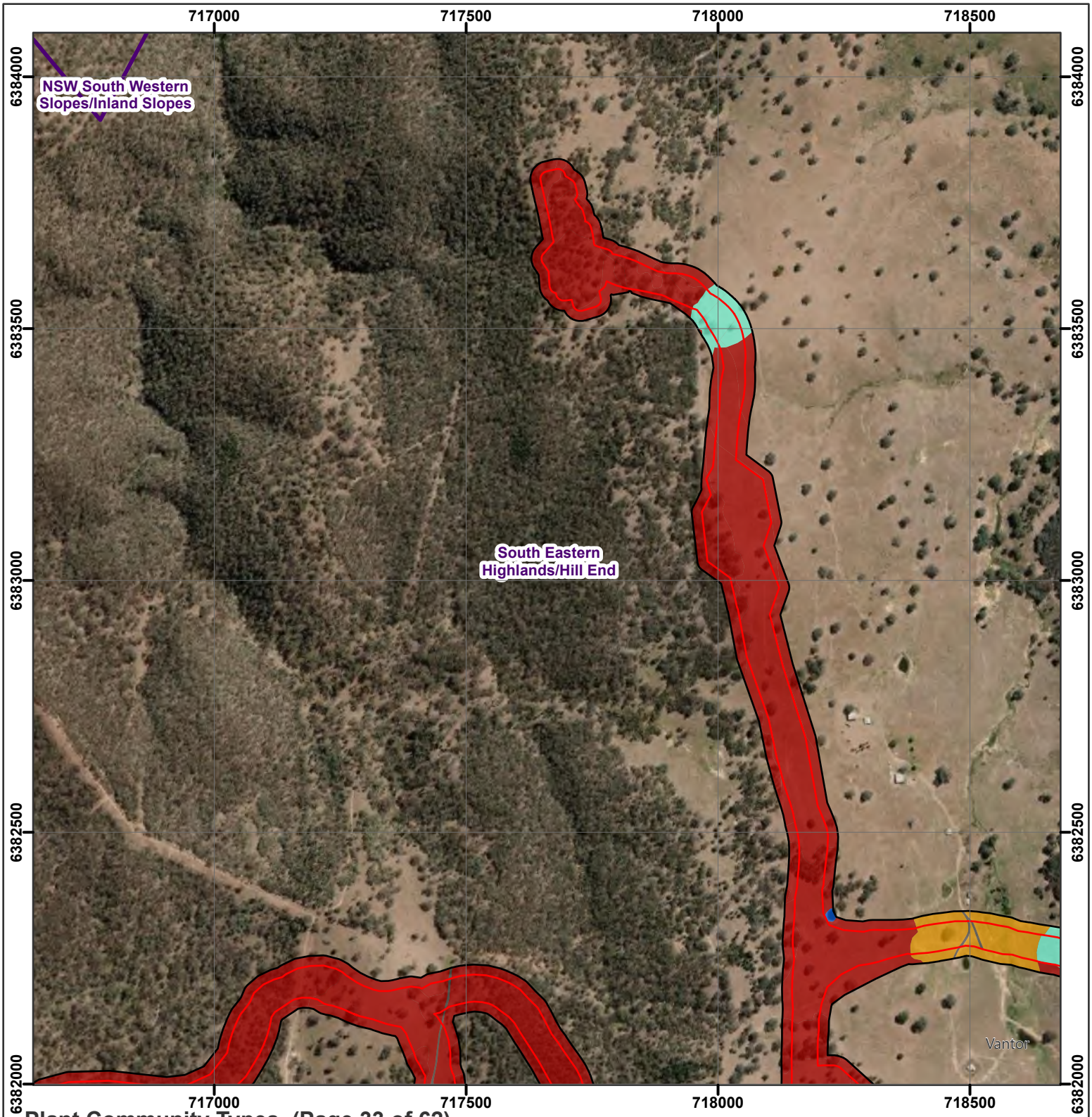
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Datum/Projection:
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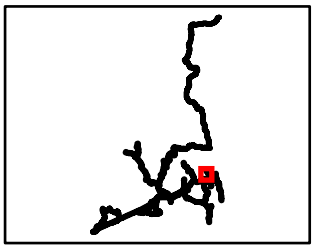
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- Dam
- Road/Track

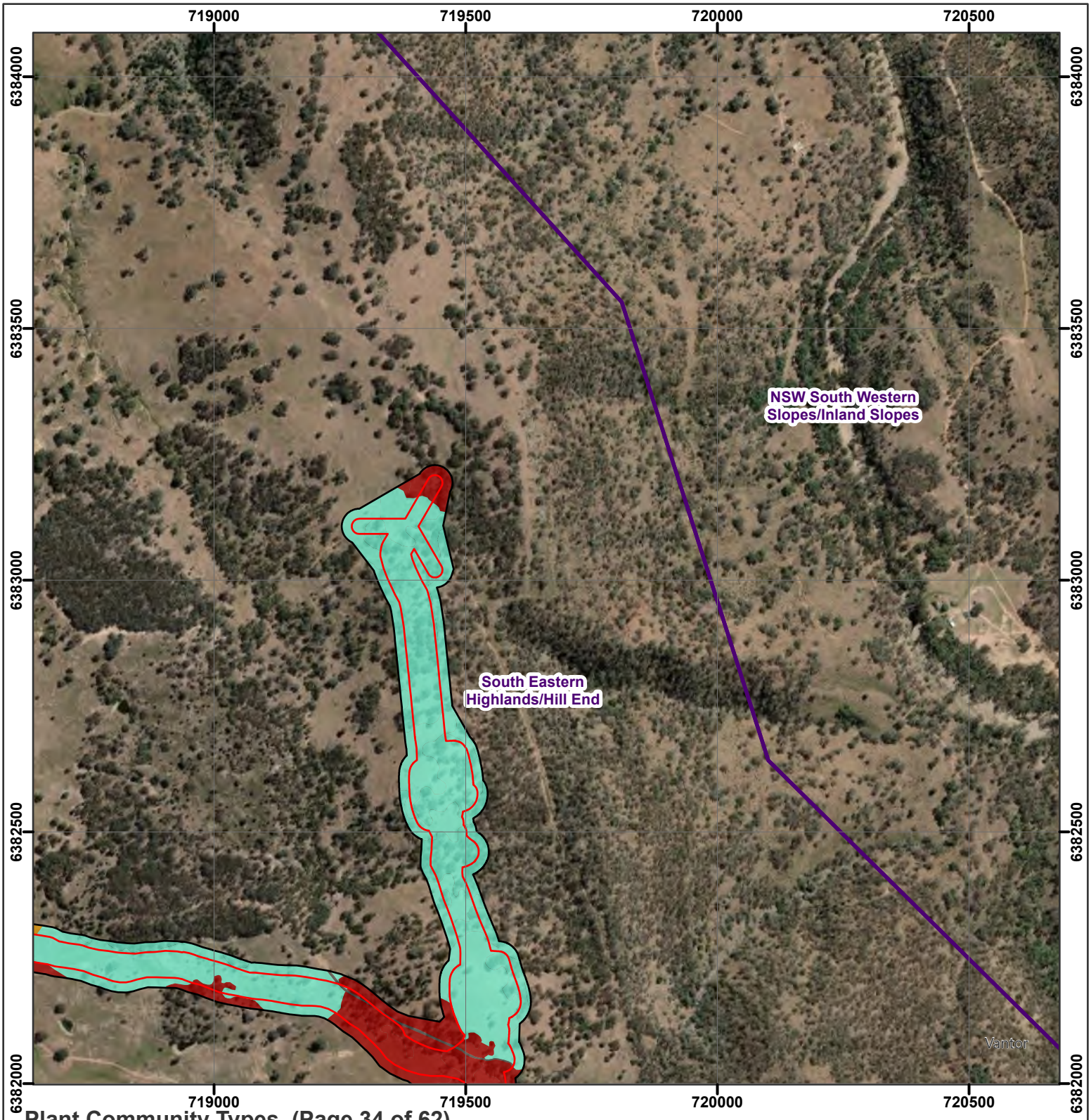
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Plant Community Types (Page 34 of 62)

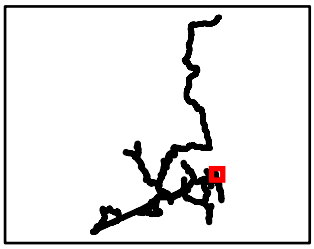
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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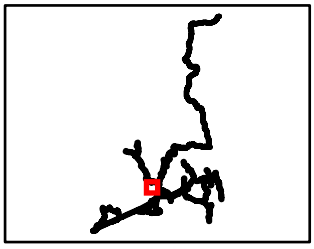
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion
- Dam
- Road/Track

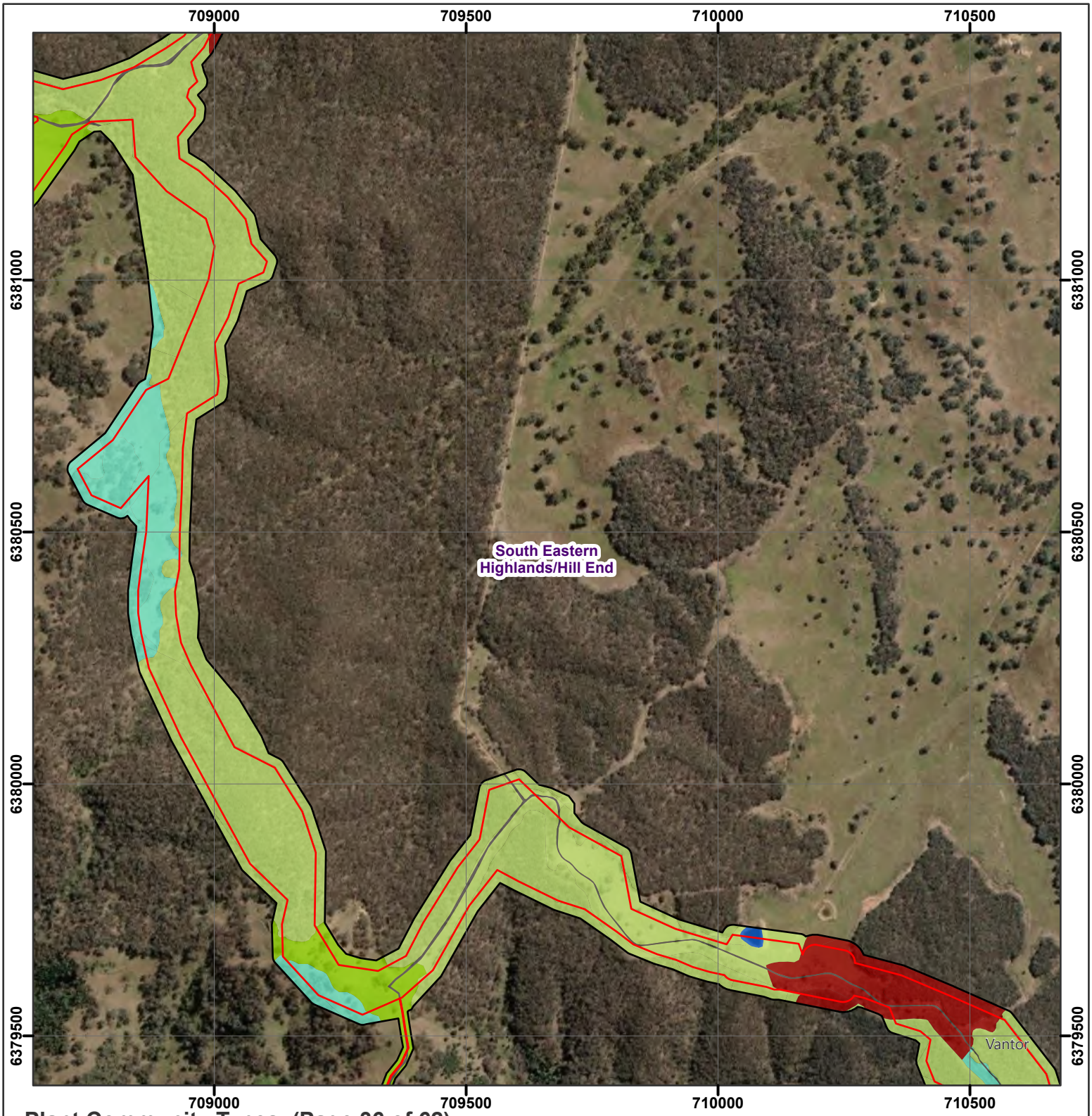
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Datum/Projection:
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Location: Burrendong, NSW
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Plant Community Types (Page 36 of 62)

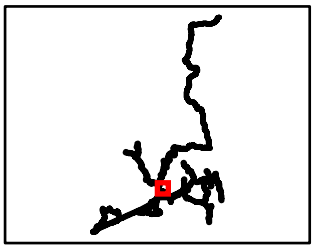
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 37 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion
- Road/Track

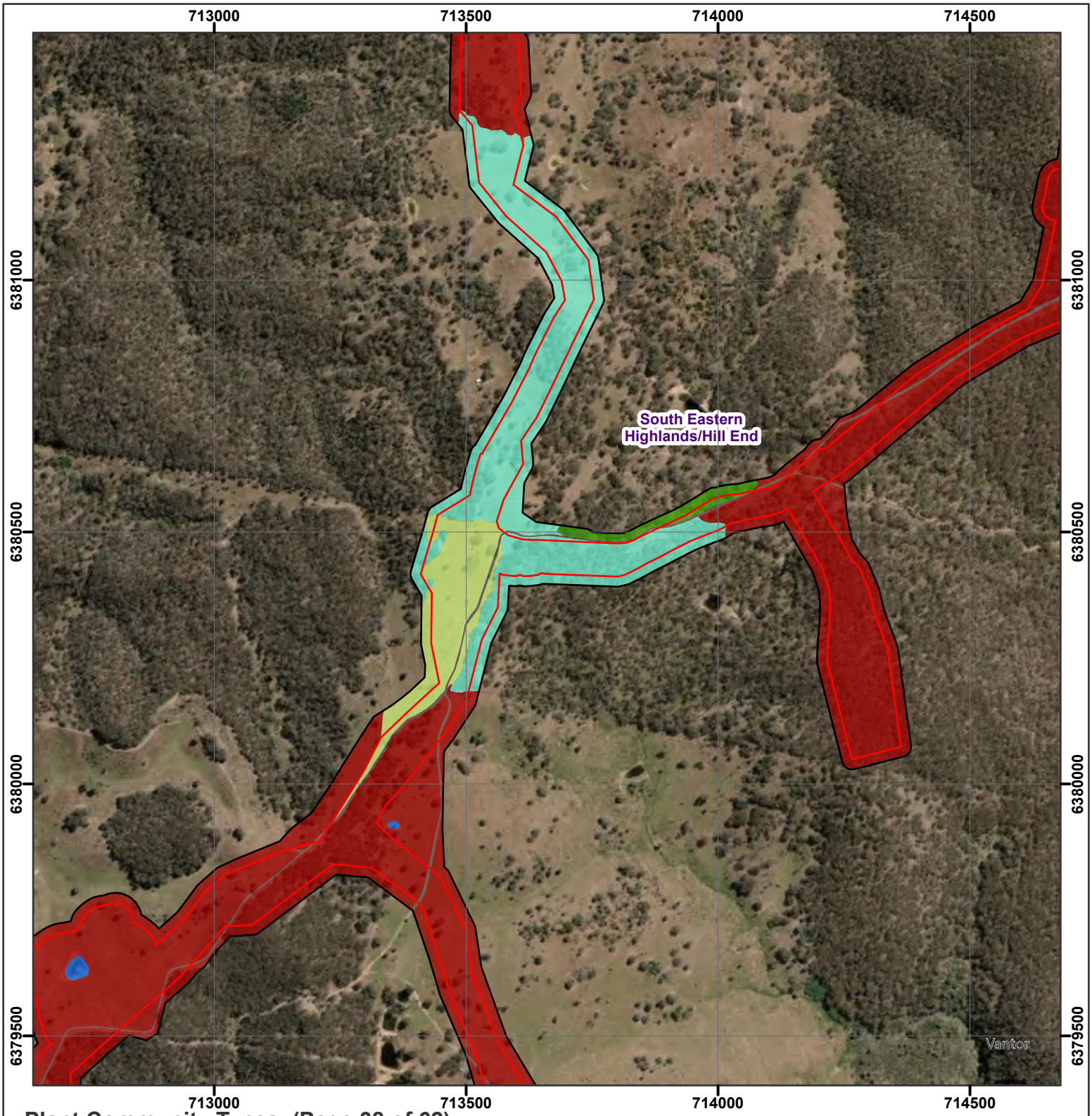
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Datum/Projection:
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Plant Community Types (Page 38 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 270: White Box - Tumbledown Red Gum - Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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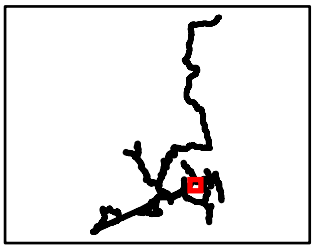
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- Road/Track

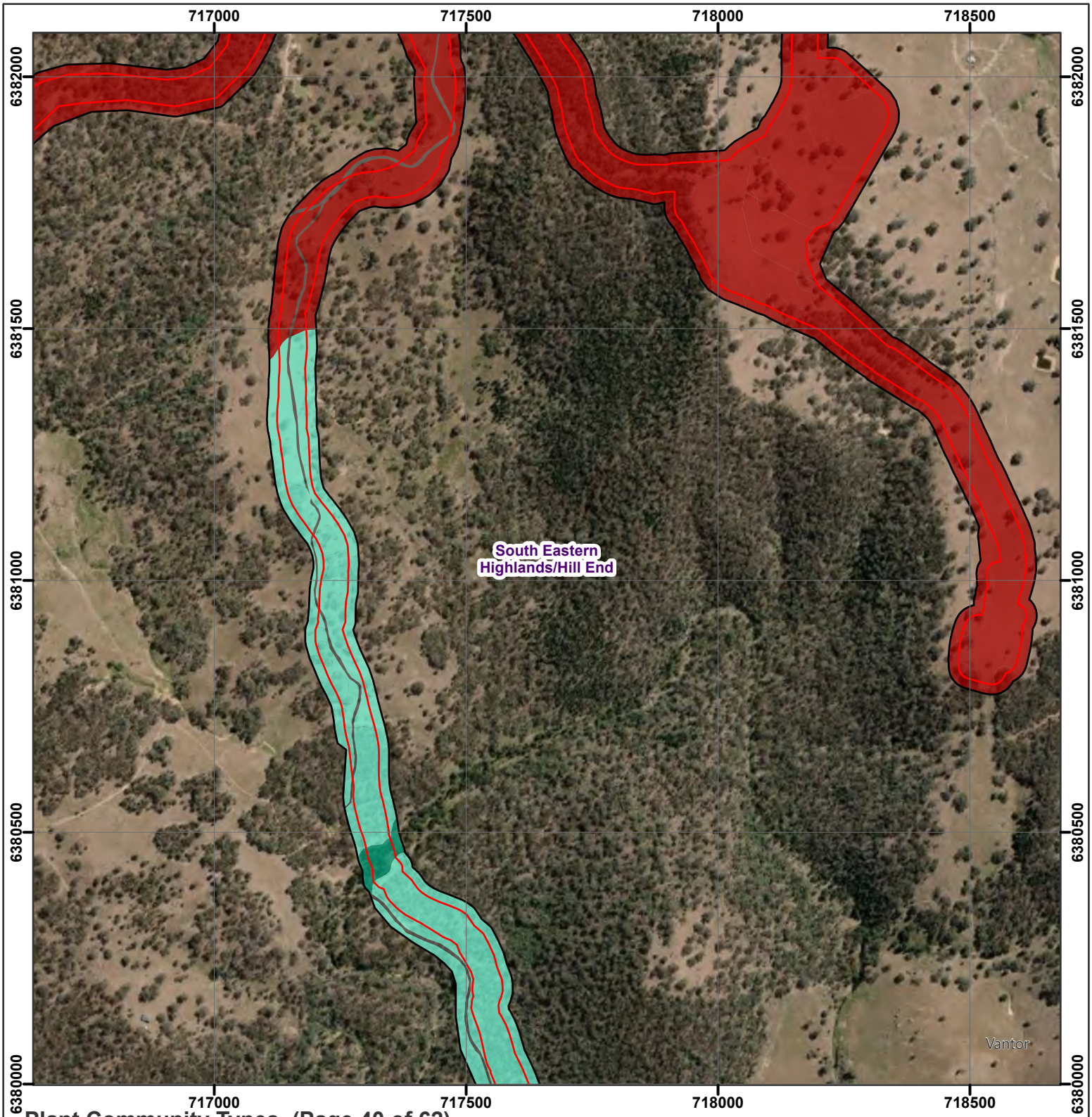
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Datum/Projection:
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Plant Community Types (Page 40 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- Road/Track

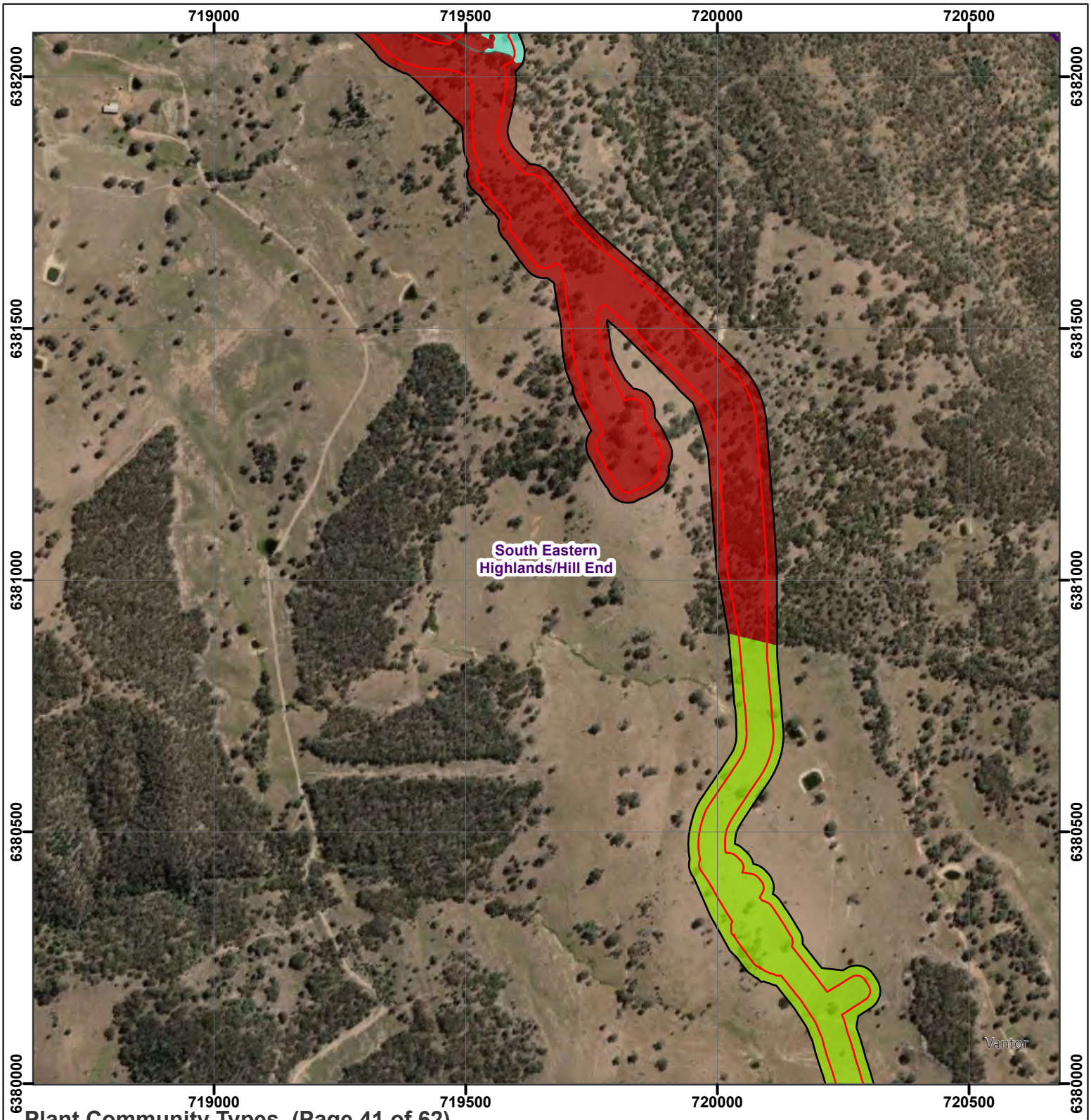
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Datum/Projection:
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Plant Community Types (Page 41 of 62)

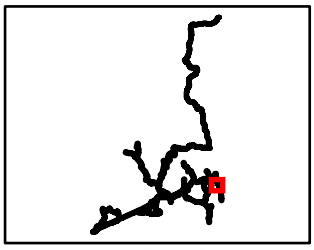
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- Road/Track

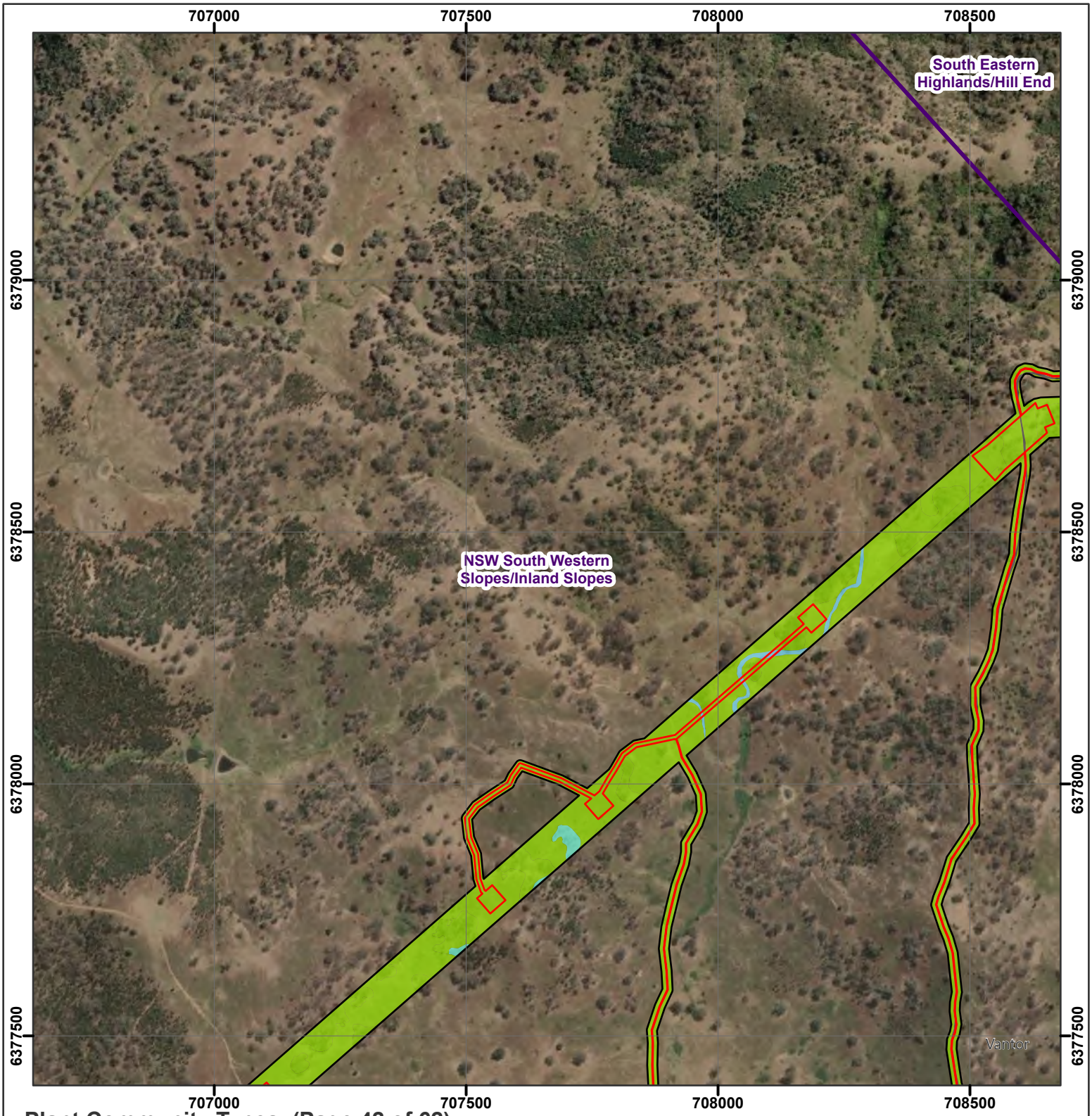
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Datum/Projection:
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Plant Community Types (Page 42 of 62)

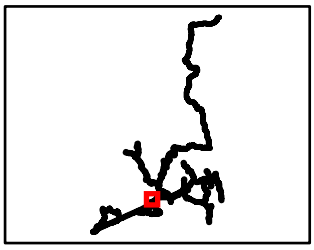
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Drainage
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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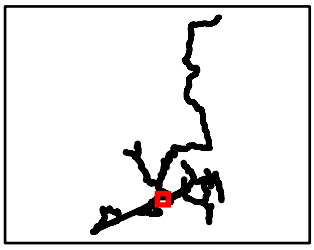
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion
- Road/Track

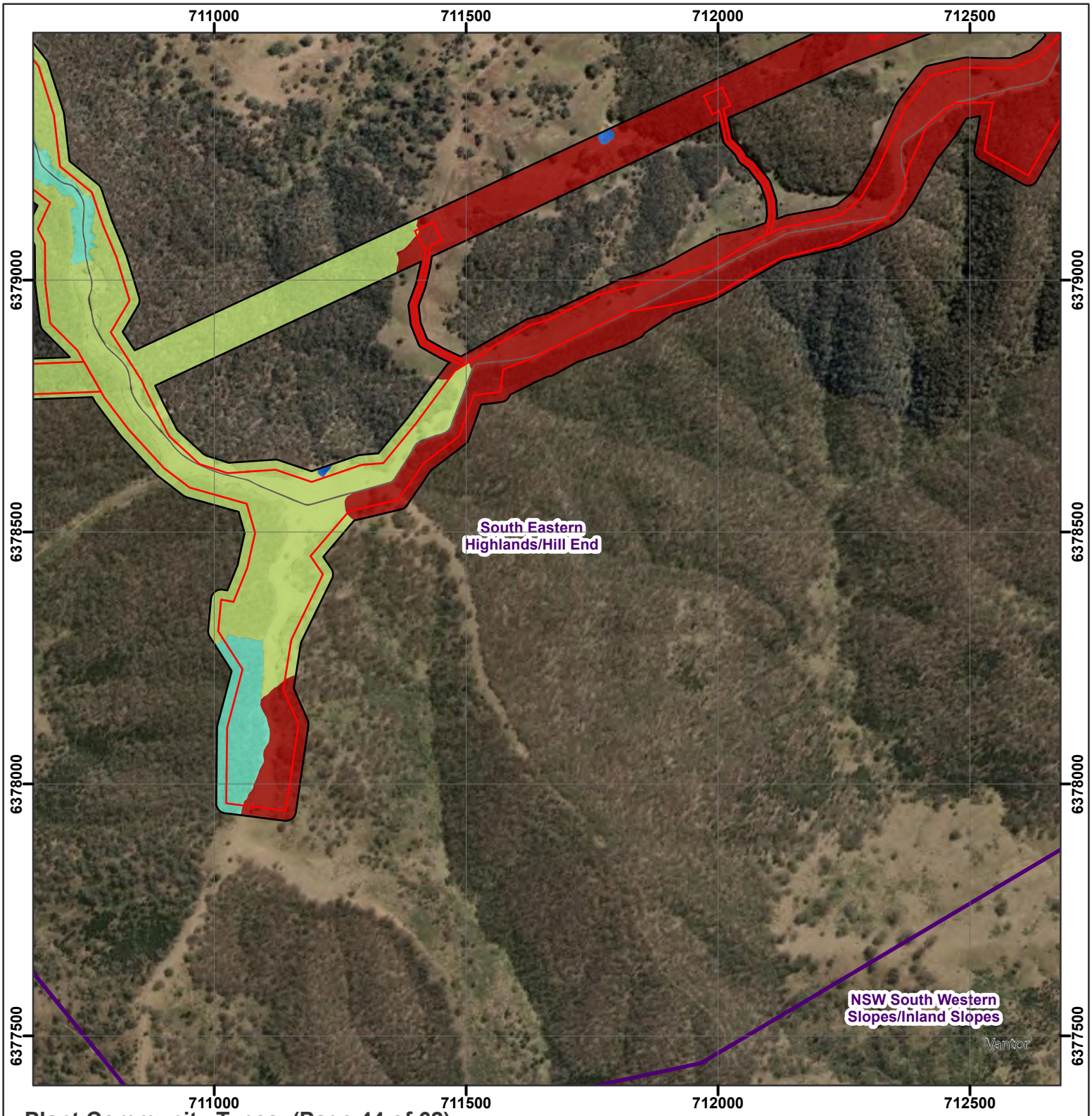
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Datum/Projection:
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Plant Community Types (Page 44 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion
- Dam
- Road/Track

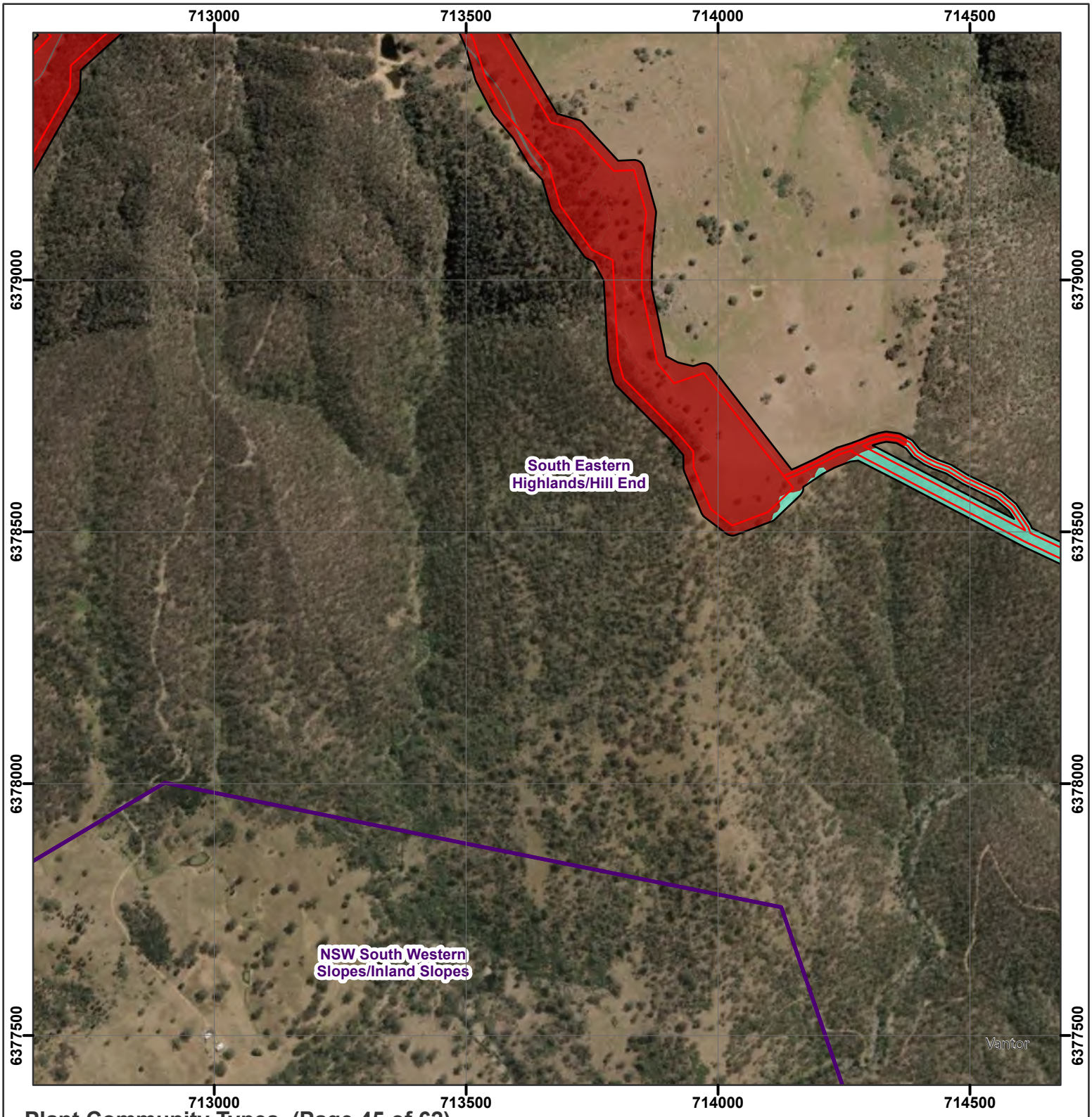
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Datum/Projection:
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Plant Community Types (Page 45 of 62)

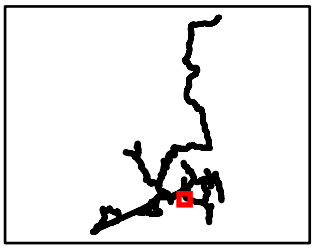
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- Road/Track

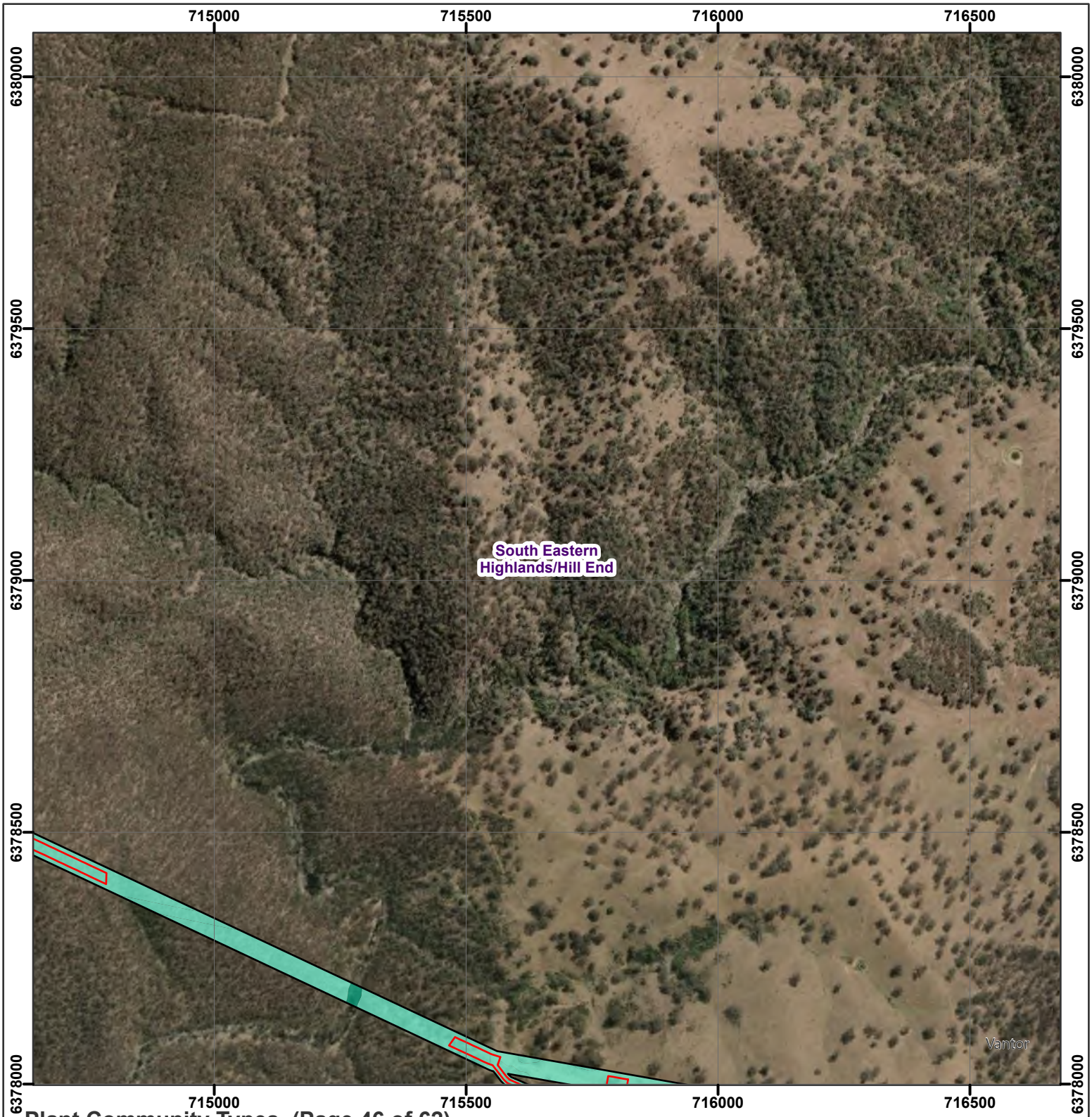
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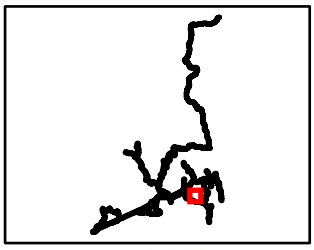
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes

0 75 150 300
Metres

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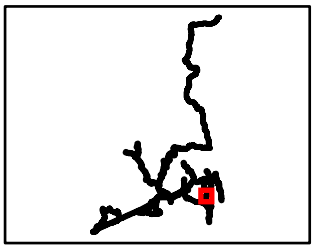
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 48 of 62)

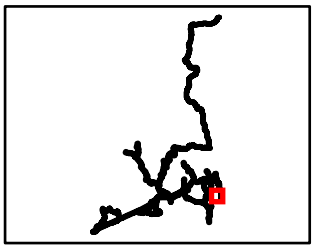
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion

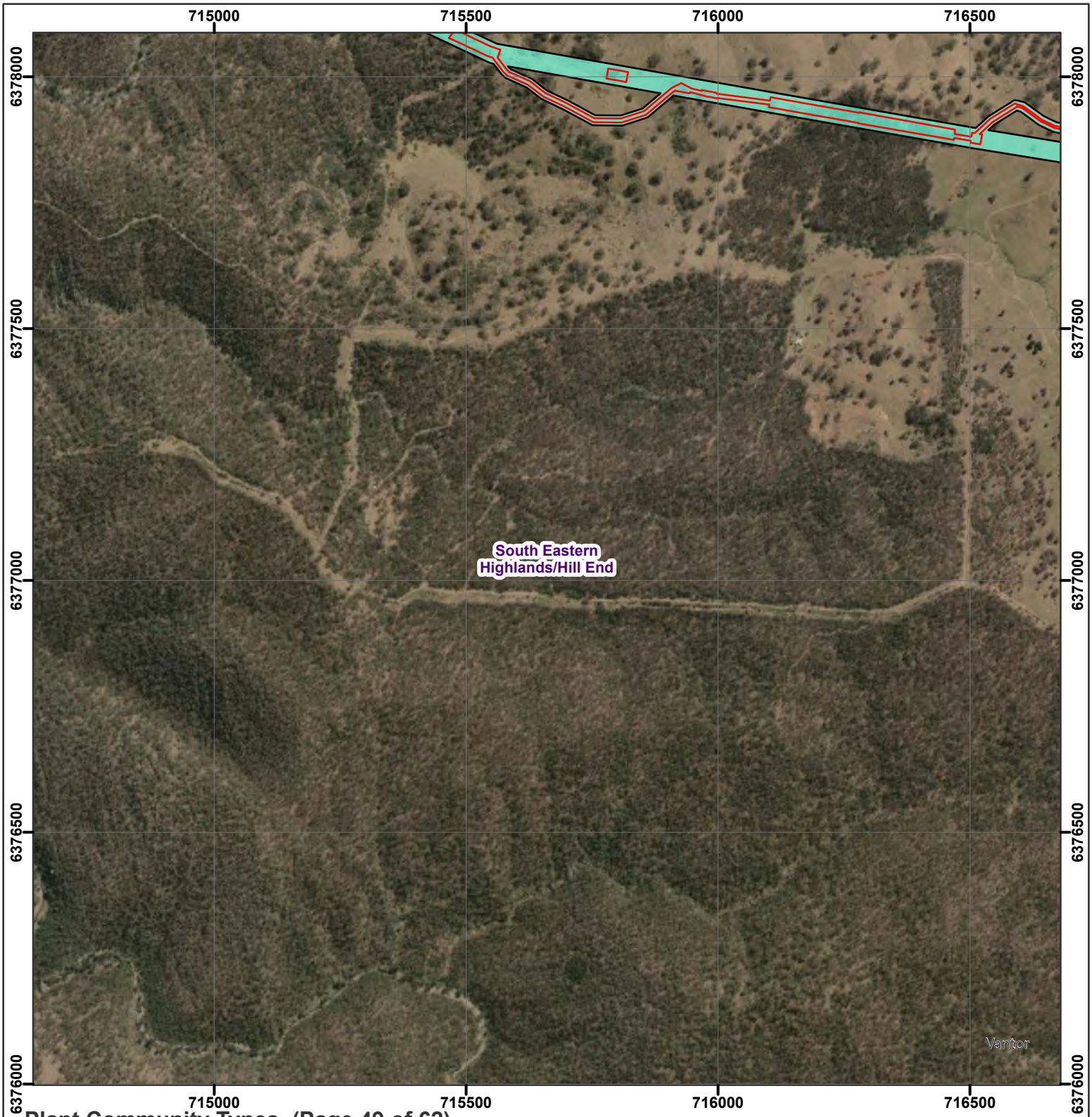
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Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
Date Prepared: 26/02/2026



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Plant Community Types (Page 49 of 62)

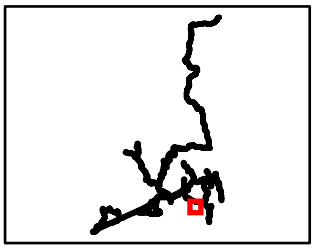
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes

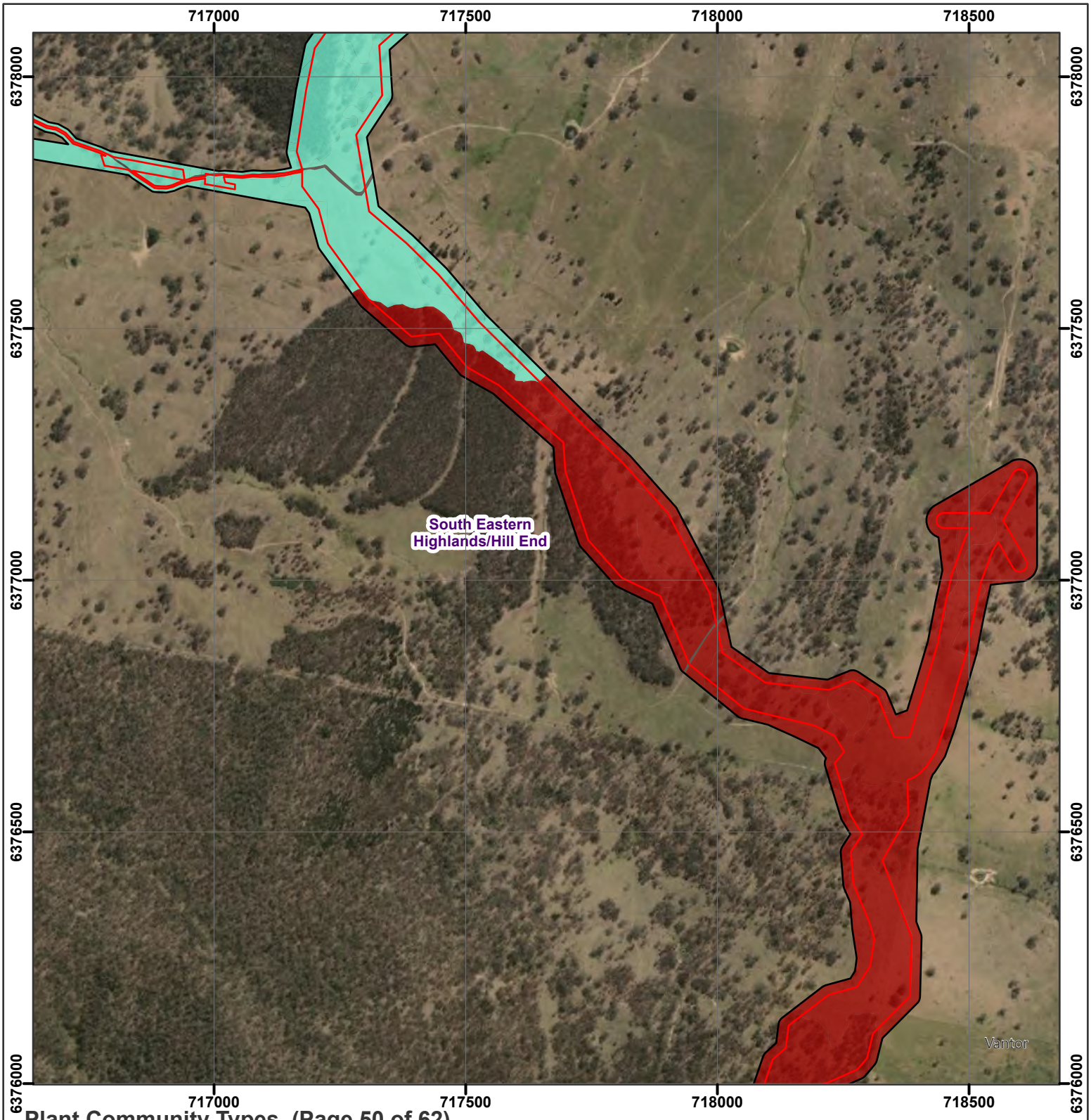
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Datum/Projection:
GDA 1994 MGA Zone 55
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Plant Community Types (Page 50 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion
- Road/Track

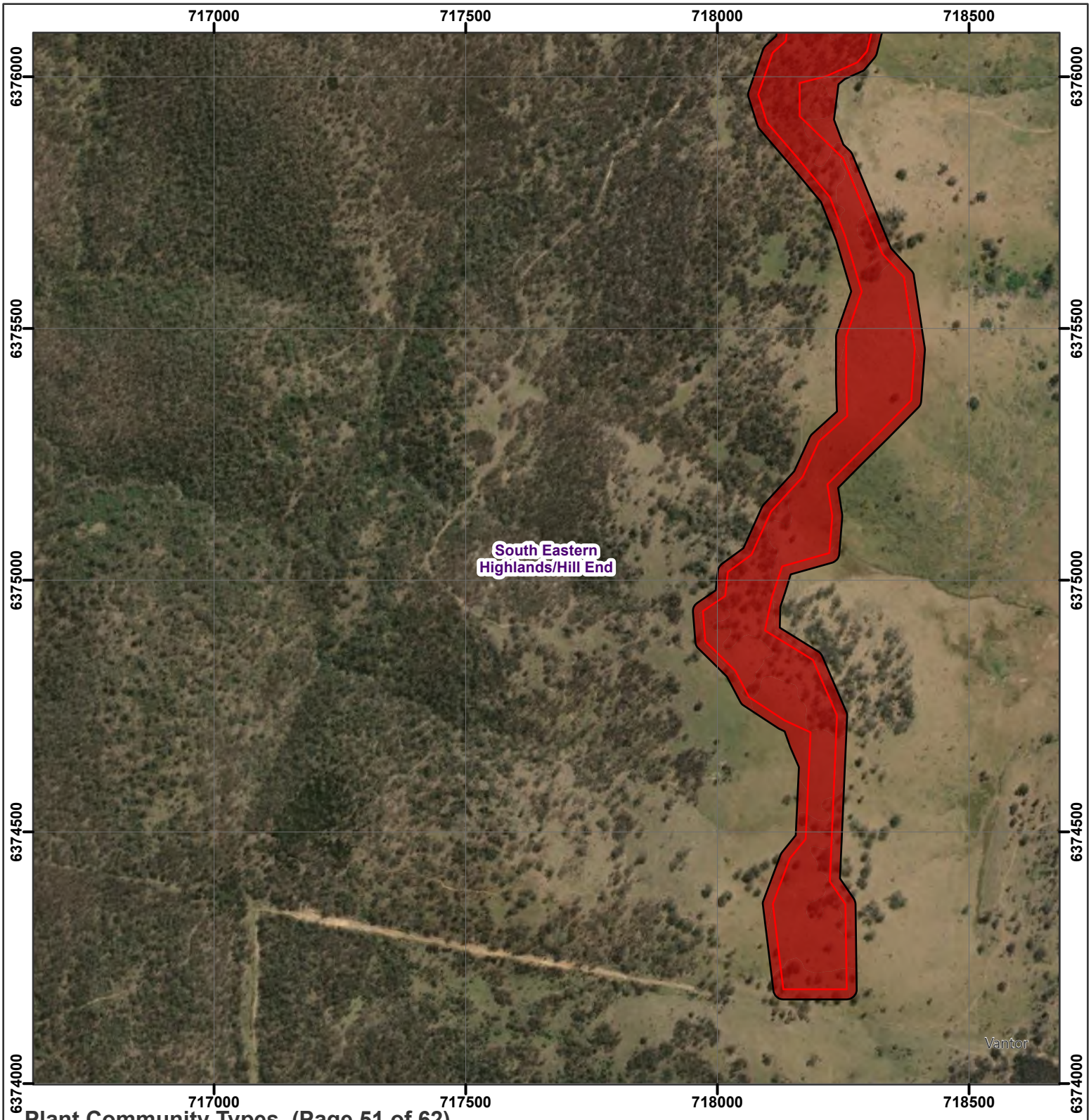
0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 51 of 62)

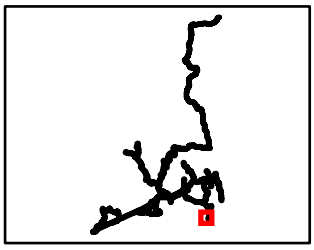
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion

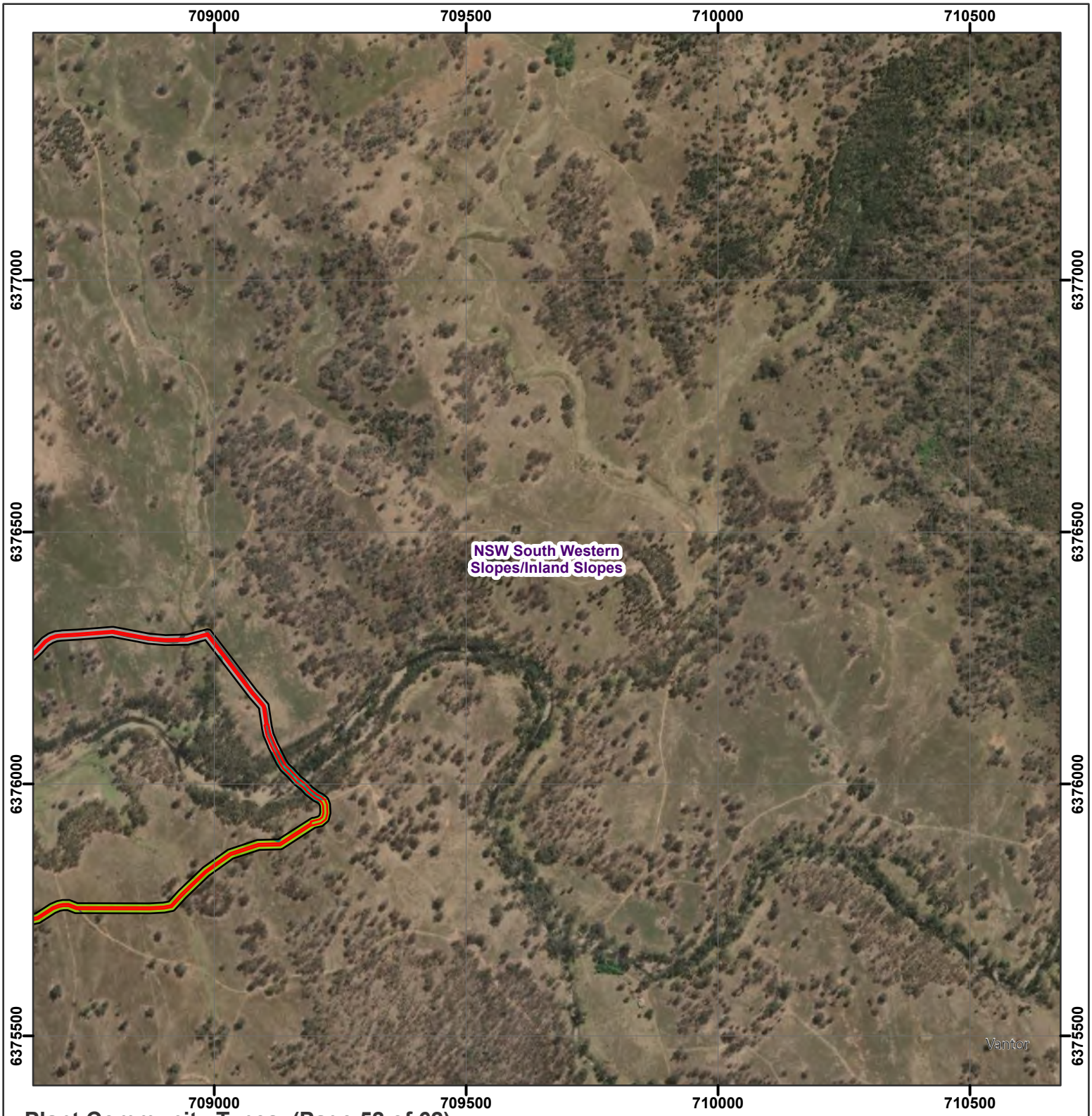
0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 52 of 62)

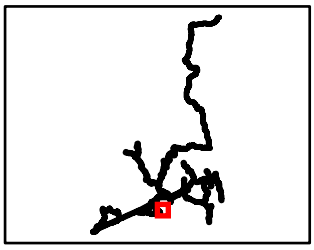
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 53 of 62)

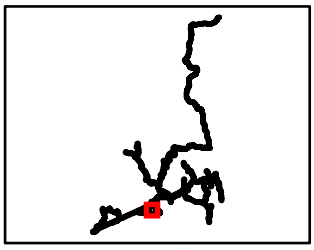
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Drainage
- Road/Track
- Cleared

0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 54 of 62)

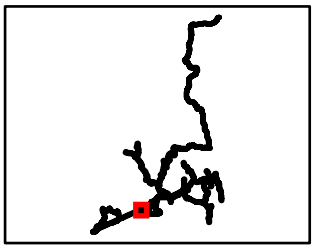
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Drainage
- Road/Track
- Cleared

0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 55 of 62)

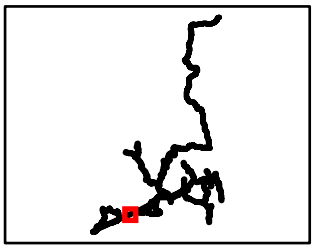
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Drainage
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 56 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Drainage
- Dam
- Road/Track
- Cleared

0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 57 of 62)

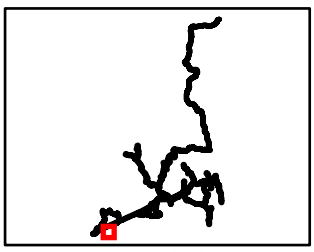
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Road/Track

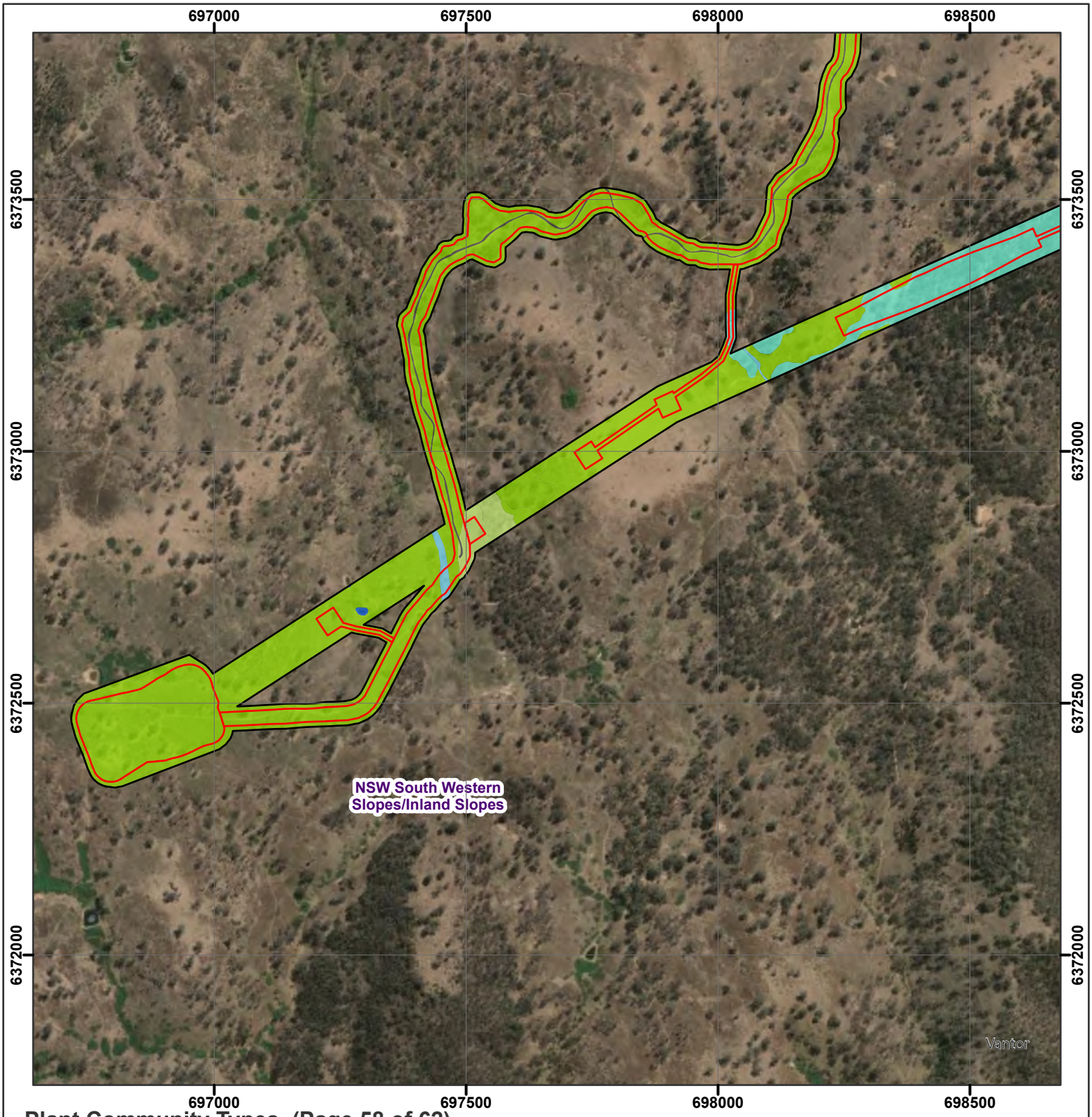
0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
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Plant Community Types (Page 58 of 62)

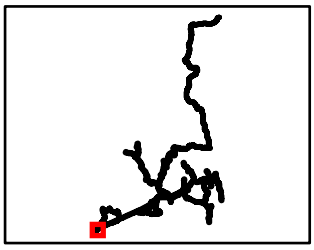
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion
- Drainage
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 59 of 62)

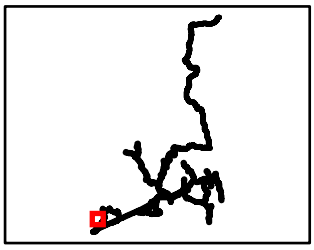
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Plant Community Types (Page 60 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Road/Track
- Cleared

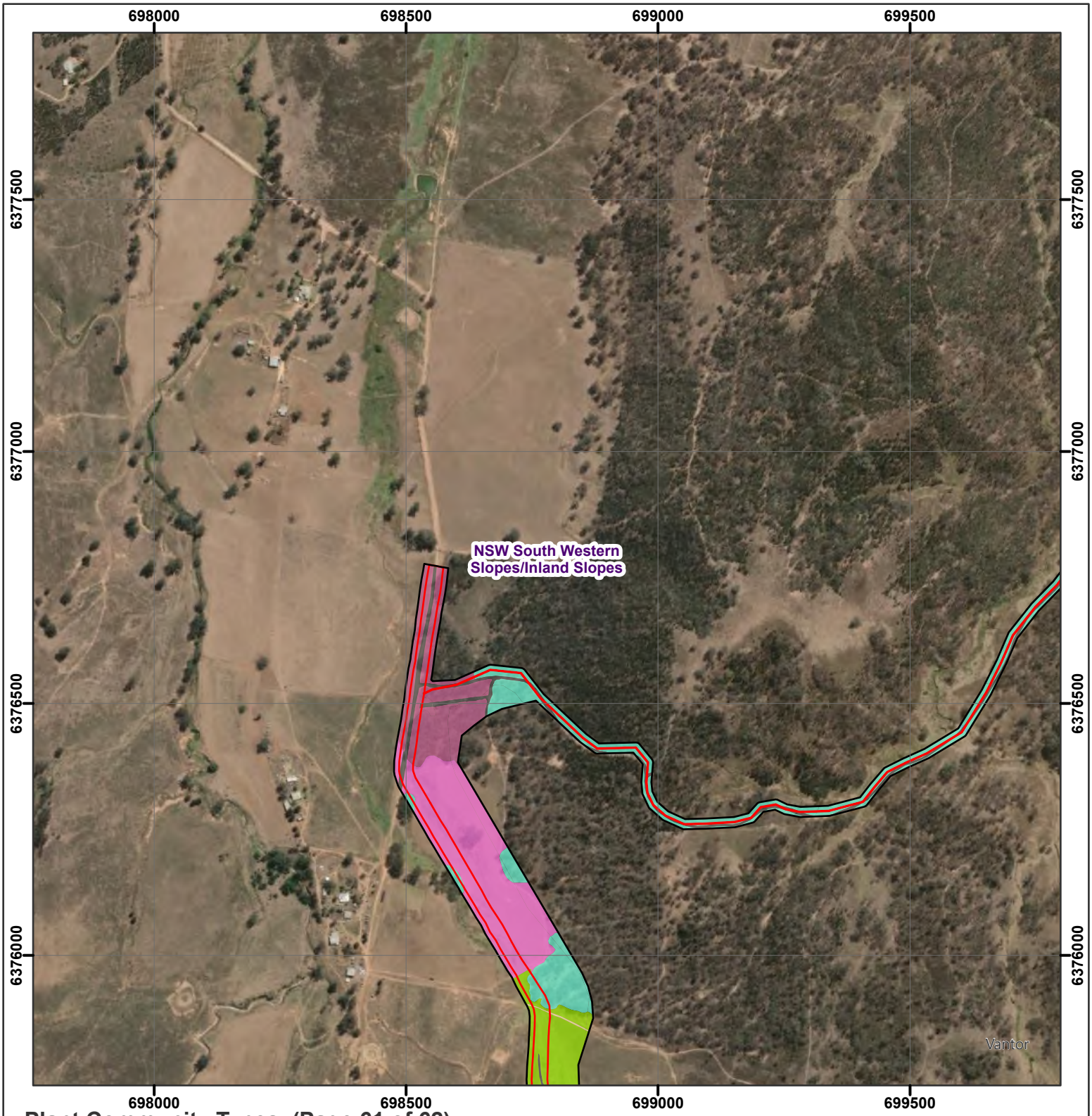
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GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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Plant Community Types (Page 61 of 62)

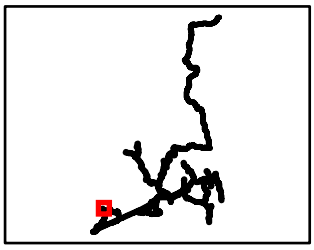
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion
- Cropped
- Drainage
- Road/Track
- Cleared

0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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Plant Community Types (Page 62 of 62)

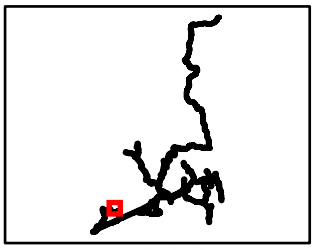
- Development Corridor
- Development Footprint
- IBRA Subregions

Plant Community Types

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
- Road/Track

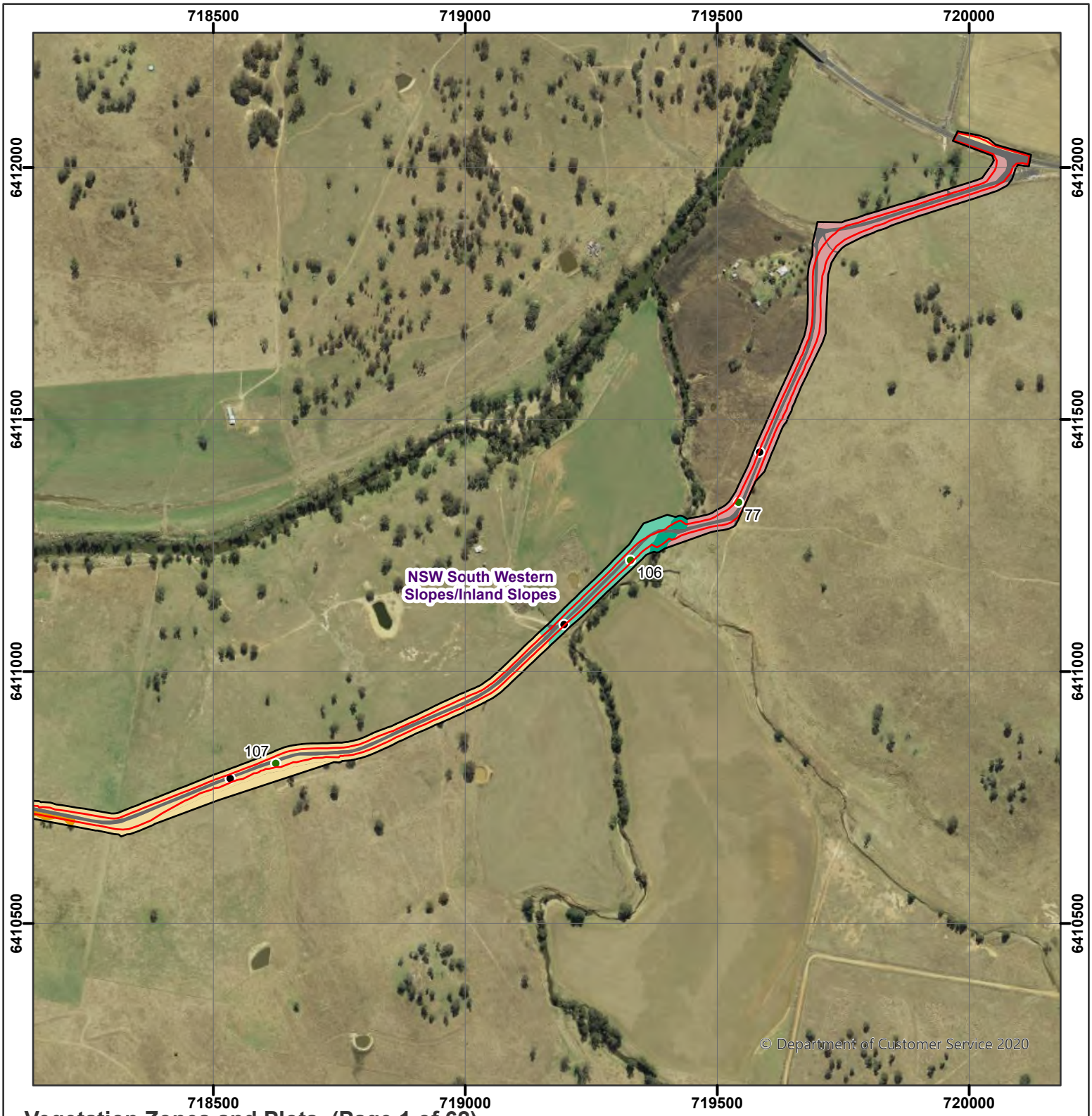
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Datum/Projection:
GDA 1994 MGA Zone 55
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Vegetation Zones and Plots (Page 1 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

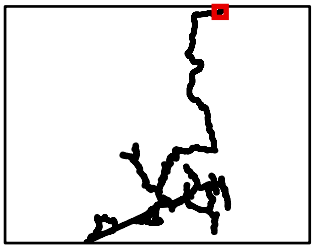
- Start
- End

Vegetation Zones

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: DNG
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: Good
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion: DNG
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 2 of 62)

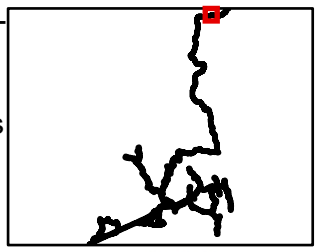
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: Good
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- 281,Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion,Good
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion: DNG
- Exotic
- Road/Track

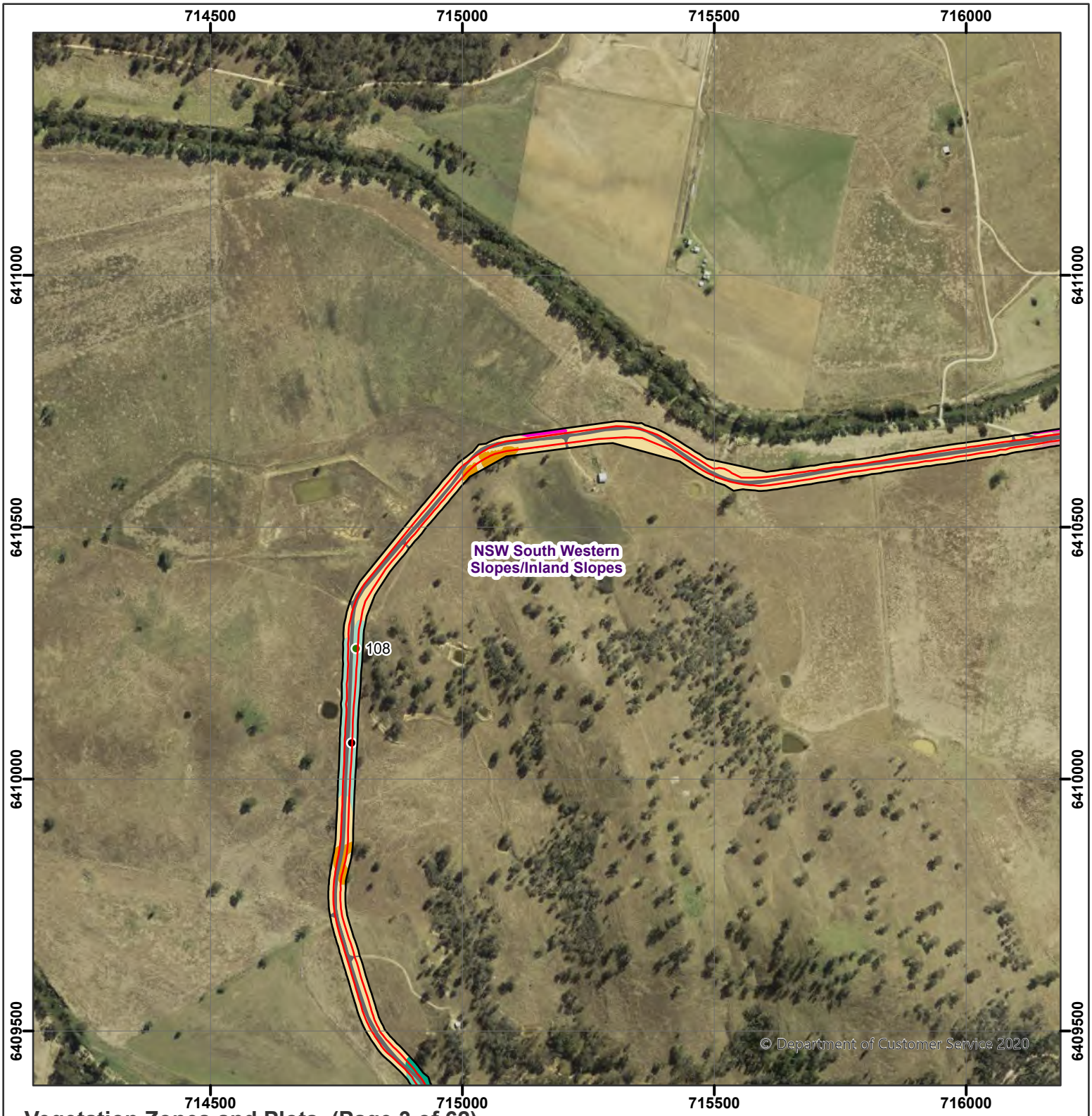
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Metres

Datum/Projection:
GDA 1994 MGA Zone 55
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Vegetation Zones and Plots (Page 3 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

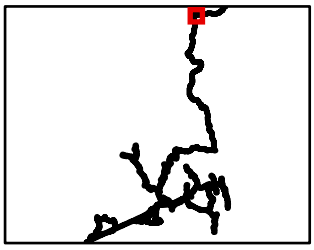
- Start
- End

Vegetation Zones

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: Good
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion: DNG
- Exotic
- Road/Track

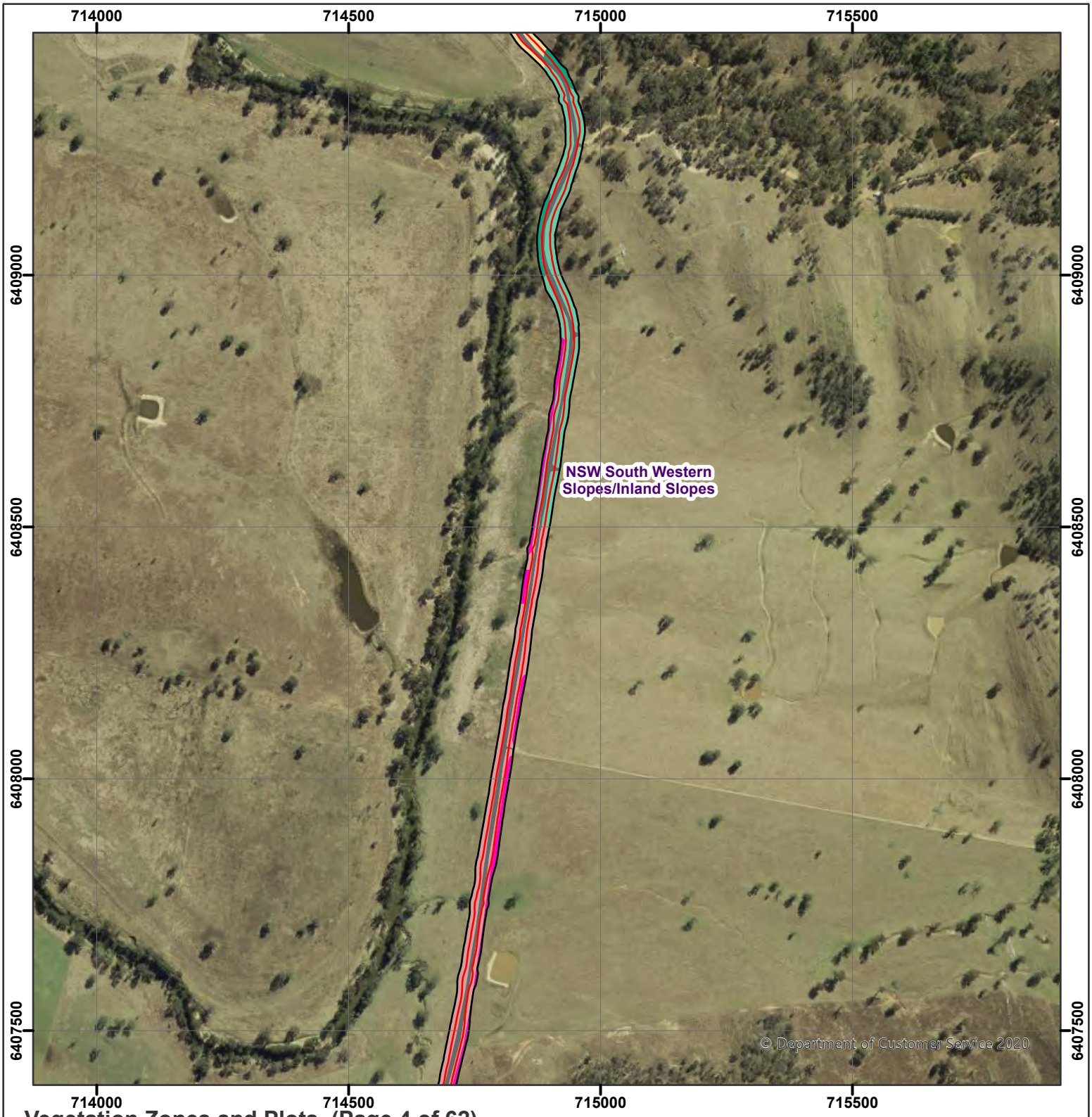
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Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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Vegetation Zones and Plots (Page 4 of 62)

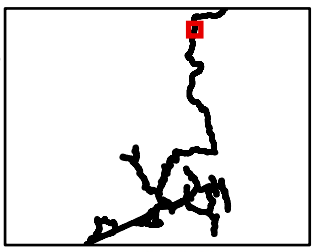
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: DNG
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion: DNG
- Exotic
- Road/Track

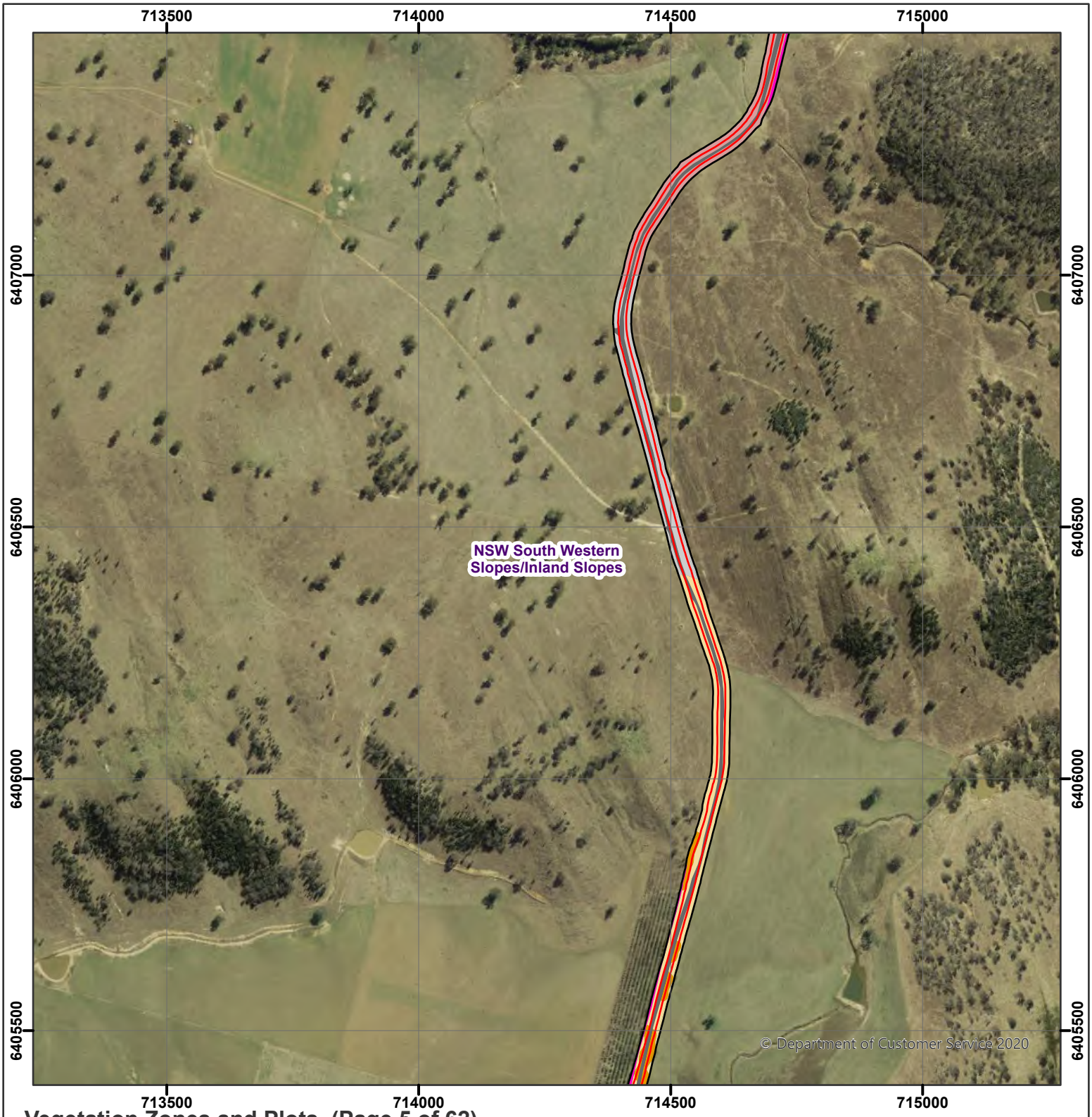
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Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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Vegetation Zones and Plots (Page 5 of 62)

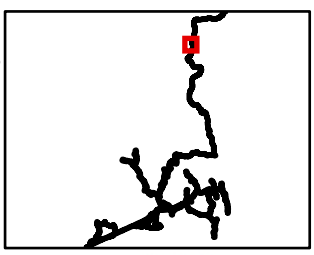
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions: DNG
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: Good
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion: DNG
- Exotic
- Road/Track

0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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Vegetation Zones and Plots (Page 6 of 62)

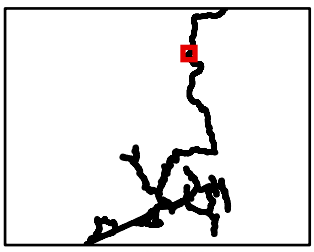
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: Good
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- 461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion: DNG
- Exotic
- Road/Track

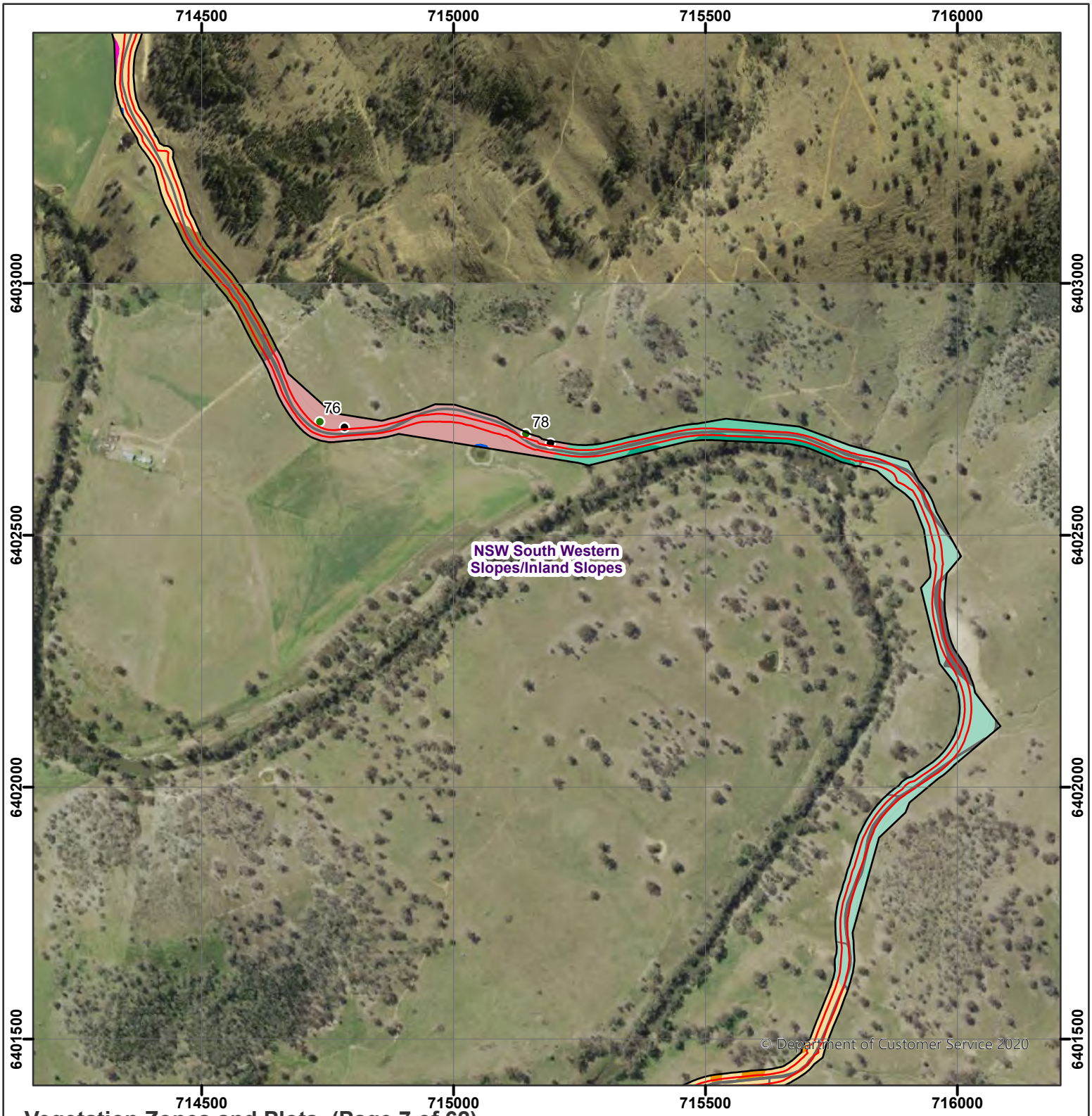
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Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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Vegetation Zones and Plots (Page 7 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

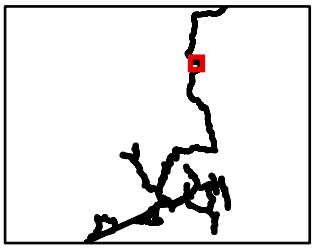
- Start
- End

Vegetation Zones

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: Good
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion: DNG
- 461: Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion: DNG
- Exotic
- Dam
- Road/Track
- Cleared

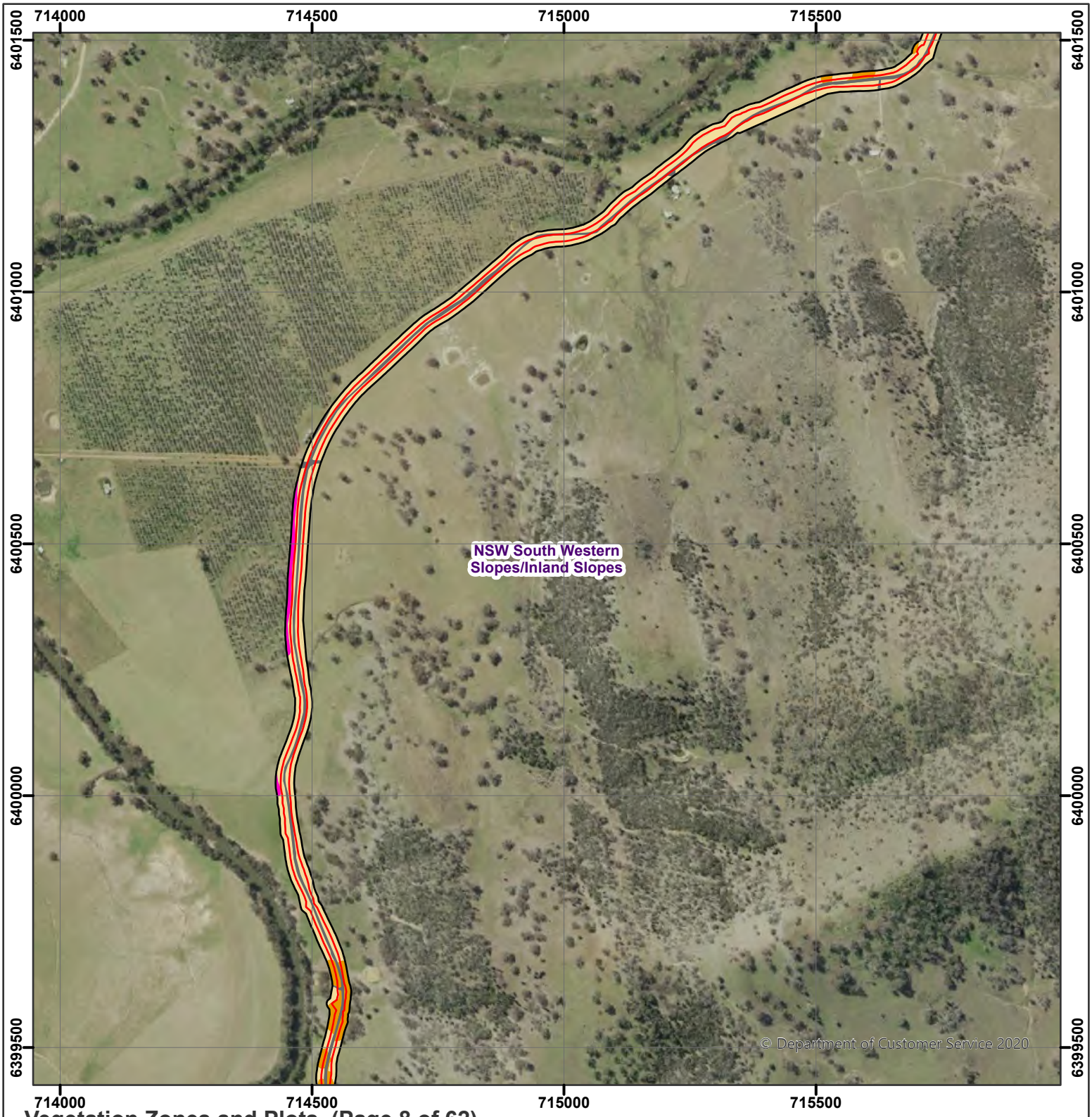
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Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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Vegetation Zones and Plots (Page 8 of 62)

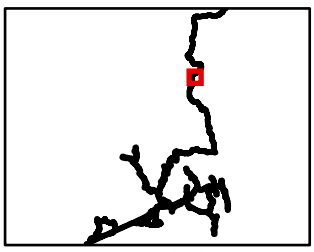
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: Good
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- Exotic
- Road/Track
- Cleared

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 9 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

- Start
- End

Vegetation Zones

- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: Good
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- Drainage
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 10 of 62)

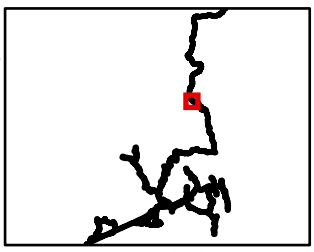
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion: DNG
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 11 of 62)

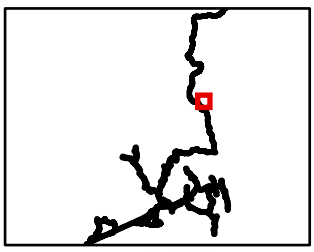
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Road/Track

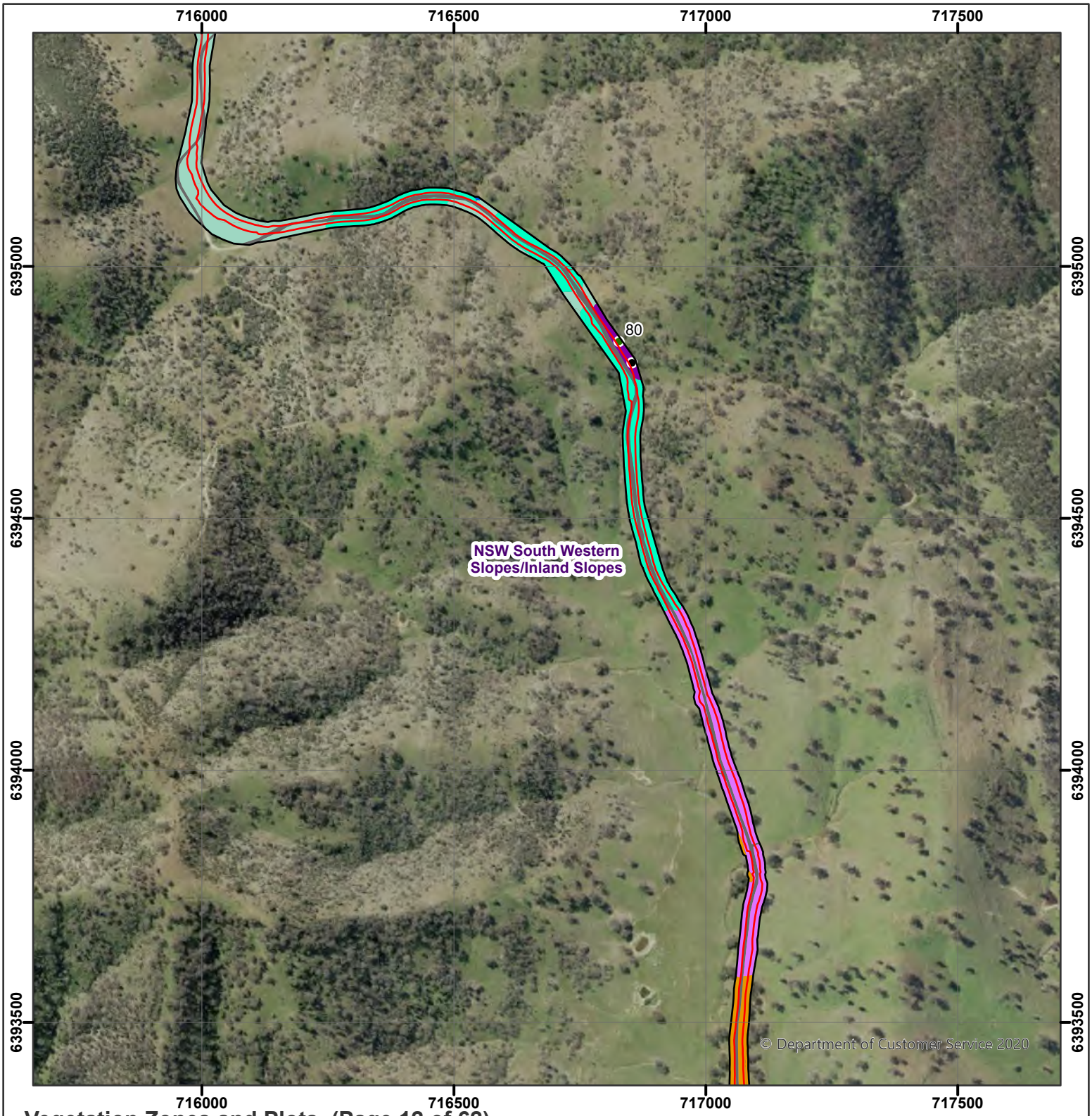
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Datum/Projection:
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Vegetation Zones and Plots (Page 12 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

- Start
- End

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 274: White Box - Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee region: Good
- 274: White Box - Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee region: DNG
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: Good
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 13 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 274: White Box - Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee region: DNG
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: Good
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- Dam
- Road/Track

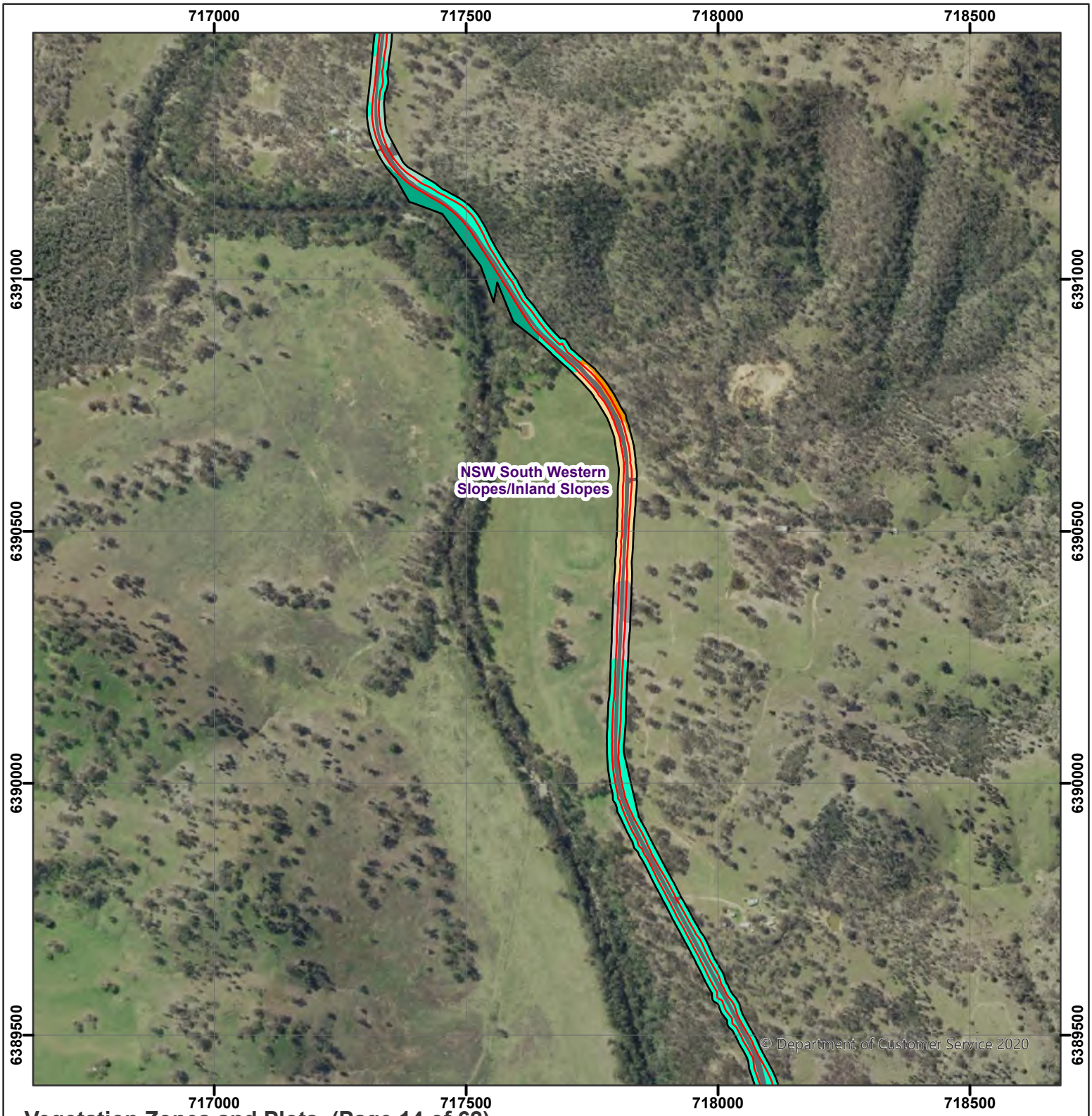
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Datum/Projection:
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Location: Burrendong, NSW
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Vegetation Zones and Plots (Page 14 of 62)

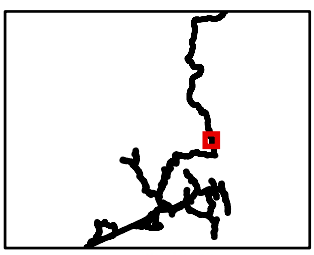
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions: Good
- 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions: DNG
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: Good
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 15 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

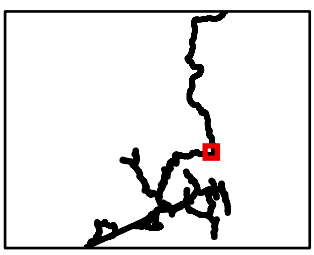
- Start
- End

Vegetation Zones

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: DNG
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: Good
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: Good
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 16 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: Good
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Exotic
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 17 of 62)

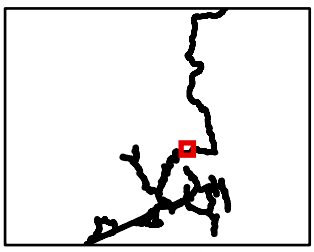
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Road/Track
- Cleared

0 75 150 300
Metres

Datum/Projection:
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Location: Burrendong, NSW
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Vegetation Zones and Plots (Page 18 of 62)

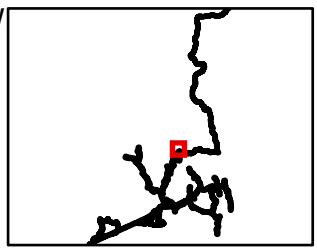
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Exotic
- Built
- Road/Track

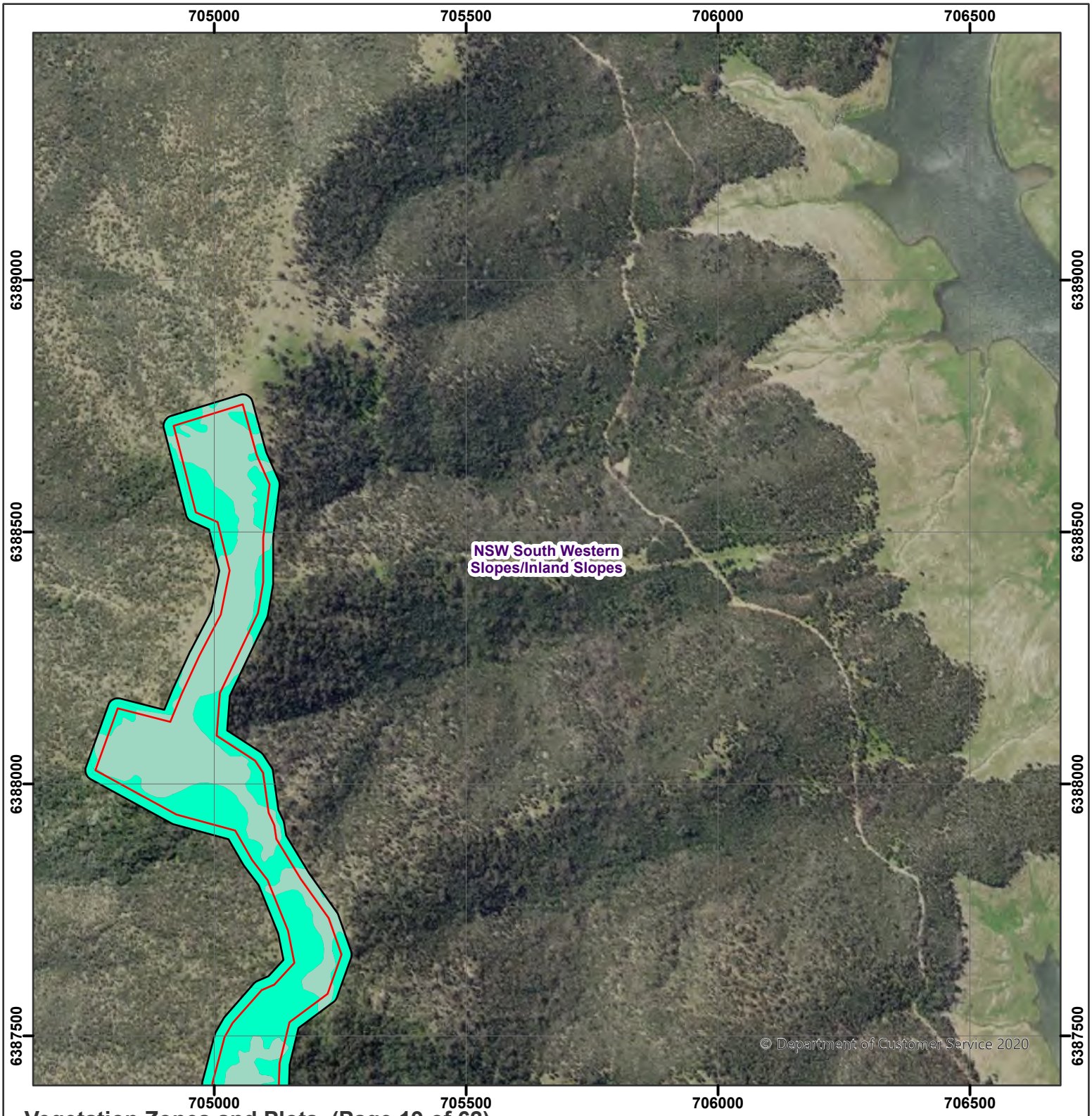
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Datum/Projection:
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Vegetation Zones and Plots (Page 19 of 62)

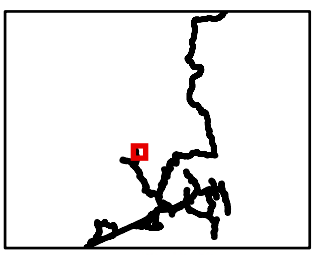
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG

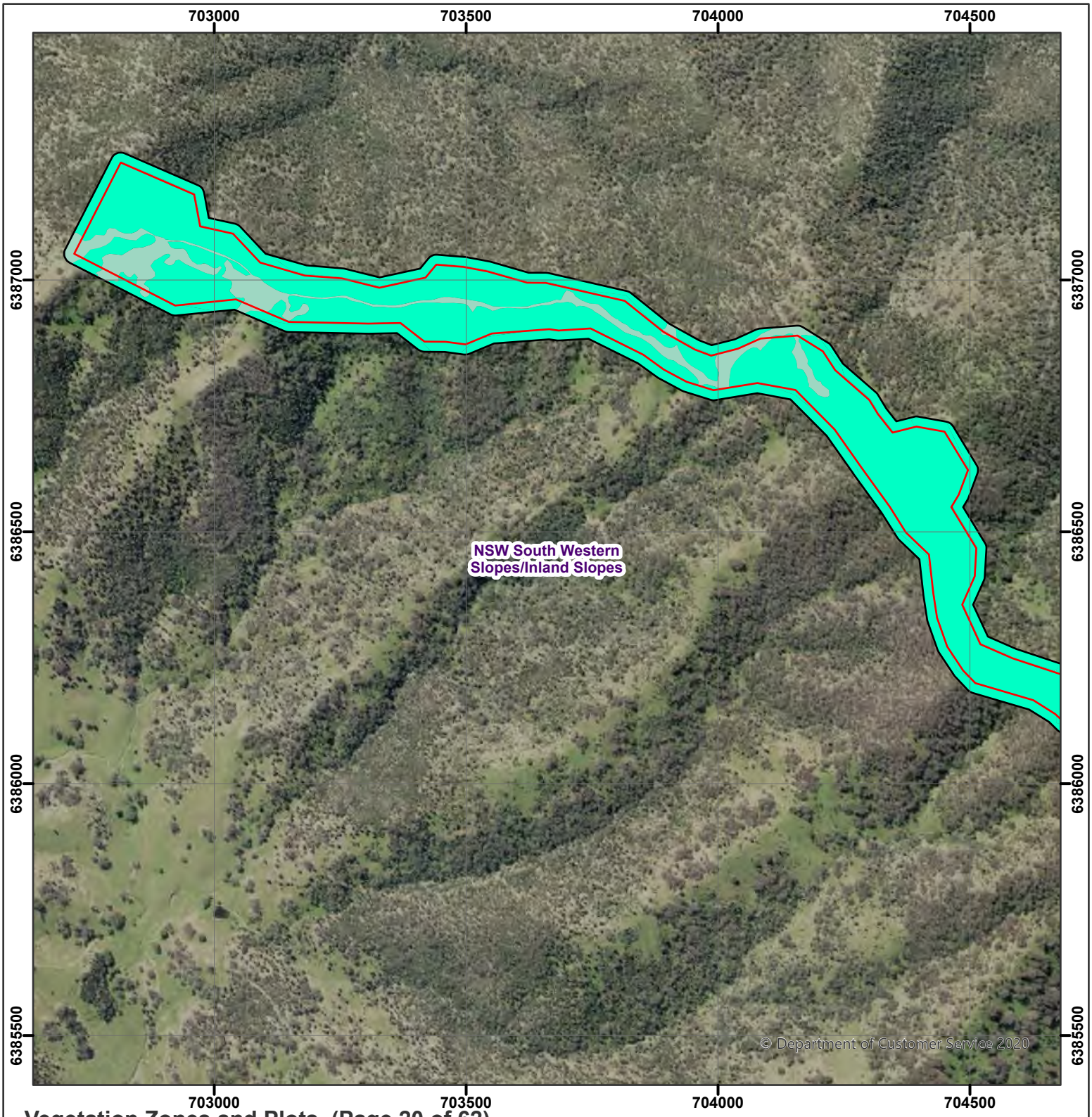
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Datum/Projection:
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Vegetation Zones and Plots (Page 20 of 62)

Development Corridor

Development Footprint

IBRA Subregions

Vegetation Zones

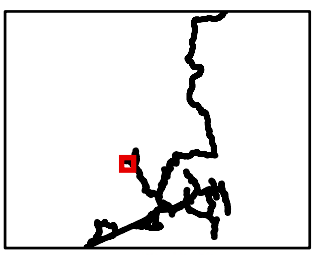
272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good

272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG

0 75 150 300

Metres

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Vegetation Zones and Plots (Page 21 of 62)

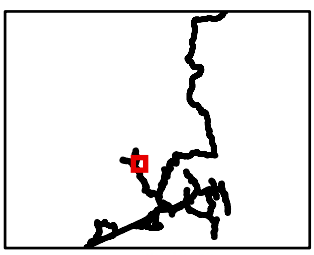
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 22 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

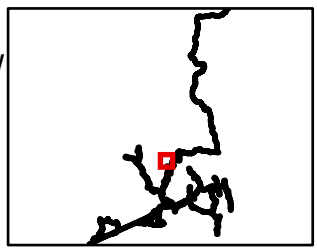
- Start

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Road/Track
- Cleared

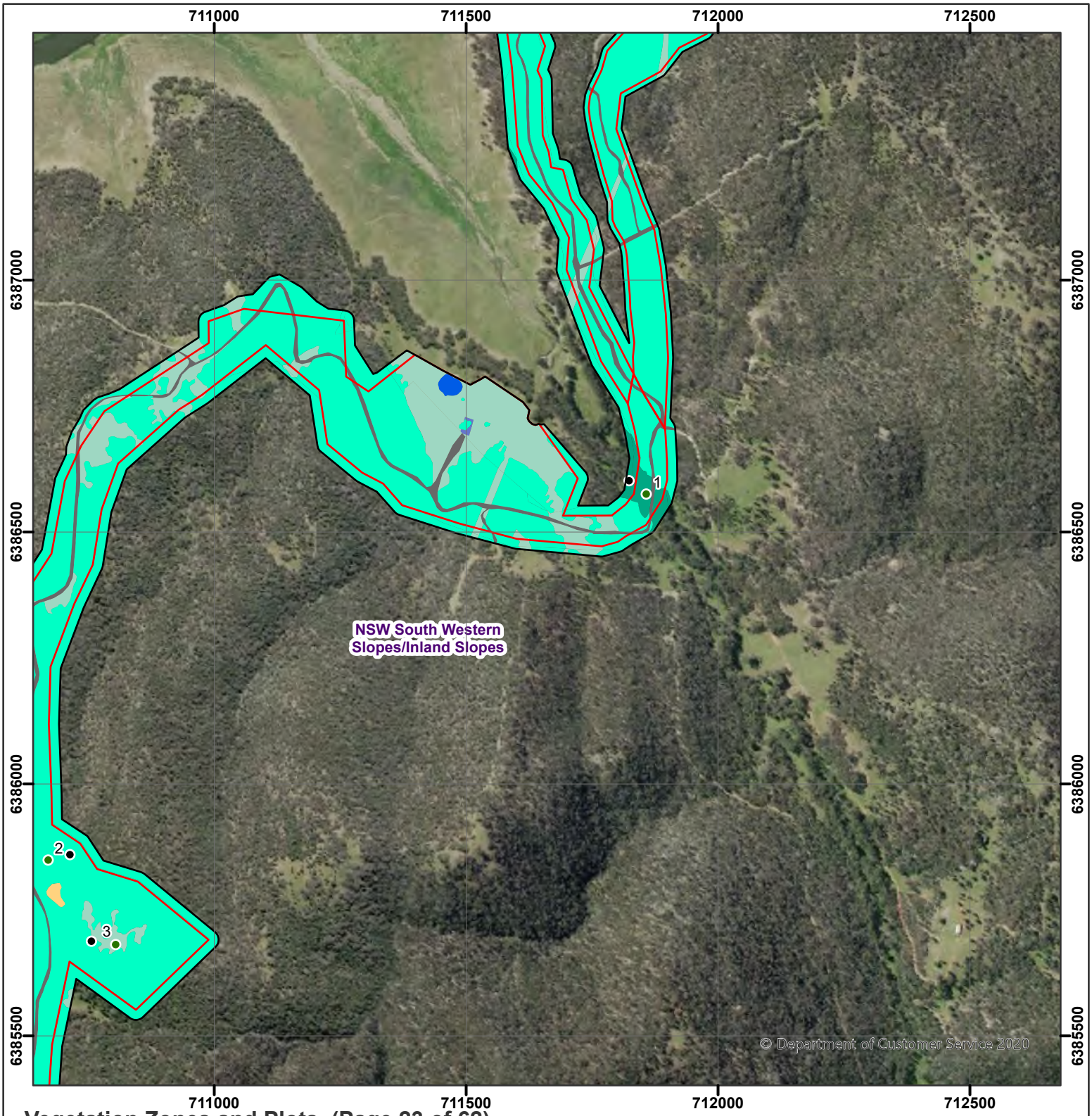
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Datum/Projection:
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Vegetation Zones and Plots (Page 23 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

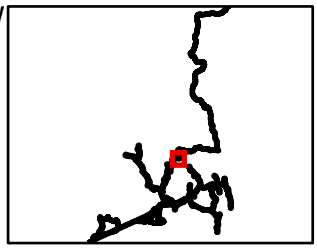
- Start
- End

Vegetation Zones

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Cattleyard
- Dam
- Road/Track
- Cleared

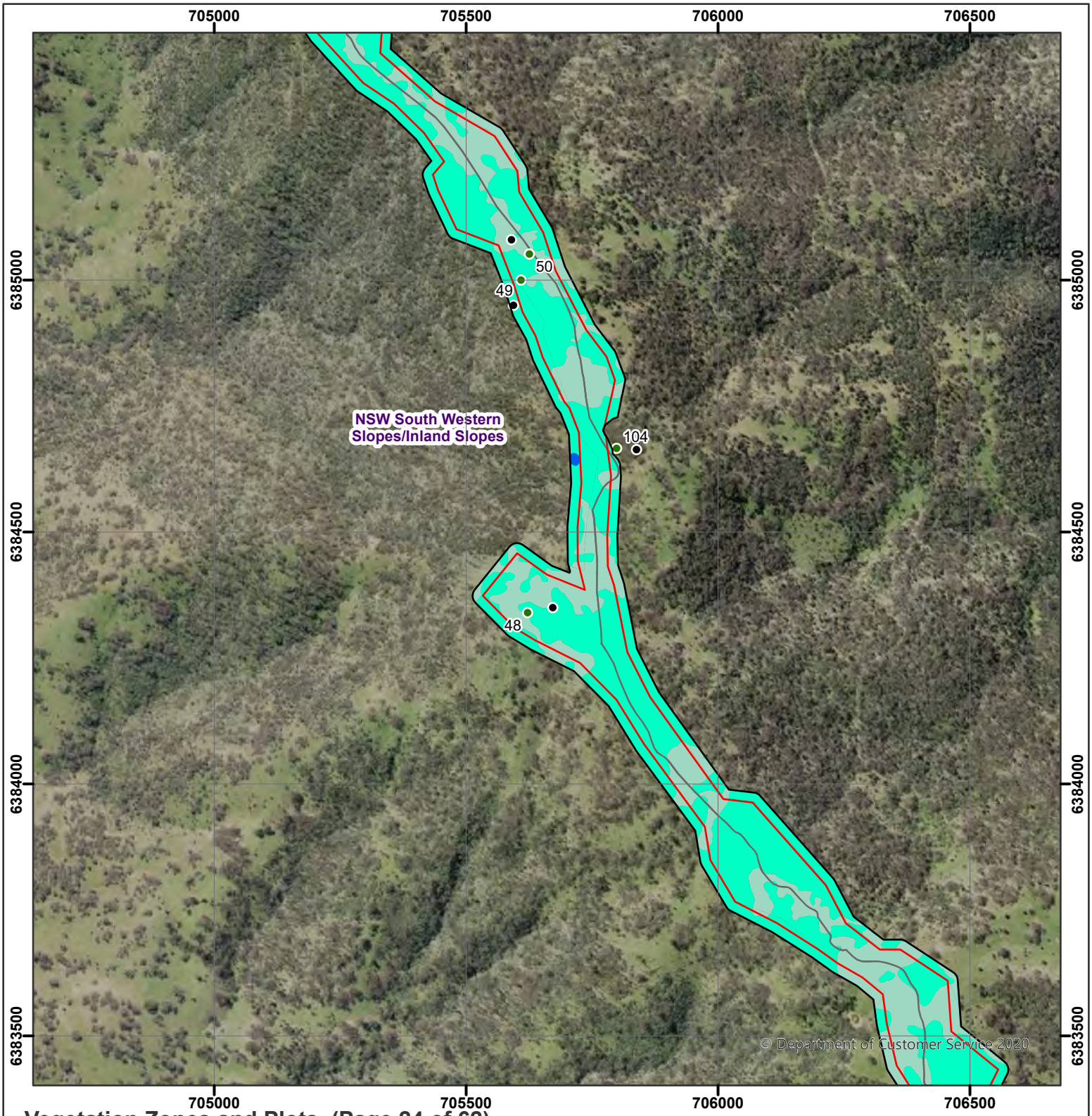
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Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 24 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

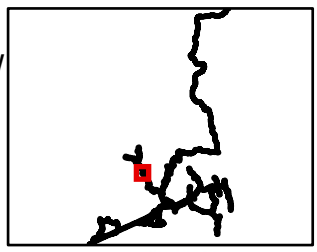
- Start
- End

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Dam
- Road/Track

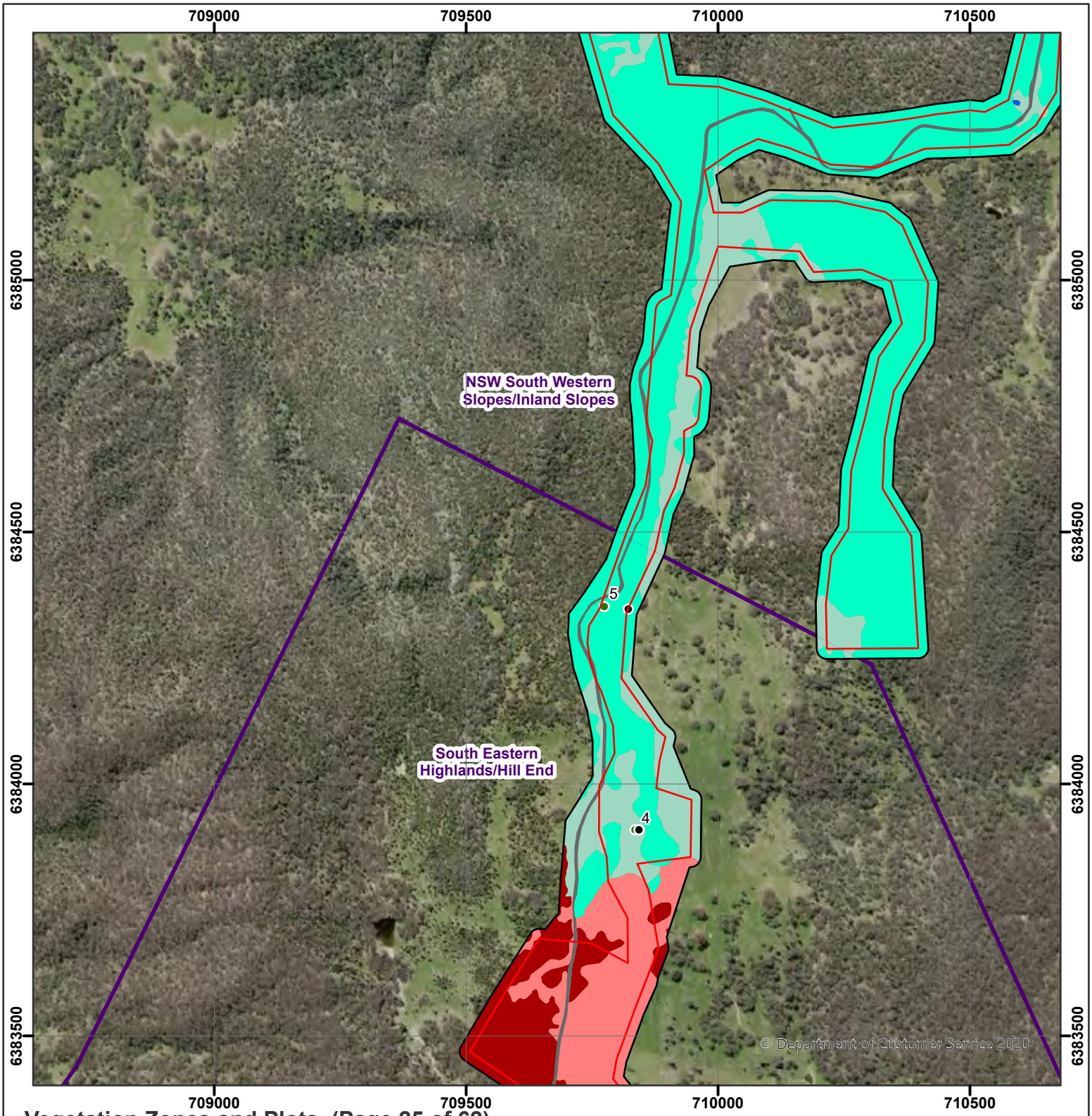
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Metres

Datum/Projection:
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Location: Burrendong, NSW
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Vegetation Zones and Plots (Page 25 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

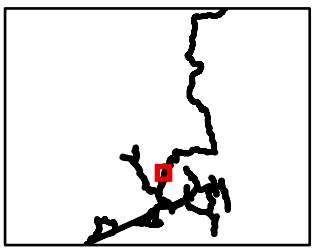
- Start
- End

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 26 of 62)

- Development Corridor
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- IBRA Subregions

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Road/Track

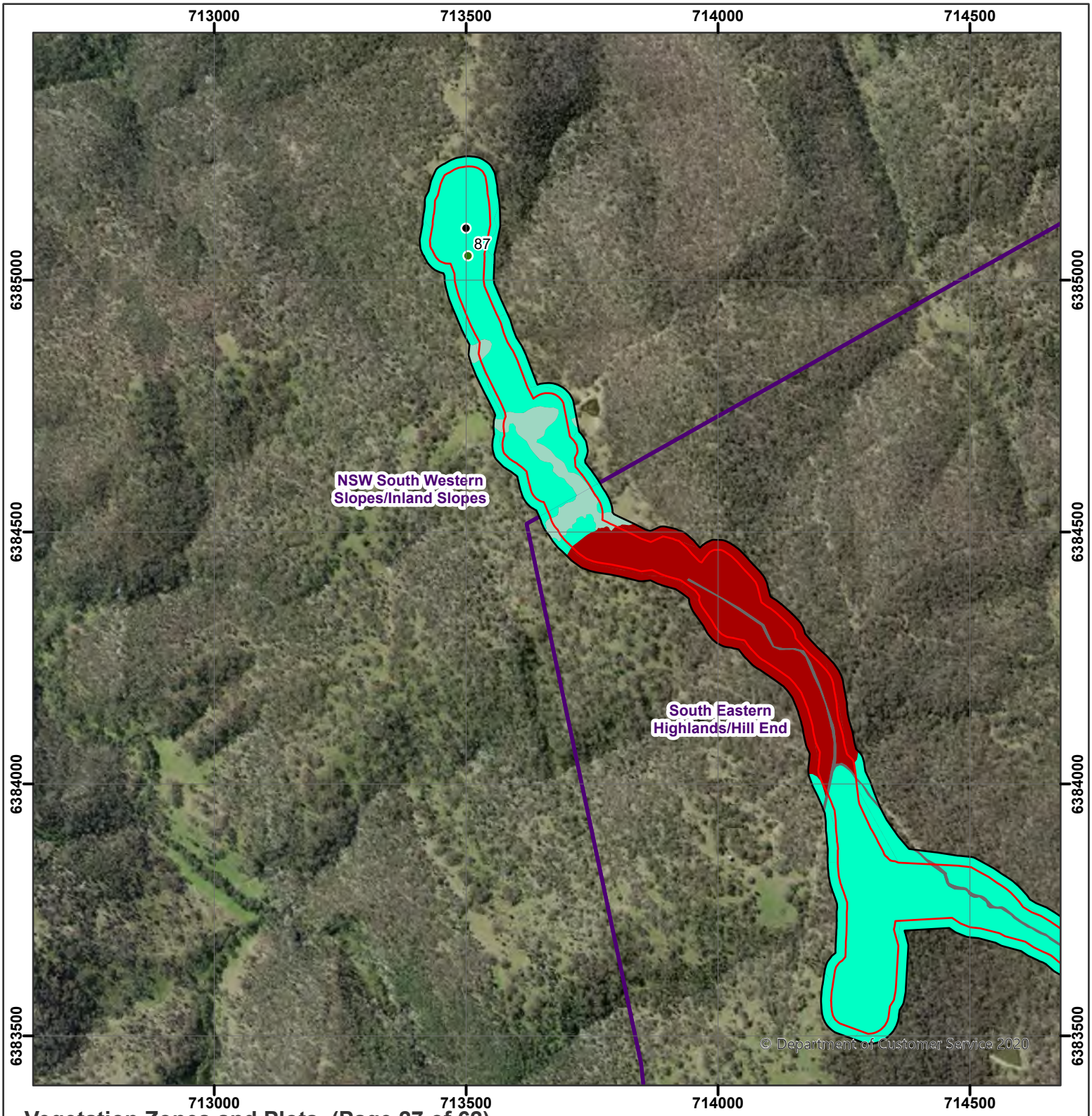
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Datum/Projection:
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Vegetation Zones and Plots (Page 27 of 62)

- Development Corridor
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- IBRA Subregions

Vegetation Integrity Survey Plot Location

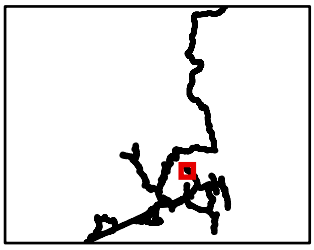
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Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 28 of 62)

- Development Corridor
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Vegetation Integrity Survey Plot Location

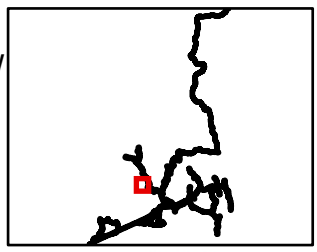
- Start
- End

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Road/Track

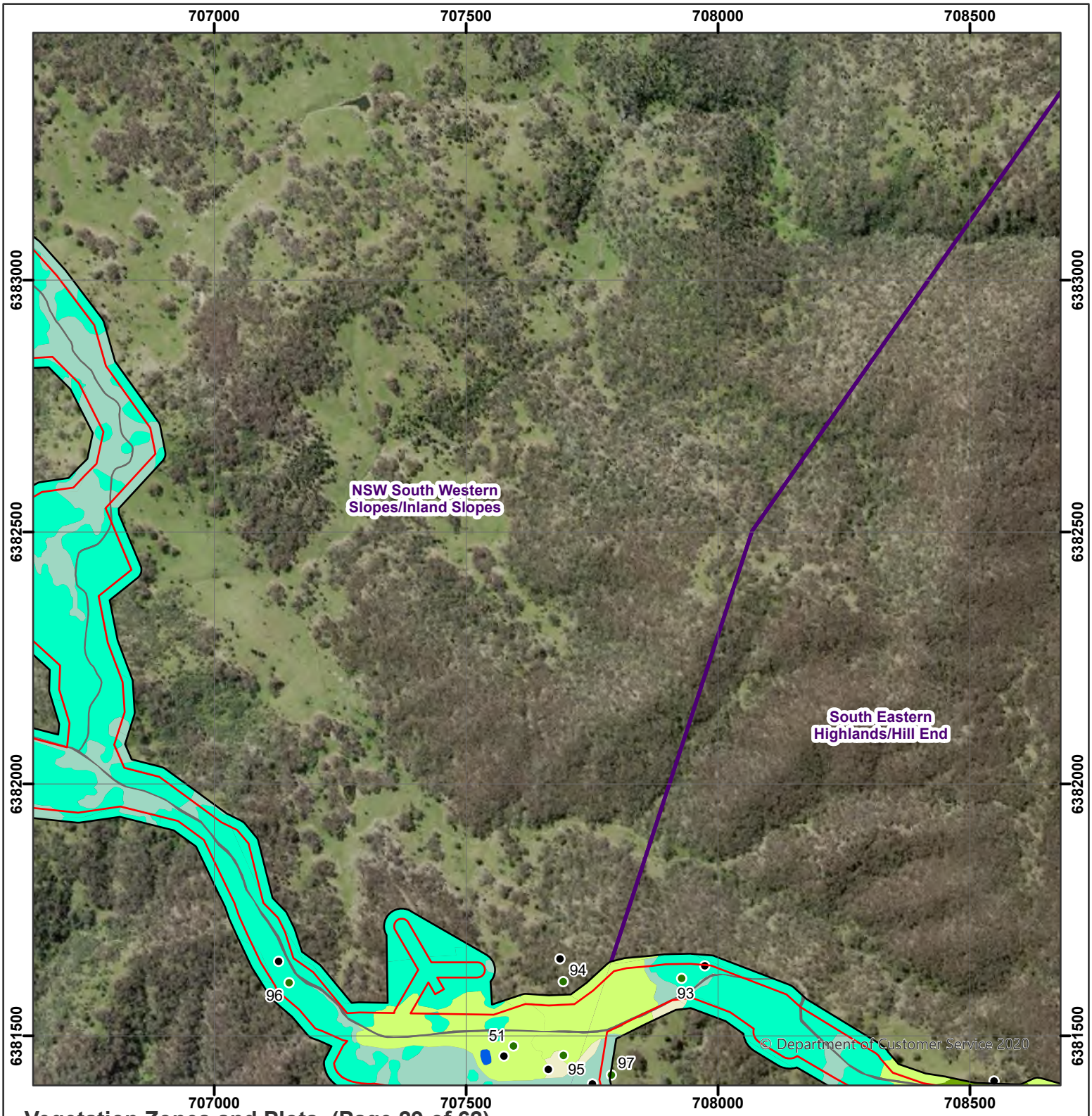
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Datum/Projection:
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Vegetation Zones and Plots (Page 29 of 62)

- Development Corridor
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Vegetation Integrity Survey Plot Location

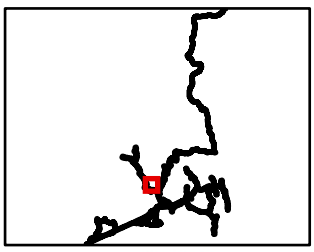
- Start
- End

Vegetation Zones

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: Good
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: Good
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: DNG
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 30 of 62)

- Development Corridor
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Vegetation Integrity Survey Plot Location

- Start
- End

Vegetation Zones

- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: Good
- Road/Track
- Cleared

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 31 of 62)

- Development Corridor
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Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 32 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

- Start
- End

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- Dam
- Built
- Road/Track

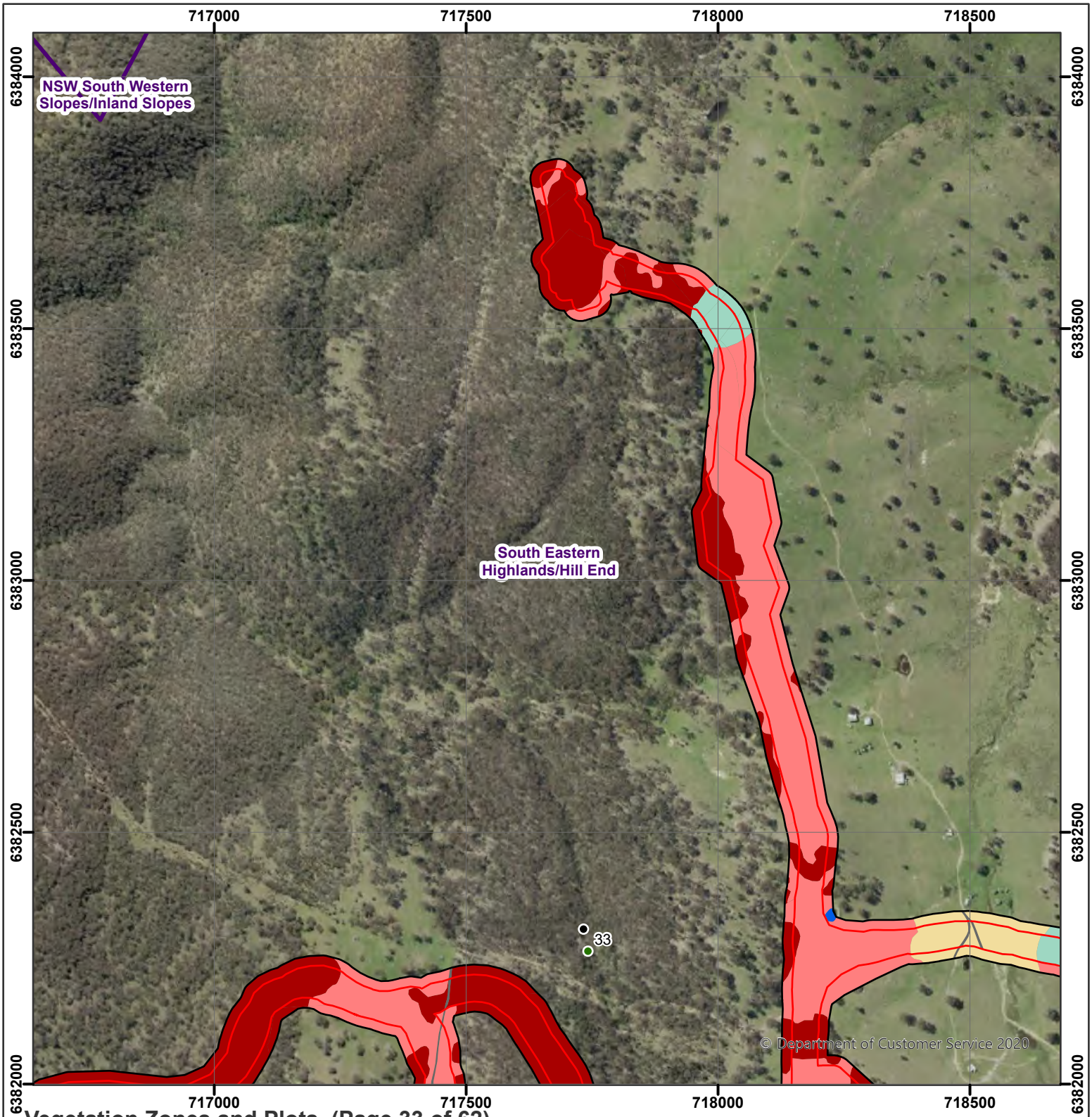
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Datum/Projection:
GDA 1994 MGA Zone 55
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Vegetation Zones and Plots (Page 33 of 62)

- Development Corridor
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Vegetation Integrity Survey Plot Location

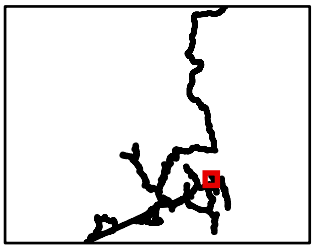
- Start
- End

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- Dam
- Road/Track

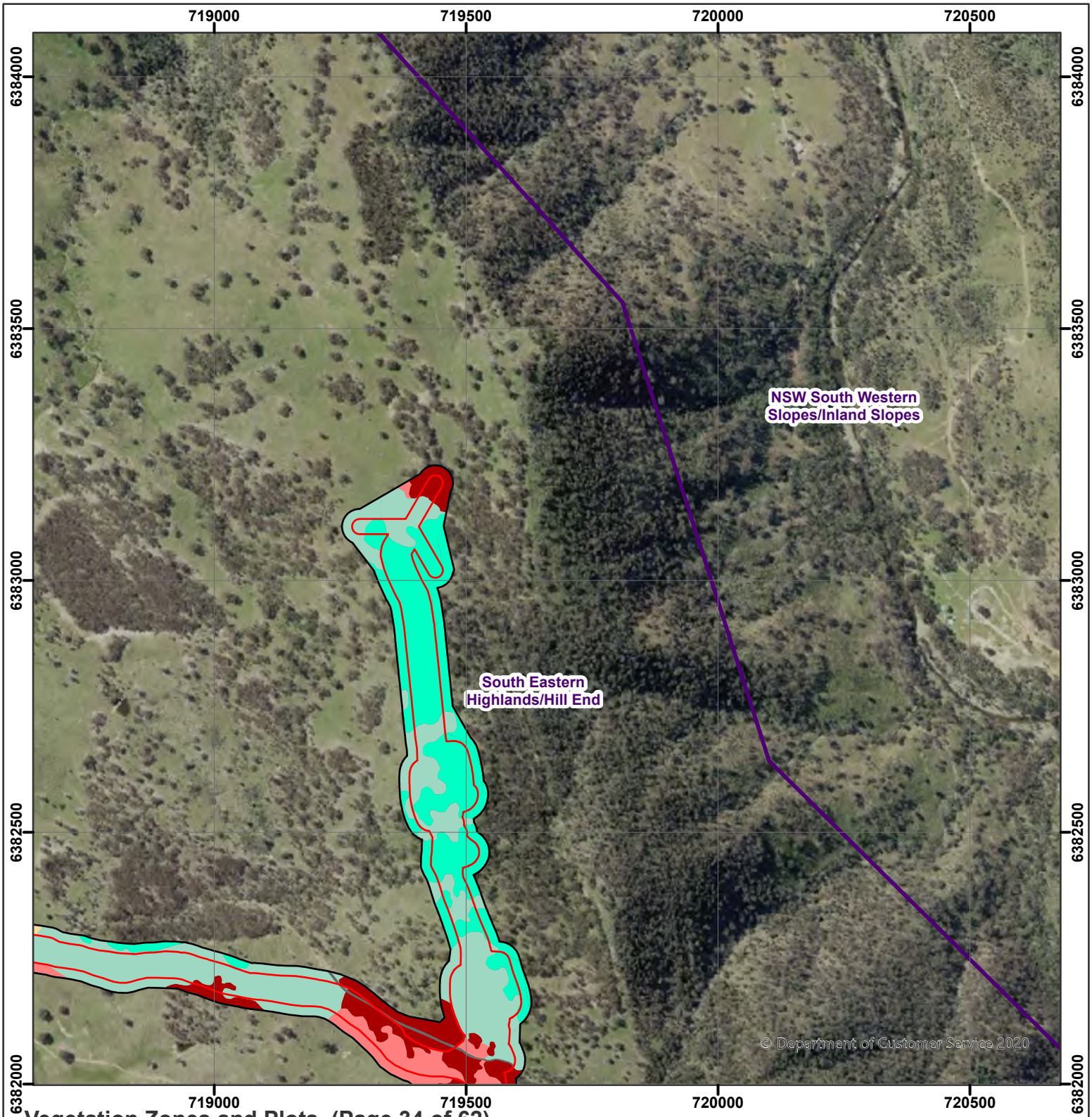
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Datum/Projection:
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Vegetation Zones and Plots (Page 34 of 62)

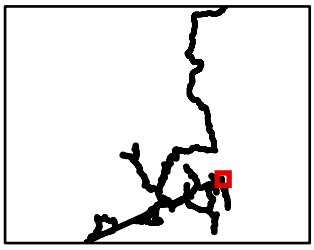
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion: DNG
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- Road/Track

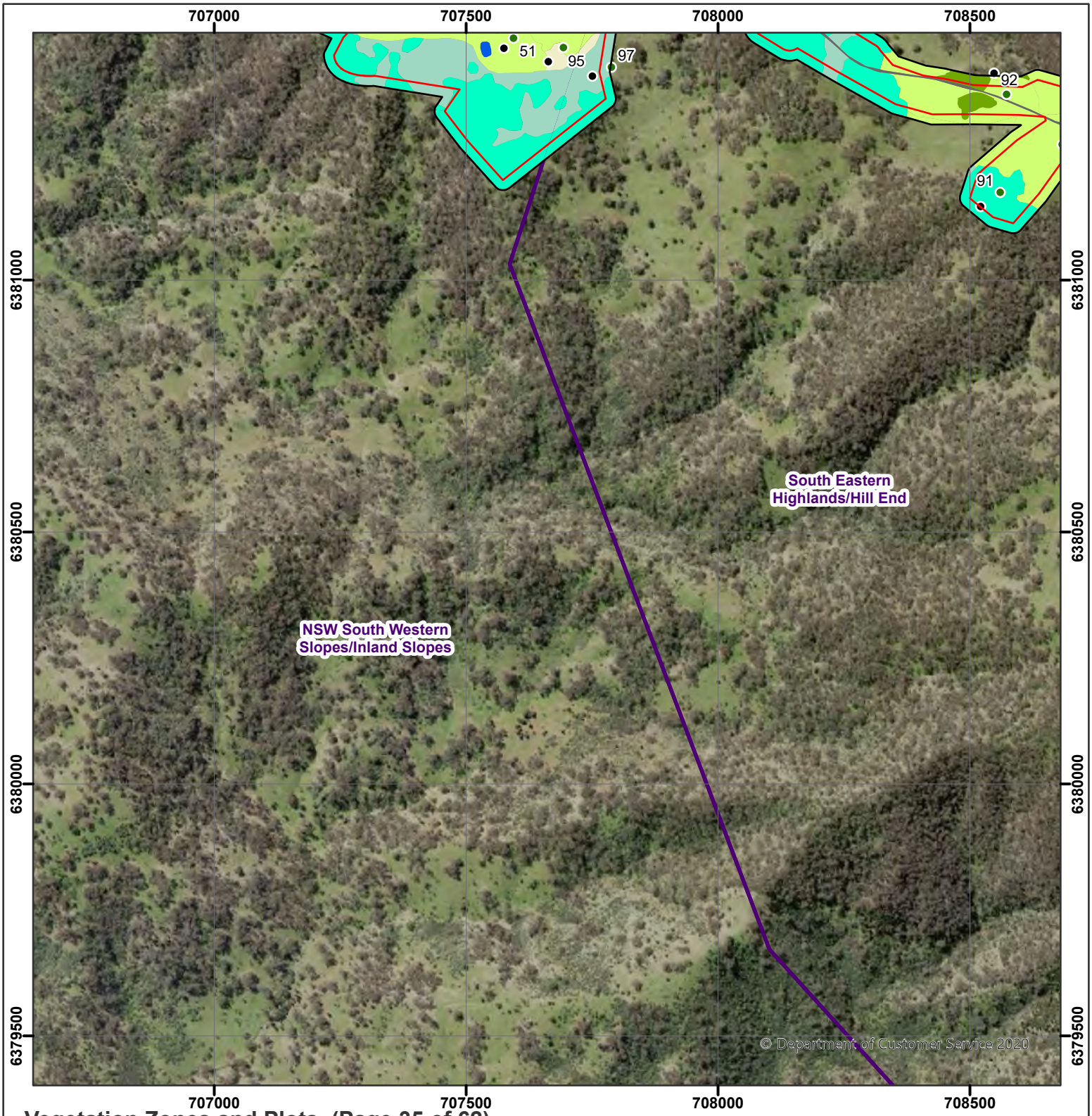
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Datum/Projection:
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Vegetation Zones and Plots (Page 35 of 62)

- Development Corridor
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Vegetation Integrity Survey Plot Location

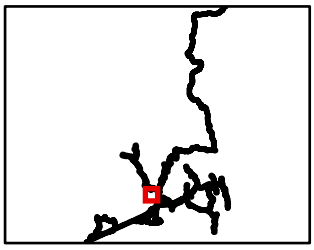
- Start
- End

Vegetation Zones

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: Good
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: Good
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: DNG
- Dam
- Road/Track

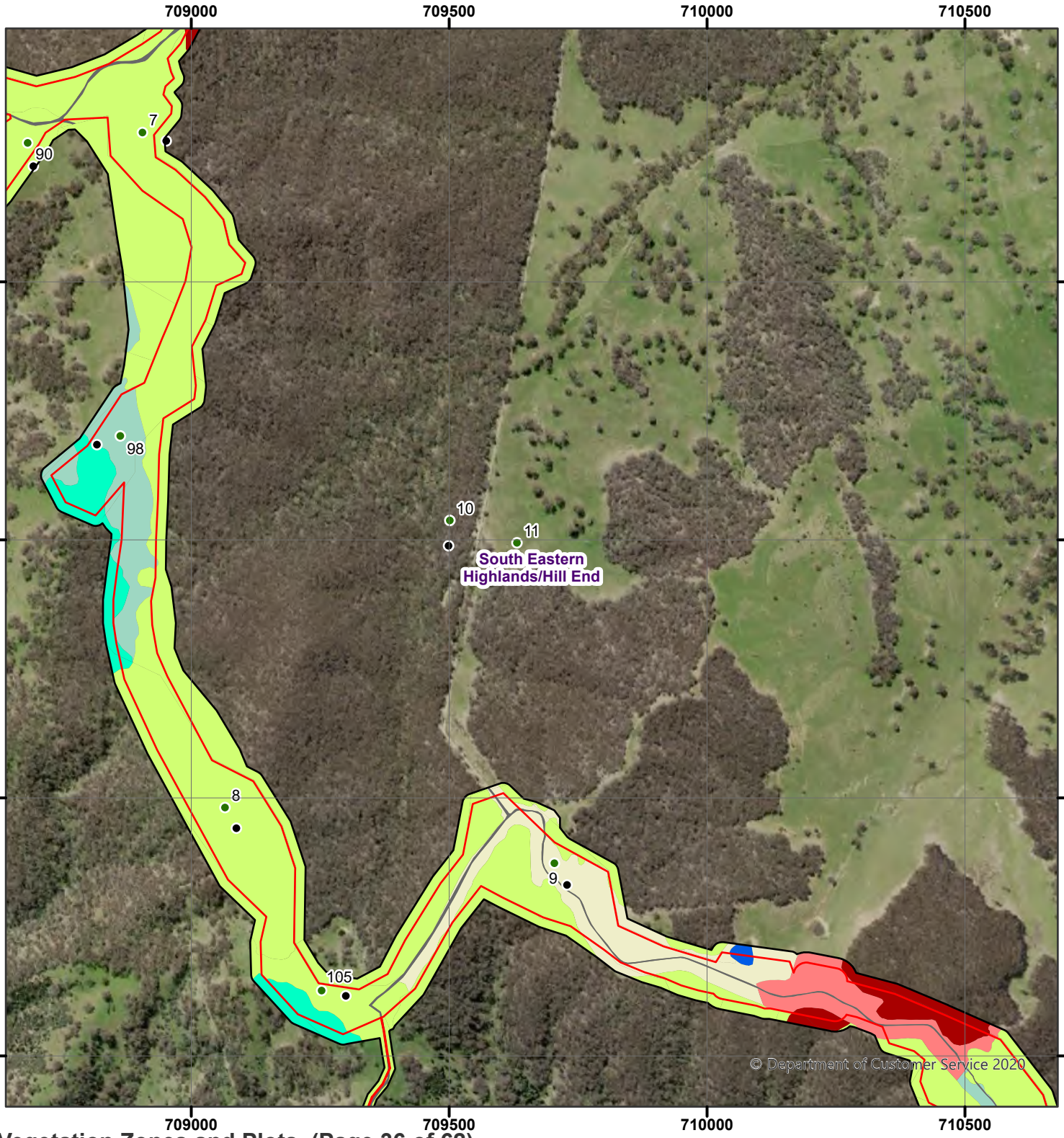
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Datum/Projection:
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Vegetation Zones and Plots (Page 36 of 62)

- Development Corridor
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- IBRA Subregions

Vegetation Integrity Survey Plot Location

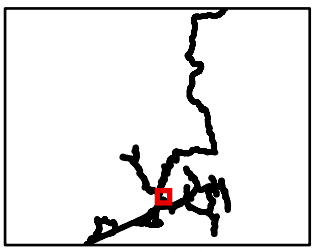
- Start
- End

Vegetation Zones

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: Good
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: DNG
- Dam
- Road/Track

0 75 150 300
Metres

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Vegetation Zones and Plots (Page 37 of 62)

- Development Corridor
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Vegetation Zones

- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: Good
- Road/Track

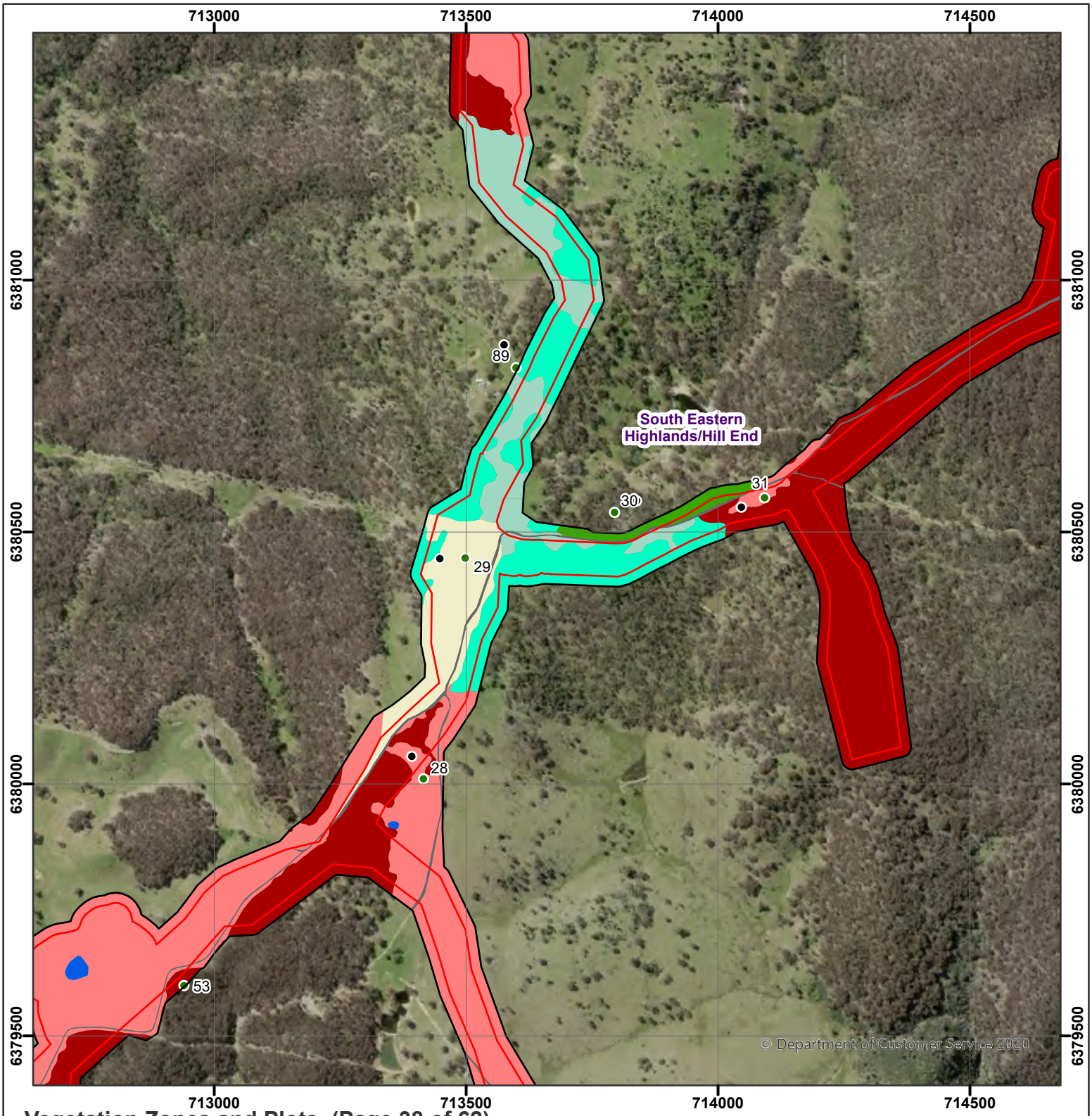
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Datum/Projection:
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- Development Corridor
- Development Footprint
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Vegetation Integrity Survey Plot Location

- Start
- End

Vegetation Zones

- 270: White Box - Tumbledown Red Gum - Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: DNG
- Dam
- Road/Track

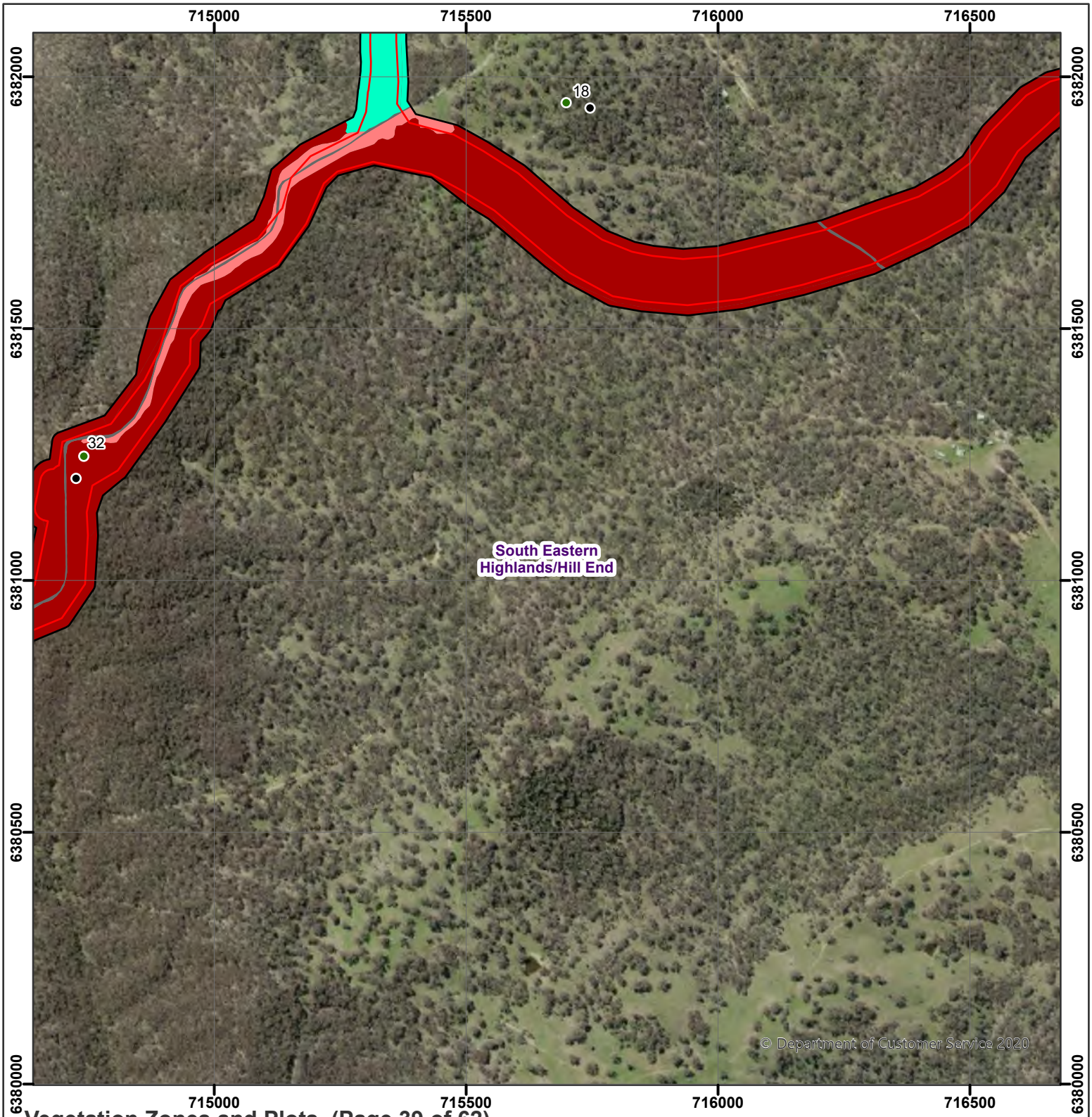
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Datum/Projection:
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Vegetation Zones and Plots (Page 39 of 62)

- Development Corridor
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Vegetation Integrity Survey Plot Location

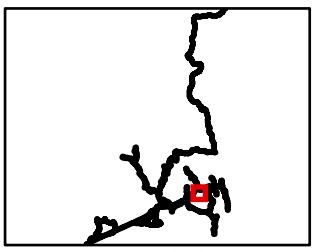
- Start
- End

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- Road/Track

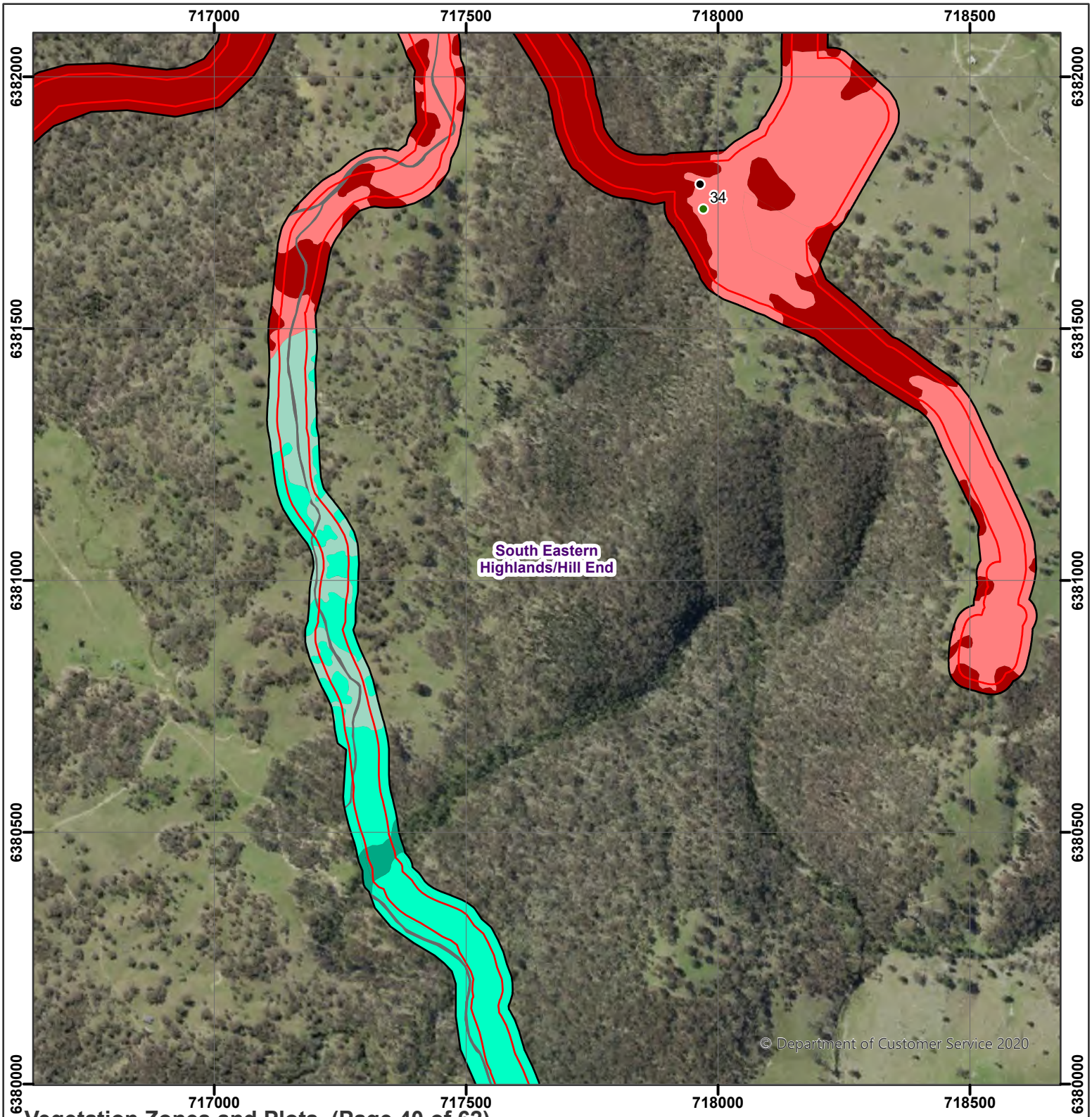
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Vegetation Zones and Plots (Page 40 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

- Start
- End

Vegetation Zones

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 41 of 62)

- Development Corridor
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Vegetation Integrity Survey Plot Location

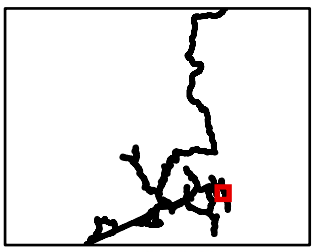
- Start
- End

Vegetation Zones

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: Low
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- Road/Track

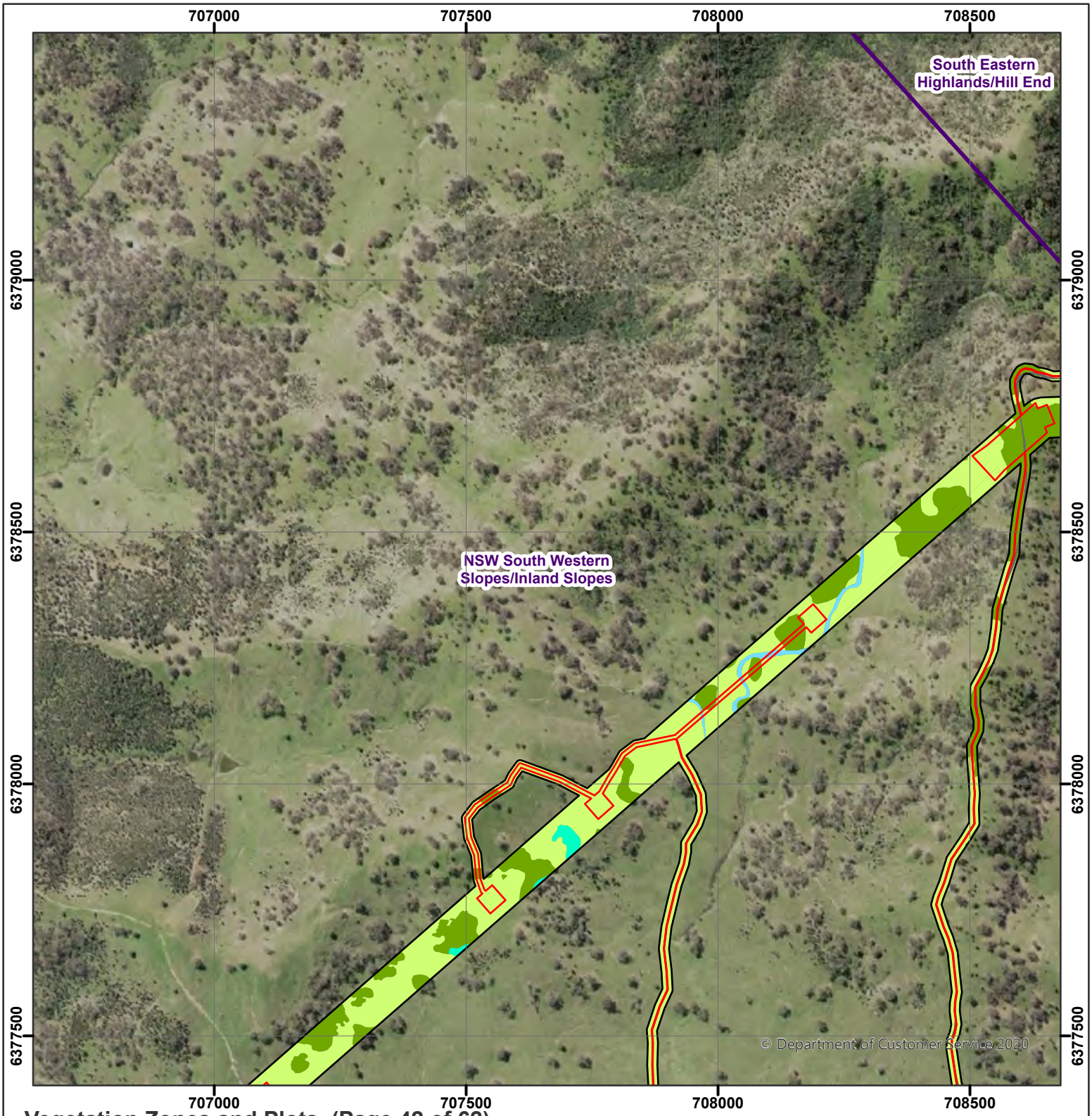
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Metres

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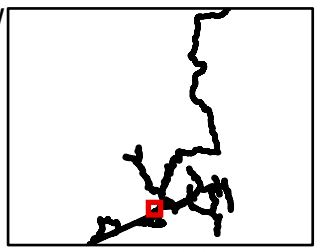
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: Good
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- Drainage
- Road/Track

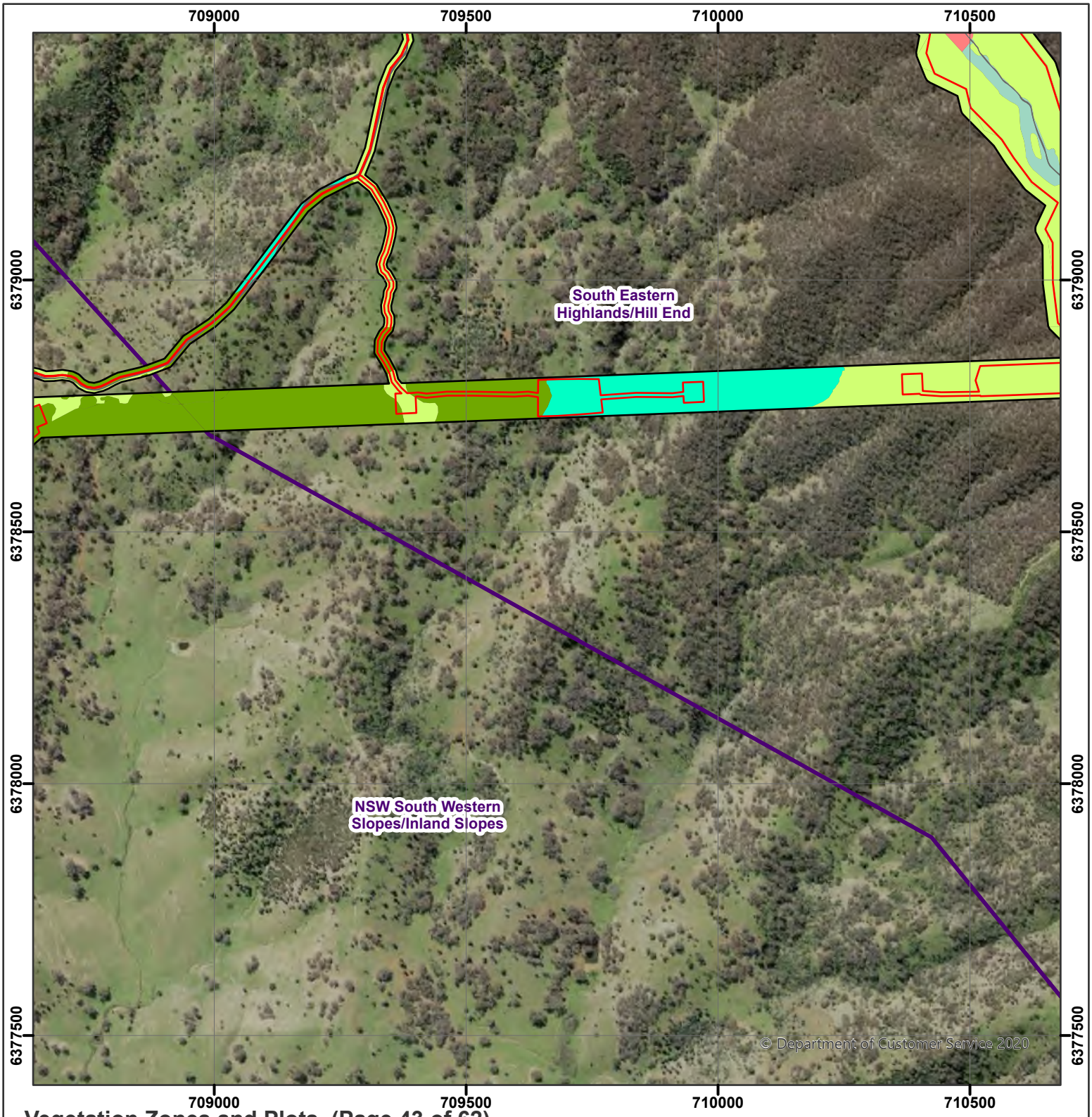
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Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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Vegetation Zones and Plots (Page 43 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: Good
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: Good
- Road/Track

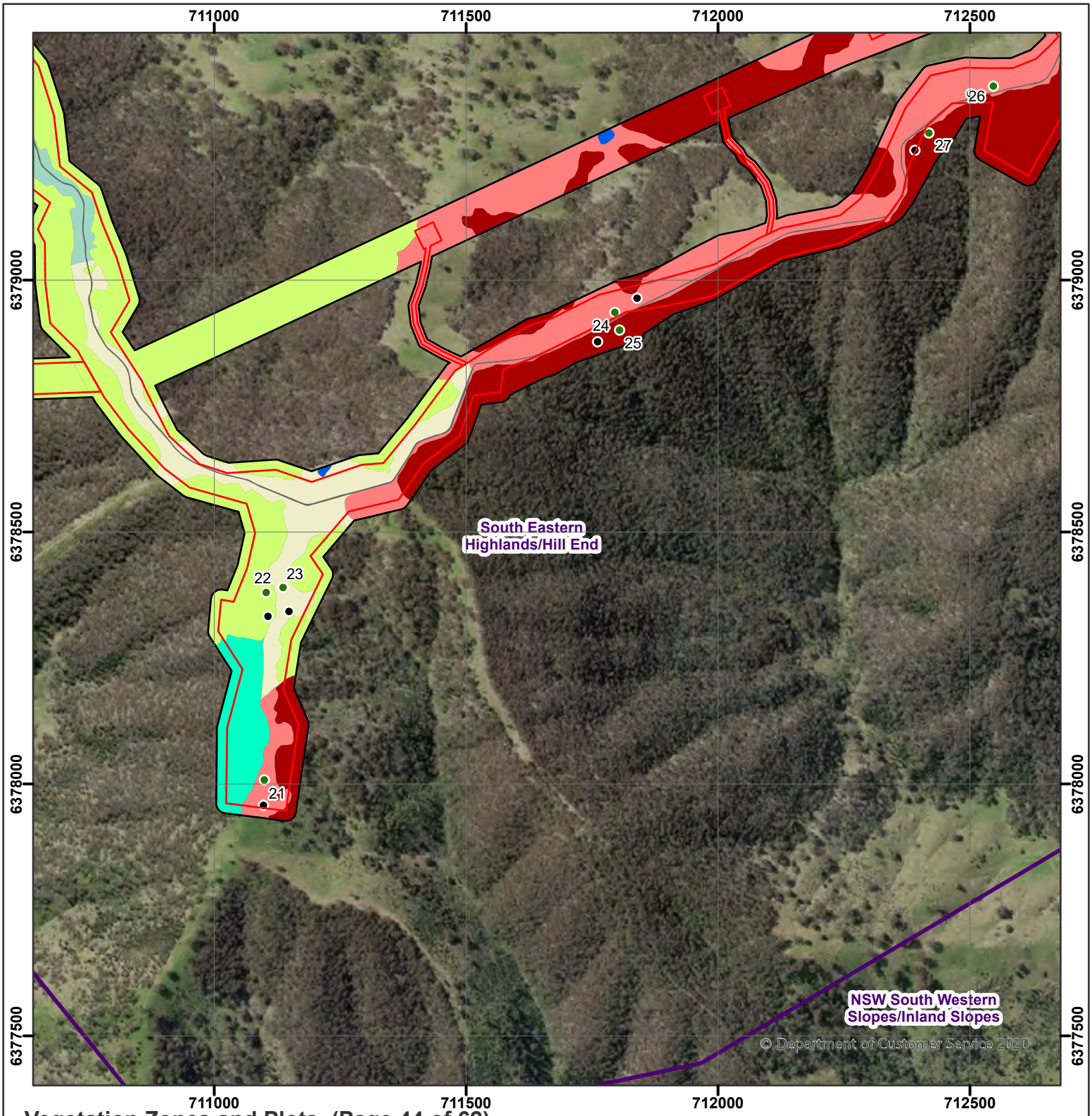
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Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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Vegetation Zones and Plots (Page 44 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

- Start
- End

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: Good
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: DNG
- Dam
- Road/Track

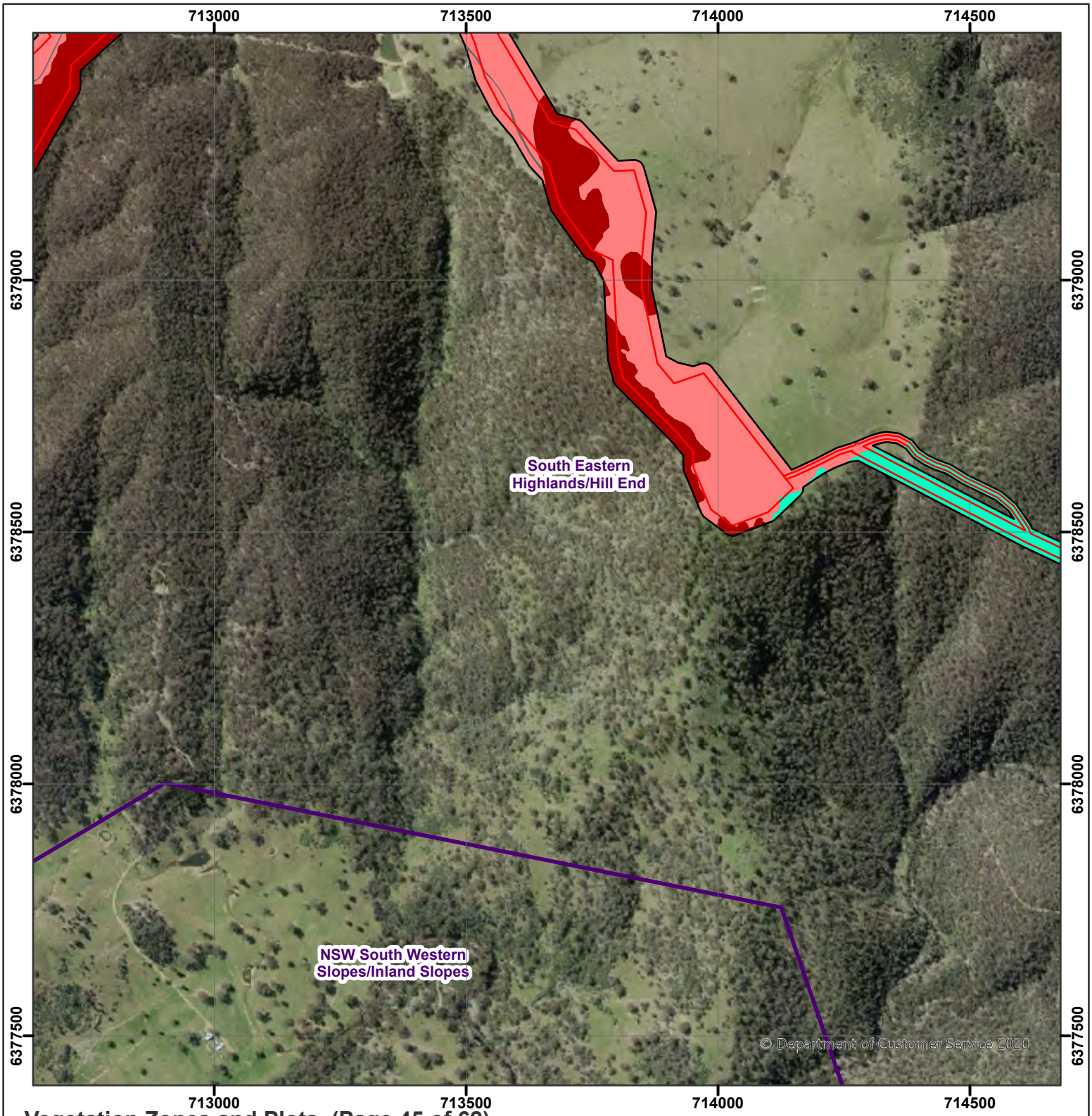
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Datum/Projection:
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Vegetation Zones and Plots (Page 45 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 46 of 62)

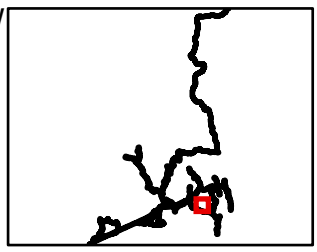
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG

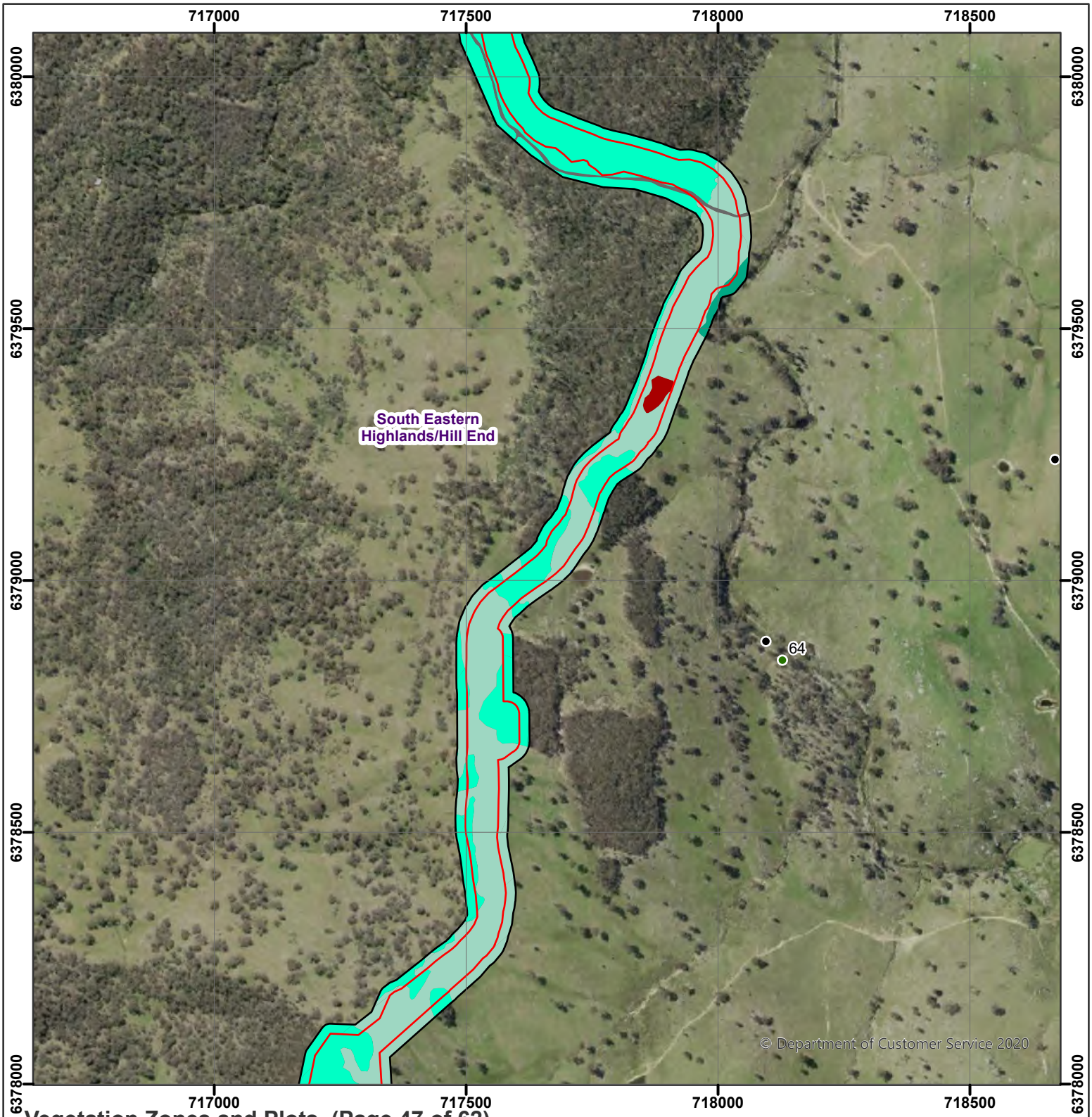
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Datum/Projection:
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Vegetation Zones and Plots (Page 47 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

- Start
- End

Vegetation Zones

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 48 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

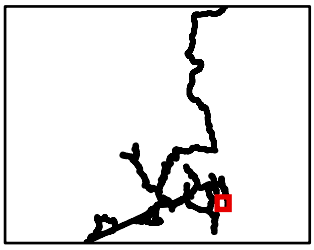
- Start
- End

Vegetation Zones

266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: Low

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 49 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG

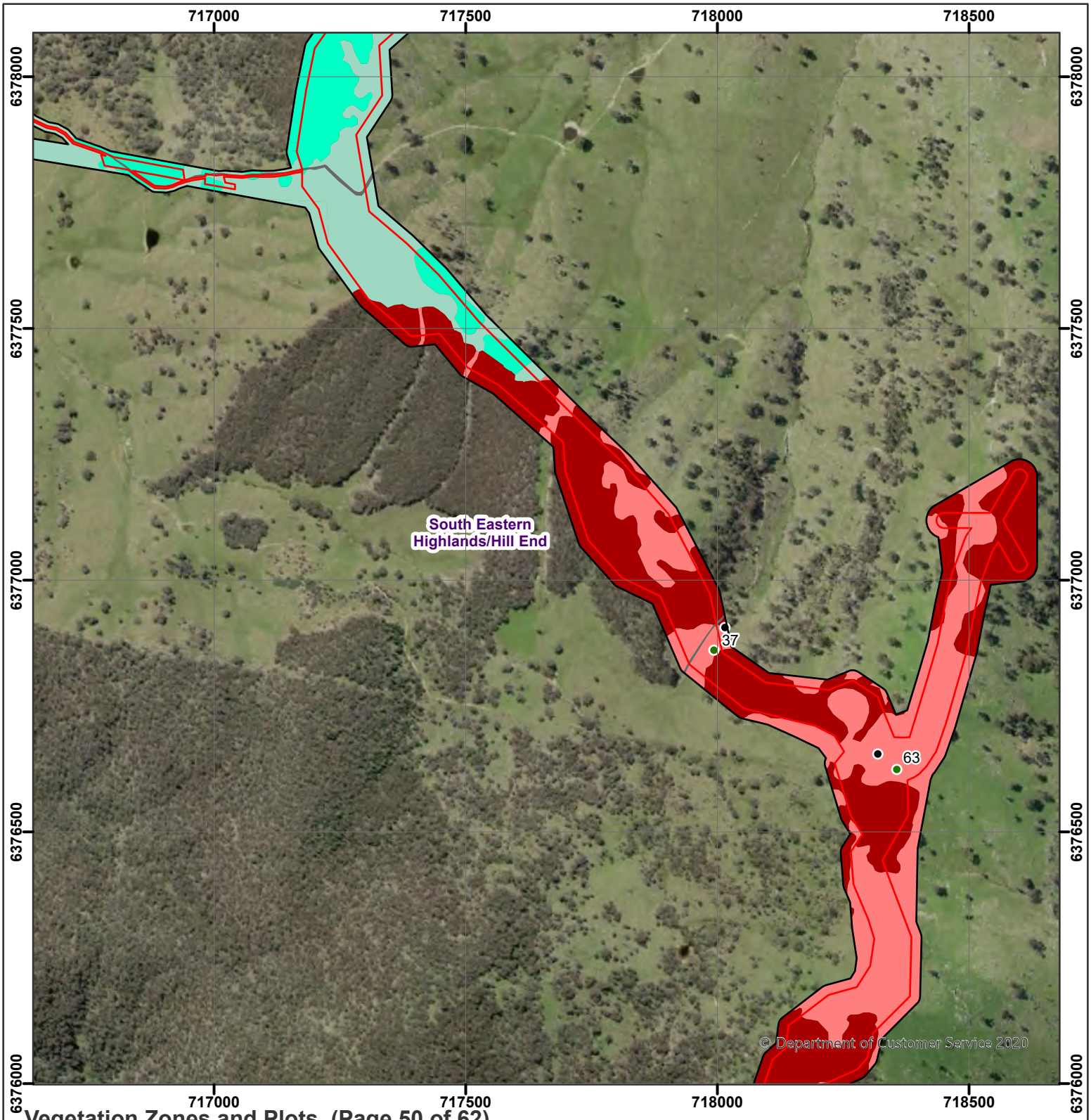
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Datum/Projection:
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Vegetation Zones and Plots (Page 50 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

- Start
- End

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 51 of 62)

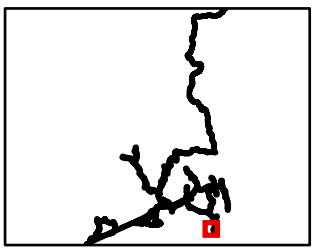
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: Good
- 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion: DNG

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 52 of 62)

- Development Corridor
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- IBRA Subregions

Vegetation Integrity Survey Plot Location

- Start
- End

Vegetation Zones

- 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions: DNG
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: Good
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: DNG
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 53 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

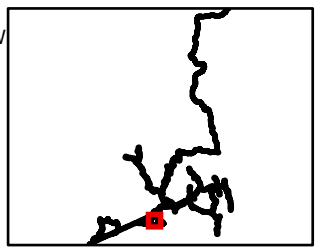
- Start
- End

Vegetation Zones

- 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions: DNG
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: DNG
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: Good
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Road/Track
- Cleared

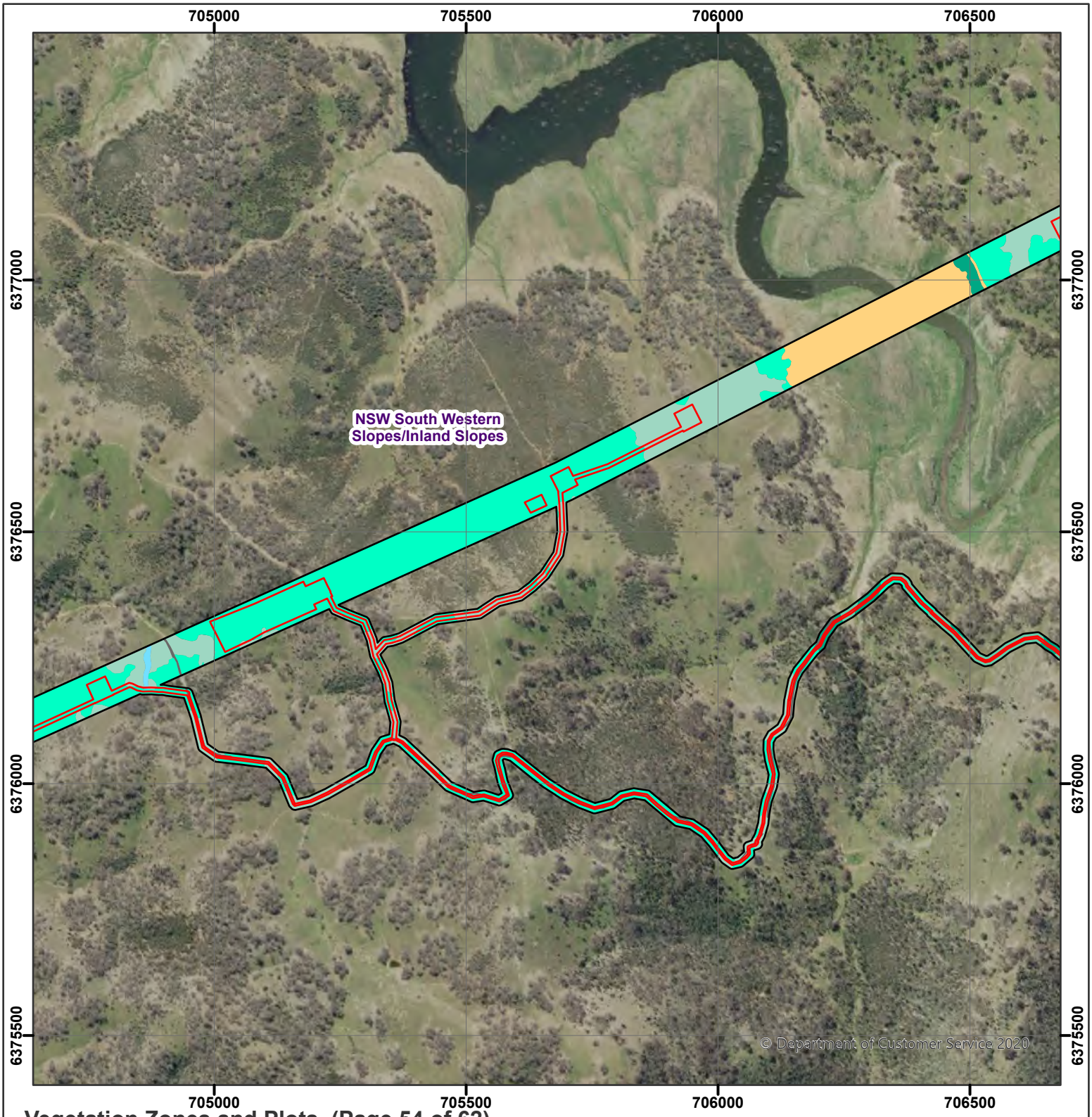
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Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
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Vegetation Zones and Plots (Page 54 of 62)

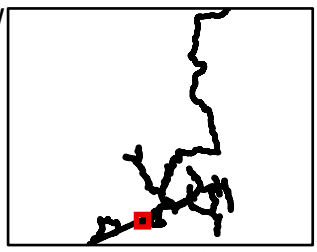
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Drainage
- Road/Track
- Cleared

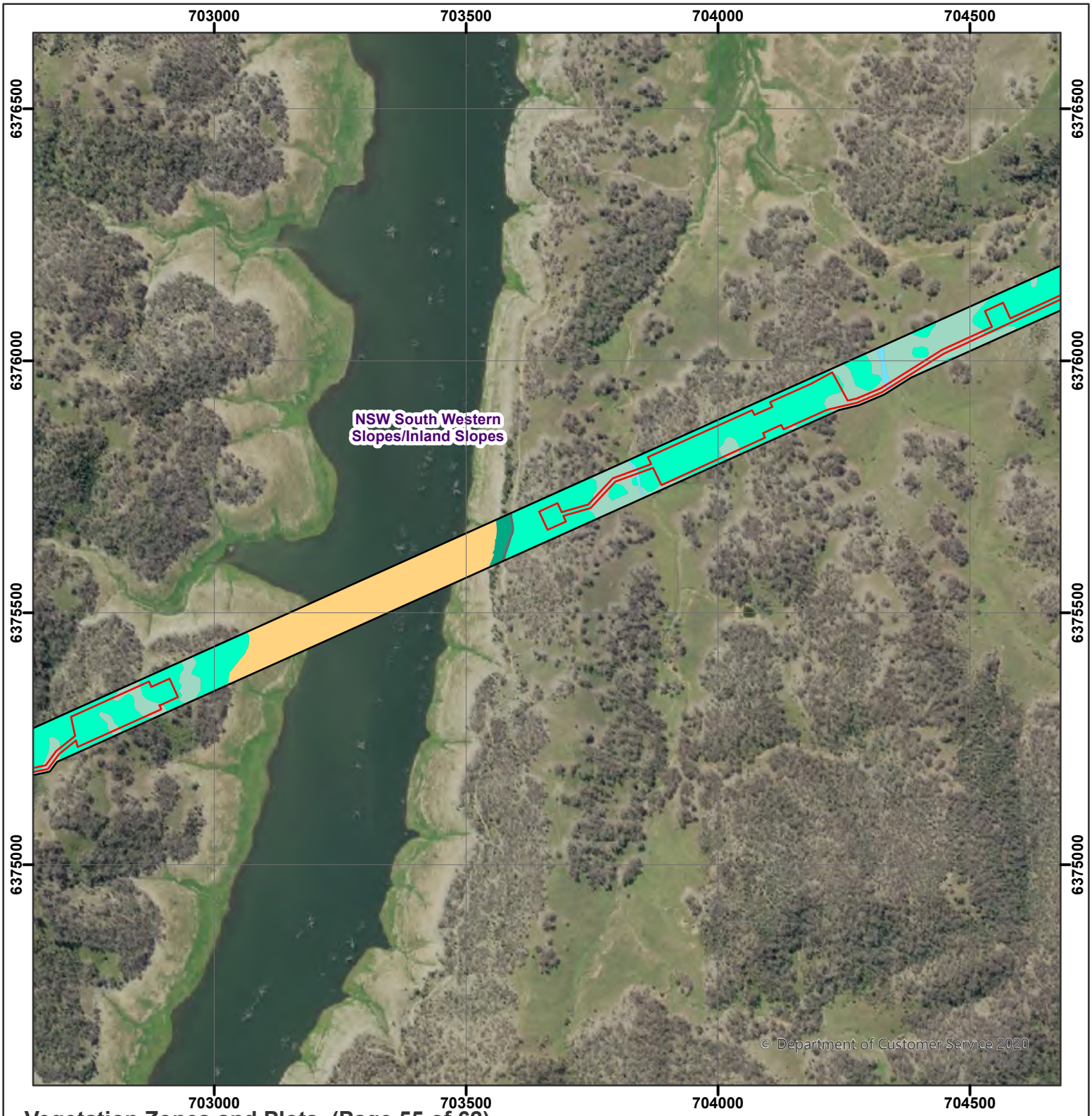
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Datum/Projection:
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Vegetation Zones and Plots (Page 55 of 62)

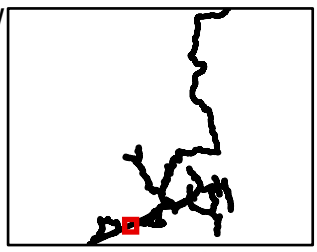
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 84: River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Drainage
- Road/Track
- Cleared

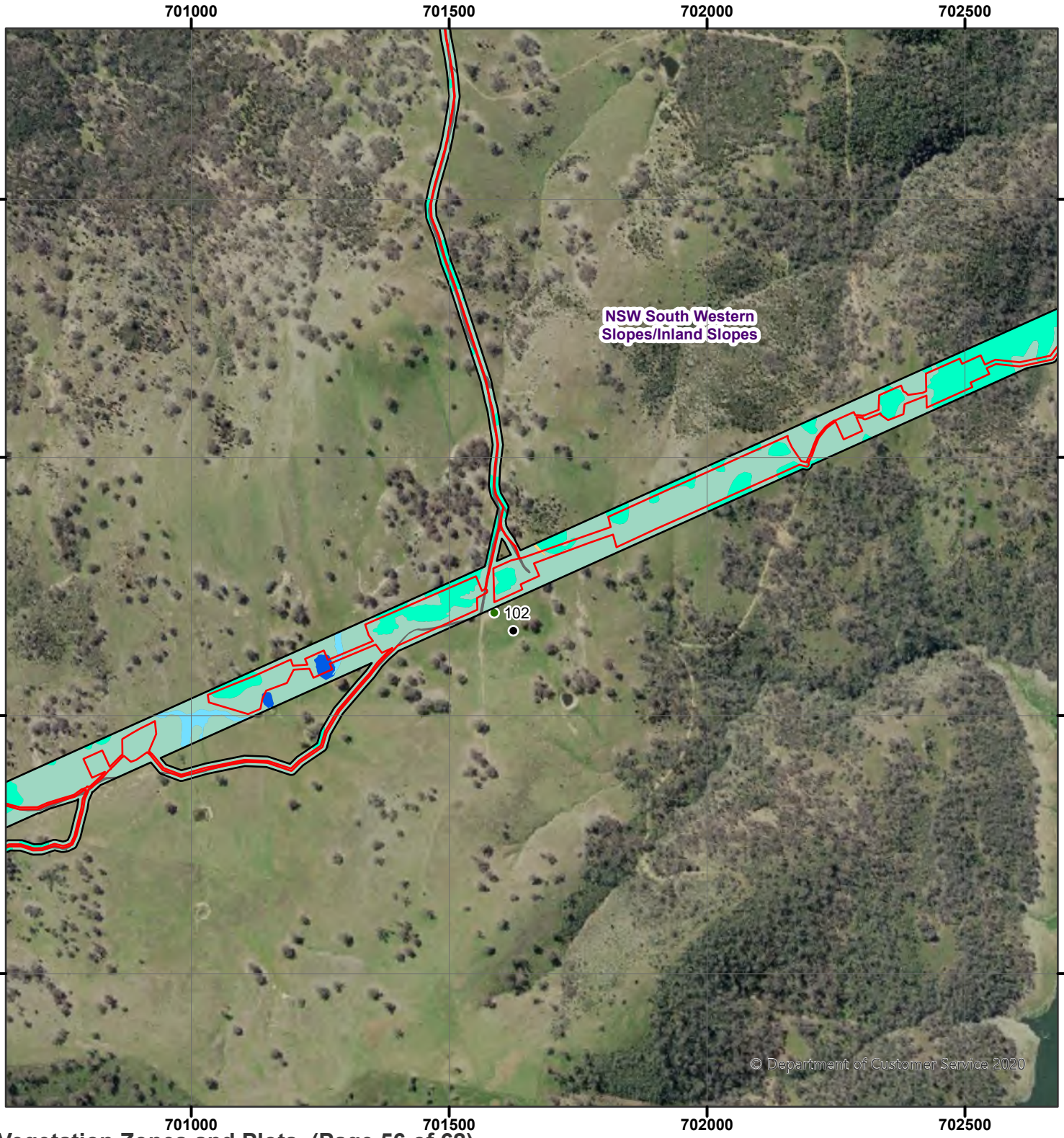
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Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 56 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

- Start
- End

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Drainage
- Dam
- Road/Track
- Cleared

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 57 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Road/Track

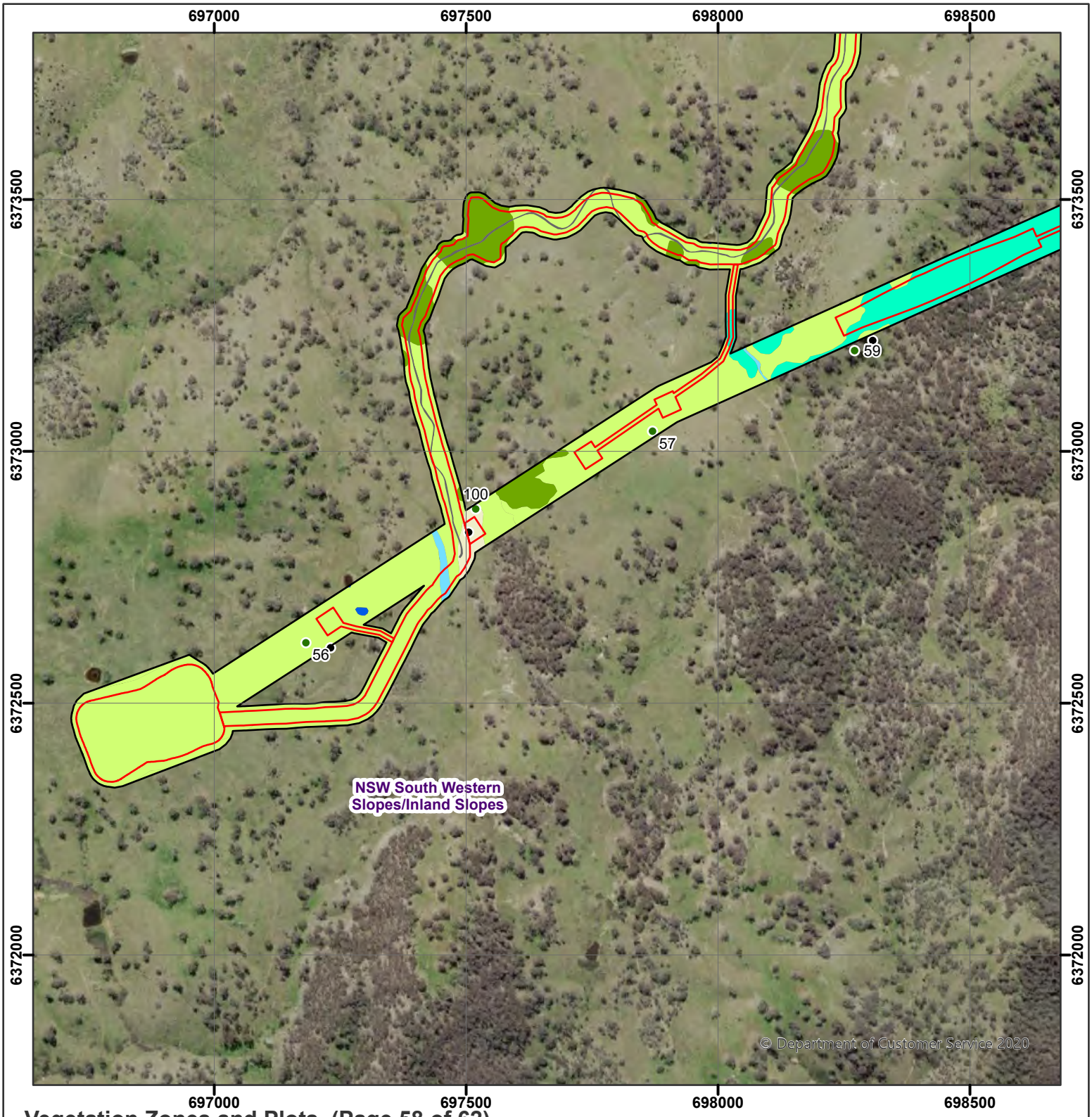
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Datum/Projection:
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Vegetation Zones and Plots (Page 58 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

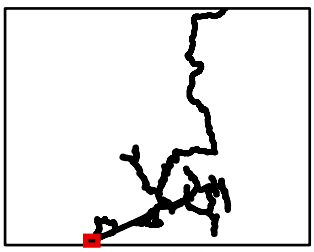
- Start
- End

Vegetation Zones

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: Good
- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: Good
- 331: Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion: DNG
- Drainage
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 59 of 62)

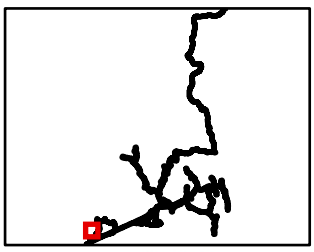
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: DNG
- Dam
- Road/Track

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 60 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

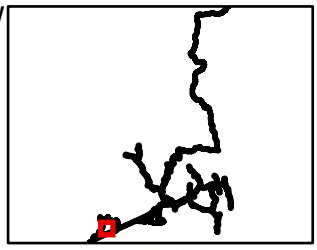
- Start

Vegetation Zones

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Road/Track
- Cleared

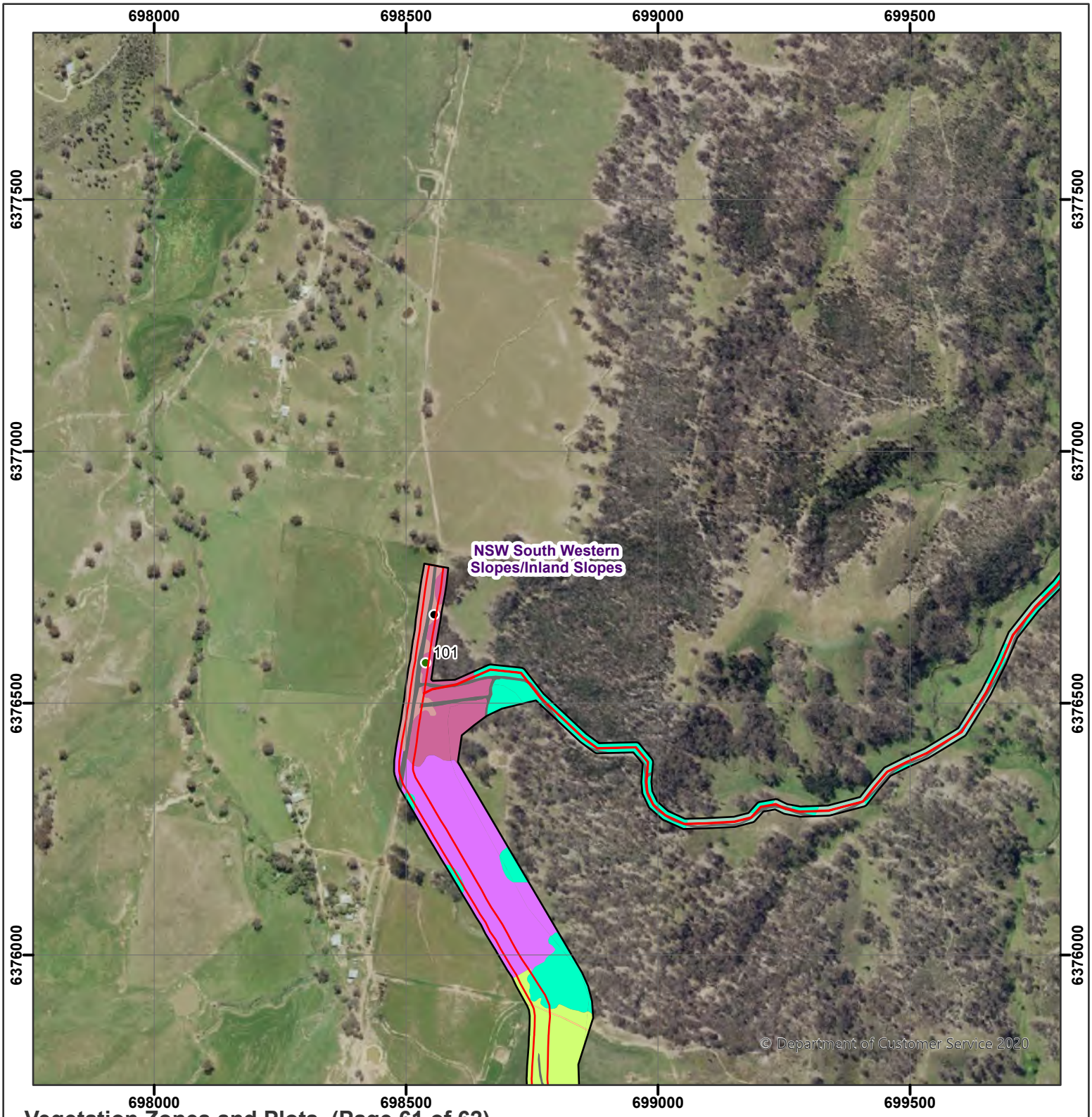
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Datum/Projection:
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Vegetation Zones and Plots (Page 61 of 62)

- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Integrity Survey Plot Location

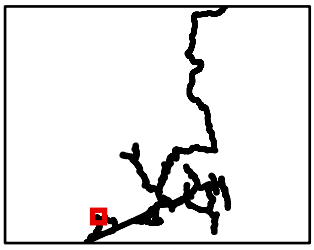
- Start
- End

Vegetation Zones

- 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion: DNG
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- 281,Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion,Good
- 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion: DNG
- Cropped
- Drainage
- Road/Track
- Cleared

0 75 150 300
Metres

Datum/Projection:
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Vegetation Zones and Plots (Page 62 of 62)

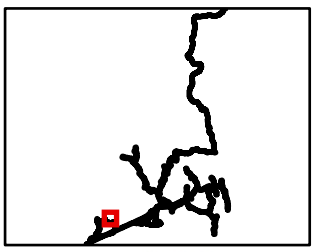
- Development Corridor
- Development Footprint
- IBRA Subregions

Vegetation Zones

- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: Good
- 272: White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes: DNG
- Road/Track

0 75 150 300
Metres

Datum/Projection:
GDA 1994 MGA Zone 55
Location: Burrendong, NSW
Date Prepared: 26/02/2026



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Appendix E : Fauna List

Scientific Name	Common Name	BC Act Listing	EPBC Act Listing
	Birds		
Acanthagenys rufogularis	Spiny-cheeked honeyeater		
Acanthiza chrysorrhoa	Yellow-rumped Thornbill		
Acanthiza lineata	Striated Thornbill		
Acanthiza nana	Yellow Thornbill		
Acanthiza pusilla	Brown Thornbill		
Acanthiza reguloides	Buff-rumped Thornbill		
Acanthorhynchus tenuirostris	Eastern Spinebill		
Accipiter cirrocephalus	Collared Sparrowhawk		
Accipiter fasciatus	Brown Goshawk		
Aegotheles cristatus	Owlet Nightjar		
Alisterus scapularis	Australian King-Parrot		
Anas superciliosa	Pacific Black Duck		
Anthochaera carunculata	Red Wattlebird		
Anthus novaeseelandiae	Australian Pipit		
Aphelocephala leucopsis	Southern Whiteface	V	V
Aquila audax	Wedge-tailed Eagle		
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	
Artamus personatus	Masked Woodswallow		
Artamus cinereus.	Black-faced Woodswallow		
Cacatua galerita	Sulphur-crested Cockatoo		
Cacatua sanguinea	Little Corella		
Cacomantis flabelliformis	Fan-tailed Cuckoo		
Caligavis chrysops	Yellow-faced Honeyeater		
Calyptorhynchus lathami lathami	Glossy Black Cockatoo	V	V
Chalcites basalis	Horsfield's Bronze-cuckoo		
Chalcites lucidus	Shining Bronze-Cuckoo		
Chenonetta jubata	Australian Wood Duck		
Chthonicola sagittata	Speckled Warbler	V	
Cincloramphus mathewsi	Rufous Songlark		
Cinclosoma punctatum	Spotted Quail-thrush		
Climacteris affinis	White-browed Treecreeper		
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	V

Scientific Name	Common Name	BC Act Listing	EPBC Act Listing
Colluricincla harmonica	Grey Shrike-thrush		
Coracina novaehollandiae	Black-faced Cuckoo-shrike		
Coracina papuensis	White-bellied Cuckoo-shrike		
Corcorax melanorhamphos	White-winged Chough		
Cormobates leucophaea	White-throated Treecreeper		
Corvus coronoides	Australian Raven		
Cracticus nigrogularis	Pied Butcherbird		
Cracticus torquatus	Grey Butcherbird		
Dacelo novaeguineae	Laughing Kookaburra		
Daphoenositta chrysoptera	Varied sittella	V	NL
Dicaeum hirundinaceum	Mistletoebird		
Edolisoma tenuirostris	Cicadabird		
Egretta novaehollandiae	White-faced Heron		
Elanus axillaris	Black Shouldered Kite		
Entomyzon cyanotis	Blue-faced Honeyeater		
Eolophus roseicapilla	Galah		
Eopsaltria australis	Eastern Yellow Robin		
Eurystomus orientalis	Dollarbird		
Falco berigora	Brown Falcon		
Falco cenchroides cenchroides	Nankeen Kestrel		
Falco peregrinus	Peregrine Falcon		
Gerygone olivacea	White-throated Gerygone		
Glossopsitta concinna	Musk Lorikeet		
Grallina cyanoleuca	Magpie-lark		
Gymnorhina tibicen	Australian Magpie		
Haliaeetus leucogaster	White-bellied Sea Eagle	V	
Haliastur sphenurus	Whistling Kite		
Heteroscenes pallidus	Pallid Cuckoo		
Hieraaetus morphnoides	Little Eagle	V	
Hirundapus caudacutus	White-throated Needletail	NL	V
Hirundo neoxena	Welcome Swallow		
Lalage sueurii	White-winged Triller		
Lichmera indistincta	Brown Honeyeater		
Malurus cyaneus	Superb Fairy-wren		
Malurus lamberti	Variegated Fairy-wren		
Manorina melanocephala	Noisy Miner		

Scientific Name	Common Name	BC Act Listing	EPBC Act Listing
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	E	E
Melophaga lewinii	Lewin's Honeyeater		
Melithreptus brevirostris	Brown-headed Honeyeater		
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	
Microeca fascinans	Jacky Winter		
Myiagra inquieta	Restless Flycatcher		
Neochmia temporalis	Red-browed Finch		
Nesoptilotis leucotis	White-eared Honeyeater		
Ninox novaeseelandiae	Boobook Owl		
Ocyphaps lophotes	Crested Pigeon		
Oriolus sagittatus	Olive-backed Oriole		
Pachycephala pectoralis	Golden Whistler		
Pachycephala rufiventris	Rufous Whistler		
Pardalotus punctatus	Spotted Pardalote		
Pardalotus striatus	Striated Pardalote		
Petrochelidon ariel	Fairy Martin		
Petroica boodang	Scarlet Robin	**V**	
Petrochelidon nigricans	Tree Martin		
Petroica goodenovii	Red-capped Robin		
Phalacrocorax carbo	Great Cormorant		
Phaps chalcoptera	Common Bronzewing		
Philemon citreogularis	Little Friarbird		
Philemon corniculatus	Noisy Friarbird		
Platycercus elegans	Crimson Rosella		
Platycercus eximius	Eastern Rosella		
Podargus strigoides	Tawny Frogmouth		
Plectorhyncha lanceolata	Striped Honeyeater		
Pomatostomus superciliosus	White-browed Babbler		
Pomatostomus temporalis temporalis	Grey-crowned Babbler	V	
Psephotus haematonotus	Red-rumped Parrot		
Ptilotula fusca	Fuscous Honeyeater		
Ptilotula penicillata	White-plumed Honeyeater		
Pyrrholaemus sagittatus	Speckled Warbler		
Rhipidura albiscapa	Grey Fantail		
Rhipidura leucophrys	Willie Wagtail		

Scientific Name	Common Name	BC Act Listing	EPBC Act Listing
Scythrops novaehollandiae	Channel-billed Cuckoo		
Sericornis frontalis	White-browed Scrubwren		
Smicrornis brevirostris	Weebill		
Stagonopleura guttata	Diamond Firetail	V	V
Stizoptera bichenovii	Double-barred Finch		
Strepera graculina	Pied Currawong		
Sturnus vulgaris	Common Starling		
Synoicus ypsilophora	Brown Quail		
Threskiornis moluccus	White Ibis		
Todiramphus sanctus	Sacred Kingfisher		
Trichoglossus haematodus	Rainbow Lorikeet		
Turdus merula	Common blackbird		
Vanellus miles	Masked Lapwing		
Zosterops lateralis	Silvereye		
Mammals (Bats)			
Austronomus australis	White-Striped Free-tailed Bat		
Chalinolobus dwyeri	Large-eared Pied Bat	V	V
Chalinolobus gouldii	Gould's Wattled Bat		
Chalinolobus morio	Chocolate Wattled Bat		
Chalinolobus picatus	Little Pied Bat	V	
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	
*Nyctophilus corbeni**	Corben's Long-eared Bat	V	V
Nyctophilus geoffroyi	Lesser Long-eared Bat		
Nyctophilus gouldi	Gould's Long-eared Bat		
Ozimops petersi	Inland Free-tailed Bat		
Ozimops planiceps	South-eastern Free-tailed Bat		
Ozimops ridei	Ride's Free-tailed Bat		
*Saccolaimus flaviventris**	Yellow-bellied Sheath-tailed Bat	V	
Scotorepens balstoni	Inland Broad-nosed Bat		
Scotorepens greyii	Little Broad-nosed Bat		
Vespadelus darlingtoni	Large Forest Bat		
Vespadelus regulus	Southern Forest Bat		
*Vespadelus troughtoni**	Eastern Cave Bat	V	
Vespadelus vulturnus	Little Forest Bat		
Mammals (Other)			
Acrobates pygmaeus	Feathertail Glider		

Scientific Name	Common Name	BC Act Listing	EPBC Act Listing
Macropus giganteus	Eastern Grey Kangaroo		
Osphranter robustus robustus	Wallaroo		
Petaurus breviceps	Sugar glider		
Phascolarctos cinereus	Koala	E	E
Pseudocheirus peregrinus	Ringtail Possum		
Trichosurus vVulpecula	Brush tailed possum		
Vombatus ursinus	Wombat		
Reptiles			
Amphibolurus muricatus	Jacky Lizard		
Carlia sp.	Rainbow Skink		
Pogona barbata	Beaded Dragon		
Pseudechis porphyriacus	Red Bellied Black Snake		
Pseudonaja textilis	Eastern Brown Snake		
Tiliqua rugosa	Eastern shingleback		
Varanus varius	Lace Monitor		
Feral Species			
Capra hircus	Goat		
Dama dama	Fallow Deer		
Oryctolagus cuniculus	Rabbit		
Sus scrofa	Pig		
Vulpes vulpes	Fox		

Appendix F : Likelihood Table

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia		E	E	Central New South Wales through northern and central Victoria into South Australia. In NSW, found in the southern subregions of the Brigalow Belt South Bioregion, the eastern subregions of the Darling Riverine Plain Bioregion, the NSW South Western Slopes Bioregion and the eastern subregions of the Cobar Peneplain Bioregion.	Flat to undulating plains, low slopes and rises and, to a lesser extent, drainage depressions and flats. May extend to more elevated hillslopes on the fringes of its range. Often occurs on productive soils derived from alluvial or colluvial materials.	Known	Community identified within the northern power connection corridor option. No longer within current Project Site.
Natural Temperate Grassland of the South Eastern Highlands			CE	Confined to the Southern Tablelands, a region bounded by the ACT, Yass, Boorowa, the Abercrombie River, Goulburn, the Great Eastern Escarpment, the Victorian border and the eastern boundary of Kosciusko National Park. The community occurs in a number of distinct plant associations (see Armstrong et al., 2013). According to the association present, the community is found in various topographical positions and on a variety of substrates. The altitudinal range of the community is between 500 m and 1200 m asl.	The community is found on broad sweeping plains with poor drainage and cold air inversions that promote frosts which inhibit tree growth; on all topographical locations, including upper-slopes, crests and plateaux on basalt landscapes; and in frost hollows in areas otherwise dominated by woodlands or forests. The community may also occur in a landscape mosaic with several woodland communities.	Unlikely	Distribution does not coincide with the study region.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		CE	CE	Occurs in an arc along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW to central Victoria. In NSW, it occurs in the Brigalow Belt South, Nandewar, New England Tableland, Sydney Basin, NSW North Coast, South Eastern Highlands, South East Corner, NSW South Western Slopes and Riverina Bioregions.	Areas where rainfall is between 400 and 1200 mm per annum, on moderate to highly fertile soils at altitudes of 170 m to 1200 m.	Known	Community identified within the Project Site. Assessment undertaken. Offset credits calculated and additional measures offered.
Ammobium craspedioides	Yass Daisy	V	V	Found from near Crookwell on the Southern Tablelands to near Wagga Wagga on the South Western Slopes. Most populations are in the Yass region.	Habitat consists of moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities. Apparently unaffected by light grazing, as populations persist in some grazed sites. Found in a number of TSRs, Crown reserves, cemeteries and roadside reserves within the region.	Unlikely	No records of occurrence within the study region
Austrostipa wakoolica		E	E	Confined to the floodplains of the Murray River tributaries of central-western and south-western NSW, with localities including Manna State Forest, Matong, Lake Tooim, Merran Creek, Tulla, Cunninyeuk and Mairjimmy State Forest (now part of South West Woodland Nature Reserve)	Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise	Unlikely	Known distribution does not overlap with study region

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
Dichanthium setosum	Bluegrass	V	V	In NSW, found on the New England Tablelands, North West Slopes and Plains and the Central Western Slopes.	Cleared woodland, grassy roadside remnants and highly disturbed pasture, on heavy basaltic black soils and red-brown loams with clay subsoil.	Potential	Known to occur north of the study region. Surveys completed and no individuals were recorded.
Eucalyptus aggregata	Black Gum	V	V	Black Gum is found in the NSW Central and Southern Tablelands, with small isolated populations in Victoria and the ACT. In NSW it occurs in the South Eastern Highlands Bioregion and on the western fringe of the Sydney Basin Bioregion. Black Gum has a moderately narrow distribution, occurring mainly in the wetter, cooler and higher parts of the tablelands, for example in the Blayney, Crookwell, Goulburn, Braidwood and Bungendore districts.	Grows in the lowest parts of the landscape on alluvial soils, and on cold, poorly-drained flats and hollows adjacent to creeks and small rivers. Also occurs as isolated paddock trees in modified native or exotic pastures. Many populations occur on travelling stock reserves, though stands and isolated individuals also occur on private land.	Unlikely	No records of occurrence within the study region. Surveys completed and no individuals were recorded.
Euphrasia arguta		CE	CE	In NSW, recently recorded only from Nundle area of the north western slopes and tablelands, from near the Hastings River and from the Barrington Tops.	Eucalypt forest with a mixed grass and shrub understorey, disturbed areas, along roadsides.	Unlikely	Not recorded within the study region. Surveys completed and no individuals were recorded.
Grevillia wilkinsonii	Tumut Grevillia	CE	CE	The Tumut Grevillea has a highly restricted distribution in the NSW South-west Slopes region. Its main occurrence is along a 6 km stretch of the Goobarragandra River approximately 20 km east of Tumut	This species generally grows in close proximity to the water, at altitudes between 310 and 340 m. Most healthy adult plants occur in open sunny areas. Associated native vegetation in the Goobarragandra	Unlikely	Recorded populations do not coincide with the study region. Surveys completed and

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
				where about 1,000 plants are known. The other occurrence is a small population that straddles the boundary of two private properties at Gundagai where only eight mature plants survive.	sites are typically remnant riverine shrub communities adjacent to open-forest, with the most common tree species being Blakely's Red Gum (Eucalyptus blakelyi), Apple Box (*E.* bridgesiana), Yellow Box (*E.* melliodora), and Red Stringybark (*E.* macrorhyncha) and with Kurrajongs (Brachychiton populneus) sometimes growing in nearby paddocks.		no individuals were recorded.
Homoranthus darwinioides		V	V	Central tablelands and western slopes of NSW, occurring from Putty to the Dubbo district. Found west of Muswellbrook between Merriwa and Bylong, and north of Muswellbrook to Goonoo SF.	Woodland with shrubby understorey, usually in gravely sandy soils.	Unlikely	Species not recorded in targeted surveys of potential habitat.
Prasophyllum petilum / Prasophyllum wybong	Tarengo Leek Orchid	E	E	Four sites in NSW: at Boorowa, Captains Flat, Ilford and Delegate. Also experimentally introduced at Bowning Cemetery NSW. The NSW Herbarium considers *Prasophyllum petilum* and *Prasophyllum* sp. Wybong (C. Phelps ORG5269) to be synonyms. This taxonomic recognition will be released in the next Orchidaceae taxonomic update via the Australian Plant Census, which provides a list of currently accepted names. As it stands, the two species are treated as one for NSW regulatory purposes,	Natural Temperate Grassland, grassy woodland, and Box-Gum woodland.	Unlikely	Habitat is considered marginal. Surveys have been undertaken and no individuals were recorded. However, not all areas were surveyed adequately so species offset credits have been calculated.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
				with the distinction maintained under Commonwealth legislation.			
Swainsona recta	Small Purple-pea	E	E	Queanbeyan and Wellington-Mudgee areas. Historically also recorded at Carcoar, Culcairn and Wagga Wagga.	Grassland, open woodland and open forests dominated by *Eucalyptus blakelyi* (Blakely's Red Gum), *E. melliodora* (Yellow Box), *E. rubida* (Candlebark Gum) and *E. goniocalyx* (Long-leaf Box).	Potential	Assumed present. Surveys required during micro-siting. Species offset credits have been calculated
Tylophora linearis		V	E	In NSW, found in the Barraba, Mendooran, Temora and West Wyalong districts in the northern and central western slopes. Records include Crow Mountain near Barraba, Goonoo, Pilliga West, Cumbil, and Eura State Forests, Coolbaggie Nature Reserve, Goobang National Park, and Beni Conservation Area	Dry scrub, open forest, dry woodlands of *Eucalyptus fibrosa*, *Eucalyptus sideroxylon*, *Eucalyptus albens*, *Callitris endlicheri*, *Callitris glaucophylla* and *Allocasuarina luehmannii*.	Unlikely	Known to occur within the broader landscape. Surveys have been undertaken and no individuals were recorded. However, not all areas were surveyed adequately so species offset credits have been calculated.
Zieria obcordata	Granite Zieria	E	E	Occurs at two sites with a geographic range of 105 km. These are in the Wuuluman area near Wellington, comprising of a single subpopulation over 3 sites comprising up to 200 plants and Crackerjack Rock/Rock Forests area NW of Bathurst, with a	Grows in eucalypt woodland or shrubland dominated by species of Acacia on rocky hillsides. Also occurs in Eucalyptus and Callitris dominated woodland with an open, low shrub understorey, on moderately steep, mainly west to north-facing slopes in	Unlikely	Known to occur within the broader landscape but no suitable rocky areas within the

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
				subpopulation comprising of 14 sites, totalling to approximately 700 adults plants after good seasons.	sandy loam amongst granite boulders. The altitude range of sites is 500 to 830 m.		Development Corridor. No individuals were recorded during targeted surveys.
Actitis hypoleucos	Common Sandpiper		M	Summer migrant. In NSW, widespread along coastlines and also occurs in many areas inland.	Coastal wetlands and some inland wetlands, especially muddy margins, or rocky shores. Also inhabits estuaries and deltas, lakes, pools, billabongs, reservoirs, dams and claypans, mangroves.	Unlikely	Wide ranging species. Not recorded during 483 independent bird surveys
Anthochaera phrygia	Regent Honeyeater	CE	CE	Inland slopes of south-east Australia, and less frequently in coastal areas. In NSW, most records are from the North-West Plains, North-West and South-West Slopes, Northern Tablelands, Central Tablelands and Southern Tablelands regions; also recorded in the Central Coast and Hunter Valley regions.	Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of *Casuarina cunninghamiana (*River Oak).	Potential	Wide-ranging species. Not recorded during 483 independent bird surveys.
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V	In NSW, only known from the Central and Southern Tablelands, and the South Western Slopes.	Sloping, open woodland areas with predominantly native grassy ground layers, rocky outcrops or scattered, partially buried rocks.	Unlikely	Expert report determined that 65 ha of rocky habitat is potential habitat for this species. No individuals have been found, however, species offset

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
							credits have been calculated.
Apus pacificus	Fork-tailed Swift		M	Recorded in all regions of NSW.	Riparian woodland., swamps, low scrub, heathland, saltmarsh, grassland, Spinifex sandplains, open farmland and inland and coastal sand-dunes.	Known	Species recorded. Impact assessment undertaken.
Botaurus poiciloptilus	Australasian Bittern	E	E	Found over most of NSW except for the far north-west.	Permanent freshwater wetlands with tall, dense vegetation, particularly *Typha* spp. (bullrushes) and *Eleocharis* spp. (spikerushes).	Unlikely	Wide ranging species. Not recorded during 483 independent bird surveys.
Calidris acuminata	Sharp-tailed Sandpiper		M	Summer migrant. Widespread in most regions of NSW, especially in coastal areas, but sparse in the south-central Western Plain and east Lower Western Regions.	Shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	Unlikely	Wide ranging species. Not recorded during 483 independent bird surveys.
Calidris ferruginea	Curlew Sandpiper	E	CE, M	Occurs along the entire coast of NSW, and sometimes in freshwater wetlands in the Murray-Darling Basin.	Littoral and estuarine habitats, including intertidal mudflats, non-tidal swamps, lakes and lagoons on the coast and sometimes inland.	Unlikely	Wide ranging species. Not recorded during 483 independent bird surveys.
Calidris melanotos	Pectoral Sandpiper		M	Summer migrant to Australia. Widespread but scattered in NSW. East of the Great Divide, recorded from Casino and Ballina, south to Ulladulla. West of the Great Divide,	Shallow fresh to saline wetlands, including coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools,	Unlikely	Wide ranging species. Not recorded during 483

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
				widespread in the Riverina and Lower Western regions.	creeks, floodplains and artificial wetlands.		independent bird surveys.
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Recorded from Rockhampton in Qld south to Ulladulla in NSW. Largest concentrations of populations occur in the sandstone escarpments of the Sydney basin and the NSW north-west slopes.	Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.	Known	Wide ranging species. Breeding habitat is not located within the Development Corridor. Additional mitigation measures have been generated for bats.
Climacteris picumnus	Brown Treecreeper	V	V	The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges.	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.	Known	Wide ranging species. Recorded within the Development Corridor. Ecosystem credits will be offset.
Dasyurus maculatus	Spotted-tailed Quoll	V	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Qld.	Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Preferred habitat includes escarpments, gullies, saddles and riparian habitat as well as rock	Unlikely	No suitable habitat. The Development Corridor lacks denning areas and high

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
					areas where it finds den sites (EPBC Act Policy Statement 3.4). Use multiple den sites (possibly 20) which includes rock crevices, boulder tumbles, hollow logs and caves, moving between them every 1-4 days (DELWP 2016). The last known recording near Lake Burrendong was in 1996 (Ala.org.au 2025).		densities of medium size prey. The area is heavily baited with 1080 to control wild dogs – with single dog baits capable of killing quolls (DELWP 2016). Ecosystem credits have been included for this species.
Delma impar	Striped Legless Lizard	V	V	In NSW, occurs in the Southern Tablelands, the South West Slopes and possibly on the Riverina.	Natural Temperate Grassland, secondary and modified grassland, open Box-Gum Woodland.	Unlikely	Not recorded within the study region. Outside of the species geographical range.
Falco hypoleucos	Grey Falcon	E	V	Arid and semi-arid zones. In NSW, found chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range.	Shrubland, grassland and wooded watercourses, occasionally in open woodlands near the coast, and near wetlands.	Likely	Previously recorded within the Project site. No observations during the 483 independent bird surveys.
Gallinago hardwickii	Latham's Snipe		M	Migrant to east coast of Australia, extending inland west of the Great Dividing Range in NSW.	Freshwater, saline or brackish wetlands up to 2000 m above sea-level; usually freshwater swamps, flooded grasslands or heathlands.	Unlikely	Wide ranging species. No suitable habitat within the

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
							Development Corridor.
Grantiella picta	Painted Honeyeater	V	V	Widely distributed in NSW, predominantly on the inland side of the Great Dividing Range but avoiding arid areas.	Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	Likely	Wide ranging species. No individuals were recorded during the 483 independent bird surveys. Ecosystem credits have been included for this species.
Hirundapus caudacutus	White-throated Needletail		V, M	All coastal regions of NSW, inland to the western slopes and inland plains of the Great Divide.	Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	Known	Species identified during site surveys. Assessments undertaken for this species.
Lathamus discolor	Swift Parrot	E	CE	Migrates from Tasmania to mainland in Autumn-Winter. In NSW, the species mostly occurs on the coast and south west slopes.	Box-ironbark forests and woodlands.	Potential	Wide-ranging species. No individuals were recorded during the 483 independent bird surveys.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
Leipoa ocellata	Malleefowl	E	V	Arid and semi-arid zones. In NSW, populations occur in the south west mallee centred on Mallee Cliffs NP and extending east to near Balranald; in the Scotia mallee west of the Darling River; and in the Goonoo forest near Dubbo. Recorded less recently in the Pilliga forests, around Cobar and Goulburn River NP.	Predominantly mallee communities. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands, or other woodlands dominated by Mulga or native Cypress Pine species.	Unlikely	Distribution overlaps western section of the Project Site. No individuals recorded.
Litoria booroolongensis	Booroolong Frog	E	E	Restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. Several populations have recently been recorded in the Namoi catchment.	Permanent streams with some fringing vegetation cover such as ferns, sedges or grasses.	Unlikely	No suitable habitat.
Melanodryas cucullata cucullata	Hooded Robin	E	E	The Hooded Robin is widespread, found across Australia, except for the driest deserts and the wetter coastal areas. The south-eastern form (subspecies cucullata) is found from Brisbane to Adelaide and throughout much of inland NSW	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. Often perches on low dead stumps and fallen timber or on low-hanging branches, using a perch-and-pounce method of hunting insect prey.	Known	Wide ranging species. Ecosystem species that will be offset under ecosystem credits.
Motacilla flava	Yellow Wagtail		M	Regular summer migrant to mostly coastal Australia. In NSW recorded Sydney to Newcastle, the Hawkesbury and inland in the Bogan LGA.	Swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land, lawns.	Unlikely	Not recorded within the study region

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
Myiagra cyanoleuca	Satin Flycatcher		M	In NSW, widespread on and east of the Great Divide and sparsely scattered on the western slopes, with very occasional records on the western plains.	Eucalypt-dominated forests, especially near wetlands, watercourses, and heavily vegetated gullies.	Potential	Wide ranging species. Not recorded during surveys.
Numenius madagascariensis	Eastern Curlew		CE, M	Summer migrant to Australia. Primarily coastal distribution in NSW, with some scattered inland records.	Estuaries, bays, harbours, inlets and coastal lagoons, intertidal mudflats or sandflats, ocean beaches, coral reefs, rock platforms, saltmarsh, mangroves, freshwater/brackish lakes, saltworks and sewage farms.	Unlikely	No suitable habitat. Not recorded during surveys.
Nyctophilus corbeni	Corben's Long-eared Bat	V	V	Distribution coincides approximately with the Murray Darling Basin; the Pilliga Scrub region is the distinct stronghold for this species.	Mallee, *Allocasuarina luehmannii* (bulloke) and box eucalypt-dominated communities, especially box/ironbark/cypress-pine vegetation.	Likely	Wide ranging species. Ecosystem species and will be offset under ecosystem credits.
Petauroides volans	Greater Glider	E	V	Eastern Australia, from the Windsor Tableland in north Queensland through to central Victoria (Wombat State Forest).	Eucalypt forests and woodlands. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.	Unlikely	No suitable habitat.
Petaurus norfolcensis	Squirrel Glider	V	-	The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria.	Inhabits mature old growth Box woodlands and River Red Gum Forests west of the Great Dividing Range with a shrub or Acacia midstorey and abundant tree hollows.	Potential	Surveys undertaken and not recorded within areas of potential habitat.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
Petrogale penicillate	Brush-tailed Rock-wallaby	E	V	In NSW they occur from the Qld border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit.	Rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges.	Unlikely	No suitable habitat within Development Corridor.
Phascolarctos cinereus	Koala	V	V	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. There are sparse and possibly disjunct populations in the Bega District, and at several sites on the southern tablelands.	Eucalypt woodlands and forests.	Known	Species recorded in targeted surveys of potential habitat. Species credits are offset for this species.
Polytelis swainsonii	Superb Parrot	V	V	In NSW, occurs on inland slopes of the Great Divide and on adjacent plains, especially along the major river-systems.	Box-gum woodland, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest.	Potential	Wide ranging species. No individuals were recorded during surveys.
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria.	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Potential	Know to occur in the study region. No individuals were recorded. However, a known population exists in Wellington. Ecosystem credit species.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
Rhipidura rufifrons	Rufous Fantail		M	Coastal and near coastal districts of northern and eastern Australia, including on and east of the Great Divide in NSW.	Wet sclerophyll forests, subtropical and temperate rainforests. Sometimes drier sclerophyll forests and woodlands.	Unlikely	No suitable habitat.
Rostratula australis	Australian Painted Snipe	E	E	In NSW most records are from the Murray-Darling Basin. Other recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys.	Swamps, dams and nearby marshy areas.	Unlikely	No suitable habitat.
Stagonopleura guttata	Diamond Firetail	V	V	The Diamond Firetail is endemic to south-eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia. It is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Cental and South Western Slopes	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).	Known	Wide ranging species. Species has been recorded and included in ecosystem offsets
Galaxias rostratus	Flathead Galaxias		CE	Known from the southern part of the Murray Darling Basin. They have been recorded in the Macquarie, Lachlan, Murrumbidgee and Murray Rivers in NSW. Despite extensive scientific sampling over the past 15 years there have been very few recorded sightings of Flathead Galaxias. They have not been recorded and are	known from the southern part of the Murray Darling Basin. They have been recorded in the Macquarie, Lachlan, Murrumbidgee and Murray Rivers in NSW. Despite extensive scientific sampling over the past 15 years there have been very few recorded sightings of Flathead Galaxias. They have not been recorded and are	Unlikely	Known distribution does not coincide with study region

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
				considered locally extinct in the lower Murray, Murrumbidgee, Macquarie and Lachlan Rivers. The species is now only known from the upper Murray River near Tintaldra and wetland areas near Howlong	considered locally extinct in the lower Murray, Murrumbidgee, Macquarie and Lachlan Rivers. The species is now only known from the upper Murray River near Tintaldra and wetland areas near Howlong		
Maccullochella macquariensis	Trout Cod		E	Endemic to the southern Murray-Darling river system, including the Murrumbidgee and Murray Rivers, and the Macquarie River in central NSW. The species was once widespread and abundant in these areas but has undergone dramatic declines in its distribution and abundance over the past century. The last known reproducing population of Trout Cod is confined to the Murray River below Yarrawonga downstream to Tocumwal.	The species is usually associated with deeper water pools and instream cover such as logs and boulders. In the Murray River, where it is found with Murray cod, it occupies slightly faster-flowing locations.	Unlikely	Known distribution does not coincide with study region
Maccullochella peelii	Murray Cod		V	Throughout most of the Murray Darling Basin with the exception of some localised extinctions. Some translocated populations exist outside the species' natural distribution in impoundments and waterways (Cataract Dam and the Nepean River system in NSW).	Clear rocky streams to slow flowing, turbid rivers and billabongs. Frequently found in the main river channel and larger tributaries; also in floodplain channels when they contain water.	Potential	Recorded within the Project site. Not within Development Corridor.
Macquaria australasica	Macquarie Perch	E	E	Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal	River and lake habitats, especially the upper reaches of rivers and their tributaries.	Unlikely	Known distribution does not coincide with study region

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood	Justification
				NSW, including the Hawkesbury and Shoalhaven catchments.			

Appendix G : Biodiversity Credit Report

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00024561/BAAS18153/21/00024562

Proposal Name
Burrendong Wind Farm - SEH Project

BAM data last updated *
05/08/2025

Assessor Name
Cheryl O'Dwyer

Assessor Number
BAAS18153

BAM Data version *
Current classification (live - default) (82)

Proponent Names

Report Created
31/03/2026

BAM Case Status
Finalised

Assessment Revision
22

BOS entry trigger

Assessment Type
Major Projects

Date Finalised
31/03/2026

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
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 Highla	Critically Endangered Ecological Community	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion

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 Highla	Critically Endangered Ecological Community	270-White Box - Tumbledown Red Gum - Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes
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 Highla	Critically Endangered Ecological Community	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

Species
Grevillea divaricata / Grevillea divaricata

Additional Information for Approval

PCT Outside Ibra Added

PCT
84-River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion
266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
270-White Box - Tumbledown Red Gum - Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes
272-White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes
277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
287-Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion

331-Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
84-River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Not a TEC	0.3	0	8	8
266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	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 Highla	25.1	46	474	520

270-White Box - Tumbledown Red Gum - Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes	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 Highla	0.2	6	0	6
272-White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes	Not a TEC	98.0	2157	894	3051
277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	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 Highla	1.3	0	47	47
287-Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	Not a TEC	213.7	2790	975	3765
331-Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion	Not a TEC	51.3	823	145	968

84-River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region

	Eastern Riverine Forests This includes PCT's: 42, 84, 85, 485, 486, 1127, 1270, 1714, 3020, 4061, 4063, 4064, 4065, 4066, 4067, 4068, 4069, 4070, 4071, 4072, 4073, 4075, 4076, 4077, 4078, 4079, 4080, 4081, 4083, 4084, 4085, 4086, 4087, 4139	Eastern Riverine Forests <50%	84_Good	No	8	Hill End, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	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,	-	266_DNG	No	166	Hill End, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					

	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 Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099,	-	266_Low	No	308	Hill End, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
	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 Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421,	-	266_Good	Yes	46	Hill End, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
270-White Box - Tumbledown Red Gum - Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW	-	270_Good	Yes	6	Hill End, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376,					

	3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
272-White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Western Slopes Grassy Woodlands This includes PCT's: 201, 202, 266, 267, 268, 272, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 301, 316, 326, 337, 347, 383, 421, 426, 433, 434, 437, 441, 444, 461, 483, 509, 516, 544, 589, 590, 593, 599, 847, 955, 1303, 1304, 1315, 1329, 1383, 1609, 1693, 1695, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3401, 3403, 3404, 3405, 3406, 3485, 4147	Western Slopes Grassy Woodlands >=50% and <70%	272_Good	Yes	2157	Hill End, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Western Slopes Grassy Woodlands This includes PCT's: 201, 202, 266, 267, 268, 272, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 301, 316, 326, 337, 347, 383, 421, 426, 433, 434, 437, 441, 444, 461, 483, 509, 516, 544, 589, 590, 593, 599, 847, 955, 1303, 1304, 1315, 1329, 1383, 1609, 1693, 1695, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3401, 3403, 3404, 3405, 3406, 3485, 4147	Western Slopes Grassy Woodlands >=50% and <70%	272_DNG	No	894	Hill End, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	White Box - Yellow Box - Blakely's Red Gum	-	277_DNG	No	47	Hill End, or

	Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383,					Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
287-Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 217, 255, 273, 287, 330, 333, 341, 343, 346, 348, 358, 403, 455, 456, 472, 577, 581, 592, 617, 673, 676, 713, 940, 956, 1277, 1279, 1313, 1316, 1381, 1610, 1661, 1668, 1709, 3753, 3754, 3756, 3768, 3769, 4153	Western Slopes Dry Sclerophyll Forests >=50% and <70%	287_DNG	No	975	Hill End, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 217, 255, 273, 287, 330, 333, 341, 343, 346, 348, 358, 403, 455, 456, 472, 577, 581, 592, 617, 673, 676, 713, 940, 956, 1277, 1279, 1313, 1316, 1381, 1610, 1661, 1668, 1709, 3753, 3754, 3756, 3768, 3769, 4153	Western Slopes Dry Sclerophyll Forests >=50% and <70%	287_Good	Yes	2790	Hill End, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
331-Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 179, 217, 243, 255, 270, 273, 287, 291, 309, 321, 322, 323, 324, 325, 327, 330, 331, 333, 341, 343, 346, 348, 354,	Western Slopes Dry Sclerophyll Forests <50%	331_Good	Yes	823	Hill End, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	358, 379, 387, 396, 398, 399, 401, 402, 403, 404, 405, 406, 407, 408, 409, 414, 415, 417, 419, 420, 423, 425, 430, 431, 440, 443, 449, 455, 456, 457, 459, 462, 463, 467, 468, 469, 470, 471, 472, 473, 476, 477, 478, 479, 480, 482, 515, 531, 532, 576, 577, 581, 592, 610, 617, 671, 673, 676, 712, 713, 714, 746, 863, 889, 940, 956, 1133, 1176, 1277, 1278, 1279, 1307, 1313, 1314, 1316, 1381, 1610, 1654, 1655, 1656, 1660, 1661, 1663, 1668, 1669, 1671, 1672, 1674, 1676, 1679, 1709, 1711, 1770, 1771, 3753, 3754, 3756, 3757, 3758, 3759, 3760, 3761, 3762, 3763, 3766, 3767, 3768, 3769, 3770, 3771, 3772, 3773, 3774, 3775, 3776, 3777, 3778, 3780, 3781, 3782, 3783,					

	3784, 3785, 3786, 4153					
	Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 179, 217, 243, 255, 270, 273, 287, 291, 309, 321, 322, 323, 324, 325, 327, 330, 331, 333, 341, 343, 346, 348, 354, 358, 379, 387, 396, 398, 399, 401, 402, 403, 404, 405, 406, 407, 408, 409, 414, 415, 417, 419, 420, 423, 425, 430, 431, 440, 443, 449, 455, 456, 457, 459, 462, 463, 467, 468, 469, 470, 471, 472, 473, 476, 477, 478, 479, 480, 482, 515, 531, 532, 576, 577, 581, 592, 610, 617, 671, 673, 676, 712, 713, 714, 746, 863, 889, 940, 956, 1133, 1176, 1277, 1278, 1279, 1307, 1313, 1314, 1316, 1381, 1610, 1654, 1655, 1656, 1660, 1661, 1663, 1668, 1669,	Western Slopes Dry Sclerophyll Forests <50%	331_DNG	No	145	Hill End, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	1671, 1672, 1674, 1676, 1679, 1709, 1711, 1770, 1771, 3753, 3754, 3756, 3757, 3758, 3759, 3760, 3761, 3762, 3763, 3766, 3767, 3768, 3769, 3770, 3771, 3772, 3773, 3774, 3775, 3776, 3777, 3778, 3780, 3781, 3782, 3783, 3784, 3785, 3786, 4153					

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Aprasia parapulchella / Pink-tailed Legless Lizard	**266_DNG, 272_Good, 272_DNG, 266_Good**	13.4	428.00
Burhinus grallarius / Bush Stone-curlew	**266_DNG, 287_DNG, 287_Good, 331_Good, 266_Good**	21.3	616.00
Cercartetus nanus / Eastern Pygmy-possum	**272_Good, 272_DNG, 287_DNG, 287_Good, 331_Good**	8.0	260.00
Grevillea divaricata / Grevillea divaricata	**331_Good**	5.5	245.00

Keyacris scurra / Key's Matchstick Grasshopper	**266_DNG, 266_Good**	5.8	167.00
Ninox connivens / Barking Owl	**266_DNG, 272_Good, 272_DNG, 287_DNG, 287_Good, 331_Good, 266_Good**	8.9	295.00
Ninox strenua / Powerful Owl	**287_DNG, 287_Good**	1.6	22.00
Persoonia marginata / Clandulla Geebung	**287_Good, 287_DNG**	47.5	1062.00
Petaurus norfolcensis / Squirrel Glider	**266_DNG, 272_Good, 272_DNG, 287_DNG, 287_Good, 331_Good, 266_Good**	8.9	295.00
Phascogale tapoatafa / Brush-tailed Phascogale	**266_DNG, 272_Good, 272_DNG, 331_Good, 266_Good**	7.3	273.00
Phascolarctos cinereus / Koala	**84_Good, 266_DNG, 270_Good, 272_Good, 272_DNG, 277_DNG, 287_Good, 287_DNG, 331_Good, 331_DNG, 266_Low, 266_Good**	389.8	9549.00
Swainsona recta / Small Purple-pea	**266_DNG, 270_Good, 277_DNG, 266_Low, 266_Good**	26.5	458.00

Swainsona sericea / Silky Swainson-pea	**266_DNG, 277_DNG, 331_Good, 331_DNG, 266_Low, 266_Good**	77.6	1744.00
Tyto novaehollandiae / Masked Owl	**266_DNG, 272_Good, 272_DNG, 287_DNG, 287_Good, 331_Good, 266_Good**	8.9	295.00

Credit Retirement Options

Like-for-like credit retirement options

Aprasia parapulchella / Pink-tailed Legless Lizard	Spp	IBRA subregion
	Aprasia parapulchella / Pink-tailed Legless Lizard	Any in NSW
Burhinus grallarius / Bush Stone-curlew	Spp	IBRA subregion
	Burhinus grallarius / Bush Stone-curlew	Any in NSW
Cercartetus nanus / Eastern Pygmy-possum	Spp	IBRA subregion
	Cercartetus nanus / Eastern Pygmy-possum	Any in NSW
Grevillea divaricata / Grevillea divaricata	Spp	IBRA subregion
	Grevillea divaricata / Grevillea divaricata	Any in NSW

Keyacris scurra / Key's Matchstick Grasshopper	Spp	IBRA subregion
	Keyacris scurra / Key's Matchstick Grasshopper	Any in NSW
Ninox connivens / Barking Owl	Spp	IBRA subregion
	Ninox connivens / Barking Owl	Any in NSW
Ninox strenua / Powerful Owl	Spp	IBRA subregion
	Ninox strenua / Powerful Owl	Any in NSW
Persoonia marginata / Clandulla Geebung	Spp	IBRA subregion
	Persoonia marginata / Clandulla Geebung	Any in NSW
Petaurus norfolcensis / Squirrel Glider	Spp	IBRA subregion
	Petaurus norfolcensis / Squirrel Glider	Any in NSW
Phascogale tapoatafa / Brush-tailed Phascogale	Spp	IBRA subregion
	Phascogale tapoatafa / Brush-tailed Phascogale	Any in NSW
Phascolarctos cinereus / Koala	Spp	IBRA subregion

	Phascolarctos cinereus / Koala	Any in NSW
Swainsona recta / Small Purple-pea	Spp	IBRA subregion
	Swainsona recta / Small Purple-pea	Any in NSW
Swainsona sericea / Silky Swainson-pea	Spp	IBRA subregion
	Swainsona sericea / Silky Swainson-pea	Any in NSW
Tyto novaehollandiae / Masked Owl	Spp	IBRA subregion
	Tyto novaehollandiae / Masked Owl	Any in NSW