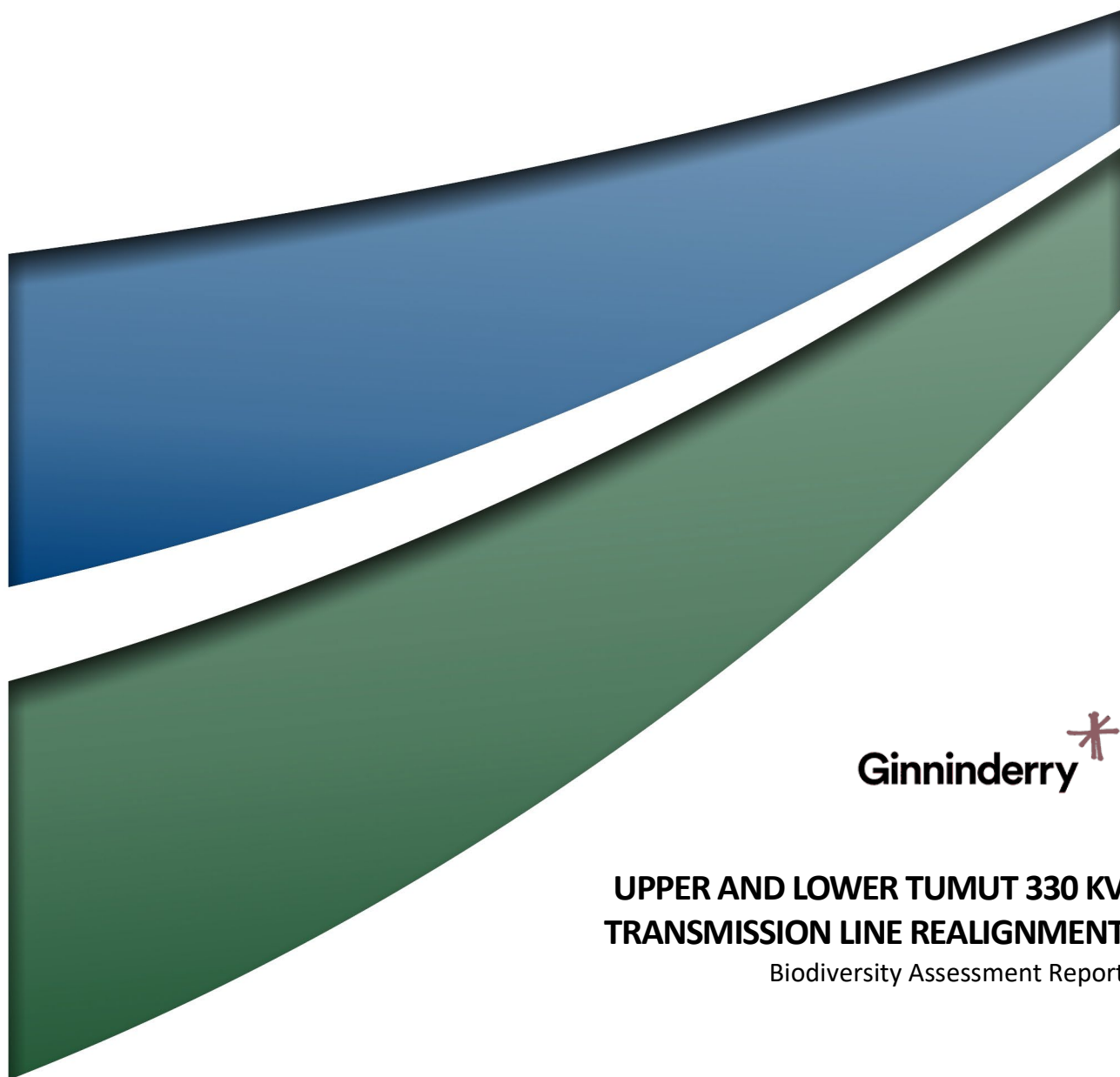




Ginninderry 

**UPPER AND LOWER TUMUT 330 KV
TRANSMISSION LINE REALIGNMENT**
Biodiversity Assessment Report

FINAL

June 2024



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Biodiversity Assessment Report

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Riverview Projects (ACT) Pty Ltd for the
Ginninderry Joint Venture

Project Director: Karina Carwardine
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Report No. 21968_R05
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Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
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V2	Keira Banks	30/05/2024	Keira Banks	30/05/2024

Executive Summary

Riverview Projects (ACT) Pty Ltd for the Ginninderry Joint Venture (GJV) engaged Umwelt to prepare a Biodiversity Assessment Report (BAR) as part of the Environmental Impact Statement (EIS) for the proposed Upper and Lower Tumut 330 kilovolt (kV) transmission line realignment (the Proposal). The Proposal involves the relocation of part of the Upper and Lower Tumut Transmission lines near their point of connection in the Australian Capital Territory (ACT).

This report presents the results of a desktop review of ecological information, and an ecological assessment comprising of vegetation mapping and condition assessment, threatened fauna habitat assessment, and threatened species surveys.

The assessment identified that 2.66 hectares (ha) of ACT16 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland, 0.21 ha of ACT01 Dry Tussock Grassland, and 2.06 ha of ACT25 *Eucalyptus macrorhyncha* Tableland Grass/Shrub Forest derived native grassland, comprising ten vegetation zones, may be impacted by the proposed development:

- ACT16.1 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland – moderate to high quality (0.08 ha)
- ACT16.4 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland derived native grassland – moderate to high quality (0.02 ha)
- ACT16.5 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland derived native grassland – low quality (2.27 ha)
- ACT16.6 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland derived native grassland – low quality (<0.01 ha)
- ACT16.7 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland derived native grassland – low quality (0.28 ha)
- ACT01.1 Dry Tussock Grassland – high quality (<0.01 ha)
- ACT01.3 Dry Tussock Grassland – low quality (0.03 ha)
- ACT01.4 Dry Tussock Grassland – exotic (0.17 ha)
- ACT25.4 *Eucalyptus macrorhyncha* Tableland Grass/Shrub Forest derived native grassland – moderate to high quality (0.47 ha)
- ACT25.5 *Eucalyptus macrorhyncha* Tableland Grass/Shrub Forest derived native grassland – low quality (1.59 ha).

Vegetation zones ACT16.1, ACT16.4 and ACT16.5, covering a total of 2.37 ha across 11 areas, met the classification criteria for the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed *White Box – Yellow Box – Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands* critically endangered ecological community. The majority (2.29 ha) is in the derived state, with 0.1 ha supporting high quality understorey with multiple important species.

Vegetation zone ACT01.1 (less than 0.01 ha) met the classification criteria for the EPBC Act listed *Natural Temperate Grassland of the South Eastern Highlands* critically endangered ecological community.

No threatened flora species assessed as having a moderate or high likelihood of occurrence were detected during species surveys in the Impact Area.

The Impact Area supports a total of 1.09 ha of potential habitat for pink-tailed worm-lizard (*Aprasia parapulchella*) across 20 separate patches. Only 0.15 ha is considered high quality. No targeted surveys for the species were undertaken as their presence was assumed, given that the species is known to occur in the local area. Due to the small amount of available habitat within the Impact Area, it is unlikely that it supports a population that would be considered important, and its removal is unlikely to have an adverse impact on habitat critical to the survival of pink-tailed worm-lizard. As such, it is considered unlikely that the Proposal would have a significant impact on pink-tailed worm-lizard.

The Proposal would impact 4.09 ha of potential golden sun moth (*Synemon plana*) habitat, only 0.33 ha of which is high quality. There are no records of golden sun moth occurring within the Impact Area, and the species was not found during targeted surveys across multiple years of survey. The Golden Sun Moth Conservation Advice (DAWE, 2021a) does not define any important populations, and it is considered unlikely that the Impact Area supports an important population of the species. Based on the description in the Golden Sun Moth Conservation Advice, it is unlikely that the potential golden sun moth habitat in the Impact Area is considered habitat critical to the survival of the species. As such, it is unlikely that the Proposal would result in a significant impact on golden sun moth.

The Superb Parrot (*Polytelis swainsonii*) Recovery Plan states that the species requires vegetated corridors to move between breeding and foraging habitat and that degradation and destruction of movement corridors is a key factor implicated in the species' decline. The Proposal would require the removal of three trees that are suitable for superb parrot movement (based on advice from the Conservator of Flora and Fauna's office). An additional six suitable movement trees would require canopy modification to comply with canopy height restrictions underneath transmission lines. Targeted surveys undertaken for the superb parrot did not find the species within these potential movement corridors, or elsewhere within the Proposal Area.

All native vegetation within the Impact Area is considered suitable foraging habitat for the superb parrot (4.9 ha made up of multiple areas distributed along the Proposed Alignment). The removal of foraging habitat and the loss or modification of trees identified as critical for superb parrot movement indicates that the Proposal may have a significant impact on the superb parrot under the EPBC Act.

The Proposal would require the removal of six suitable foraging trees for gang-gang cockatoo (*Callocephalon fimbriatum*), two of which also provide potential breeding habitat. In addition, 10 suitable foraging trees, one of which also provides potential breeding habitat, are close to the Impact Area and would require modification to comply with canopy height restrictions. This habitat is considered critical to the survival of the species in the Gang-gang Cockatoo Conservation Advice (DAWE, 2022). The Proposal may therefore result in a significant impact on gang-gang cockatoo under the EPBC Act.

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1.0 Introduction

1.1 Overview

Riverview Projects (ACT) Pty Ltd for the Ginninderry Joint Venture (GJV) engaged Umwelt to prepare a Biodiversity Assessment Report (BAR) as part of the Environmental Impact Statement (EIS) for the proposed Upper and Lower Tumut 330 kilovolt (kV) transmission line realignment (the Proposal). The Proposal involves the relocation of part of the Upper and Lower Tumut Transmission lines near their point of connection in the Australian Capital Territory (ACT). The two transmission lines extend from Kosciuszko National Park in New South Wales (NSW), through Brindabella National Park in the ACT, before exiting and then re-entering the ACT near Uriarra Village in the ACT (**Figure 1.1**).

The new alignments would divert from near the ACT/NSW border and extend southeast, crossing the Molonglo and Murrumbidgee Rivers in the ACT then connecting to existing towers at the Stockdill Substation on Stockdill Drive in western Belconnen, ACT (**Figure 1.1**). The new alignments traverse a combined distance of approximately 11.3 kilometres (km).

The Proposal also involves the decommissioning and removal of part of the existing Upper and Lower Tumut transmission lines. The sections that would be removed extend northeast from NSW then cross the Murrumbidgee River into the Ginninderry Conservation Corridor (**Figure 1.1**). The Lower Tumut transmission line connects into the Canberra Substation in Macnamara, while the Upper Tumut transmission line diverts south to connect into the Stockdill Substation. The sections to be removed traverse a combined distance of approximately 12.3 km.

The Proposal also involves the installation of an additional 330 kV cable along Line 3C. This is referred to as the “stringing of an additional conductor”. As shown in **Figure 1.1**, Line 3C runs between the Canberra and Stockdill Substations along the edge of the suburb of Holt. The additional conductors would be a continuation of the new Lower Tumut transmission line as it runs past the Stockdill Substation then continues to the Canberra Substation.

This report has been prepared in accordance with the ACT *Planning Act 2023* (Planning Act) with consideration of matters protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the ACT *Nature Conservation Act 2014* (NC Act).

Only the ACT portion of the works have been assessed in this ecological impact assessment, with NSW components assessed via separate processes under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) in relation to works proposed on freehold land, and under the EPBC Act in relation to EPBC Act protected matters and works proposed on Commonwealth land. The Proposal is not covered under the West Belconnen Strategic Assessment so requires standalone assessment.

The Proponent for the Proposal is the GJV; a joint venture between the ACT Suburban Land Agency (SLA) and Riverview Developments (ACT) Pty Ltd. On behalf of the GJV, Riverview Projects (ACT) Pty Ltd has engaged Umwelt to prepare this BAR following receipt of the EIS Scoping Document from the ACT Environment, Planning and Sustainable Development Directorate (EPSDD) under Division 8.2.2 of the PD Act, on 13 July 2023.

1.2 Proposal Area

The Proposal Area is located within the districts of Coree, Stromlo and Belconnen in the ACT, more than 13 km west of the Canberra city centre (see **Figure 1.1**). From the ACT/NSW border, the new alignments would extend southeast through farmland across the Murrumbidgee and Molonglo River corridors to the Stockdill Substation on Stockdill Drive (see **Figure 1.2**). The sections of the transmission lines to be removed extend northeast from the ACT/NSW border, across farmland and the Murrumbidgee River corridor, then across the Ginninderry Conservation Corridor (GCC) and West Belconnen Future Urban Area (FUA) to the Canberra Substation in Macnamara. Line 7 connects into the Canberra Substation, but Line 1 diverts south to connect into the Stockdill Substation. The section of Line 3C to be strung with an additional conductor is located between the Canberra and Stockdill Substations (**Figure 1.2**).

The Proposal is located across 39 different ACT land parcels, of which 17 would have the new alignments, 17 have the existing lines that would be removed, and 11 are for Line 3C stringing. Some blocks are used for multiple components of the Proposal.

The Australian and ACT Governments share responsibility for land development in the ACT. National Land is used by or on behalf of the Commonwealth, while Territory Land is managed by the ACT Government on behalf of the Commonwealth. All ACT land in the Proposal Area is on Territory Land.

The Proposal Area is a mixture of privately leased rural land and public land. The privately leased land is mostly undeveloped and managed with sheep grazing, except for the eastern part of the Proposal Area which is being developed for residential purposes and utility infrastructure. The public land is managed as nature reserve or other conservation areas (e.g. the GCC). All existing land uses would continue unchanged following construction of the Proposal, with minor disruptions associated with construction (e.g. exclusion of stock from construction areas).

For the purpose of this BAR, the terminology used to describe the areas for assessment are described in **Table 1.1**.

Table 1.1 Terminology Used to Describe the Proposal Area

Term	Description
Proposal Area	The total area in which the Proposal would be developed. It comprises both the areas required for construction and operation, as well as the lines to be demolished, and covers an area of approximately 75.2 hectares (ha).
New alignments	The new sections of Lines 1 and 7 that would be installed between the ACT/NSW border and Stockdill Substation.
Line 3C alignment	The section of Line 3C along which an additional conductor would be strung.
Proposed Alignment	The area through which the proposed new transmission lines (Lines 1 and 7) would operate. This includes tower footings and the 60 meter (m) wide transmission line easements of the new alignments. It includes a vegetation clearance zone around the new alignments to the east of the Molonglo River, which is a slightly different shape to the standard transmission line easements as it accounts for the sag and swing of the conductors during hot and/or windy conditions (see Figure 1.2). trees taller than 6 m would be removed from within the vegetation clearance zone to ensure they do not make contact with the conductors. Towers have been moved or made taller to avoid tree removal to the west of the Molonglo River, but the area to the east of the Molonglo River is more constrained due to other utility installations and tree removal is unable to be completely avoided in this area. The Proposed Alignment covers a total area of 61.3 ha.

Term	Description
Impact Area	The area that would be directly impacted by the Proposal. This includes the impact areas of the new alignments associated with tower footings, access tracks, trees that would need to be cleared or lopped due to their proximity to the lines, construction compounds and laydown areas. It includes the vegetation clearance zone to the east of the Molonglo River in which trees taller than 6 m would be removed, and other trees might be lopped, to ensure they do not make contact with the conductors. The Impact Area encompasses permanent impacts (which occur over the lifetime of the Proposal) and temporary impacts during construction such as laydown areas. The Impact Area is 10.8 ha.

The Impact Area and Proposed Alignment are shown in **Figure 1.1**. For the vegetation clearance zone, only impacts on trees have been considered as discussed in **Section 5.2**. All other impact assessments are based on impacts from the new tower footings and construction areas.

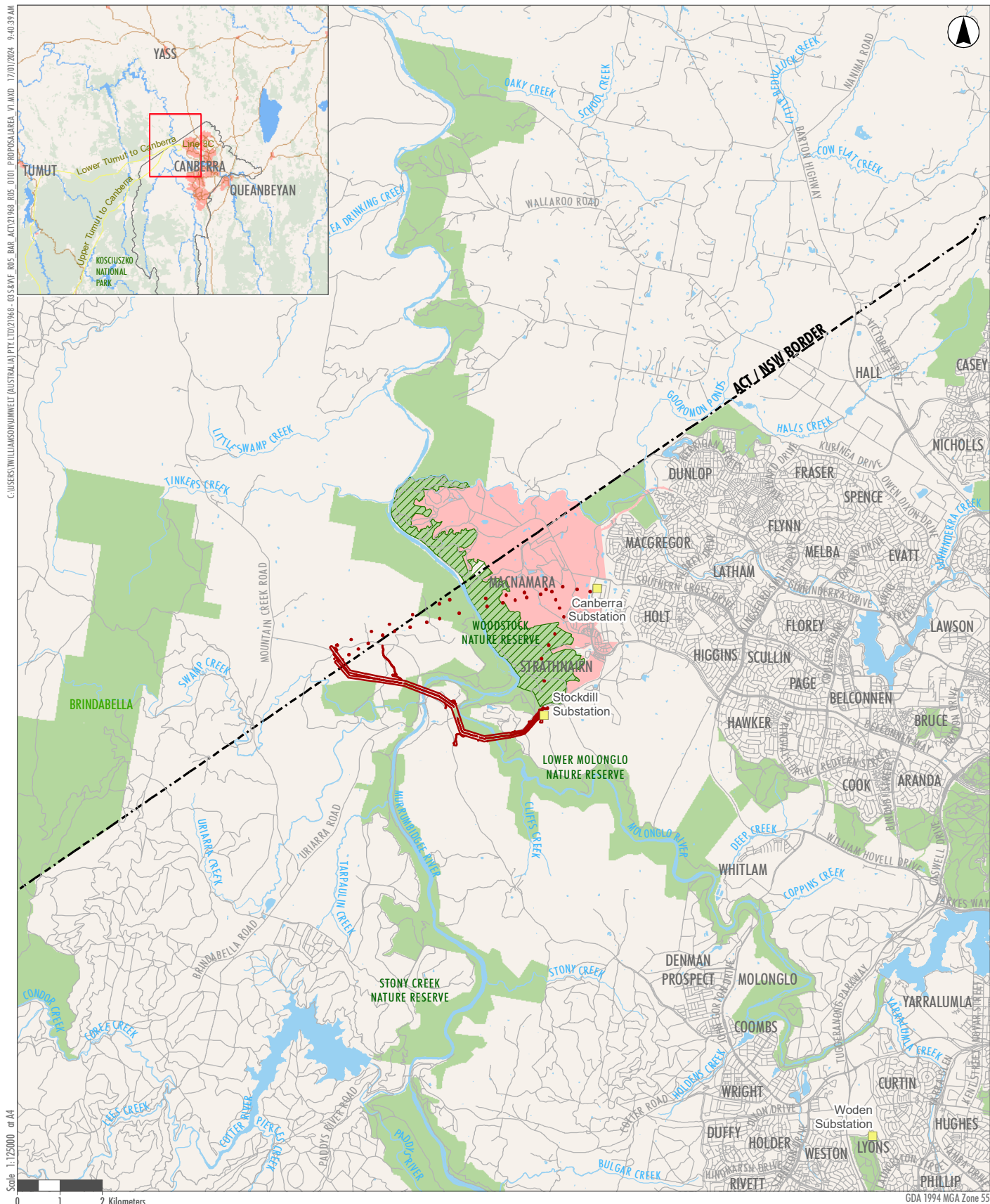
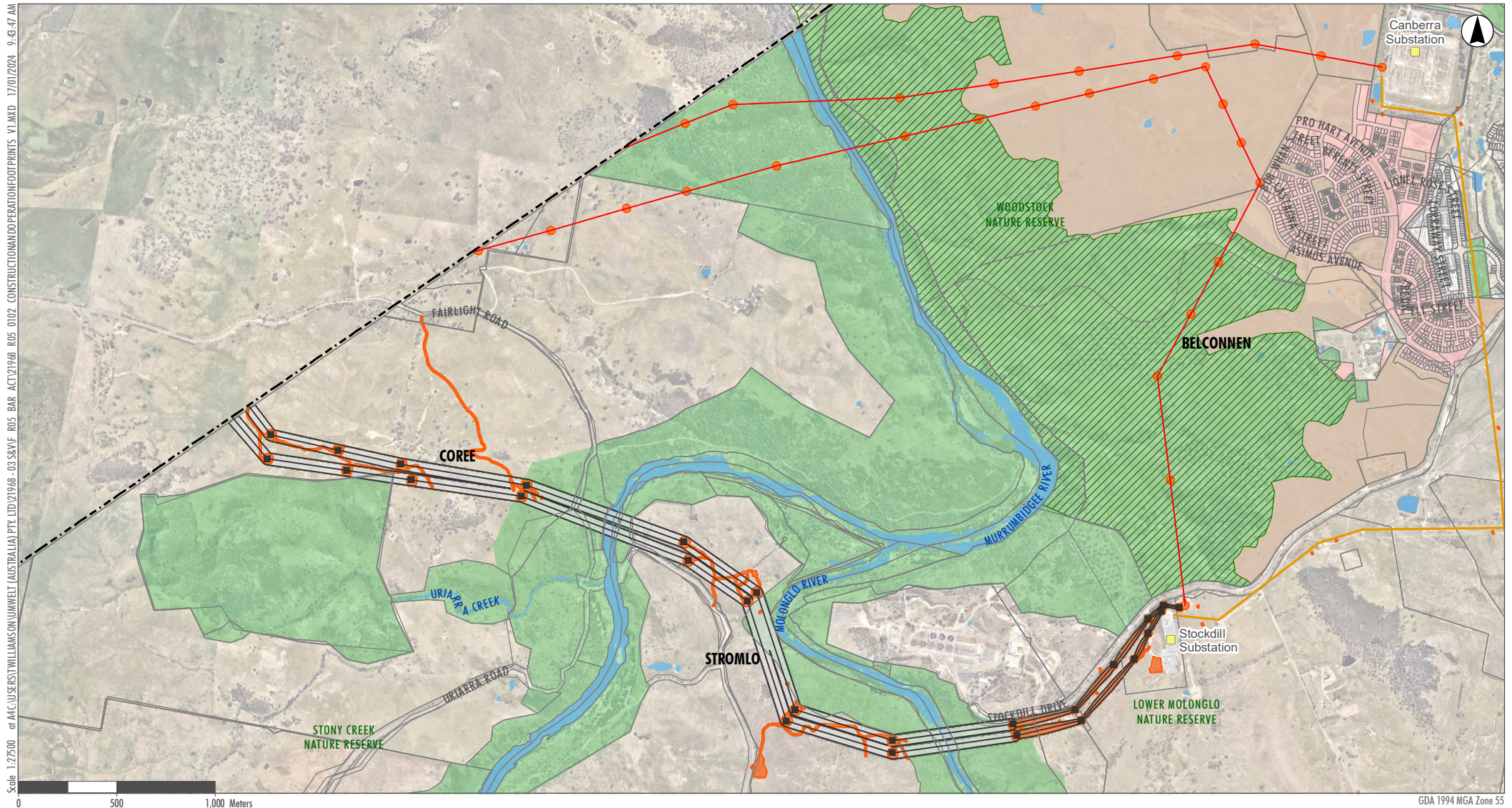


FIGURE 1.1
Proposal Area



Legend

- Transmission Lines to be Removed
- Line 3C (Additional Conductor Stringing)
- Proposed Alignment
- Impact Area
- Property Boundaries
- Existing Substation
- ACT/NSW Border
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

Image Source: Nearmap (2023) Data source: ACT Government (2023)

FIGURE 1.2
Construction and Operational
Footprints of the Proposal

1.3 Objectives

The objective of this BAR is to describe the ecological values that may be impacted by the Proposal including matters listed under the EPBC Act and / or the NC Act. This report comprises the following:

- Desktop review (**Section 3.1** and **Section 4.1**).
- Vegetation mapping and assessment of ACT Plant Community Type (PCT) and threatened ecological communities (**Section 3.3** and **Section 4.4.1** to **Section 4.4.3**).
- Threatened fauna habitat assessment and mapping (**Section 3.3.4** and **Section 4.4.4**).
- Targeted surveys of the following threatened species (**Section 3.3.5** and **Section 4.4.5**):
 - golden sun moth (*Synemon plana*)
 - superb parrot (*Polytelis swainsonii*)
 - gang-gang cockatoo (*Callocephalon fimbriatum*)
 - Austral toadflax (*Thesium australe*)
 - hoary sunray (*Leucochrysum albicans*)
 - small purple-pea (*Swainsona recta*)
 - pale pomaderris (*Pomaderris pallida*).
- Impact assessment (**Section 5.0**).
- Recommendation of measures for mitigating and managing impacts (**Section 6.0**).

2.0 Scoping Document Requirements

A Scoping Document was issued for the Proposal by the EPSDD on 13 July 2023, which identifies matters to be addressed in the EIS. It includes scoping requirements from the EPSDD as well as comments from various government entities including the ACT Conservator of Flora and Fauna (the Conservator).

The ACT scoping requirements and entity comments pertaining to matters to be addressed in this ecological impact assessment are outlined in **Table 2.1** and **Table 2.2**.

Table 2.1 Scoping Document and BAR Cross-reference

Scoping Requirement	Relevant Section of this Report
Section 7.1 – Risk Assessment	
The below risks are considered potentially significant and must be addressed in the EIS: - Impacts on fauna (including aquatic and arboreal species and threatened species such as pink-tailed worm-lizard, superb parrot, and golden sun moth). - Impacts on flora and ecological communities, including critically endangered Box Gum Woodland (BGW) and Natural Temperate Grassland (NTG). - Removal of tree species suitable for superb parrot nesting. - Clearance of native vegetation. - Spread of invasive species/weeds off-site during construction.	Section 5.0
Section 8.2.1 – Ecology and Natural Environment	
Provide a description of the ecological values (including native vegetation, endangered ecological communities, and threatened species) and their habitat on, and adjacent to the site, including but not limited to: - yellow box – Blakely's red gum grassy woodland (BGW) - natural temperate grassland (NTG) - pink-tailed worm-lizard (<i>Aprasia parapulchella</i>) - superb parrot (<i>Polytelis swainsonii</i>) - little eagle (<i>Hieraaetus morphnoides</i>) - perunga grasshopper (<i>Perunga ochracea</i>) - hoary sunray (<i>Leucochrysum albicans</i>) - gang-gang cockatoo (<i>Callocephalon fimbriatum</i>) - diamond firetail (<i>Stagonopleura guttata</i>) - scarlet robin (<i>Petroica boodang</i>) - southern white-face (<i>Aphelocephala leucopsis</i>) - golden sun moth (<i>Synemon plana</i>) - groundcovers including <i>Themeda australis</i> or <i>Microlaena stipoides</i>.	Section 4.4
Ecological surveys must be undertaken by a qualified ecologist for each impacted species and their habitats.	Section 3.3
Provide maps showing the location of all habitat and overlay all aspects of the proposed development to show the extent of any impact.	Section 4.0

Scoping Requirement	Relevant Section of this Report
Describe the direct and indirect impacts on ecological values. The description must include all areas that may be impacted by the decommissioning, construction, and installation of the transmission lines, including pole placement, laydown, access arrangements and any areas that will be impacted by maintenance works following completion of construction.	Section 5.0
Consider the indirect impacts of the development on fauna species in relation to: - Increased predation efficiency and predator abundance due to the erection of poles and lines adjacent to grasslands. - Increased mortality of birds due to collisions with powerlines, with particular consideration for superb parrot and other avian species known to occur in the area.	Section 5.6
Consider impacts of removal of tree species (<i>Eucalyptus rossii</i> or <i>E. blakelyi</i>) suitable for superb parrot nesting and provide detailed assessment of the possible impacts on their breeding habitat.	Section 5.3.4
Consider the impact of removing mature, hollow-bearing trees on connectivity for arboreal species.	Section 5.5
Consider impacts on migratory species.	Section 5.3.5
Consider the impact of weed spread due to soil disturbance and any key habitat that is at risk of being affected.	Section 5.6
Detail any potential cross border impacts.	Section 5.6
Describe measures for the avoidance and mitigation of the impacts identified and, if proposed, any offset measures.	Section 6.0
Outline alternative design options that have been explored to avoid or reduce the impact.	Section 2.4 of the EIS

Table 2.2 ACT Conservator of Flora and Fauna Comments

Scoping Requirements	Relevant Section of this Report
A4 – The Conservator of Flora and Fauna	
A4: 3 - Consider impacts on: - little eagle (<i>Hieraaetus morphnoides</i>) - perunga grasshopper (<i>Perunga ochracea</i>) - hoary sunray (<i>Leucochrysum albicans</i>) - gang-gang cockatoo (<i>Callocephalon fimbriatum</i>) - diamond firetail (<i>Stagonopleura guttata</i>) - scarlet robin (<i>Petroica boodang Callocephalon fimbriatum</i>) - southern whiteface (<i>Aphelocephala leucopsis</i>).	Section 5.0
A4: 4 – Areas of groundcover dominated (most abundant species) by either <i>Themeda australis</i> or <i>Microlaena stipoides</i> must be mapped and additional survey for <i>Thesium australis</i> undertaken.	Section 3.3.1
A4: 5 – Each Proposal Area must be clearly mapped, especially around towers sites and access tracks (new and old). Existing towers in McNamara and Strathnairn are located within NTG and pink-tailed worm-lizard habitat and detailed maps must be available to accurately assess these impacts.	Section 4.0
A4: 6 – Impacts of removal of the existing lines must also be identified and assessed, including impacts to vegetation, especially trees.	Section 5.0

Scoping Requirements	Relevant Section of this Report
A4: 7 – Impacts on migratory species, including Rainbow Bee-eater (<i>Merops ornatus</i>) must also be considered.	Section 5.3.4.9
A4: 8 – Important connectivity pathways must be mapped and the impacts of the proposal on these pathways assessed.	Section 4.0
A4: 9 – Consideration and mitigation of impacts to native burrowing animals must also be included.	Section 4.0
A4: 10 – Superb Parrot (<i>Polytelis swainsonii</i>) suitable nesting habitat assessment based on ACT Government research has shown that there is >50 % likelihood that a tree is suitable for superb parrot nesting if the tree has the following attributes: • tree species is <i>Eucalyptus rossii</i> or <i>Eucalyptus blakelyi</i> • trunk diameter at breast height >70 cm • >9 tree hollows (with entrance size > 4 cm) are visible from the ground. Piecemeal reduction of this potential habitat area is an important threat to avoid. The EIS must include an assessment of the area identified overleaf [see Figure 3.3] for trees that meet criteria underlined above and any impacts to any identified suitable trees if avoidance is not possible.* Finally, due to the Parkwood development area, landscape connectivity between the breeding colony and critical SP foraging habitat through the southern boundary of Woodstock Nature Reserve is important. Research shows that trees 10–15 m in height support SP movement, so their removal should be avoided within the area identified overleaf [see Figure 3.3]. The EIS must include a tree assessment of this area and identification and assessment of any impacts to trees that contribute to SP movement.*	Section 5.3.4
A4: 11 – Assessment of significant impact is required for the golden sun moth (<i>Synemon plana</i>). Preliminary distribution models for the species that focus on dispersal limited females, indicate that the area may hold moderate to high quality habitat for golden sun moth (based on a combination of abiotic and landscape features identified at good condition sites across the ACT).	Section 5.3.2
A4:13 – Site investigations prior to construction (and ideally during approval process) should include surveys for Matters of National Environmental Significance during appropriate survey periods, relative to the values being surveyed.	Section 3.0

*These comments were revised following consultation with the Conservator's team. Refer to Appendix B of the EIS for more information on the changes made to the entity comments.

3.0 Methods

3.1 Desktop Review

A desktop review was conducted to identify any known ecological or site-specific values in the Proposal Area. This included searching relevant databases, species profiles for targeted fauna species and populations, species habitat preferences, and other information relating to the Proposal Area. Published broad-scale mapping within a minimum 10 km search area buffer, was used allowing a greater understanding of the biodiversity that may occur in, utilise, or transit through the Proposal Area. The desktop review included the following:

- ‘Protected Matters Search’ (DCCEEW, 2023) to identify Matters of National Environmental Significance (MNES) protected under the EPBC Act that may occur in the Proposal Area with a 10 km buffer applied (the Protected Matters Search is provided in **Appendix A**).
- Search of the ACT Government’s mapping tool ‘ACTmapi’ (ACT Government, 2023) to identify matters protected under the NC Act and that may occur in the Proposal Area, with a 10 km buffer applied.
- Search of the ACT Government’s mapping tool ‘ACTmapi’ (ACT Government, 2023) to review the regional habitat connectivity value of the Proposal Area.
- Review of Canberra Nature Map and Atlas of Living Australia to identify matters protected under EPBC Act and/or NC Act that have been recorded in or near the Proposal Area.
- Modelling from the Conservator, which provided information on superb parrot and golden sun moth habitat for further assessment.
- Review of eBird and Birdlife Australia databases to inform bird values for the Proposal Area and surrounding area.
- Specially, the following EPBC Act documentation was reviewed:
 - National Recovery Plan White Box – Yellow Box – Blakely’s Red Gum Grassy Woodland and Derived Native Grassland (NSW Government, 2011).
 - Approved Conservation Advice for White box – Yellow Box – Blakely’s Red Gum Grassy Woodland and derived Native Grassland (TSSC, 2023).
 - National Recovery Plan for the Superb Parrot *Polytelis swainsonii* (DAWE, 2021b).
 - *Polytelis swainsonii* (Superb Parrot) Conservation Advice (TSSC, 2016a).
 - *Aprasia parapulchella* (Pink-tailed Worm-lizard) Conservation Advice (TSSC, 2015).
 - *Synemon plana* (Golden Sun Moth) Conservation Advice (DAWE, 2021a).
 - Threat abatement plan for competition and land degradation by rabbits (DoEE, 2016).
- Other ecological information pertaining to the Proposal Area and neighbouring blocks as available.

3.2 Likelihood of Occurrence

Information from the desktop review was used to inform an assessment of the likelihood that threatened ecological communities, threatened species, or migratory species could occur in the Proposal Area. It included consideration of the location of nearby records and observation dates, presence of key habitat features and recent information about species populations in the area. Likelihood ratings were assigned in accordance with **Table 3.1**. This table is prepared prior to field work and any species considered likely to occur but not likely to be impacted will be discussed in **Section 5.0**.

Table 3.1 Key to Likelihood of Occurrence Assessment

Likelihood	Description
Known	The species or community has been recorded within the Proposal Area in the past 5 years.
High	It is highly likely that the species inhabits or community is present in the Proposal Area and the species is dependent on suitable habitat that is known or highly likely to occur in the Proposal Area (i.e., for breeding or important life cycle periods such as winter flowering resources), or is known or likely to maintain resident populations in the Proposal Area. Also includes species known or likely to visit the Proposal Area during regular seasonal movements or migration.
Moderate	Potential habitat or community is known or likely to be present in the Proposal Area. Species is unlikely to maintain sedentary populations, however, may seasonally use resources within the Proposal Area opportunistically or during migration. The species is unlikely to be dependent on habitat within the Proposal Area (i.e., for breeding or important life cycle periods such as winter flowering resources), or habitat likely to be in a modified or degraded state. Includes cryptic flowering flora species that were not seasonally targeted by surveys and that have not previously been recorded.
Low	It is unlikely that the species inhabits, or the community is present in the Proposal Area. It may be an occasional visitor, but habitat within the Proposal Area is widely distributed in the local area, meaning that the species is not dependent on available habitat in the Proposal Area (i.e., for breeding or important life cycle periods such as winter flowering resources). Specific habitat is not known to be present in the Proposal Area, or the species are a non-cryptic perennial flora species have previously been targeted by surveys and not recorded.

3.3 Field Survey

Fieldwork was conducted by field ecologists in December 2021, November and December 2022, and February, August, and October 2023 to confirm the results of the desktop review and inform the preparation of the BAR.

Fieldwork was restricted to the Impact Area except for the assessment of mature and hollow-bearing trees, which also occurred within the 'Superb Parrot Tree Assessment Area' shown in **Figure 3.3** (and as requested by the Conservator).

3.3.1 Vegetation Mapping and Condition Assessment

Native vegetation was mapped using a step point transect approach to differentiate between native and exotic dominated groundcover. Vegetation communities and condition zones were mapped, with vegetation units mapped as per the ACT PCT classification system. Native vegetation was mapped into vegetation condition zones, following the methods developed by Capital Ecology (Capital Ecology, 2018a and Capital Ecology, 2018b), replicated in **Table 3.2**, **Table 3.3** and **Table 3.4**.

Vegetation condition type and condition was assessed through collection of rapid assessment points recording dominant species in each stratum and vegetation floristic plots. Vegetation zone boundaries were mapped in the field to a high resolution (5 m) using a GPS hand-held data collection device.

Table 3.2 Vegetation Zones for PCT ACT16 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland (from Capital Ecology, 2018a)

Groundstorey Dominance (perennial) Native or exotic	Mature Characteristic Canopy sp./spp. Present or absent	Regeneration of Characteristic Canopy sp./spp. Present or absent	Native Forb Diversity* Low, Mod-high	Vegetation Zone ID
Native	Present	Present	Moderate- high	16.1
			Low	16.2
	Absent	Present	Moderate- high	16.3
		Absent	Moderate- high	16.4
		Absent	Low	16.5
Exotic	Present	Present	Low	16.6
	Present	Absent	Low	16.7
	Absent	Absent	Low	16.8

* Low = < 12 sp. (disturbance tolerant species only); Moderate- high = ≥ 12 sp.; incl. ≥ 1 important sp.; incl. disturbance sensitive sp.

Table 3.3 Vegetation Zones for PCT ACT01 Tablelands Dry Tussock Grassland (from Capital Ecology, 2018b)

Groundstorey Dominance	Native Forb Diversity (Floristic Value Score)	Vegetation Zone ID	Reason for Exotic Dominance
Native	High: FVS ≥ 6.5	01.1	
	Mod: FVS ≥ 5 but ≤ 6.5 and/or >50% foliage cover of <i>Carex bichenoviana</i> , <i>Themeda triandra</i> or <i>Poa labillardieri</i>	01.2	
	Low: FVS < 5	01.3	
Exotic	N/A	01.4	Pasture and agricultural weed species (cultivation or pasture improvement, such as <i>Phalaris</i> pasture)
	N/A	01.4	Stock camp (soil nutrification, annual weed dominance)
	N/A	01.4	Noxious weed species (e.g. dense serrated tussock or Chilean needlegrass)

Table 3.4 Vegetation Zones for PCT ACT25 *Eucalyptus macrorhyncha* Tableland Grass/Shrub Forest (from Capital Ecology, 2018a)

Groundstorey Dominance (perennial) Native or exotic	Mature Characteristic Canopy sp./spp. Present or absent	Regeneration of Characteristic Canopy sp./spp. Present or absent	Native Forb Diversity* Low, Mod-high	Vegetation Zone ID
Native	Present	Present	Moderate- high	25.1
			Low	25.2
	Absent	Present	Moderate- high	25.3
		Absent	Moderate- high	25.4
		Absent	Low	25.5
Exotic	Present	Present	Low	25.6
	Present	Absent	Low	25.7
	Absent	Absent	Low	25.8

* Low = < 12 sp. (disturbance tolerant species only); Moderate- high = ≥ 12 sp.; incl. ≥ 1 important sp.; incl. disturbance sensitive sp.

3.3.1.1 Rapid Assessment Points and Plots

Eleven vegetation plots were completed in the Impact Area in December 2022 concurrently during vegetation mapping.

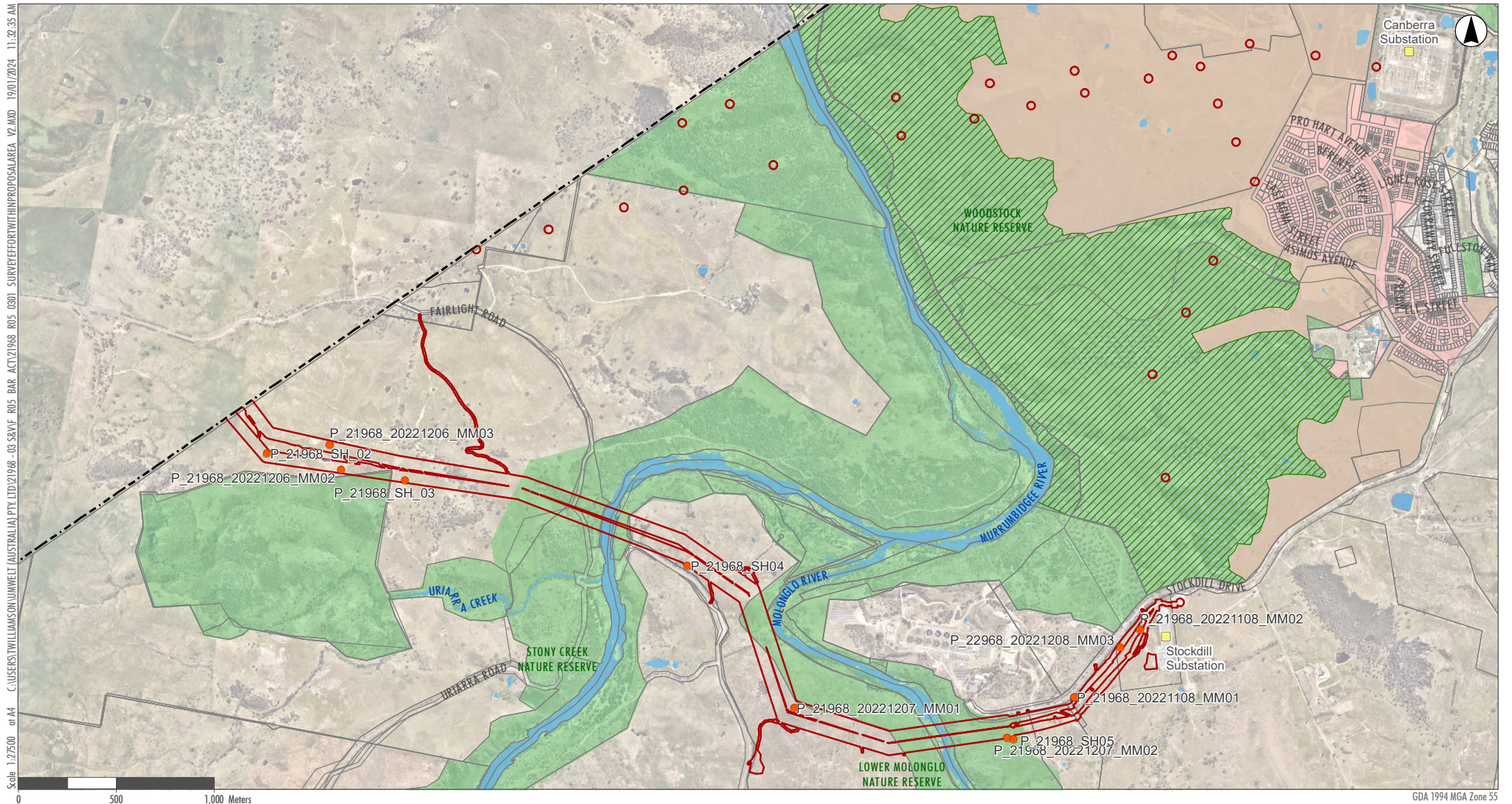
Vegetation plots were undertaken within representative areas of box-gum woodland and native grassland in the Impact Area (**Figure 3.1**). No floristic plots were undertaken in areas unlikely to support any TECs. Plots were undertaken consistent with the *ACT Environmental Offsets Calculator Assessment Methodology* (ACT Government, 2015).

Data on structural attributes were recorded along 50 m transects or in 20 x 50 m plots whilst floristic data was recorded in 20 x 20 m plots. Structural data collected in 20 x 50 m plots included the number of large trees present and total length of fallen logs present. Structural data collected along 50 m transects comprised native overstorey cover, native midstorey cover, native ground cover (for grasses, shrubs and other) and exotic plant cover. Whether or not regeneration of overstorey species was present in the relevant vegetation zone was recorded. The cover and estimated abundance of all plant species identified in a 20 x 20 m plot was recorded.

The number of plots conducted in each vegetation zone also met requirements of the *ACT Environmental Offsets Calculator Assessment Methodology* (**Table 3.5**).

Table 3.5 Number of Plots Conducted in each Vegetation Zone in the Impact Area

Vegetation Zone	Extent of PCT (ha)	Required Number of Plots (as per EPD, 2015)	Number of Plots Conducted
ACT16.1 <i>Eucalyptus melliodora</i> – <i>E. blakelyi</i> Tableland Grassy Woodland – moderate – high quality	0.08	1	1
ACT16.4 <i>Eucalyptus melliodora</i> – <i>E. blakelyi</i> Tableland Grassy Woodland – moderate – high quality	0.02	1	1
ACT16.5 <i>Eucalyptus melliodora</i> – <i>E. blakelyi</i> Tableland Grassy Woodland – low quality	2.26	1	2
ACT16.6 <i>Eucalyptus melliodora</i> – <i>E. blakelyi</i> Tableland Grassy Woodland – low quality	< 0.01	1	1
ACT16.7 <i>Eucalyptus melliodora</i> – <i>E. blakelyi</i> Tableland Grassy Woodland – low quality	0.28	1	1
ACT25.4 <i>Eucalyptus macrorhyncha</i> Tableland Grass/Shrub Forest – moderate – high quality	0.47	1	1
ACT25.5 <i>Eucalyptus macrorhyncha</i> Tableland Grass/Shrub Forest – low quality	1.59	1	1
ACT01.1 Tablelands Dry Tussock Grassland	< 0.01	1	1
ACT01.3 Tablelands Dry Tussock Grassland	0.03	1	1
ACT01.4 Tablelands Dry Tussock Grassland	0.17	1	1



Legend

- Proposed Alignment and Impact Area
- Plot Location
- Existing Substation
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

Image Source: Nearmap (2023) Data source: ACT Government (2023)

FIGURE 3.1
Survey Effort Within the
Proposed Alignment and

3.3.2 Threatened Ecological Communities

3.3.2.1 Box Gum Woodland Assessment

Each vegetation zone identified as ACT16 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland was assessed against key diagnostic criteria identified in the *Approved Conservation Advice for White box – Yellow Box – Blakely's Red Gum Grassy Woodland and derived Native Grassland* (BGW Conservation Advice) (TSSC, 2023) to determine whether patches meet the listing definition for the EPBC Act listed *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* critically endangered ecological community (EPBC Act BGW).

Patches that did not meet the key diagnostic criteria are considered not to represent the EPBC Act BGW and therefore were not considered for further assessment. Patches that did meet the key diagnostic criteria are considered to represent the EPBC Act BGW, and were assessed using minimum condition thresholds described in the BGW Conservation Advice and below.

Minimum condition thresholds are used to identify patches of BGW that are the most functional, relatively natural and in comparatively good condition. They are designed to identify patches of BGW that retain sufficient conservation values to be considered an MNES. These patches then help to prioritise legal protection for the ecological community. Any patch meeting the condition thresholds for Class A, B, or C (as defined in TSSC, 2023) is considered an MNES, with Class A patches being of the highest conservation value and greatest priority for protection. Patches that link remnants in the landscape, occur in depauperate areas, contain rare, declining, or threatened species and contribute to representation across the entire range of BGW, are important to the viability of the ecological community.

Each vegetation zone identified as ACT16 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland was also assessed for classification as the NC Act listed *Yellow Box – Blakely's Red Gum Grassy Woodland* critically endangered ecological community (NC Act BGW), which is defined in the *Conservation Advice (Yellow Box – Blakely's Red Gum Grassy Woodland)* (ACT Government, 2020a) and in the *ACT Native Woodland Conservation Strategy* (ACT Government, 2019).

No specific diagnostic criteria or condition thresholds for the NC Act BGW are defined in those documents, however it is stated that it is a component of the EPBC Act listing. In the absence of condition thresholds for the NC Act listed BGW, the condition thresholds from the EPBC Act BGW Conservation Advice were applied and any subsequent assessments were undertaken on that basis.

3.3.2.2 Natural Temperate Grassland Assessment

Each vegetation zone identified as ACT01 *Tablelands Dry Tussock Grassland* (**Table 3.3**) was assessed against the key diagnostic characteristics identified in the *Approved Conservation Advice for Natural Temperate Grassland of the South Eastern Highlands* (NTG Conservation Advice) (TSSC, 2016b) to determine whether patches meet listing definition for the EPBC Act listed *Natural Temperate Grassland of the South Eastern Highlands* critically endangered ecological community (EPBC Act NTG).

Patches that did not meet the key diagnostic characteristics are considered not to represent the EPBC Act NTG and therefore were not considered for further assessment. Patches that did meet the key diagnostic characteristics are considered to represent the EPBC Act NTG, and were assessed using condition thresholds described in the NTG Conservation Advice and below.

Condition thresholds are used to identify which patches of natural temperate grassland are the most important for protection under the EPBC Act. Any patches meeting the condition thresholds for category A or B (as defined in TSSC, 2016) is considered a priority for assessment.

The *Nature Conservation (Natural Temperate Grassland) Conservation Advice 2020* (ACT Government, 2020b) states that Natural Temperate Grassland in the ACT is encompassed in the EPBC Act listing definition. As such, the above method also applies to identifying patches of ACT01 *Tablelands Dry Tussock Grassland* that represent NC Act NTG.

3.3.3 Native Vegetation

Areas that met the definition of native vegetation under the NC Act were mapped. Section 233 of the NC Act defines a native vegetation as:

‘an area where –

a. either –

- i. 10% or more of the area is covered with vegetation (whether dead or alive); and
- ii. no more than 60% of the ground layer vegetation cover is exotic annual (at any time of the year); and
- iii. more than 50% of the perennial ground layer vegetation cover is native vegetation; or

b. trees or shrubs indigenous to the area have a canopy cover of 10% or more in any stratum of the area.’

3.3.4 Threatened Fauna Habitat Assessment

3.3.4.1 Pink-Tailed Worm-Lizard

Desktop mapping of pink-tailed worm-lizard habitat (rocky areas including low outcroppings of rocks, scattered boulders, and other surface rock debris) within the Impact Area was completed in January 2023 using aerial imagery from October 2019.

Vegetation mapping was overlayed onto the mapped habitat to produce preliminary condition zones in accordance with **Table 3.6**. Mapped condition zones were confirmed on-ground between 7 and 9 August 2023 and re-classified as required. Mapping was undertaken using phone or tablet enabled with a GPS.

Table 3.6 Pink-tailed Worm-lizard Habitat Condition Categories (Wong and Osbourne, 2010)

Habitat Condition	Description
High	Suitable rocky areas primarily dominated by kangaroo grass (<i>Themeda australis</i>) supporting a moderate to high diversity of native forbs and characterised by a moderate to high density of partially embedded rocks. Exotic annual species may be present.
Moderate	Suitable rocky areas primarily dominated by spear grasses (<i>Austrostipa</i> spp.) and wallaby grasses (<i>Rytidosperma</i> spp.) supporting native forbs and characterised by a moderate to high density of partially embedded rocks. Exotic annual species may be present.
Low	Suitable rocky areas that have been subject to high levels of disturbance in the recent past displaying high levels of disturbance to the soil layer or dominated by sown pasture grasses, other agronomic species, and weeds; includes former sheep camps that no longer support native ground cover.

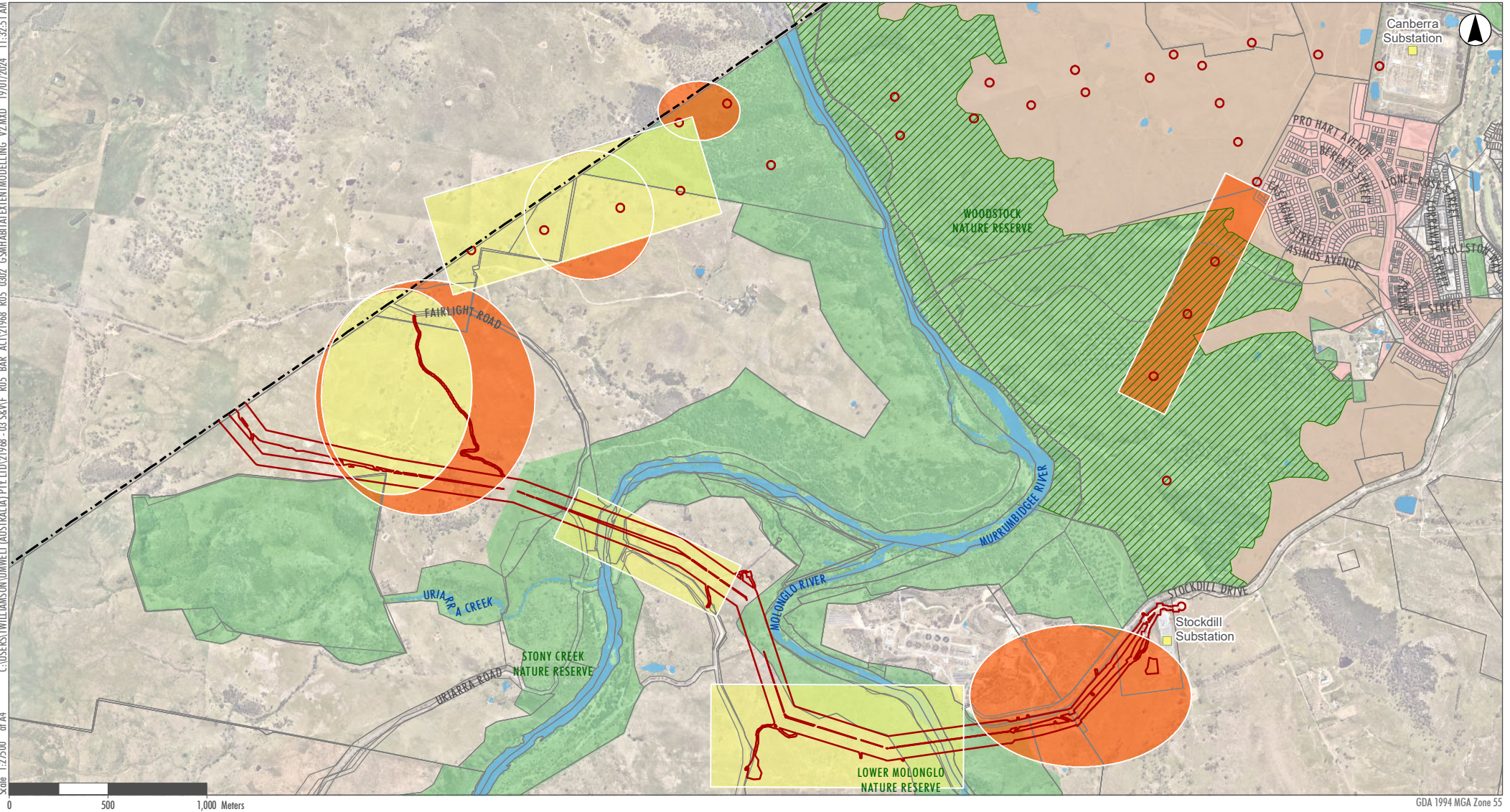
3.3.4.2 Golden Sun Moth

Golden sun moth habitat was mapped using 50 m transects, which assessed the ground stratum composition against the condition classes presented within **Table 3.7**. All transects were conducted in areas of potential habitat not shaded by taller vegetation or structures.

Areas of potential habitat identified as per this methodology were compared against the golden sun moth habitat modelling from the Conservator's office (**Figure 3.2**) to identify areas to be subject to targeted surveys (discussed further in **Section 3.3.5.2**).

Table 3.7 Classification Criteria for Golden Sun Moth Habitat (SMEC and Rowell, 2018)

Habitat Condition	Notes	Minimum Criteria
High quality	Primary natural temperate grassland or native pasture dominated by native larval food plants (i.e. <i>Rytidosperma</i> sp. and/or <i>Austrostipa</i> sp.), with low weed cover and some bare ground.	> 10% cover <i>Rytidosperma</i> sp. > 15% cover <i>Rytidosperma</i> sp. and <i>Austrostipa</i> sp. combined > 5% bare ground < 5% broadleaf Low to moderate biomass Moderate to high native plant diversity
Moderate quality	Primary or secondary grassland, with a moderate component of <i>Rytidosperma</i> sp. and/or <i>Austrostipa</i> sp., and/or moderate weed cover.	> 5% cover <i>Rytidosperma</i> sp. > 10% cover <i>Rytidosperma</i> sp. and/or <i>Austrostipa</i> sp. combined > 3% bare ground < 10% broadleaf Low to moderate biomass Moderate native plant diversity
	Native-dominated grassland typically with a moderate to high component of <i>Rytidosperma</i> sp. and/or <i>Austrostipa</i> sp., but less than high quality habitat because of one or more of the following conditions:	OR On a steep slope or hilltop On a south or east-facing slope Soil very shallow and/or stony, rock outcrops present Secondary grassland or contains scattered trees
Low quality	Larval food plants (<i>Rytidosperma</i> sp., <i>Austrostipa</i> sp. and/or Chilean needlegrass) are a minor component of the ground layer, growing sparsely or in patches among unsuitable vegetation such as:	Exotic species (excluding Chilean Needlegrass) Native C4 grasses (such as <i>Themeda triandra</i>) Other unsuitable native ground cover (e.g. <i>Poa labillardieri</i> , rushes/sedges)
		AND > 10% cover <i>Rytidosperma</i> sp. and/or <i>Austrostipa</i> sp. combined < 20% broadleaf > 10% and < 50% cover Chilean Needlegrass (note low quality Chilean Needlegrass if no native species present)
Chilean needlegrass dominated	Grassland dominated by Chilean needlegrass (<i>Nassella neesiana</i>).	> 50% cover Chilean needlegrass
Low density Chilean needlegrass	Grassland (without high abundance of other feed species) with moderate occurrence of Chilean needlegrass.	>10–50% cover of Chilean needlegrass



Legend

- | | | |
|--|---|--|
| Proposed Alignment and Impact Area | ACT/NSW Border | Existing Substation |
| Conservator Golden Sun Moth Extent | Property Boundaries | |
| All Golden Sun Moth Model | Watercourses | |
| Female Golden Sun Moth Model | Nature Reserves | |
| | Ginninderry Conservation Corridor | |
| | Ginninderry / Parkwood Development | |

FIGURE 3.2
Predictive Modelling of Golden Sun Moth Habitat
Extent (provided by ACT Government)

3.3.4.3 Perunga Grasshopper

Due to historical habitat modification and fragmentation, perunga grasshopper is thought to have a small range, occurring only in the ACT and adjacent areas in NSW. In the ACT, the perunga grasshopper has been found in larger patches of native grasslands dominated by wallaby grasses (*Rytidosperma* spp.), speargrass (*Austrostipa* sp.) or kangaroo grass (*Themeda triandra*) including within the NTG ecological community and open woodlands areas (ACT Government, 2017a). Field observations suggest that the species uses grass tussocks as shelter and refers sites that have a mosaic of tall tussock grasses, shorter grasses and forbs, and bare ground. The species has, however, also been recorded in heavily grazed habitats, where the availability of dense grass tussocks was low (ACT Government, 2017a).

Based on this information, areas of native grassland (including derived grasslands) dominated by wallaby grasses (*Rytidosperma* spp.), speargrass (*Austrostipa* sp.) or kangaroo grass (*Themeda triandra*) in the Impact Area were considered potential habitat for perunga grasshopper.

3.3.4.4 Mature and Hollow-bearing Trees

An assessment of the presence of mature and hollow-bearing trees was undertaken on 15, 22 and 28 November 2022; and in October 2023, within the Proposed Alignment and Impact Area.

Mature eucalypt trees are defined as larger than 50 cm diameter breast height (DBH) (ACT Government, 2021).

Hollows were recorded from ground level in both native and exotic trees, with the following data recorded for each hollow-bearing tree:

- Tree species and condition.
- Diameter at breast height in centimetres.
- Presence and abundance of hollows in the following size classes:
 - Extra-small hollows <2.5 cm.
 - Small hollows 2.5–5 cm.
 - Medium hollows 5–10 cm.
 - Large hollows 10–30 cm.
 - Extra-large hollows >30 cm.

3.3.4.5 Woodland Birds

Areas of woodland, open forest and grasslands considered habitat for woodland birds including the diamond firetail, scarlet robin, and southern whiteface (as identified for assessment in the EIS Scoping Document) and other species as identified as having a moderate to high likelihood of occurrence in the Proposed Alignment, were mapped as part of the vegetation mapping and condition assessment (**Section 4.4.1**).

Additional habitat mapping for superb parrot and gang-gang cockatoo was undertaken in accordance with the Conservator's comments in the EIS Scoping Document (see **Section 2.0**). These are described below.

Superb Parrot

Consistent with research undertaken by the ACT Government as provided in the EIS Scoping Document (see **Section 2.0**), trees assessed to have a > 50% likelihood that they are suitable for superb parrot breeding were mapped in the Proposed Alignment in November 2022 and October 2023. These trees have the following attributes:

- tree species is scribbly gum (*Eucalyptus rossii*) or Blakely's red gum (*E. blakelyi*) and
- trunk diameter at breast height > 70 cm and
- > 9 tree hollows (with entrance size > 4 cm) are visible from the ground.

Consistent with the EIS Scoping Document, tree height was also assessed, noting that the Conservator's office stated that trees 10–15 m in height are critical to support superb parrot movement.

The areas in which the assessments were undertaken were consistent with the requirement from the Conservator's office, refined from the scoping document through further consultation. This area will be referred to hereafter as the Superb Parrot Tree Assessment Area (**Figure 3.3**).

Eucalyptus and *Acacia* species recorded during the vegetation surveys provide superb parrot foraging habitat. As the species is also known to feed on native and exotic grass seed, it is likely that superb parrot may also use the open grassland areas within these areas. For the purpose of this assessment all native vegetation within the Impact Area has been considered suitable foraging habitat for superb parrot.

Gang-Gang Cockatoo

The presence of foraging and breeding habitat for gang-gang cockatoo was mapped in the Proposed Alignment in November 2022 and October 2023. Foraging habitat includes woodlands with *Eucalyptus* and *Acacia* species. At the time, breeding habitat included hollow-bearing trees with preferred hollows with an average entrance width of 13.1 cm (range 9–24 cm) and which occur around 7.5 m (range 5–9.4 m) above the ground (Davey and Mulvaney, 2020). Data on the size of hollows (see **Section 4.4.4.4**) and height of trees were captured.

The ACT Government is undertaking extensive research into the tree characteristics that make a tree suitable for gang-gang cockatoo nesting. In April-May 2024, a researcher from the ACT Government examined the potential gang-gang cockatoo breeding trees identified by Umwelt in 2022 and 2023 against the above criteria, to confirm whether they were indeed suitable for gang-gang cockatoo nesting. As Umwelt's initial assessment used more conservative criteria, it resulted in an over-estimation of the number of potential breeding trees that would be impacted by the Proposal. This was refined following the ACT Government's surveys.

Little Eagle

Suitable little eagle breeding and feeding habitat is present in the local landscape, with known breeding activity and tracking data from the ACT Government demonstrating that it feeds within local woodland and grasslands (including derived grassland) in the local area (J. Hopkins pers. comm. 30 August 2023). The species is also regularly recorded within the Molonglo Valley and Murrumbidgee Valley.

In the ACT the species most commonly preys on rabbit, with birds (parrots and small passerines <500 g), insects (such as Christmas beetles *Anoplognathus* sp. and cicadas) and reptiles also forming part of their diet. They are also known to take carrion. The quality of vegetation is less important compared to the presence of habitat features for prey species. Based on this it is considered highly likely that the species uses the entire Proposal Area for foraging. For this reason, no targeted surveys were undertaken for the species.

3.3.4.6 Migratory Birds

An assessment of habitat for rainbow bee-eater and little eagle (as identified for assessment in the EIS Scoping Document) and for white-throated needletail (as a species with a moderate likelihood of occurrence) was undertaken.

Rainbow Bee-eater

It should be noted that rainbow bee-eater is no longer listed under the EPBC Act as a migratory species but has been considered for completeness against the EIS Scoping Document.

Rainbow bee-eater is found in a variety of habitats including open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and roadside vegetation.

Breeding habitat features for the rainbow bee-eater include sandy river banks, creeks, dams, or roadside cuttings. Due to the position of the Impact Area, none of these features will be present. No assessment of breeding habitat was considered necessary.

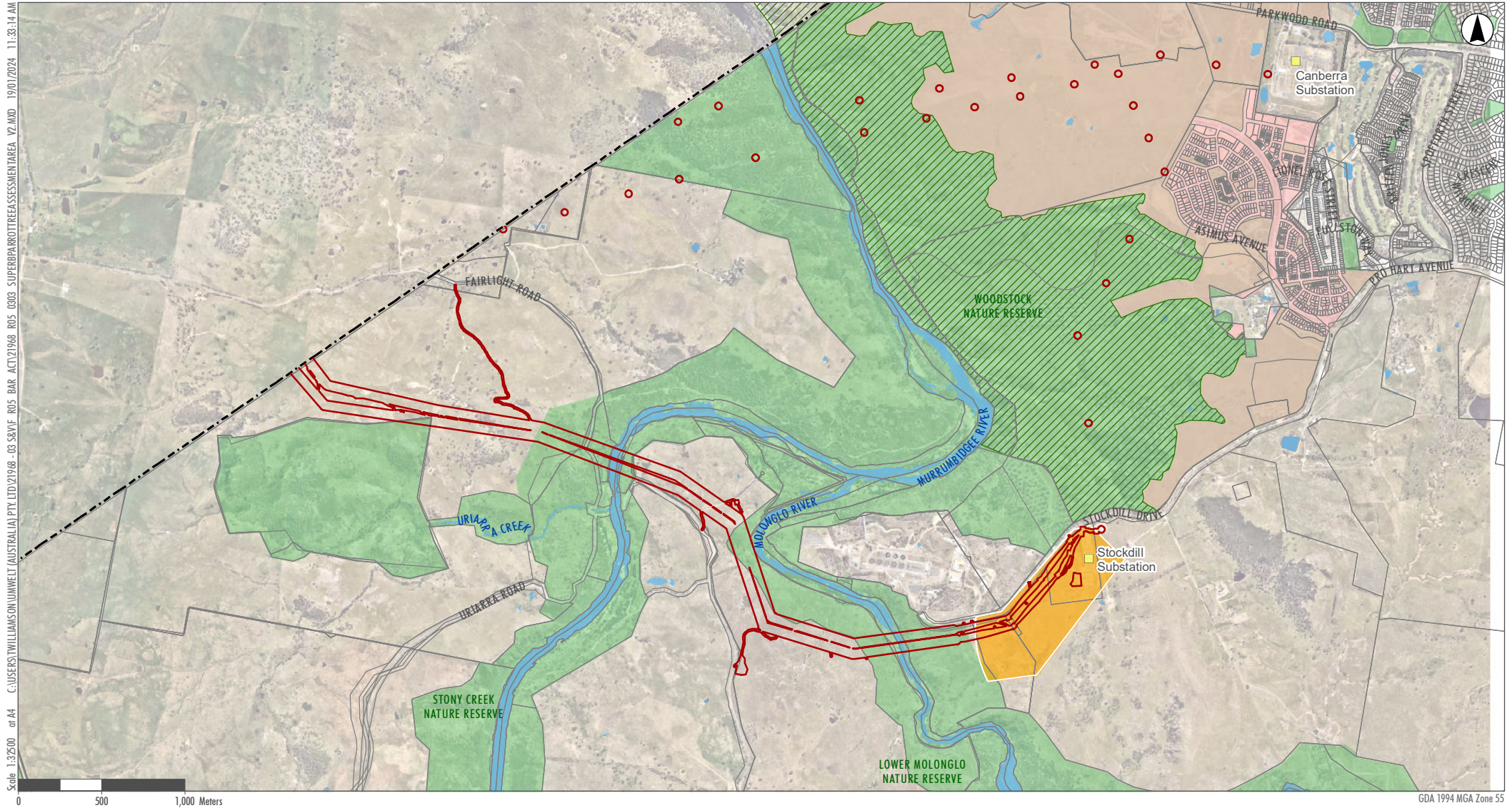
As an insectivorous species it was considered that the presence of feeding habitat is widespread in the Proposed Alignment and Impact Area and an additional assessments of feeding habitat was not required. It is understood that the species usually forages from open perches, from which it may scan for prey (e.g. flying insects). It has however, also been known to forage from the ground (DCCEEW, 2023b).

White-throated Needletail

White-throated needletail is an aerial specialist and rarely lands. In the ACT, the species occurs in flocks of between five and 50 individuals and does not exhibit discernible terrestrial habitat preferences. It commonly occurs at heights of between one to 300 m, to over 1,000 m above ground level (ACT Government, 2018b).

The species is likely to be an intermittent visitor to the aerial habitat over the Proposal Area, consistent with other parts of the landscape surrounding the ACT. It is not anticipated that the species would interact with habitat in the Proposal Area.

Due to the aerial and highly mobile nature of the species, a habitat assessment for this species would not be informative so was not warranted.



Legend

- Proposed Alignment and Impact Area
- Superb Parrot Tree Assessment Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

FIGURE 3.3
Superb Parrot Tree Assessment Area

3.3.5 Threatened Species Surveys

3.3.5.1 Pink-tailed Worm-lizard

Pink-tailed worm-lizard has been recorded near the Proposal Area, including within areas of the Ginninderry development (Capital Ecology, 2019) and along the Molonglo River corridor (ACTmapi, 2023). Presence of the species within the Proposal Area was therefore assumed, and targeted surveys were not undertaken so as to avoid invasive rock turning surveys.

3.3.5.2 Golden Sun Moth

Targeted golden sun moth surveys were conducted within the Study Area in the 2021-22 flying season. This was undertaken to confirm the presence/absence of golden sun moth in areas modelled as potential habitat by the ACT Government which were confirmed through on-ground vegetation survey by Umwelt to be potential habitat. The meandering surveys were conducted over 6 days in December 2021 in potential habitat.

Additional, targeted surveys were undertaken in potential habitat in the Impact Area over four days in November 2023 which captured new areas of the alignment resulting from redesign.

Each survey consisted of an observer walking through identified habitat counting flying golden sun moth males, collecting data using a hand-held GPS device. All surveys were undertaken in accordance with the following conditions outlines in the EPBC Act survey guidelines (DEWHA, 2009):

- locally-expecting flying season to be between early November and late December
- warm days above 20°C
- warmest part of the day between 10 am and 2 pm
- clear or mostly cloudless sky
- still or relatively still wind conditions
- at least two days since rain.

3.3.5.3 Perunga Grasshopper

Perunga grasshopper is cryptic and difficult to detect. Survey guidelines have not been developed for the species and targeted surveys are not recommended due to the difficulty in detecting the species. For the purpose of this assessment, it was assumed that the species is present in areas of potential habitat as identified in **Section 3.3.4.3**.

3.3.5.4 Superb Parrot and Gang-gang Cockatoo

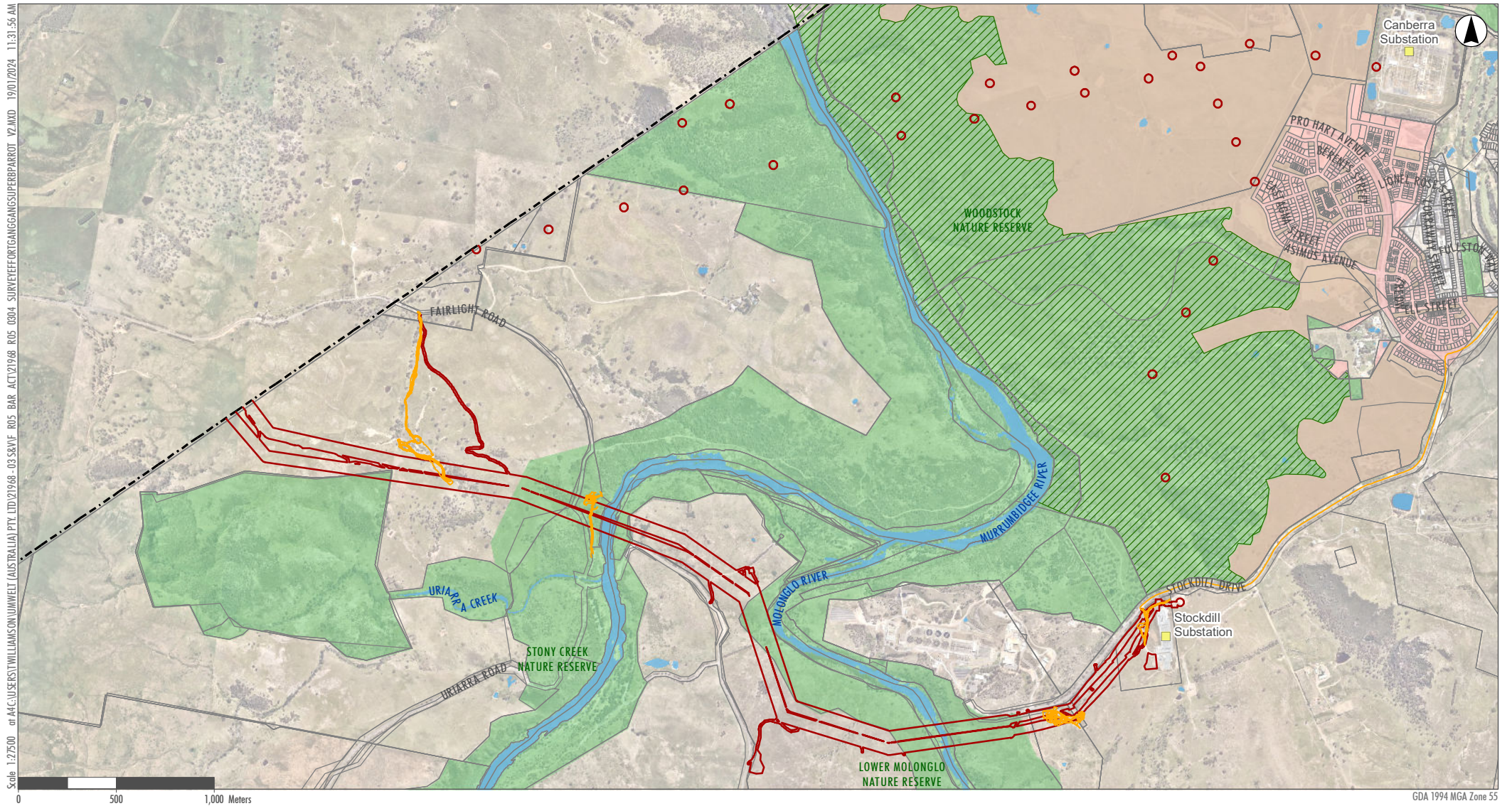
Surveys were conducted in 2022 at two locations for superb parrot and three locations for gang-gang cockatoo in the Impact Area (**Figure 3.4; Table 3.8**). Surveys were conducted across four days across three time periods (9–11 am, 12–1 pm and 4–6 pm), in accordance with the EPBC Act Survey Guidelines for Threatened Birds (DEWHA, 2010). A total of 12 hours of survey was conducted which comprised of 36 x 20 minute / 2 ha surveys.

Table 3.8 Survey Effort for Superb Parrot and Gang-gang Cockatoo Targeted Surveys

Location	Date Surveyed	Hours Completed		
		Morning (9–11am)	Noon (12–1pm)	Afternoon (4–6pm)
Superb Parrot				
East of Molonglo River	29/11/22	2	0	0
	30/11/22	1	0	1
	1/12/22	0	1	1
	2/12/23	0	1	0
East of Murrumbidgee River	29/11/22	0	0	0
	30/11/22	1	0	1
	1/12/22	0	1	1
	2/12/22	0	1	0
West of Murrumbidgee River	-	-	-	-
Gang-gang Cockatoo				
East of Molonglo River	13/12/22	1	-	0
	14/12/22	0	-	1
	15/12/22	1	-	0
	20/12/22	0	-	1
East of Murrumbidgee River	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
West of Murrumbidgee River	13/12/22	2	-	0
	14/12/22	0	-	2
	15/12/22	2	-	0
	20/12/22	0	-	2

3.3.5.5 Other Threatened Bird Species

Opportunistic sightings of other threatened species were recorded during the surveys for superb parrot and gang-gang cockatoo, as described in **Section 3.3.5.4**.



Legend

- Proposed Alignment and Impact Area
- Bird Survey Transect
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

FIGURE 3.4
Survey Effort for Superb Parrot and Gang-gang Cockatoo

3.3.5.6 Threatened Flora

Hoary Sunray and Small Purple-pea

Targeted surveys were completed on 18–19 October 2023, consisting of walked parallel field transects with approximately 10 m separation width in accordance with NSW Government (2020b). Surveys were undertaken throughout the Impact Area (**Figure 3.5**). All data were collected using a hand-held GPS device.

Austral Toadflax

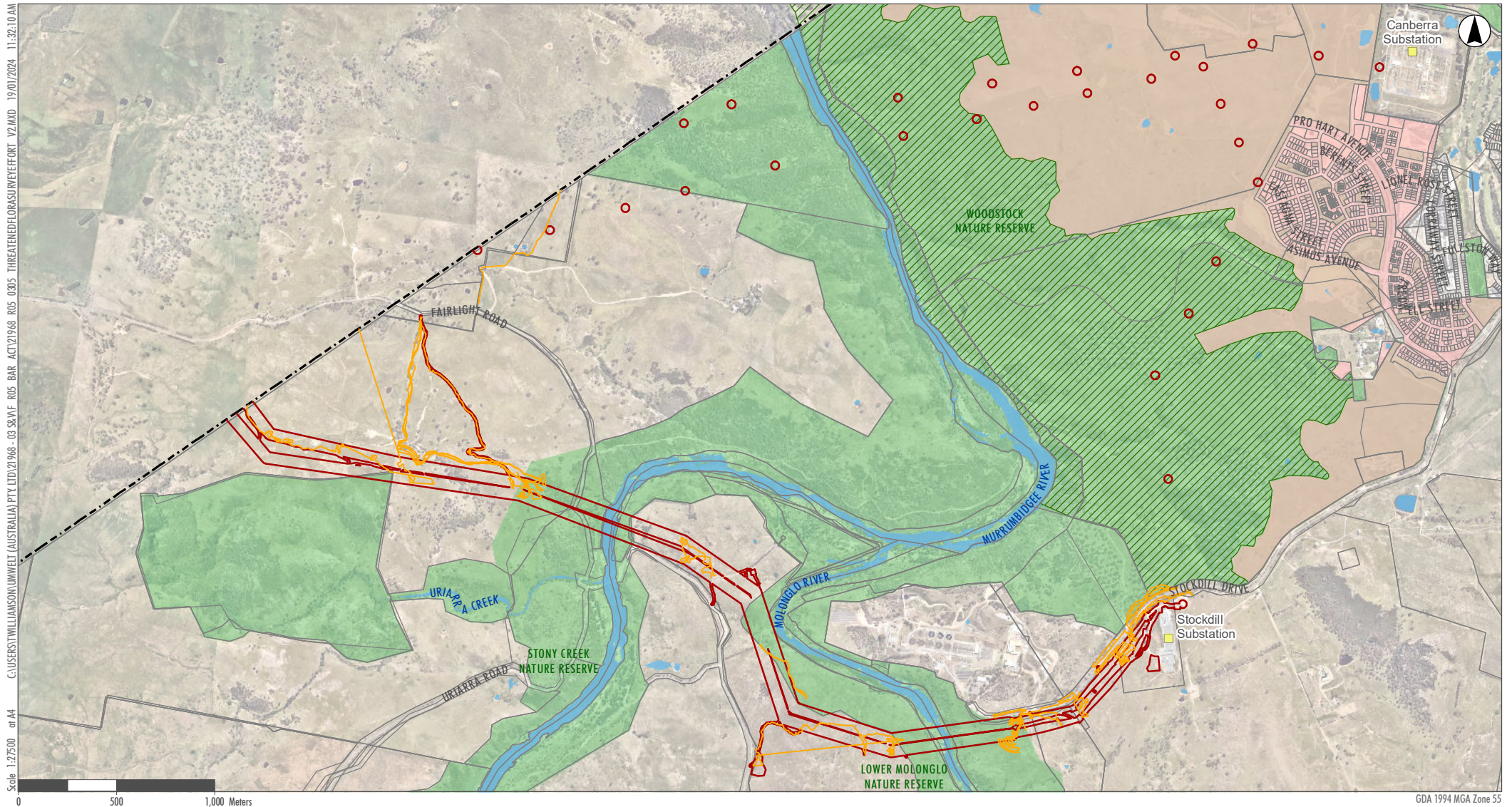
Targeted Austral toadflax surveys were completed on 13 February 2023 and 18-19 October 2023, consisting of walked parallel field transects with approximately 10 m separation width in accordance with NSW Government (2020b). Surveys were undertaken throughout the Impact Area (**Figure 3.5**). All data was collected using a hand-held GPS device.

Consistent with the EIS Scoping Document, the second round of survey in October 2023 were undertaken to improve detection rates for the species. While not the preferred survey time for this species, approval to survey in Spring was provided by the Conservator's office.

The surveys were undertaken across the Impact Area, with a focus on patches supporting a higher quality understorey (i.e. ACT01.1, ACT16.1 and ACT16.4), noting that these patches also supported a greater cover of native grasses including kangaroo grass and weeping grass.

Pale Pomaderris

As the pale pomaderris is large and highly distinctive, particularly when flowering in September to December, an informal survey was undertaken for the species, with observations recorded as part of the vegetation assessment surveys in October 2023.



Legend

- Proposed Alignment and Impact Area
- Threatened Flora Transect
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development
- Existing Substation

FIGURE 3.5
Threatened Flora Survey Effort

4.0 Results

4.1 Desktop Review

4.1.1 EPBC Act Protected Matters Search

The EPBC Act Protected Matters Search Tool (PMST) indicated that 62 threatened species, 13 migratory species, and three threatened ecological communities may occur within 10 km of the Impact Area. A summary of the PMST report is provided in **Table 4.1**, with the full report at **Appendix A**.

Table 4.1 Results of EPBC Act Protected Matters Search Tool

MNES	Class	No. of Listed Ecological Communities or Species
Listed Threatened Ecological Communities	-	3
Listed Threatened Species	Bird	18
	Fish	4
	Frog	5
	Insect	2
	Mammal	8
	Plant	21
	Reptile	3
Listed Migratory Species	Bird	13

4.1.2 ACT Significant Matters

ACTmapi (2023) identified two threatened ecological communities and twelve threatened species that have been recorded within or in close proximity to the Proposal Area (**Figure 4.1**). The threatened ecological communities included threatened woodlands and grasslands. Three threatened grassland species (pink-tailed worm-lizard, Perunga grasshopper and golden sun moth), and four threatened flora species (Murrumbidgee bossiaea (*Bossiaea grayi*), pale pomaderris, hoary sunray and button wrinklewort (*Rutidosia leptorrhynchoides*)) were also identified as potentially occurring in the Proposal Area.

ACTmapi returned no results for ACT registered trees located in the Proposal Area.

Ten threatened woodland birds that are listed under the NC Act and known to occur in the area were not identified via the search on ACTmapi, however were identified on eBird, Birdlife Australia, Atlas of Living Australia (AoLA) and/or Canberra Nature Map (CNM) search tools.

A summary of the database searches is included in the likelihood of occurrence assessments in **Section 4.2**.

4.2 Likelihood of Occurrence

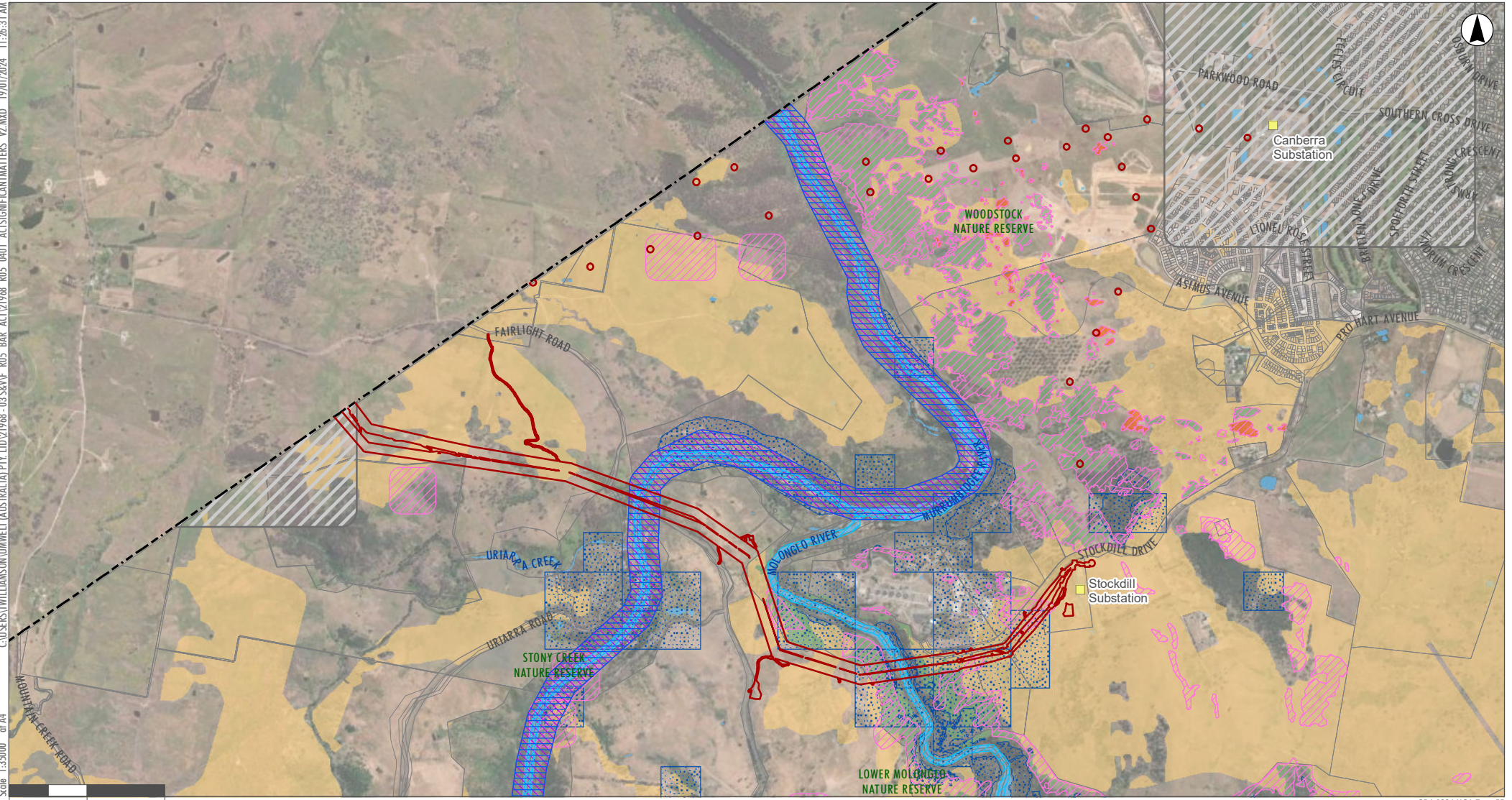
Threatened ecological communities and species listed under the EPBC Act and/or NC Act with a moderate or high likelihood of occurring in the Proposal Area are summarised in **Table 4.2** (refer to **Appendix B** for the full assessment). This included two threatened ecological community and 16 species.

Table 4.2 Threatened Species Likelihood of Occurrence Summary

Scientific Name	Common Name	EPBC Act	NC Act	Database	Likelihood of Occurrence
Threatened Ecological Communities					
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Box gum woodland	Critically endangered	Critically endangered	PMST; ACTmapi	High – Due to the position of the Proposal Area relative to the current known distribution and assumed or known historic (pre-1750s) distribution of box-gum woodland, the Proposal Area is highly likely to support this ecological community.
Natural Temperate Grassland of the South Eastern Highlands	Natural temperate grassland	Critically endangered	Critically endangered	PMST; ACTmapi	High – Due to the position of the Proposal Area relative to the current known distribution and assumed or known historic (pre-1750s) distribution of natural temperate grasslands, the Proposal Area is highly likely to support this ecological community.
Birds					
<i>Aphelocephala leucopsis</i>	Southern whiteface	Vulnerable	Not listed	PMST; BioNet; AoLA; BirdLife Australia	High / Known – Potential habitat for this species exists within the Proposal Area. Species has been recorded within the Proposal Area.
<i>Callocephalon fimbriatum</i>	Gang-gang cockatoo	Endangered	Vulnerable	PMST; AoLA; BioNet	Moderate – Potential habitat for this species is likely to exist within the Proposal Area. Species has been recorded within close proximity to the Proposal Area, approximately 400 metres.
<i>Daphoenositta chrysoptera</i>	Varied sittella	Not listed	Vulnerable	AoLA; BioNet; ACTmapi	Moderate – This species occurs in dry forest and woodland, which is supported in the local landscape.
<i>Grantiella picta</i>	Painted honeyeater	Vulnerable	Vulnerable	PMST; CNM; AoLA	Moderate – Potential habitat for this species may be present within the Proposal Area. The species has been recorded within close proximity to the Proposal Area, approximately 500 metres.
<i>Hieraaetus morphnoides</i>	Little eagle	Not listed	Vulnerable	AoLA; BioNet, ACT Government	High / Known – This species has been recorded within the Proposal Area.
<i>Hirundapus caudacutus</i>	White-throated needle-tail	Vulnerable; migratory (JAMBA, CAMBA, ROKAMBA)	Vulnerable	PMST; CNM; AoLA	Moderate – This species is a non-breeding visitor to the ACT during the summer. It may use the airspace above the Proposal Area. The species has been recorded within the general vicinity to the Proposal Area.

Scientific Name	Common Name	EPBC Act	NC Act	Database	Likelihood of Occurrence
<i>Lalage tricolor</i>	White-winged triller	Not listed	Vulnerable	CNM	High / Known – this species has been recorded within the Proposal Area. Potential habitat for this species is likely to be present within the Proposal Area.
<i>Melanodryas cucullate</i>	Hooded robin	Endangered	Vulnerable	CNM; AoLA; BioNet	Moderate – Potential habitat for this species is likely to be present within the Proposal Area.
<i>Petroica Boodang</i>	Scarlet robin	Not listed	Vulnerable	CNM; AoLA; BioNet	High / Known – this species has been recorded within the Proposal Area. Potential habitat for this species is likely to be present within the Proposal Area.
<i>Polytelis swainsonii</i>	Superb parrot	Vulnerable	Vulnerable	PMST; AoLA; BioNet	High – This species is likely to regularly disperse through the site and may occasionally forage in the Proposal Area. Potential habitat for this species exists within the area. The species has been recorded in the general vicinity of the Proposal Area.
<i>Stagonopleura guttata</i>	Diamond firetail	Vulnerable	Not listed	AoLA; BioNet	High / Known – this species has been recorded within the Proposal Area. Potential habitat for this species is likely to be present within the Proposal Area.
Invertebrates					
<i>Synemon plana</i>	golden sun moth	Vulnerable	Vulnerable	PMST; CNM; AoLA; BioNet	Moderate – potential species habitat has been recorded within the Proposal Area and while surveys undertaken by Umwelt in 2021 failed to detect the species, the surveys were undertaken in a poor season and therefore presence could not be ruled out.
Reptiles					
<i>Aprasia parapulchella</i>	pink-tailed worm-lizard	Vulnerable	Vulnerable	PMST; AoLA; ACTmapi; BioNet	Known/High – this species has been recorded within adjacent to the Proposal Area. Mapped habitat for this species is present in the Proposal Area.
Flora					
<i>Leucochrysum albicans</i>	hoary sunray	Endangered	Not listed	PMST; CNM; AoLA	Moderate – suitable habitat of box-gum woodland is likely to be present within the Proposal Area.
<i>Pomaderris pallida</i>	pale pomaderris	Vulnerable	Vulnerable	PMST; CNM; AoLA; ACTmapi, BioNet	Moderate – suitable habitat of box-gum woodland is likely to be present within the Proposal Area.

Scientific Name	Common Name	EPBC Act	NC Act	Database	Likelihood of Occurrence
<i>Swainsona recta</i>	small purple-pea	Endangered	Endangered	PMST; AoLA	Moderate – suitable habitat of box-gum woodland is likely to be present within the Proposal Area.
<i>Thesium austral</i>	Austral toadflax	Vulnerable	Vulnerable	PMST	Moderate – suitable habitat of box-gum woodland is likely to be present within the Proposal Area. Suitable rocky habitat is present within the Proposal Area



Legend

- | | | | | |
|--|--|--|--|---|
| <ul style="list-style-type: none"> Proposed Alignment and Impact Area ACT/NSW Border Property Boundaries Watercourses Existing Substation | ACT Significant Species
Aquatic and Fish <ul style="list-style-type: none"> Murray Cod (<i>Maccullochella peelii peelti</i>) Macquarie Perch (<i>Macquaria australasica</i>) Trout Cod (<i>Maccullochella macquariensis</i>) | Mammals <ul style="list-style-type: none"> Spotted-tailed Quoll (<i>Dasyurus maculatus</i>) Reptiles <ul style="list-style-type: none"> Pink-tailed Worm-lizard (<i>Aprasia parapulchella</i>) | Threatened Plants <ul style="list-style-type: none"> Hoary Sunray (<i>Leucochrysum albicans</i>) Pale Pomaderris (<i>Pomaderris pallida</i>) Rare and Other Important Plants <ul style="list-style-type: none"> Rare Plants | ACT Significant Species <ul style="list-style-type: none"> Natural temperate grassland_NTG Exotic grassland_EXG Potential Threatened Woodland |
|--|--|--|--|---|

FIGURE 4.1
ACT Significant Matters Results

4.3 Habitat Connectivity

The ACTmapi 'Significant species, Vegetation Communities and Registered Trees' layer (ACT Government, 2023; Barrett and Love, 2012) includes layers that show habitat connectivity modelling values for generalist, woodland, and forest bird species throughout the ACT, as well as connectivity values in local and regional contexts.

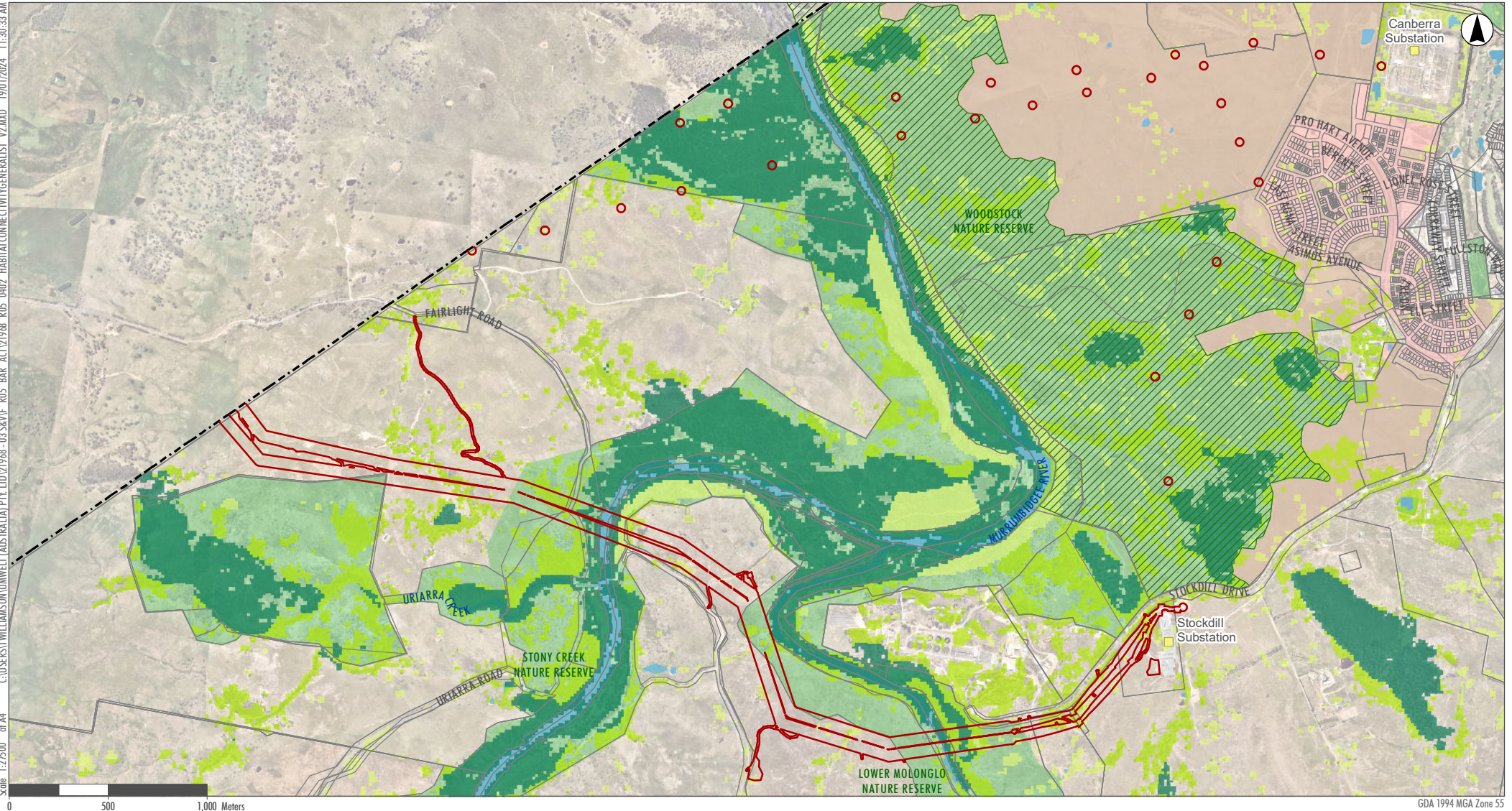
A habitat connectivity assessment was undertaken in the context of the Proposed Alignment.

For generalist and forest bird species the Proposed Alignment has low - moderate connectivity value, particularly in the east (**Figure 4.2; Figure 4.3**). While the Proposed Alignment includes an area of high connectivity value over the Murrumbidgee River where the new and existing transmission lines span the river, the Proposal would not directly impact vegetation within this area.

Habitat modelling for woodland bird species indicates that the Proposed Alignment supports patches that are of high connectivity value, particularly to the east (**Figure 4.4**). As above, while the Proposed Alignment includes an area of high connectivity value over the Murrumbidgee River, the Proposal would not directly impact vegetation within this area.

The Proposed Alignment is also adjacent to the Molonglo River corridor, Uriarra Creek corridor, and Swamp Creek corridor, which have high connectivity value. Southwest of the Proposal Area there is a large high-quality patch located in Swamp Creek Nature Reserve. These areas of high-quality habitat connectivity are likely to provide important breeding and foraging habitat, as well as connectivity values for all bird species, including those identified as having a moderate to high likelihood of occurring in the Proposal Area (see **Table 4.2**). These areas would not be impacted by the Proposal.

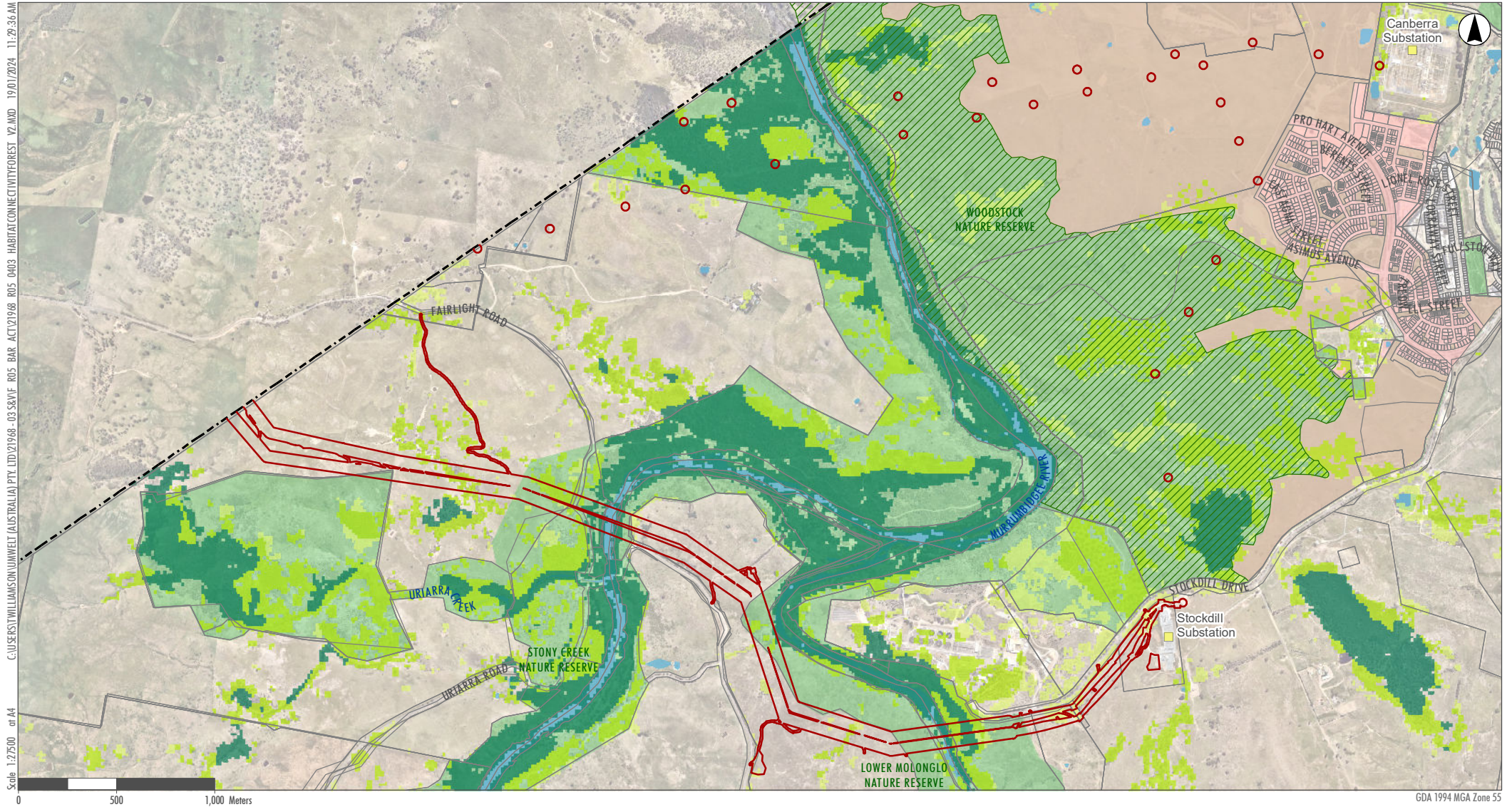
Additionally, the Proposal Area is located approximately 3 km from Brindabella National Park, which provides a high level of habitat connectivity for forest and generalist bird species and a moderate level for woodland bird species. Brindabella National Park would not be impacted by the Proposal.



Legend

- | | | |
|--|---|---|
| Proposed Alignment and Impact Area | ACT/NSW Border | Existing Substation |
| Habitat (Colonisation Potential) Generalist Model | Property Boundaries | Watercourses |
| Low | Nature Reserves | Ginninderry Conservation Corridor |
| Moderate | Ginninderry / Parkwood Development | |
| High | | |

FIGURE 4.2
Habitat Connectivity Values – Generalist Bird Species (ACTmapI 2023)

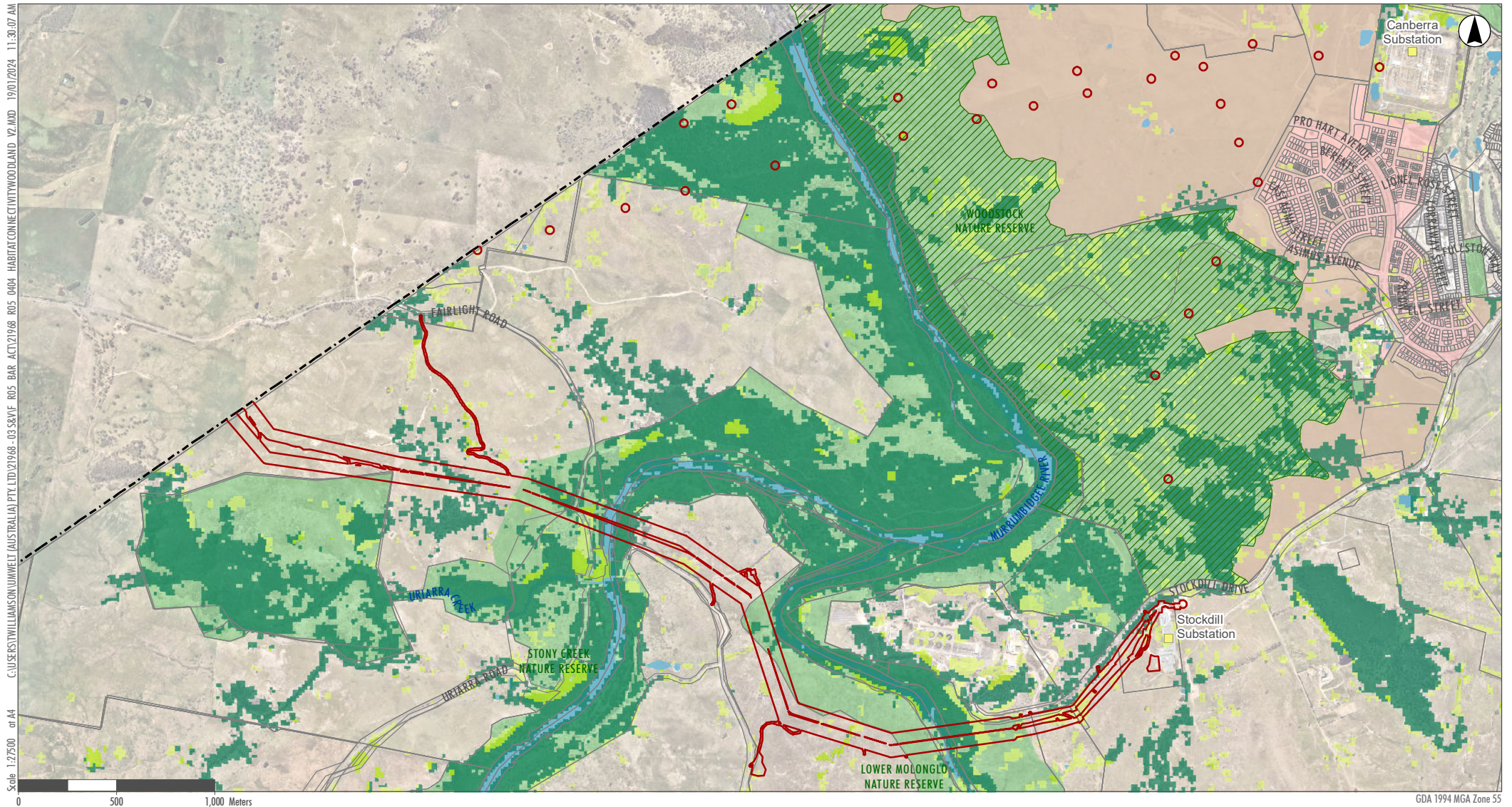


Legend

- | | | |
|---|---|--|
| Proposed Alignment and Impact Area | ACT/NSW Border | Existing Substation |
| Low | Property Boundaries | |
| Moderate | Watercourses | |
| High | Nature Reserves | |
| | Ginninderry Conservation Corridor | |
| | Ginninderry / Parkwood Development | |

Image Source: Nearmap (2023) Data source: ACT Government (2023)

FIGURE 4.3
Habitat Connectivity Values – Forest Bird Species (ACTmapi 2023)



Legend

- Proposed Alignment and Impact Area
- ACT/NSW Border
- Property Boundaries
- Existing Substation
- Habitat (Colonisation Potential) Woodland Model
- Watercourses
- Nature Reserves
- Low
- Moderate
- High
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

Image Source: Nearmap (2023) Data source: ACT Government (2023)

FIGURE 4.4
Habitat Connectivity Values – Woodland Bird
Species (ACTmap 2023)

4.4 Description of the Environment

4.4.1 Vegetation Mapping and Condition Assessment

Vegetation in the Impact Area comprises box-gum woodland, derived native grassland and dry forest. Three PCTs comprising ten zones were mapped in the Impact Area (**Figure 4.5**). The PCTs and zones consisted of:

- ACT16.1 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland – moderate to high quality
- ACT16.4 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland derived native grassland – moderate to high quality
- ACT16.5 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland derived native grassland – low quality
- ACT16.6 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland derived native grassland – low quality
- ACT16.7 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland derived native grassland – low quality
- ACT01.1 Dry Tussock Grassland – high quality
- ACT01.3 Dry Tussock Grassland – low quality
- ACT01.4 Dry Tussock Grassland – exotic
- ACT25.4 *Eucalyptus macrorhyncha* Tableland Grass/Shrub Forest derived native grassland – moderate to high quality
- ACT25.5 *Eucalyptus macrorhyncha* Tableland Grass/Shrub Forest derived native grassland – low quality.

Exotic vegetation and native planted vegetation and infrastructure (gravel and asphalt roads) were also present.

Table 4.3 Extent of Vegetation Zones in the Impact Area

Plant Community Type and Vegetation Zone	Description	Extent in Impact Area (ha)
ACT16.1	Native groundstorey dominated, mature canopy present, regeneration present, mod-high native forb diversity.	0.08
ACT16.4	Native groundstorey dominated, mature canopy absent, regeneration absent, mod-high native forb diversity.	0.02
ACT16.5	Native groundstorey dominated, mature canopy absent, regeneration absent, low native forb diversity.	2.27
ACT16.6	Exotic groundstorey dominated, mature canopy present, regeneration present, low native forb diversity.	<0.01
ACT16.7	Exotic groundstorey dominated, mature canopy present, regeneration absent, low native forb diversity.	0.28

Plant Community Type and Vegetation Zone	Description	Extent in Impact Area (ha)
ACT01.1	Native groundstorey dominated, high native forb diversity.	<0.01
ACT01.3	Native groundstorey dominated, low native forb diversity.	0.03
ACT01.4	Exotic groundstorey dominated.	0.17
ACT25.4	Native groundstorey dominated, mature canopy absent, regeneration absent, mod-high native forb diversity.	0.47
ACT25.5	Native groundstorey dominated, mature canopy absent, regeneration absent, low native forb diversity.	1.59
Exotic	Exotic vegetation.	3.97
Planted	Planted native vegetation.	0.24
Infrastructure	Gravel and asphalt roads.	0.22
Not mapped	Areas that have not been mapped – refers to poles with footings that are not being removed.	1.51
Total		10.84

4.4.1.1 ACT16.1 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland – High Quality

A total of 0.08 ha across four patches of ACT16.1 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland (hereafter ACT16.1) was recorded in the Impact Area (**Table 4.3; Figure 4.5**).

While the extent of ACT16.1 in the Impact Area is small, the patches are part of much larger patches that extend within and outside the Proposed Alignment.

The patches included two tree species, Blakely's red gum and yellow box. Twelve forb species were recorded, rough raspwort (*Haloragis heterophylla*), stinking pennywort (*Hydrocotyle laxiflora*), native geranium (*Geranium solanderi*), variable willowherb (*Epilobium billardierianum*), small St. John's wort (*Hypericum gramineum*), swamp dock (*Rumex brownii*), common raspwort (*Gonocarpus tetragynus*), yellow autumn-lily (*Tricoryne elatior*), hyssop loosestrife (*Lythrum hyssopifolia*), sheep's burr (*Acaena echinate*), scaly buttons (*Leptorhynchus squamatus*), slender tick-trefoil (*Desmodium varians*). Eight native grass species were also recorded, weeping grass, followed by plume grass (*Dichelachne* sp.), common wheatgrass (*Anthosachne scabra*), kangaroo grass, wallaby grasses (*Rytidosperma* spp.), blownglass (*Lachnagrostis filiformis*) and snowgrass (*Poa sieberiana*).

4.4.1.2 ACT16.4 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland – Derived Grassland – High Quality

A total of 0.02 ha across two patches of ACT16.4 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland (hereafter ACT16.4) was recorded in the Impact Area (**Table 4.3; Figure 4.5**).

While the extent of ACT16.4 in the Impact Area is small, the patches are part of much larger patches that extend within and outside the Proposed Alignment.

The patches included one tree species, Blakely's red gum. Fourteen forb species were recorded, common sunray (*Triptilodiscus pygmaeus*), yellow autumn-lily, star cudweed (*Euchiton sphaericus*), common raspwort, *Wahlenbergia* sp., fuzzweed (*Vittadinia cuneata*), narrow-leaf new holland daisy (*Vittadinia muelleri*), native carrot (*Daucus glochidiatus*), common everlasting (*Chrysocephalum apiculatum*), bears-ear (*Cymbonotus lawsonianus*), sheep's burr, Australian crassula (*Crassula sieberiana*), clustered everlasting (*Chrysocephalum semipapposum*) and slender tick-trefoil.

Fifteen native grass species were also recorded, predominantly brown's lovegrass (*Eragrostis brownii*) followed by, red-leg grass (*Bothriochloa macra*), slender speargrass (*Austrostipa scabra*), a wallaby grass (*Rytidosperma* sp.), short wallaby grass (*Rytidosperma carphoides*), brown-black wallaby grass (*Rytidosperma duttonianum*), lobed wallaby grass (*Rytidosperma auriculatum*), blownglass, common wheatgrass, purple wiregrass (*Aristida ramosa*), weeping grass, kangaroo grass, kneed speargrass (*Austrostipa bigeniculata*), hairy panic (*Panicum effusum*) and nine-awned grass (*Enneapogon nigricans*).

4.4.1.3 ACT16.5 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland

A total of 2.27 ha across five patches of ACT16.5 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland (hereafter ACT16.5) was recorded in the Impact Area (**Table 4.3; Figure 4.3**).

While the extent of ACT16.5 in the Impact Area is small, the patches are part of much larger patches that extend within and outside the Proposed Alignment.

The patches included fifteen forb species, rough raspwort, creeping cudweed, small St. John's wort, pale sundew (*Drosera peltate*), *Wahlenbergia* sp., native geranium, swamp dock, a wood sorrel (*Oxalis* spp.), Tadgell's bluebell (*Wahlenbergia multicaulis*), hyssop loosestrife, common sunray, golden weather-grass (*Hypoxis hygrometrica*), star cudweed, jersey cudweed (*Pseudognaphalium luteoalbum*) and Australian bindweed (*Convolvulus angustissimus*).

Ten native grass species were recorded including, weeping grass, common wheatgrass, brown's lovegrass, red-leg grass, kangaroo grass, common swamp wallaby grass (*Amphibromus nervosus*), a wallaby grass (*Rytidosperma* sp.), short wallaby grass, lobed wallaby grass, and plume grass.

Fescue (*Vulpia* spp.) was recorded at a high percentage coverage for ACT16.5.

4.4.1.4 ACT16.6 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland

One patch of less than 0.01 hectares of ACT16.6 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland (hereafter ACT16.6) was recorded in the Impact Area (**Table 4.3; Figure 4.5**).

Blakely's red gum was present with seven trees recorded.

The dominant understorey species was white horehound (*Marrubium vulgare*). African lovegrass (*Eragrostis curvula*), St John's wort, Patterson's curse (*Echium plantagineum*) were recorded, which are all Class 3 species declared under the ACT *Pest Plants and Animals Act 2005* (PPA Act) (see **Section 4.4.6**).

Three native forb species were recorded, native oxalis (*Oxalis perennans*), *Wahlenbergia* spp. and native geranium and one native grass, common wheatgrass.

4.4.1.5 ACT16.7 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland

A total of 0.28 ha across four patches of ACT16.7 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland (hereafter ACT16.7) was recorded in the Impact Area (Table 4.3; Figure 4.5).

The patches included seven forb species, hyssop loosestrife, star cudweed, *Wahlenbergia* sp., a wood sorrel, swamp dock, Australian crassula and small St. John's wort (*Hypericum gramineum*).

Four native grass species were recorded predominantly weeping grass, wallaby grasses, common wheatgrass, and brown's lovegrass.

Exotic species recorded included African lovegrass (Class 3), St. John's wort (*Hypericum perforatum*) (Class 3), Patterson's curse (Class 3), blackberry (*Rubus fruticosus* sp. agg.) (Class 3), viper's bugloss (*Echium vulgare*) (Class 3).

4.4.1.6 ACT01.1 Tablelands Dry Tussock Grassland

Less than 0.01 ha in one patch of ACT01.1 Tablelands Dry Tussock Grassland (hereafter ACT01.1) was recorded in the Impact Area (Table 4.3; Figure 4.5).

While the extent of ACT01.1 in the Impact Area is small, the patch is part of a larger area of the PCT that extends within and outside the Proposed Alignment.

The patch included thirteen native grass species were recorded predominantly kangaroo grass (*Themeda triandra*), followed by common wheatgrass, snowgrass, plume grass, slender speargrass, weeping grass, wild sorghum (*Sorghum leiocladum*), red-leg grass (*Bothriochloa macra*), forest hedgehog grass (*Echinopogon ovatus*), a wallaby grasses (*Rytidosperma* sp.), short wallaby grass, kneed speargrass, and hairy panic.

Seventeen forb species were recorded, common sunray, glycine pea (*Glycine tabacina*), native oxalis (*Oxalis perennans*), stinking pennywort, common raspwort, dwarf skullcap (*Scutellaria humilis*), tufted bluebell (*Wahlenbergia communis*), Australian bindweed, native geranium, yellow-autumn lily, slender tick-trefoil (*Desmodium varians*), *Wahlenbergia* spp., *Epilobium* spp., slender onion orchid (*Microtis parviflora*), sheep's burr, native carrot, and swamp dock.

Exotic species recorded included African lovegrass (Class 3), St. John's wort (Class 3), Patterson's curse (Class 3), viper's bugloss (Class 3), sweet briar (*Rosa rubiginosa*) (Class 2).

4.4.1.7 ACT01.3 Tablelands Dry Tussock Grassland

A total of 0.03 ha across two patches of ACT01.3 Tablelands Dry Tussock Grassland (hereafter ACT01.3) was recorded in the Impact Area (Table 4.3; Figure 4.5).

The patches included two native grass species, kangaroo grass (*Themeda triandra*) and common wheatgrass. Four forb species were recorded, native oxalis (*Oxalis perennans*), twining glycine (*Glycine clandestine*), and Australian bindweed.

Exotic species recorded include wild oats (*Avena* spp.) (the dominant species in ACT01.3), with St John's wort (*Hypericum perforatum*) (Class 3) and *Vulpia* spp. also recorded at higher percentage coverages.

4.4.1.8 ACT01.4 Tablelands Dry Tussock Grassland

A total of 0.17 ha across four patches of ACT01.4 Tablelands Dry Tussock Grassland (hereafter ACT01.4) was recorded in the Impact Area (Table 4.3; Figure 4.5).

The patches included five native grass species, kneed speargrass, weeping grass, slender speargrass, red-leg grass, and a wallaby grass (*Rytidosperma* sp.). One forb was recorded, swamp dock.

Wild oats were recorded at a high percentage coverage for ACT01.4. Other exotic species recorded include African lovegrass (Class 3), St John's wort (Class 3) and blackberry (Class 3).

4.4.1.9 ACT25.4 *Eucalyptus macrorhyncha* Tableland Grass/Shrub Forest

A total of 0.47 ha across four patches of ACT25.4 *Eucalyptus macrorhyncha* Tableland Grass/Shrub Forest (hereafter ACT25.4) was recorded in the Impact Area (Table 4.3; Figure 4.5).

The patches included twelve native grass species, red-leg grass, slender speargrass, copper-awned wallaby grass (*Rytidosperma fulvum*), short wallaby grass, common wheatgrass, brown's lovegrass, hairy panic, blowgrass, plume grass (*Dichelachne* sp.), a wallaby grasses (*Rytidosperma* sp.), windmill grass (*Chloris truncata*) and nine-awned grass. Ten forb species were recorded, creeping cudweed (*Euchiton japonicus*), small St. John's wort, star cudweed, common sunray, a bluebell (*Wahlenbergia* sp.), native carrot, yellow century (*Sebaea ovata*), Australian crassula, narrow-leaf new holland and caustic weed (*Euphorbia drummondii*).

St. John's wort (Class 3) was the only listed exotic species recorded.

4.4.1.10 ACT25.5 *Eucalyptus macrorhyncha* Tableland Grass/Shrub Forest

A total of 1.59 ha across five patches of ACT25.5 *Eucalyptus macrorhyncha* Tableland Grass/Shrub Forest (hereafter ACT25.5) was recorded in the Impact Area (Table 4.3; Figure 4.5).

The patches included one tree species (red stringybark) and one native grass species, brown's lovegrass. Seven forb species were recorded, swamp isotome (*Isotoma fluviatilis subsp. australis*), native oxalis (*Oxalis perennans*), Tadgell's bluebell, common sunray, swamp dock, native geranium, and star cudweed.

Exotic species recorded include Fescue (which was the dominant understorey species) and *Bromus* sp..



GDA 1994 MGA Zone 55

Legend

- | | | |
|---------------------|---|---|
| Impact Area | Vegetation Communities Within Impact Area | |
| ACT/NSW Border | ACT16.1 Eucalyptus melliodora – E. blakelyi Grassy Woodland - moderate-high | ACT16.5 Eucalyptus melliodora – E. blakelyi Grassy Woodland_DNG - low |
| Property Boundaries | ACT16.4 Eucalyptus melliodora – E. blakelyi Grassy Woodland_DNG - moderate-high | ACT16.6 Eucalyptus melliodora – E. blakelyi Grassy Woodland - planted |
| Watercourses | ACT25.4 Eucalyptus macrohyncha Grass / Shrub Forest - DNG- moderate-high | ACT25.5 Eucalyptus macrohyncha Grass / Shrub Forest - DNG- low |
| Nature Reserves | | |

FIGURE 4.5A

Extent of Vegetation Communities
within the Impact Area



Legend

- | | | | |
|--|---|---|---|
| <ul style="list-style-type: none"> Impact Area ACT/NSW Border Property Boundaries Watercourses Nature Reserves Ginninderry Conservation Corridor | <ul style="list-style-type: none"> Ginninderry / Parkwood Development Existing Substation | Vegetation Communities Within Impact Area <ul style="list-style-type: none"> ACT01.1 Tablelands Dry Tussock Grassland - High ACT01.3 Tablelands Dry Tussock Grassland - Low ACT01.4 Tablelands Dry Tussock Grassland - Exotic | <ul style="list-style-type: none"> ACT16.1 Eucalyptus melliodora — E. blakelyi Grassy Woodland - moderate-high ACT16.4 Eucalyptus melliodora — E. blakelyi Grassy Woodland_DNG - moderate-high ACT16.5 Eucalyptus melliodora — E. blakelyi Grassy Woodland_DNG - low ACT16.6 Eucalyptus melliodora — E. blakelyi Grassy Woodland - planted ACT16.7 Eucalyptus melliodora — E. blakelyi Grassy Woodland - low |
|--|---|---|---|

FIGURE 4.5B
Extent of Vegetation Communities within the Impact Area

4.4.2 Threatened Ecological Communities

4.4.2.1 EPBC Act Listed White Box – Yellow Box – Blakely’s Red Gum Grassy Woodlands and Derived Native Grasslands Critically Endangered Ecological Community

Vegetation zones ACT16.1, ACT16.4 and ACT16.5 covering a total of 2.37 ha across 11 areas in the Impact Area meet the classification criteria for the EPBC Act listed *White Box – Yellow Box – Blakely’s Red Gum Grassy Woodlands and Derived Native Grasslands* critically endangered ecological community (Table 4.5; Figure 4.6). The majority (2.29 ha) is in the derived state, with 0.1 ha supporting high quality understorey with multiple important species. All zones were assessed as Class B due to the sparse cover (or absence) of canopy species (Table 4.6).

Noting that the Impact Area sits within a landscape that supports larger patches of EPBC Act BGW (as previously assessed by Umwelt), the assessment considered the total patch size to be greater than 2 ha as part of this assessment process.

Table 4.4 Summary of the Size (ha) of Individual Areas of Vegetation Zones that meet EPBC Act Listed BGW Classification Criteria

ACT16.1 – High Quality BGW	ACT16.4 – Derived Native Grassland; High Quality Native Understorey	ACT16.5 – Derived Native Grassland; Low Quality Native Understorey	Total
0.03	0.01	0.02	0.06
0.01	0.01	0.68	0.70
0.01	-	0.66	0.67
0.03	-	0.02	0.05
-	-	0.89	0.89
0.08	0.02	2.27	2.37

4.4.2.2 NC Act Listed Yellow Box – Blakely’s Red Gum Grassy Woodland Critically Endangered Ecological Community

No specific diagnostic criteria for the NC Act listed *Yellow Box- Blakely’s Red Gum Grassy Woodland* critically endangered ecological community are defined and the criteria for the EPBC Act BGW were applied. Within the Impact Area, vegetation zones ACT16.1, ACT16.4 and ACT16.5 (total 2.37 ha) were assessed as NC Act BGW (Figure 4.6).

4.4.2.3 EPBC Act Listed Natural Temperate Grassland of the South Eastern Highlands

Vegetation zone ACT01.1 in the Impact Area (less than 0.01 ha) met the EPBC Act listed *Natural Temperate Grassland of the South Eastern Highlands* critically endangered ecological community classification criteria (Table 4.7; Figure 4.6). This patch is recognised to meet the high to very high condition threshold (patches with good native coverage and high native plant diversity) given that it had at least 12 non-grass native species and over 50% groundcover foliage of kangaroo grass.

TSSC (2016) also considers areas that are critical to the survival of the ecological community to be all patches that meet the key diagnostic characteristics and condition thresholds for the ecological community plus buffer zones.

A buffer zone is defined as a “...contiguous area immediately adjacent to a patch of the ecological community that is important for protecting its integrity. The purpose of the buffer zone is to help protect and manage the national ecological community. The recommended minimum buffer zone for the ecological community is 30 metres from the edge of a patch...[however]... a larger buffer zone may be applied, where practical, to protect patches that are of particularly high conservation value, or if patches are down slope of drainage lines or a source of nutrient enrichment...”

Recognising the high quality of the patch of EPBC Act NTG within the Impact Area and the position of the patch downslope of exotic grassland, it has been determined that the width of the buffer zone should equal the distance from the EPBC Act NTG (ACT01.1) to the far edge of the adjacent grassland area (ACT01.4) (**Figure 4.6**). The total area of EPBC Act NTG to be impacted by the Proposal, including the buffer is therefore 0.55 ha.

4.4.2.4 NC Act Listed Natural Temperate Grassland

No specific diagnostic criteria for the NC Act listed *Natural Temperate Grassland* critically endangered ecological community are defined and criteria for the EPBC Act NTG were applied. Within the Impact Area, vegetation zone ACT01.1 was assessed as NC Act NTG with 0.01 ha present and 0.55 ha to be impacted with the addition of the buffer zone (**Figure 4.6**).

Table 4.5 EPBC Act BGW Key Diagnostic Characteristics Assessment (TSSC, 2023)

Key Diagnostic Characteristics	ACT16.1	ACT16.4	ACT16.5	ACT16.6	ACT16.7
The ecological community occurs in the following bioregions (IBRA, DoE 2012): Brigalow Belt South, Murray Darling Depression, Nandewar, New England Tableland, NSW North Coast, NSW South Western Slopes, Riverina, South Eastern Queensland, South East Corner, South East Coastal Plain, South Eastern Highlands, Southern Volcanic Plain, Sydney Basin and Victorian Midlands (DoHA 2006; NSW Government 2011;DCCEEW 2022).	YES South Eastern Highlands	YES South Eastern Highlands	YES South Eastern Highlands	YES South Eastern Highlands	YES South Eastern Highlands
- It has, or previously had, an overstorey dominated or co-dominated by: <i>Eucalyptus albens</i> (white box) and/or <i>E. melliodora</i> (yellow box) and/or <i>E. blakelyi</i> (Blakely's red gum) (applicable across the entire range of the ecological community); or, - in the Nandewar bioregion (IBRA, DoE 2012), any of the above three species and/or <i>E. microcarpa</i> (western grey box) and/or <i>E. moluccana</i> (grey box, coastal grey box);	YES Overstorey dominated by yellow box and Blakely's red gum	YES Previously had overstorey dominated by yellow box and Blakely's red gum	YES Previously had overstorey dominated by yellow box and Blakely's red gum	YES Overstorey dominated by yellow box and Blakely's red gum	YES Overstorey dominated by yellow box and Blakely's red gum
It has a predominantly native ground layer.	YES	YES	YES	NO	NO
Tussock grasses are conspicuous in the ground layer (except in some situations, such as under dense groves of shrubs or regenerating trees), usually with several native species from some the following genera: <i>Austrostipa</i>, <i>Bothriochloa</i>, <i>Chloris</i>, <i>Cymbopogon</i>, <i>Dichanthium</i>, <i>Microlaena</i>, <i>Poa</i>, <i>Themeda</i>, <i>Rytidosperma</i> or <i>Sorghum</i>.	YES <i>Rytidosperma</i> spp. and <i>Themeda</i>	YES <i>Austrostipa</i> , <i>Bothriochloa</i> , <i>Microlaena</i> , <i>Themeda</i> , <i>Rytidosperma</i>	YES <i>Rytidosperma</i> , <i>Themeda</i> , <i>Bothriochloa</i> , <i>Microlaena</i>	NO Exotic dominated understorey	NO Exotic dominated understorey
Amongst the grass tussocks and sometimes in swathes, a range of broad-leaved forbs and petaloid monocots (e.g. lilies sens. lat.) may be a major component of the plant diversity.	YES	YES	YES	NO	NO

Key Diagnostic Characteristics	ACT16.1	ACT16.4	ACT16.5	ACT16.6	ACT16.7
While shrubs may be dominant locally within areas of the ecological community, areas of native vegetation with a more continuous shrub layer, in which the average shrub cover of the whole patch is greater than 30%, is considered to be a shrubby woodland and so is not part of the listed ecological community. In assessing this, the effects of disturbance need to be considered, for example where heavy grazing may result in high densities of shrubs during a recovery phase	YES < 30%	YES < 30%	YES < 30%	YES < 30%	YES < 30%
EPBC Act White Box – Yellow Box – Blakely’s Red Gum Grassy Woodlands and Derived Native Grasslands	YES	YES	YES	NO	NO

Table 4.6 Assessment Against EPBC Act White Box – Yellow Box – Blakely’s Red Gum Grassy Woodlands and Derived Native Grasslands Community Condition Classes and Thresholds (TSSC, 2023)

Condition Class	Patch size and features present	ACT16.1	ACT16.4	ACT16.5
Class A Good quality understorey and mature overstorey both present	Patch size 0.1 ha (1,000 m ²) or larger?	YES	YES	YES
	The ground layer is predominantly native (at least 50% of the perennial vegetation cover in the ground layer is made up of native species)?	YES	YES	YES
	The understorey contains at least 12 native, non-grass species (such as forbs, shrubs, ferns, and sedges) and that least one species should be recognised as ‘important’ (e.g., grazing-sensitive, regionally significant, listed threatened or uncommon species)?	YES At least 12 native non-grass species and at least one ‘important’ species were recognised.	YES At least 12 native non-grass species and at least one ‘important’ species were recognised.	YES At least 12 native non-grass species and at least one ‘important’ species were recognised.
	The patch contains 10 or more mature trees per hectare consistent with the key diagnostics for the ecological community (mature trees are those with a circumference of at least 125 cm measured at a height of 130 cm above the ground (equivalent to diameter of 40 cm)?	NO	NO	NO

Condition Class	Patch size and features present	ACT16.1	ACT16.4	ACT16.5
Class B Good quality understorey present. Characteristic trees may be absent.	Patch size 0.1 ha (1,000 m ²) or larger?	YES	YES	YES
	The ground layer is predominantly native?	YES	YES	YES
	The understorey contains at least 12 native, non-grass species (such as forbs, shrubs, ferns and sedges) and that least one species should be recognised as 'important' (e.g. grazing-sensitive, regionally significant, listed threatened or uncommon species)?	YES At least 12 native non-grass species and at least one 'important' species were recognised.	YES At least 12 native non-grass species and at least one 'important' species were recognised.	YES At least 12 native non-grass species and at least one 'important' species were recognised.
Class C Allows for a lower diversity in the understorey in areas where there is regeneration and/or tree density may be relatively dense.	Patch size 2 ha (20,000 m ²) or larger?	YES	YES	YES
	The ground layer is predominantly native?	YES	YES	YES
	The patch contains 20 or more mature trees per hectare? and/or	NO	NO	NO
	The patch contains natural regeneration of dominant overstorey eucalypts (the patch contains eucalyptus saplings of the dominant species that are 5 cm diameter or greater at breast height)?	YES	NO	NO
EPBC Act White Box – Yellow Box – Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands		Class B	Class B	Class B

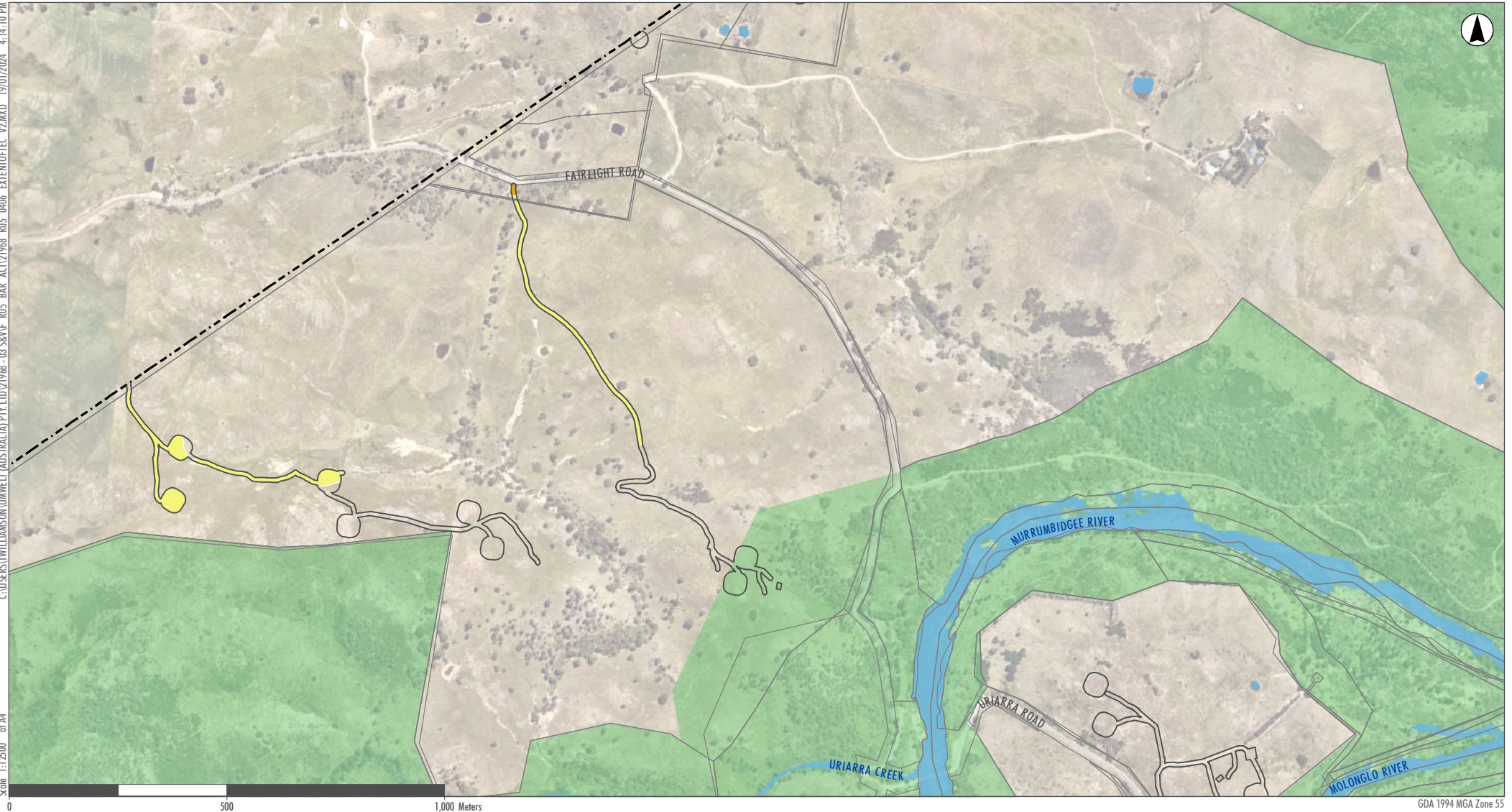
Table 4.7 Assessment Against EPBC Act Natural Temperate Grassland of South Eastern Highlands Community Condition Thresholds (TSSC, 2016)

Condition Class	Features Present	ACT01.1	ACT01.3	ACT01.4
High to Very High	Favourable sampling times: At least 12 non-grass native species OR At least 3 indicator species OR Floristic value score (FVS) of at least 6.5	YES More than 12 non-grass native species	NO	NO
Moderate – High Condition Threshold A	Characterised by at least 50% foliage cover of the ground of: <i>Themeda triandra</i> (kangaroo grass) OR <i>Poa labillardierei</i> (river tussock grass), (generally in flats and drainage lines where this vegetation type naturally occurs). OR <i>Carex bichenoviana</i> (a native sedge) (or at least 50 tussocks for every 100 m ²)	YES Greater than 50 % foliage cover of <i>Themeda triandra</i>	NO	NO
Moderate – High Condition Threshold B	Favourable sampling times: At least 8 non-grass native species OR At least 2 indicator species OR A floristic value score (FVS) of at least 5	N/A	NO	NO
EPBC Act Natural Temperate Grassland of the South Eastern Highlands		YES	NO	NO



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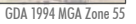


GDA 1994 MGA Zone 55

Legend

- | | |
|---------------------|---|
| Impact Area | Threatened Ecological Communities within Impact Area |
| ACT/NSW Border | ACT16.1 Eucalyptus melliodora – E. blakelyi Grassy Woodland - moderate-high |
| Property Boundaries | ACT16.4 Eucalyptus melliodora – E. blakelyi Grassy Woodland_DNG - moderate-high |
| Watercourses | ACT16.5 Eucalyptus melliodora – E. blakelyi Grassy Woodland_DNG - low |
| Nature Reserves | |

FIGURE 4.6A
Extent of Threatened Ecological Communities within the Impact Area Including NTG Buffer Zone



Threatened Ecological Communities within Impact Area

	ACT01.1 Tablelands Dry Tussock Grassland - High
	ACT01 Tablelands Dry Tussock Grassland - Exotic
	ACT1.6.1 Eucalyptus melliodora – E. blakelyi Grassy Woodland - moderate-high
	ACT1.6.4 Eucalyptus melliodora – E. blakelyi Grassy Woodland_DNG - moderate-high
	ACT1.6.5 Eucalyptus melliodora – E. blakelyi Grassy Woodland_DNG - low

Image Source: Nearmap (2023) Data source: ACT Government (2023)

4.4.3 Native Vegetation

The Impact Area supports a total of 4.43 ha of native vegetation (as defined under the NC Act) (Figure 4.7). This includes vegetation that met the listing criteria for the EPBC Act/NC Act BGW (ACT16.1, ACT16.4 and ACT16.5) and EPBC Act/NC Act NTG (ACT01.1), as well as vegetation conforming to ACT25 *Eucalyptus macrorhyncha* Tableland Grass/Shrub Forest (specifically, ACT25.4 and ACT25.5).

Refer to Section 4.4.4.4 for details on the type and distribution of mature and hollow-bearing trees in the Proposed Alignment and Impact Area.

4.4.4 Threatened Fauna Habitat Assessment

4.4.4.1 Pink-Tailed Worm-Lizard

Twenty patches of surface rocks were identified in the Impact Area that constitute potential habitat for pink-tailed worm-lizard (Table 4.8; Figure 4.8). As per Table 4.8, 0.15 ha of potential habitat was classified as high-quality; 0.14 ha was classified as moderate - high (due to the patch being predominantly moderate habitat with some high-quality habitat); 0.56 ha was classified as moderate-quality; 0.04 ha was classified as moderate - low (due to the patch being predominantly moderate with some low-quality habitat) and 0.2 ha was classified as low quality due to the presence of livestock grazing (resulting in high levels of disturbance) and presence of wild oats, and perennial exotic grass species including African lovegrass, canary grass (*Phalaris aquatica*) and fescue.

Table 4.8 Summary of Extent and Condition of Pink-tailed Worm-Lizard Habitat in the Impact Area

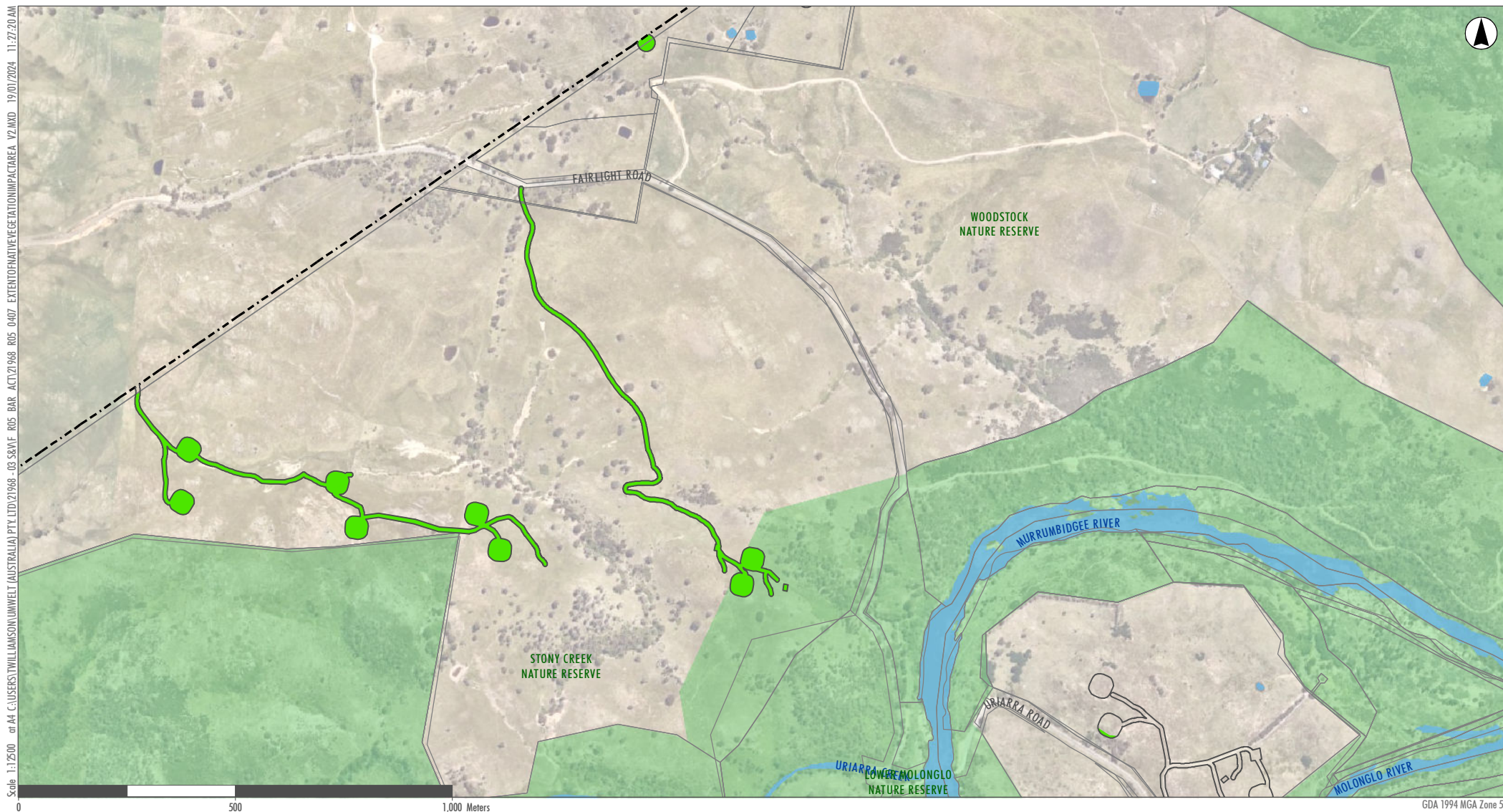
Habitat Quality Condition	No. of patches	Extent in Impact Area (ha)
Low	5	0.2
Moderate – Low	1	0.04
Moderate	10	0.56
Moderate – High	1	0.14
High	3	0.15
Total		1.09

4.4.4.2 Golden Sun Moth Habitat

Within the Impact Area, a total of 4.09 ha of potential golden sun moth habitat was identified (Table 4.9; Figure 4.9); with 0.33 ha of high-quality, 0.47 ha of moderate quality and 3.29 ha of low-quality habitat. The species was not recorded during targeted surveys in these potential habitat areas (Section 4.4.5).

Table 4.9 Extent and Condition of Potential Golden Sun Moth Habitat within the Impact Area

Habitat Quality Condition	Extent in Impact Area (ha)
Low	3.29
Moderate	0.47
High	0.33
Total	4.09



Legend

- Impact Area
- Vegetation Communities Within Impact Area
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves

Image Source: Nearmap (2023) Data source: ACT Government (2023)

FIGURE 4.5A
Extent of Vegetation
Communities within the Impact

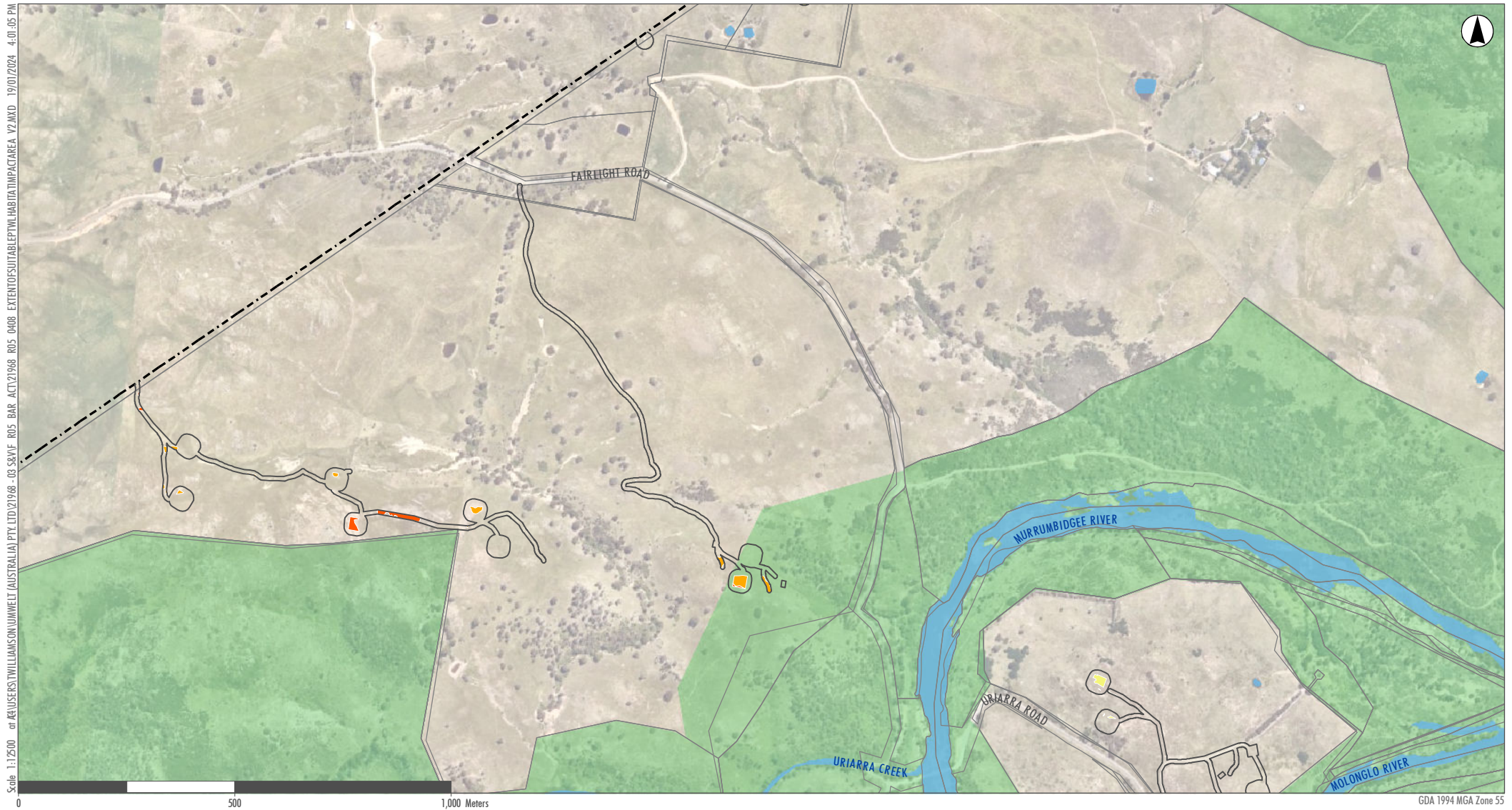


Legend

- Impact Area
 - Vegetation Communities Within Impact Area
 - ACT/NSW Border
 - Property Boundaries
 - Watercourses
 - Nature Reserves
 - Ginninderry / Parkwood Development
 - Existing Substation
 - Ginninderry Conservation Corridor
- Image source: Weirmap (2023) Data source: ACT Government (2023)

GDA 1994 MGA Zone 55

FIGURE 4.5B
Extent of Vegetation
Communities within the Impact



Legend

- | | |
|--|---------------------|
| Impact Area | ACT/NSW Border |
| Suitable Pink-tailed Worm-lizard Habitat | Property Boundaries |
| High | Watercourses |
| Moderate | Nature Reserves |
| Low | |

FIGURE 4.8A

Extent and Condition of Suitable Pink-tailed Worm-lizard Habitat Within the Impact Area

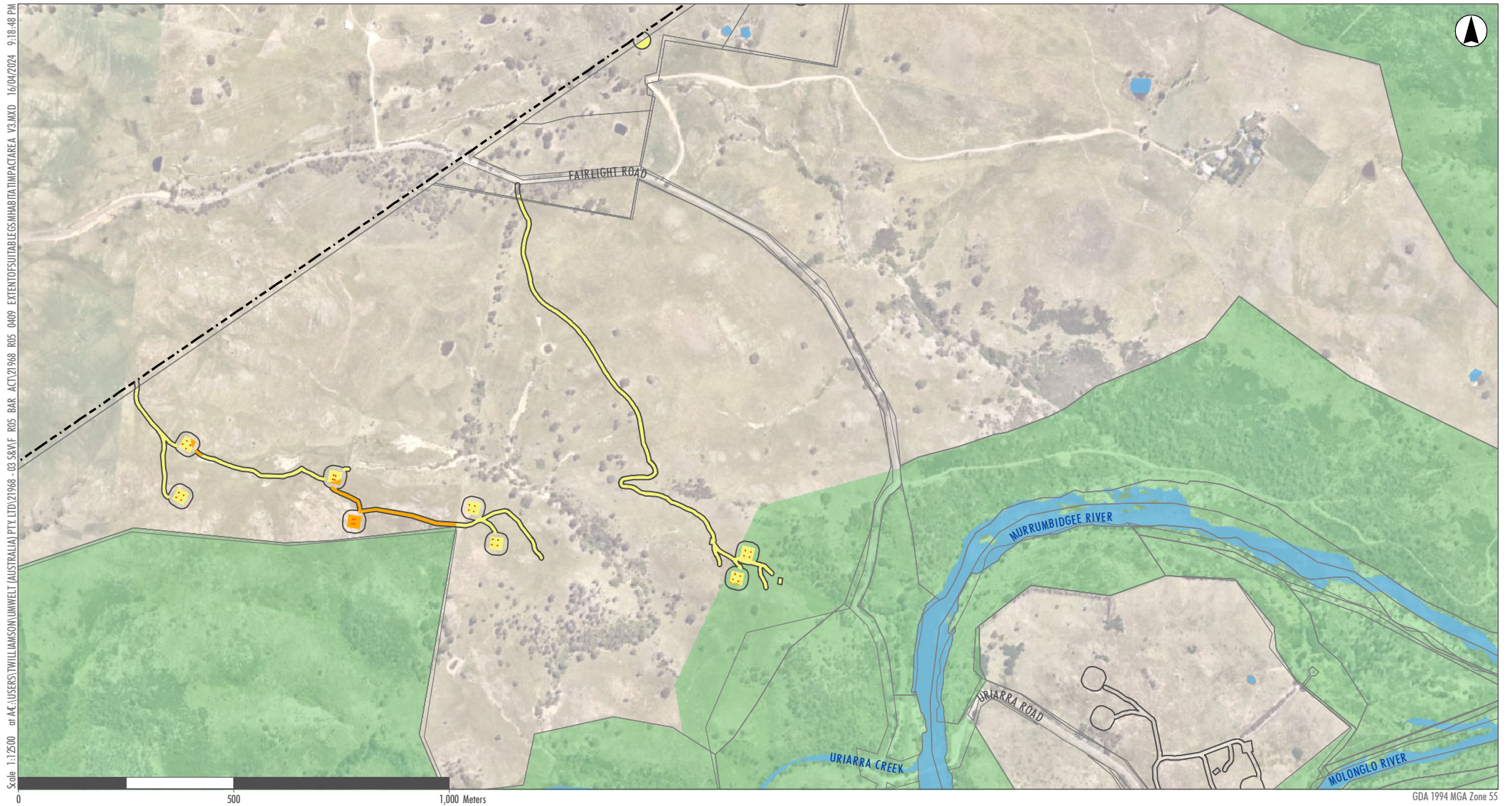


Legend

- | | | |
|--|-----------------------------------|------------------------------------|
| Impact Area | ACT/NSW Border | Ginninderry / Parkwood Development |
| Suitable Pink-tailed Worm-lizard Habitat | Property Boundaries | Existing Substation |
| Moderate | Watercourses | |
| Low | Nature Reserves | |
| | Ginninderry Conservation Corridor | |

GDA 1994 MGA Zone 55

FIGURE 4.8B
Extent and Condition of Suitable Pink-tailed Worm-lizard
Habitat Within the Impact Area



Legend

- | | |
|----------------------------------|---------------------|
| Impact Area | ACT/NSW Border |
| Suitable Golden Sun Moth Habitat | Property Boundaries |
| Moderate | Watercourses |
| Low | Nature Reserves |

FIGURE 4.9A
Extent and Condition of Potential Golden Sun Moth Habitat
within the Impact Area



Legend

- | | | |
|----------------------------------|-----------------------------------|------------------------------------|
| Impact Area | ACT/NSW Border | Ginninderry / Parkwood Development |
| Suitable Golden Sun Moth Habitat | Property Boundaries | Existing Substation |
| High | Watercourses | |
| Moderate | Nature Reserves | |
| Low | Ginninderry Conservation Corridor | |

FIGURE 4.9B
Extent and Condition of Potential Golden Sun Moth Habitat
within the Impact Area

4.4.4.3 Perunga Grasshopper

Within the Impact Area, 2.28 ha of potential Perunga grasshopper habitat was identified (**Figure 4.10**). This aligns with the extent of suitable vegetation communities (ACT01.1, ACT16.4 and ACT16.5), with ACT01.1 dominated by kangaroo grass and ACT16.4 and ACT16.5 containing species considered to be Perunga grasshopper habitat.

4.4.4.4 Mature and Hollow-Bearing Trees

Thirty mature Eucalypt trees and 32 hollow-bearing trees were identified within the Proposed Alignment (**Table 4.10; Figure 4.11**).

Six mature Blakely's red gum trees were recorded within the Impact Area. All of these trees were above 6 m in height (the maximum height permitted under operating powerlines), so would require removal. A further 10 trees would require modification (canopy reduction) to comply with canopy height restrictions. For the purpose of this assessment, all Blakely's red gums within 10 m and all yellow box within 15 m of the Impact Area boundary were included in the canopy reduction count, based on the lifeform of these species.

These trees provide potential breeding and/or foraging habitat for woodland birds including 11 EPBC Act and/or NC Act listed threatened species identified as having a moderate or high likelihood of occurrence (**Table 4.2; Appendix A**).

Habitat for woodland birds is discussed further in **Section 4.4.4.5**, including mature and hollow-bearing trees that provide potential habitat for superb parrot and gang-gang cockatoo specifically.

4.4.4.5 Woodland Birds

Superb Parrot

No potential superb parrot breeding trees were recorded in the Impact Area.

Eucalyptus and *Acacia* species recorded in the Proposed Alignment and Impact Area provide superb parrot foraging habitat. As the species is also known to feed on native and exotic grass seed, it is likely that superb parrot may also use the open grassland areas within these areas. For the purpose of this assessment all native vegetation within the Impact Area is considered suitable foraging habitat for superb parrot (4.9 ha).

All mature and hollow-bearing trees recorded in the Proposed Alignment, Impact Area and the Superb Parrot Tree Assessment Area contribute to connecting habitat for this species, especially noting the proximity of this site to known breeding habitat within the Molonglo Valley.

Seventeen trees within the Superb Parrot Tree Assessment Area were confirmed to be within the height range (10-15 m) identified as critical for superb parrot movement. Of these, three are within the Impact Area and would need to be removed. Six are less than 10 m from the Impact Area and would require modification (canopy reduction) to comply with canopy height restrictions.

Gang-gang Cockatoo

Two potential gang-gang cockatoo breeding trees were recorded in the Impact Area and would need to be removed to comply with canopy height restrictions for overhead transmission lines. One additional potential gang-gang cockatoo breeding tree is close to the Impact Area and would require modification (canopy reduction) to comply with canopy height restrictions (**Table 4.10; Figure 4.11**).

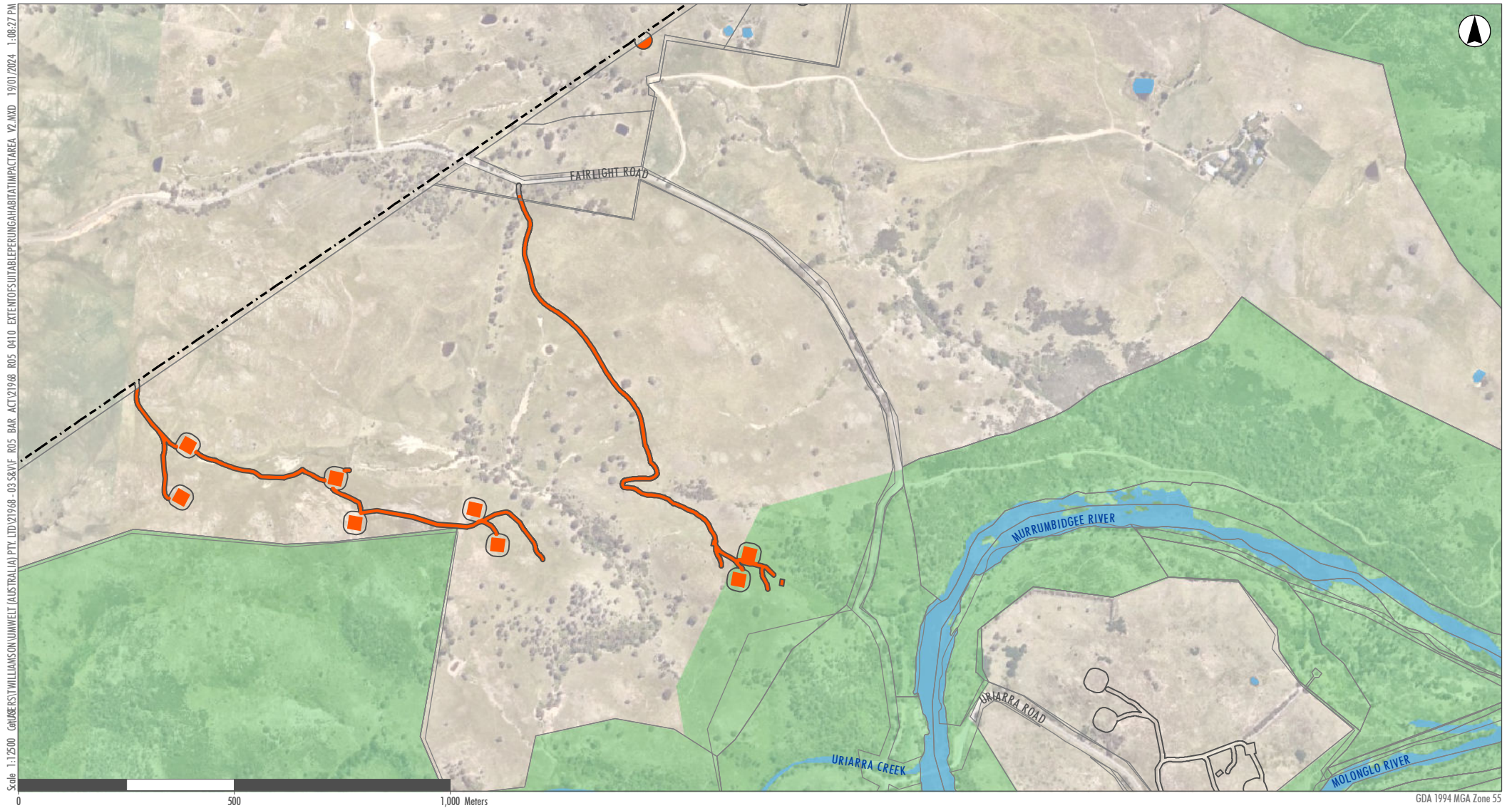
The *Eucalyptus* trees recorded in the Impact Area also provide gang-gang cockatoo foraging habitat. While foraging is mainly arboreal, gang-gang cockatoo is also known to feed on other native and exotic species, including acacias, which were recorded in the Impact Area (DAWE, 2022).

Six suitable gang-gang cockatoo foraging trees were recorded in the Impact Area (including the two identified as potential breeding habitat) and would need to be removed to comply with canopy height restrictions. An additional 10 suitable gang-gang cockatoo foraging trees (including the one tree identified as potential breeding habitat) are close to the Impact Area and would require modification (canopy reduction) to comply with canopy height restrictions (**Table 4.10; Figure 4.11**).

Other Woodland Birds

The Proposal is likely to remove 4.9 ha of box gum woodland, grasslands and open forest in the Impact Area that provide foraging and breeding habitat for woodland birds including hooded robin, scarlet robin, diamond firetail, varied sitella, white-winged triller, painted honeyeater and southern whiteface. This aligns with the extent of all vegetation communities within the Impact Area (**Figure 4.5**).

All woodland bird species assessed as part of this Proposal use a mix of woodland and open forest and grassland areas (including scattered trees) for breeding and/or foraging. While open grassland areas are not used for breeding, they provide important foraging habitat, including during breeding periods. Many of the species including diamond firetail and southern whiteface feed almost exclusively on the ground in areas of open grassland or favouring areas with low tree densities (Antos *et al.* 2008; Read, 1994;).



Legend

- Impact Area
- Suitable Perunga Grasshopper Habitat
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves

FIGURE 4.10A

Extent and Condition of Suitable Perunga Grasshopper Habitat within the Impact Area



Legend

- | | | |
|--------------------------------------|-----------------------------------|------------------------------------|
| Impact Area | ACT/NSW Border | Ginninderry / Parkwood Development |
| Suitable Perunga Grasshopper Habitat | Property Boundaries | Existing Substation |
| | Watercourses | |
| | Nature Reserves | |
| | Ginninderry Conservation Corridor | |

GDA 1994 MGA Zone 55

FIGURE 4.10B

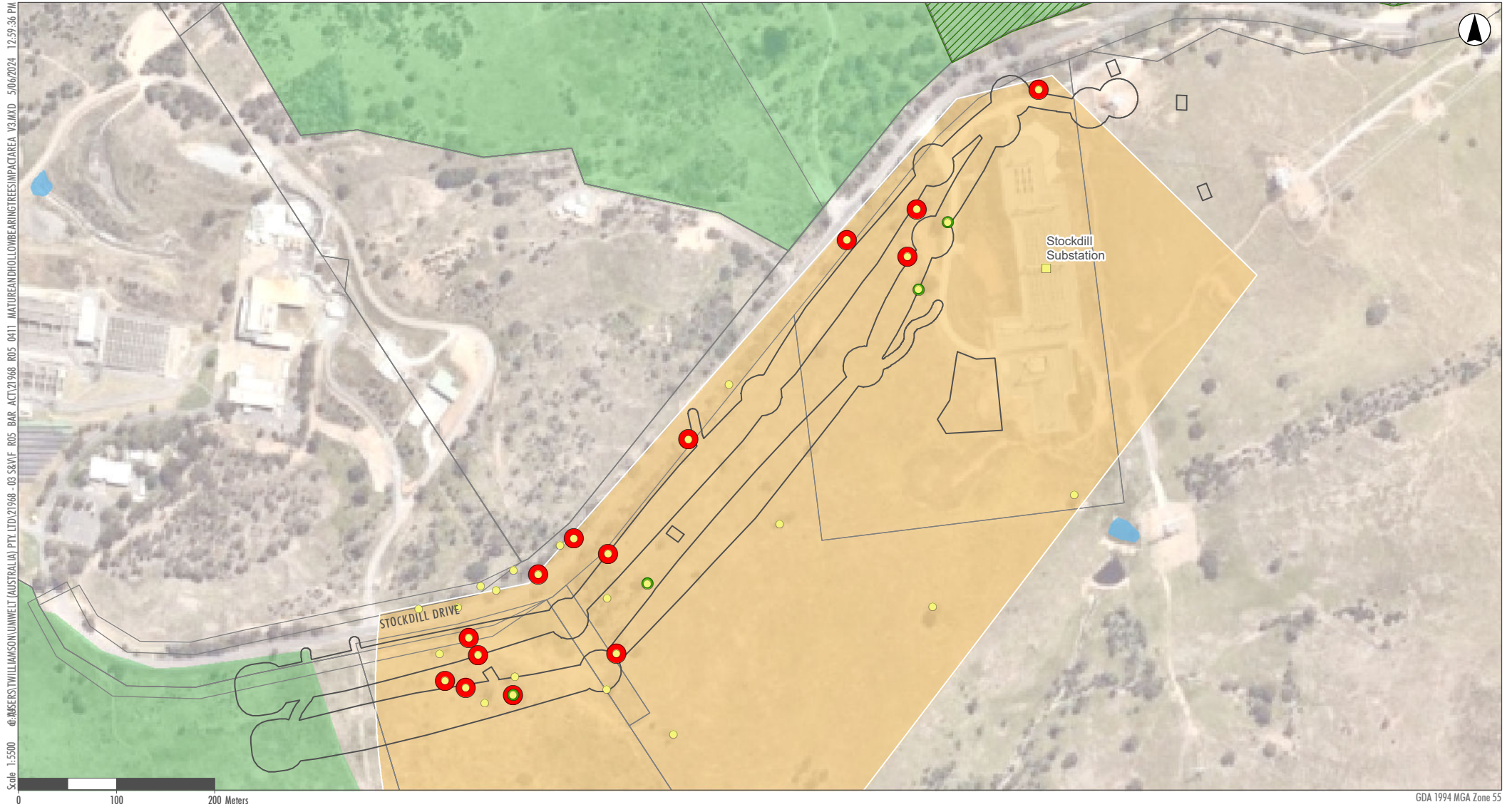
Extent and Condition of Suitable Perunga Grasshopper
Habitat within the Impact Area

Table 4.10 Mature and Hollow-Bearing Trees Recorded in or Adjacent to the Proposed Alignment (Including Potential Gang-gang Cockatoo and Superb Parrot Breeding Trees) – green represents trees that would be impacted

Tree ID	Tree Species	Mature Tree	Tree Height (metres)	DBH (cm)	Hollows					Potential Gang-gang Cockatoo Breeding Tree	Suitable Gang-gang Cockatoo Foraging Tree	Potential Superb Parrot Breeding Tree	Tree Critical for Superb Parrot Movement (10–15 m tall within Superb Parrot Tree Assessment Area)
					Small 2.5–5 cm	Medium 5–10 cm	Large 10–30 cm	Extra-large > 30 cm	Hollow height above the ground				
Trees within Impact Area (to be removed)													
HBT_HG_06	Blakely's red gum	Yes	15.5	95		3	2		Large hollow at 7.5 m	No	Yes	No	No
HBT_HG_07	Blakely's red gum	Yes	12.2	99	1	4	1		Large hollow at 5 m	Yes	Yes	No	Yes
HBT_HG_01	Blakely's red gum	Yes	7.9	65	1	1			Hollows at 3.9 m	No	Yes	No	No
HBT_HG_03	Blakely's red gum	Yes	10.8	82		1	2		Hollows at 3.4 m	No	Yes	No	Yes
HBT_HG_12	Blakely's red gum	Yes	10.6	103	2	3	1		Medium hollows at 9 m	No	Yes	No	Yes
HBT_SH_01	Blakely's red gum	Yes	21.6	102		1	2		Hollows between 6–12 m	Yes	Yes	No	No
Trees within 10 m of Impact Area (subject to modification – canopy reduction)													
HBT_SH_04	Blakely's red gum	Yes	14.6	81		1			Hollow at 6 m	No	Yes	No	Yes
HBT_SH_05	Blakely's red gum	Yes	17.4	125	1		1		Large hollow at 9 m	Yes	Yes	No	No
HBT_HG_10	Blakely's red gum	Yes	12	70		1			Hollow at 3.3 m	No	Yes	No	Yes
HBT_HG_08	Blakely's red gum	Yes	15.8	84	2	4	1		Medium hollow at 5 m and above;	No	Yes	No	No

Tree ID	Tree Species	Mature Tree	Tree Height (metres)	DBH (cm)	Hollows					Potential Gang-gang Cockatoo Breeding Tree	Suitable Gang-gang Cockatoo Foraging Tree	Potential Superb Parrot Breeding Tree	Tree Critical for Superb Parrot Movement (10–15 m tall within Superb Parrot Tree Assessment Area)
					Small 2.5–5 cm	Medium 5–10 cm	Large 10–30 cm	Extra-large > 30 cm	Hollow height above the ground				
									large hollow at 6.8 m				
HBT_HG_04	Blakely's red gum	Yes	14.9	95		1	2		Medium hollow at 6.7 m; large hollow at 6.8 m	No	Yes	No	Yes
HBT_HG_02	Blakely's red gum	Yes	14.8	106	1	5	2		Hollows between 5–9.5 m	No	Yes	No	Yes
HBT_HG_13	Blakely's red gum	Yes	15.5	86	4	2			Hollows between 5.5–9 m	No	Yes	No	No
HBT_HG_09	Blakely's red gum	Yes	6.5	73	2	2			Hollow at 5.6 m	No	Yes	No	No
HBT_SH_02	Blakely's red gum	Yes	13.5	90	3	1	2		Hollows between 6–8 m	No	Yes	No	Yes
HBT_HG_05	Blakely's red gum	Yes	10.1	82		1			Hollow at 6.9 m	No	Yes	No	Yes
Other (trees subject to no impact – in Superb Parrot Tree Assessment Area only)													
HBT_SH_03	Blakely's red gum	Yes	15	119			1		Hollow at 8 m	No	Yes (not impacted)	No	Yes
HBT_RT_03	Blakely's red gum	Yes	11.3	85		2	1		Hollows between 5–8.5 m	No	Yes (not impacted)	No	Yes
HBT_MM_06	Blakely's red gum	Yes	12.3	79		1	1		Hollows start at 3 m	No	Yes (not impacted)	No	Yes
HBT_HG_11	Blakely's red gum	Yes	16.3	81	2	2			Hollow at 8 m and above	Yes (not impacted)	Yes (not impacted)	No	No

Tree ID	Tree Species	Mature Tree	Tree Height (metres)	DBH (cm)	Hollows					Potential Gang-gang Cockatoo Breeding Tree	Suitable Gang-gang Cockatoo Foraging Tree	Potential Superb Parrot Breeding Tree	Tree Critical for Superb Parrot Movement (10–15 m tall within Superb Parrot Tree Assessment Area)
					Small 2.5–5 cm	Medium 5–10 cm	Large 10–30 cm	Extra-large > 30 cm	Hollow height above the ground				
HBT_MM_05	Blakely's red gum	Yes	10.6	58		4	1		Hollows start at 4 m	No	Yes (not impacted)	No	Yes
HBT_MM_01	Blakely's red gum	Yes	12.7	113		2	1		Hollows start at 3.5 m	No	Yes (not impacted)	No	Yes
HBT_HG_14	Blakely's red gum	Yes	7.8	93	1	1	1		Large hollow at 4.5 m	No	Yes (not impacted)	No	No
HBT_HG_15	Blakely's red gum	Yes	6.4	82				1	Hollow at 2–3 m	No	Yes (not impacted)	No	No
HBT_HG_16	Blakely's red gum	Yes	16.4	132		2	1		Hollows at 5 m and above	No	Yes (not impacted)	No	No
HBT_HG_21	Yellow box	Yes	14	70	2	2			Hollows at 6.7 m and above	No	Yes (not impacted)	No	Yes
HBT_MM_07	Blakely's red gum	No	11	40		1				No	Yes (not impacted)	No	Yes
HBT_MM_08	Blakely's red gum	No	8	40		1				No	Yes (not impacted)	No	No
HBT_HG_19	Blakely's red gum	Yes	13.5	72	1	1			Hollow at 3 m	No	Yes (not impacted)	No	Yes
HBT_MM_02	Blakely's red gum	Yes	19.3	87	1				Hollow at 5 m	No	Yes (not impacted)	No	No
HBT_SAH_02	Yellow box	Yes	-	96		3			Hollow above 5 m	No	Yes (not impacted)	No	Not within tree study area.
HBT_MM_03	Yellow box	Yes	17.5	103	1		1		Hollow at 8 m and above	No	Yes (not impacted)	No	No



Legend

- Impact Area
- Superb Parrot Future Breeding Habitat
- Hollow-Bearing Tree (33)
- Potential Gang-gang Cockatoo Breeding Tree (4)
- Tree Critical for Superb Parrot Movement (14)
- ACT/NSW Border
- Property Boundaries
- Watercourses
- Nature Reserves
- Ginninderry Conservation Corridor
- Existing Substation

Image Source: Nearmap (2023) Data source: ACT Government (2023)

FIGURE 4.11
Distribution of Mature and Hollow-Bearing Trees Recorded in or Adjacent to the Impact Area
(including Suitable Gang-gang Cockatoo and Superb Parrot Breeding Trees)

4.4.5 Targeted Threatened Species Surveys

4.4.5.1 Superb Parrot

No superb parrots were recorded within the Proposal Area.

4.4.5.2 Gang-Gang Cockatoo

Five gang-gang cockatoo individuals were recorded within the Proposal Area (but not within the Impact Area) on 29 December 2022 in an area west of the Murrumbidgee River dominated by red stringybark (**Figure 4.12**). The birds formed part of a group and were an incidental sighting, not recorded as part of the targeted surveys.

4.4.5.3 Other Threatened Birds

Two southern whiteface were observed together in the Proposal Area on 12 December 2022. These were observed during the targeted surveys for the superb parrot and gang-gang cockatoo.

One white-winged triller was observed on 18 October 2023. This was an incidental sighting, not recorded as part of the targeted surveys.

4.4.5.4 Golden Sun Moth

No golden sun moth were recorded within the Proposal Area.

4.4.5.5 Threatened Flora

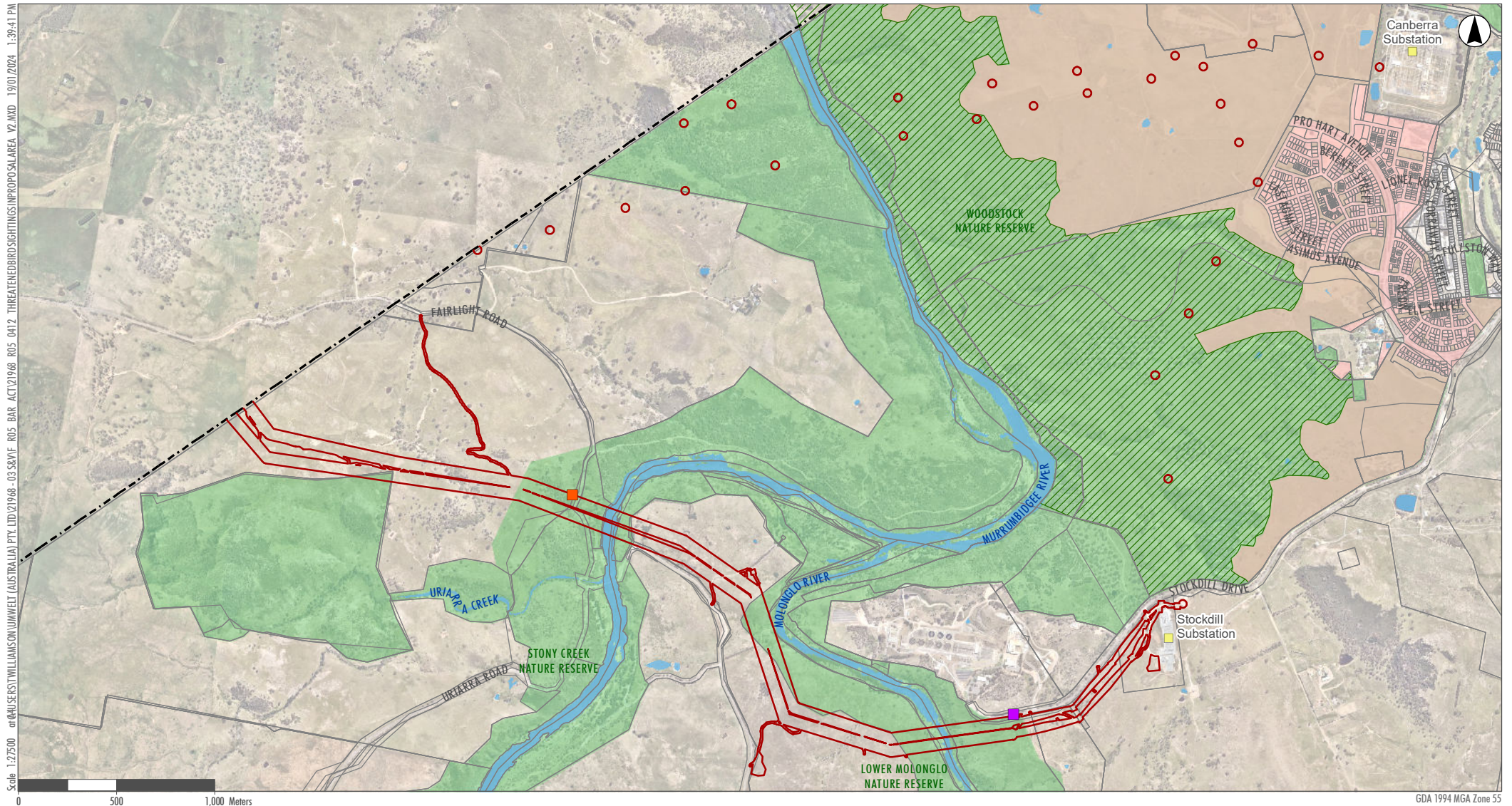
No individuals or populations of hoary sunray, Austral toadflax, small purple pea or pale pomaderris were recorded within the Impact Area.

4.4.6 Pest Plants

Six pest plants were recorded within the Impact Area that are listed on the ACT *Pest Plants and Animals Declaration 2005* (**Table 4.11**). Blackberry (*Rubus fruticosus* sp. agg.) was recorded in the Impact Area and is a weed of national significance (WoNS).

Table 4.11 Pest Plant Species Recorded in the Impact Area

Pest Plant	Weed of National Significance	Class
Blackberry (<i>Rubus fruticosus</i> sp. agg.)	Yes	Class 3 must be contained Class 4 prohibited
St John's wort (<i>Hypericum perforatum</i>)	No	Class 3 must be contained
African lovegrass (<i>Eragrostis curvula</i>)	No	Class 3 must be contained
Paterson's curse (<i>Echium plantagineum</i>)	No	Class 3 must be contained
Viper's bugloss (<i>Echium vulgare</i>)	No	Class 3 must be contained
Sweet briar (<i>Rosa rubiginosa</i>)	No	Class 2 must be suppressed Class 4 prohibited



Legend

- Proposed Alignment and Impact Area
- ACT/NSW Border
- Property Boundaries
- Existing Substation
- Gang-gang Cockatoo (1)
- Watercourses
- Nature Reserves
- White-winged Triller (1)
- Ginninderry Conservation Corridor
- Ginninderry / Parkwood Development

FIGURE 4.12
Threatened Bird Sightings in the Proposed Alignment and Impact Area

5.0 Impact Assessment

5.1 Threatened Ecological Communities

5.1.1 EPBC Act and NC Act Box Gum Woodland Ecological Community

A total of 2.37 ha across 11 areas of the EPBC Act listed White Box – Yellow Box – Blakely’s Red Gum Grassy Woodlands and Derived Native Grassland and NC Act listed Yellow Box – Blakely’s Red Gum Grassy Woodland ecological communities are present within the Impact Area and would be impacted by the Proposal (**Table 4.6; Figure 4.6**).

The majority (2.29 ha) is in the derived state, with only 0.1 ha supporting high quality understorey with multiple important species. All zones were assessed as Class B due to the sparse cover (or absence) of canopy species (**Table 4.6**).

While the Impact Area has been designed to avoid areas of BGW as much as possible (including areas supporting mature and hollow-bearing trees), six trees would need to be removed, and a further 10 are likely to require modification (canopy reduction) to maintain standards required under and adjacent to overhead powerlines. This impact is restricted to the eastern end of the Proposed Alignment where the conductors would be closest to the ground, east of the Molonglo River.

The patches of BGW form part of, and are on the edge of a much larger patch of woodland and derived native grassland in the broader landscape, which includes areas protected in the Woodstock and Molonglo River Nature Reserves.

The extent of reduction of BGW as a result of the Proposal is considered minimal in the context of the broader extent of this community, especially noting that impacts areas are made up of many small, dispersed patches. As such, it is considered unlikely that the Proposal would have a significant impact on the EPBC Act BGW ecological community.

Refer to **Appendix C** for the full significant impact assessment.

5.1.2 EPBC Act and NC Act Natural Temperate Grassland

Less than 0.01 ha of the EPBC Act listed *Natural Temperate Grassland of the South Eastern Highlands* and NC Act *Natural Temperate Grassland* critically endangered ecological communities are present in the Impact Area and would be impacted by the Proposal (**Table 4.7; Figure 4.6**).

This patch is recognised to meet the high to very high condition threshold (patches with good native coverage and high native plant diversity) given that it has at least 12 non-grass native species and has over 50% ground cover foliage of kangaroo grass.

Recognising the high quality of the patch of NTG within the Impact Area and the position of the patch downslope of exotic grassland, a buffer zone has been adopted in accordance with the NTG Conservation Advice. It has been determined that the width of the buffer zone should equal the distance from the NTG (ACT01.1) to the far edge of the adjacent grassland area (ACT01.4) (**Figure 4.6**).

The total area of NTG to be impacted by the Proposal, including the buffer zone, is 0.55 ha. It is considered unlikely that the Proposal would fragment or increase fragmentation of NTG due to the presence of the adjacent exotic grassland and the relatively small size of the impacted area. As such, it is considered unlikely that the Proposal would have a significant impact on the EPBC Act NTG ecological community.

Refer to **Appendix C** for the full significant impact assessment.

5.2 Native Vegetation

Six vegetation zones (ACT01.1, ACT16.1, ACT16.4, ACT16.5, ACT25.4 and ACT25.5) are present in the Impact Area that meet the definition of native vegetation as defined in the NC Act. A total of 4.43 ha of native vegetation would be impacted, comprising multiple small areas distributed throughout the Impact Area.

The Proposal constitutes the threatening process 'loss of mature native trees (including hollow-bearing trees) and a lack of recruitment', which is relevant to species or ecological communities listed under the NC Act (ACT Government, 2018c). Six trees would be removed, and a further 10 would require modification (canopy reduction) to maintain standards required under and adjacent to overhead powerlines.

The loss of 4.43 ha of native vegetation, including six trees, and the modification of an additional 10 trees, is minimal in the context of the wide distribution of native vegetation within the surrounding landscape, especially noting that the impacted native vegetation is made up of many small, dispersed patches which are subject to existing threats from grazing and canopy maintenance under existing transmission lines.

5.3 Threatened Fauna

5.3.1 Pink-tailed Worm-lizard

The Impact Area supports a total of 1.09 ha of potential habitat for pink-tailed worm-lizard across 20 separate patches, only 0.15 ha of which is considered high quality. No surveys for the species were undertaken and their presence was assumed. Given the small amount of available habitat within the Impact Area, it is unlikely that it supports a population that would be considered important, and its removal is unlikely to have an adverse impact on habitat critical to the survival of pink-tailed worm-lizard. As such, it is considered unlikely that the Proposal would have a significant impact on pink-tailed worm-lizard.

Refer to **Appendix C** for the full significant impact assessment.

5.3.2 Golden Sun Moth

Approximately 4.09 ha of potential golden sun moth habitat would be impacted by the Proposal, of which only 0.33 ha is high quality. There are no records of golden sun moth occurring within the Impact Area, and the species was not observed during targeted surveys across multiple years. No important populations have been defined in the GSM Conservation Advice (DAWE, 2021a), and it is unlikely that the Impact Area supports an important population of the species. Based on the description in the GSM Conservation Advice, it is unlikely that the potential golden sun moth habitat in the Impact Area would be considered habitat critical to the survival of the species. As such, it is unlikely that the Proposal would result in a significant impact on golden sun moth.

Refer to **Appendix C** for the full significant impact assessment.

5.3.3 Perunga Grasshopper

The extent of potential Perunga grasshopper habitat in the Impact Area was determined to align with the extent of ACT01.1, ACT16.4 and ACT16.5, which contain species considered to be Perunga grasshopper habitat (2.28 ha). Due to the difficulty in surveying for the presence of this species, presence has not been confirmed; however, following the precautionary principle it is assumed to be present.

5.3.4 Threatened Woodland Birds

5.3.4.1 Superb Parrot

The Proposal would remove three potential superb parrot movement trees from the Impact Area, , and would require modification (canopy reduction) of an additional six movement trees to comply with canopy height restrictions (see **Table 4.10**).

The Superb Parrot Recovery Plan states that the species requires vegetated corridors to move between breeding and foraging habitat (the species is known to travel up to 10 km from breeding sites to foraging areas), and that degradation and destruction of movement corridors is a key factor implicated in the species' decline. The three potential superb parrot habitat trees that would be impacted by the Proposal were confirmed to be within the height range (10-15 m) identified by the Conservator's office as critical for superb parrot movement, as were the six trees that would require modification (see **Table 4.10**).

Although no individuals were recorded in the Impact Area, it is likely that the species utilises the Proposal Area for foraging, including supporting breeding pairs from known breeding trees. *Eucalyptus* and *Acacia* species recorded in the Impact Area provide superb parrot foraging habitat. As the species is also known to feed on native and exotic grass seed, it is likely that the superb parrot would also use the open grassland within these areas. As such, all native vegetation within the Impact Area is considered suitable foraging habitat for the superb parrot (4.9 ha made up of multiple areas distributed along the Proposed Alignment).

As such, the Proposal would require the removal of a total of three movement trees located within the Superb Parrot Tree Assessment Area and 4.9 ha of foraging habitat, and the modification of an additional six movement trees. These impacts are considered to be unavoidable given that the Proposal design has been subject to extensive redesign to avoid impacts where possible (see **Section 6.1** for further information).

In addition, the Superb Parrot Recovery Plan states that clearing of foraging habitat has been followed by the species abandoning nearby traditional breeding areas, even where suitable nest trees remain, and that population size is primarily limited by clearing of woodland foraging habitat. This is especially the case for foraging habitat located within 10 km of breeding trees.

In accordance with the Superb Parrot Recovery Plan, the removal of foraging habitat and the loss and modification of trees identified as critical for superb parrot movement may adversely affect habitat critical to the survival of the species. The Proposal may therefore result in a significant impact on the superb parrot. However, the removal of 4.9 ha of superb parrot foraging habitat, made up of multiple small areas, is a small loss in a landscape that contains extensive areas of potential superb parrot foraging habitat (native woodlands and grasslands). Within the Proposal Area alone, ACTmapi (2023) indicates that there is 49.1 ha of native vegetation that would provide potential foraging habitat for superb parrot which would not be impacted by the Proposed Alignment.

Refer to **Appendix C** for the full significant impact assessment.

5.3.4.2 Gang-gang Cockatoo

The Proposal would remove six suitable gang-gang cockatoo foraging trees in the Impact Area, two of which also provide potential breeding habitat. In addition, 10 suitable foraging trees, one of which also provides potential breeding habitat, are close to the Impact Area and would require modification (canopy reduction) to comply with canopy height restrictions (**Table 4.10; Figure 4.11**). Five individuals have been recorded utilising suitable habitat within the Proposed Alignment.

The Gang-gang Cockatoo Conservation Advice states that habitat critical to the survival of gang-gang cockatoo includes all foraging habitat during both the breeding and non-breeding season (excluding exotic feeding grounds such as ornamental trees, shrubs, and hedges). It notes that habitat critical to the survival includes hollow-bearing trees with known or potential gang-gang cockatoo hollow chambers.

Potential foraging and breeding habitat present within the broader landscape has been avoided through the design of the Proposal, including through the refined placement of tower footings and the use of power poles rather than towers east of the Molonglo River (poles have a smaller impact footprint than towers). Clearance boundaries would be enforced through fencing and the implementation of a Construction Environmental Management Plan (CEMP).

The Gang-gang Cockatoo Conservation Advice states that habitat critical to the survival of the species should not be destroyed or modified, and that indirect impacts on the species should be minimised. While impacts on habitat critical to the survival of the species have been avoided and minimised as much as reasonably practicable through the measures discussed above, six potential habitat trees, including two potential breeding trees, would be removed; and 10 potential habitat trees, including one potential breeding tree, are adjacent to the Impact Area and would require modification. These trees are considered habitat critical to the survival of the species.

The Gang-gang Cockatoo Conservation Advice states that actions that will remove habitat critical to the survival of the species would interfere with the recovery of gang-gang cockatoo. The Proposal may interfere with the recovery of the species, and may result in a significant impact upon the gang-gang cockatoo.

Refer to **Appendix C** for the full significant impact assessment.

5.3.4.3 Little Eagle

As outlined in **Section 3.3.4.6**, potential little eagle breeding and feeding habitat is present in the local landscape, with known breeding activity and tracking data from the ACT Government demonstrating that it feeds within local woodland and grassland (including derived grassland) communities in the local area (J. Hopkins pers. comm. 30 August 2023). The species is also regularly recorded within the Molonglo Valley and Murrumbidgee Valley.

Foraging habitat in the Impact Area is unlikely, in itself, to be critical to the breeding success of pairs known to use the area, nor is it likely to be critical to the success of any active nest sites in the broader landscape given their distance to the Impact Area.

The Little Eagle Action Plan for the ACT (ACT Government 2013), which provides conservation priorities and objectives for the species, includes the following objective relevant to little eagle habitat: “Habitat sufficient to maintain a viable, wild population of Little Eagles in the long term is maintained in the ACT and region. This includes breeding sites and foraging areas.”

Despite the known occurrence of little eagle in the Proposal Area, the removal of up to 0.04 ha of native dominated grassland (ACT 01.1 and ACT01.3), 2.37 ha of box gum woodland and derived grasslands (ACT16.1, ACT16.4 and ACT16.5) and 2.06 ha of dry forest (ACT25.4 and ACT25.5) is unlikely to have a significant impact on little eagle given the quality and extent of habitat to be removed relative to the extent of similar or higher quality foraging habitat in the surrounding landscape. However, the removal of known occupied foraging habitat at this location does increase pressure on the species locally as it contributes to loss of utilised habitat in a landscape within which a sufficient, though unknown, amount of habitat must be retained to maintain a viable, wild population of little eagle in the long term in the ACT and surrounding region.

As the little eagle is listed under the NC Act and not the EPBC Act, no significant impact assessment was undertaken for the species.

5.3.4.4 Hooded Robin

Although the Proposal Area supports habitat for the hooded robin, in the ACT the species has shown a consistent steady decline over recent decades (Bounds *et al.* 2021) and is now in very low abundance in the Canberra region and has been lost from peri-urban woodland sites. Surveys conducted as part of the Woodland Bird Monitoring Project by the Canberra Ornithologists Group (COG) have not recorded the species since 2014 (Bounds *et al.* 2021).

The Proposal would remove 4.9 ha of grassy woodland habitat that may provide foraging and breeding opportunities for the hooded robin. However, the species has not previously been recorded from the vicinity of the Impact Area. Given the large distribution of the sub-species and the minimal extent of habitat removal, the Proposal is not likely to have a significant impact on this species.

Refer to **Appendix C** for the full significant impact assessment.

5.3.4.5 Scarlet Robin

The Proposal would remove 4.9 ha of potential grassy woodland habitat that may provide foraging and breeding opportunities for the scarlet robin. However, the species has not previously been recorded from the vicinity of the Impact Area. Given the large distribution of the sub-species and the minimal extent of habitat removal, the Proposal is unlikely to have a significant impact on this species.

As the scarlet robin is listed under the NC Act and not the EPBC Act, no significant impact assessment was undertaken for the species. However, it is considered that the assessment undertaken for the hooded robin would be applicable (see **Section 5.3.4.4**).

5.3.4.6 Diamond Firetail

In the ACT, the diamond firetail is considered an uncommon breeding resident and occurs infrequently at a small number of locations. In the ACT Woodland Bird Monitoring Project, the species showed no overall trend in reporting rate from 1998-2019, however, a significant decrease in reporting rate was noted from 2012 to 2017, corresponding with the end of a wetter period and start of a drier period (Bounds *et al.* 2021).

The clearing of native vegetation is the primary reason for the decline of the diamond firetail (Hodder *et al.* 2021). The replacement of native perennial grasses with exotic annual grasses has led to widespread degradation of remaining habitat (Ford 2011).

The Proposal would remove 4.9 ha of grassy woodland habitat that may provide foraging and breeding opportunities for the diamond firetail. No individuals were recorded utilising the habitat during diurnal bird surveys conducted across the Proposal Area, however the species has previously been recorded in the immediate vicinity at the eastern end of the Proposed Alignment. Given the minimal amount of vegetation to be removed and the remaining habitat in the broader area, it is considered that the Proposal is unlikely to have a significant impact on diamond firetail.

Refer to **Appendix C** for the full significant impact assessment.

5.3.4.7 Southern Whiteface

Southern whiteface is considered an uncommon breeding resident in the ACT and occurs in very low numbers at few locations. In the ACT Woodland Bird Monitoring Project, the species showed a small decline in reporting rate from 1998-2019 with a significant decline in 2009-2014 (Bounds *et al.* 2021).

The Proposal would remove 4.9 ha of grassy woodland habitat that may provide foraging and breeding habitat for the southern whiteface. The species was recorded near the western end of the Proposed Alignment but outside of the Impact Area during diurnal bird surveys. Given the minimal amount of vegetation to be removed and the remaining habitat in the broader area, it is considered that the Proposal is unlikely to have a significant impact on the southern whiteface.

Refer to **Appendix C** for the full significant impact assessment.

5.3.4.8 Painted Honeyeater

Painted honeyeater (*Grantiella picta*) is sparsely distributed from the eastern Northern Territory and north-western Queensland through to south-eastern Australia, predominantly on or west of the Great Dividing Range. The species is thought to be migratory, breeding in the southern part of its range in spring and summer before dispersing north during the non-breeding season. It is also considered to be partly nomadic in parts of its range, with movements driven by the abundance of feeding resources (Watson *et al.* 2021).

Painted Honeyeater inhabits a range of woodlands and shrublands, particularly Weeping Myall, Brigalow, box-gum woodlands, and box-ironbark forests that support a high density of mistletoe, particularly of the genus *Amyema* (DAWE 2021c). The species appears to prefer mistletoe as a nest substrate and selects nest sites in habitats where mistletoe prevalence and parasitism rates are high (Barea 2008).

In the ACT, painted honeyeater may visit for short periods over late spring and summer and is considered a rare breeding visitor to the region (COG 2018). Observations have been sporadic and widespread across the ACT. Records of individuals being recorded in Stony Creek Nature Reserve and Uriarra during 2013-2014 are the nearest observations to the Proposal Area (ACT Government, 2019b).

The Proposal would remove 4.9 ha of potential grassy woodland habitat for painted honeyeater. No individuals were recorded utilising the habitat during diurnal bird surveys conducted across the Impact Area. The painted honeyeater is a rare visitor to the ACT. Given the minimal amount of vegetation to be removed and the remaining habitat in the broader area, it is considered that the Proposal is unlikely to have a significant impact on painted honeyeater.

Refer to **Appendix C** for the full significant impact assessment.

5.3.4.9 Varied Sittella

The Proposal would remove 4.9 ha of grassy woodland habitat that may provide foraging and breeding opportunities for varied sittella. The species has not previously been recorded from the vicinity of the Impact Area. Given the large distribution of the sub-species and the minimal extent of habitat removal, the Proposal is unlikely to have a significant impact on this species.

As the varied sittella is listed under the NC Act and not the EPBC Act, no significant impact assessment was undertaken for the species. However, it is considered that the assessment undertaken for the hooded robin would be applicable (see **Section 5.3.4.4**).

5.3.5 Migratory Birds

5.3.5.1 Rainbow Bee-eater

Rainbow bee-eater is distributed across much of mainland Australia. Because of its widespread distribution and its ability to undertake long-distance movements, the extent of occurrence within Australia has not been estimated. The number of locations that rainbow bee-eater occurs in is unknown, however the population size is assumed to be reasonably large based on reporting rates for the species. The mobility of the species suggests that it is unlikely that any local or regional population would be genetically isolated and published data indicates that the distribution of the rainbow bee-eater is not severely fragmented, and is currently considered to be a low priority for management. The population size and population trends have not been quantified, but the population size is assumed to be reasonably large, and there is little documented evidence of population declines (DCCEW, 2023). Further research is required to determine the population size and population trends, and to determine threats and their actual or potential impacts before any management programs can be implemented meaningfully.

The only actual, identified threat to rainbow bee-eater is the introduced cane toad (*Bufo marinus*), which does not occur within the ACT region. No other actual threats to the survival of the species have been identified.

For these reasons it is considered unlikely that the Proposal would have a significant impact on this species. It should be noted also that rainbow bee-eater is no longer listed under the EPBC Act as a migratory species but has been considered for completeness against the EIS Scoping Document. No significant impact assessment has been undertaken for the species.

5.3.5.2 White-throated Needletail

Due to the dispersive and aerial nature of white-throated needletail and its large area of occupancy, the direct impact from development within the Impact Area is considered unlikely to have a significant impact upon the white-throated needletail.

Refer to **Appendix C** for additional information on the significant impact assessment.

Due to the modified airspace, there may be a risk of mortality due to collision with powerlines. This is discussed further in **Section 5.6**.

5.3.6 Native Burrowing Animals

The EIS Scoping Document requires that native burrowing animals be considered in the EIS. This was clarified to relate to species such as common wombat (*Vombatus ursinus*) and rakali (*Hydromys chrysogaster*).

Habitat for the common wombat includes temperate forests and grasslands that are widespread in south-eastern Australia, including the eastern parts of New South Wales and Victoria, western and north-eastern ACT and all of Tasmania. Its distribution depends on the availability of burrowing sites located near food sources, but the species is known to travel several kilometres to visit certain sites with short grass. It grazes on coarse native grasses, sedges, rushes, succulent plant roots and tubers, and pasture grasses. Due to the vast habitat range and abundance of food sources available, no assessment of habitat has been undertaken within the Impact Area and the Proposal is not expected to impact the species.

Rakali is distributed throughout Australia and has habitat burrows on the embankments of permanent waterbodies. It prefers low banks with flat and dense vegetation near the water edge. The home range varies between 1 and 4 km from a waterway. The rakali has a varied diet including fish, aquatic insects, aquatic plants, crayfish, clams, mussels, crabs, frogs, turtles and sometimes water birds and their eggs. It breeds within its home range and nests in burrows, sunken logs and reeds. Due to the position of the Proposal, none of these features will be present in the Impact Area and the Proposal is not expected to impact the species.

5.4 Threatened Flora

No threatened flora species assessed as having a moderate or high likelihood of occurrence were detected during species surveys in the Impact Area. The Proposal is therefore not expected to impact any threatened flora species.

5.5 Habitat Connectivity

The Proposal would lead to the loss of up to 0.08 ha of BGW that supports canopy trees. In total, six trees would be removed, and a further 10 would require modification (canopy reduction) to maintain standards required under and adjacent to overhead powerlines. This impact is restricted to the eastern end of the Proposed Alignment where the transmission lines would be closest to the ground, east of the Molonglo River.

The Proposal has been designed to minimise impacts on native vegetation (with particular focus on minimising impacts on mature and hollow-bearing trees) and only minimal impacts on tree and tree-canopy connectivity are therefore likely to occur. In particular, the Proposal would not impact any trees within areas of highest connectivity value (i.e. along riparian corridors). The trees would be removed from an area of low connectivity value for woodland and forest birds and moderate connectivity value for generalist species. This is illustrated in the ACTmapi habitat connectivity values mapping, reproduced in **Figure 4.2** to **Figure 4.4**.

The majority of EPBC Act and NC Act listed BGW that will be impacted is in a derived form, with impacts undertaken in small sections along the Proposed Alignment. It is considered unlikely that the Proposal would fragment or increase fragmentation of habitat within the Proposal Area.

5.6 Indirect Impacts

Native vegetation and habitat surrounding the Study Area may be indirectly impacted by the proposed works if appropriate mitigation and management measures are not implemented. Potential indirect impacts are associated with the spread of invasive species, noise and vibration, erosion and sedimentation, dust, and waste generation during construction, while potential increased predation efficiency and predator abundance due to the erection of poles and lines adjacent to grasslands, and potential increased mortality of birds due to collisions with powerlines, could occur once the Proposal is operational. These risks are discussed below.

Measures to manage indirect impacts from construction are described in **Table 6.1**. Implementation of these measures would help ensure that retained vegetation and habitat values do not decline as a result of the Proposal.

5.6.1 Spread of Invasive Species Off-site

Invasive plants may inadvertently be brought into or spread beyond the Impact Area on equipment and machinery during Proposal construction. A total of six weed species listed under the ACT *Pest Plants and Animals Act 2005* including one WoNS are currently present in the Impact Area (see **Section 4.4.6**). The risk of further spread of these weed species from the Impact Area to adjacent areas and the risk of introduction and spread of different weed species would be mitigated through implementation of weed management measures (**Table 6.1**). Implementation of such measures would substantially reduce the potential for adverse impacts on BGW, NTG, pink-tailed worm-lizard habitat, golden sun moth habitat, gang-gang cockatoo habitat, superb parrot habitat, hollow-bearing and mature trees adjacent to the Impact Area.

Works associated with the Proposal are unlikely to result in the introduction of any invasive fauna species.

5.6.2 Noise and Vibration

Due to the nature of this potential indirect impact and considering the specific listed ecological values that are present adjacent to the Impact Area (namely, pink-tailed worm-lizard, golden sun moth, gang-gang cockatoo and superb parrot), noise and vibration resulting from construction and operation of the Proposal is unlikely to have an adverse indirect impact. However, the range of noise and vibration control measures to be implemented for reducing impacts on people (**Table 6.1**) would also help ensure no adverse impacts occur on threatened species.

5.6.3 Erosion, Sedimentation, and Dust

Erosion and sedimentation have the potential to impact ecological values adjacent to the Impact Area. This risk would be mitigated through development and implementation of an Erosion and Sediment Control Plan during the construction phase, to ensure that adjacent box-gum woodland, natural temperate grassland, hollow-bearing trees and mature trees, threatened species habitat and other ecological values are not adversely impacted by overland surface water flows or sediment movement from the Impact Area (**Table 6.1**).

Dust impacts have the potential to adversely impact ecological values during ground disturbing works during construction. Potential impacts include dust deposition on vegetation which could reduce vegetation health and growth and affect vegetation integrity. The CEMP would include measures to minimise the potential for adverse dust impacts.

5.6.4 Waste

Waste generated by the Proposal has the potential to impact ecological values adjacent to the Impact Area, including BGW, NTG and threatened species habitat adjacent. Risks associated with the use and storage of fuel, and management of waste from new equipment and from infrastructure being removed (e.g. tower sections) would be managed through the implementation of standard waste management measures to be detailed in the CEMP (**Table 6.1**). Adherence to the CEMP would ensure the prevention of adverse impacts on ecological values adjacent to the Impact Area.

5.6.5 Increased Predation Efficiency and Predator Abundance Due to the Erection of Poles and Lines Adjacent to Grasslands

Overhead transmission lines can be used as a resource by some bird species, particularly birds of prey. These species may use the lines and associated towers or poles as perches for foraging and as a nesting substrate. Birds of prey, such as brown falcon and nankeen kestrel, often use transmission lines and towers as foraging perches (Fuentes, 2005). There is very limited information available on the impact of transmission lines on the abundance and behaviour of raptors in Australia.

In the Proposal Area, the risk of increased predator abundance and efficiency because of the construction of poles and lines is considered low. The construction of the transmission lines is the realignment of existing lines and is not introducing a novel feature to the landscape. It would, however, move the area of potential impact to a different part of the landscape and there may be period of adjustment as the faunal community acclimatises to the new alignment. Additionally, within the Proposed Alignment and broader landscape, grassland areas are interspersed with areas of open woodland and scattered trees which already provide existing foraging perches and nesting substrates for predatory birds.

5.6.6 Strike with Overhead Powerlines

Collision with overhead transmission lines and associated infrastructure can be a significant source of mortality for some bird species. Species considered most at risk are large terrestrial and wetland birds, as well as some small, fast-flying species (Jenkins *et al.* 2010). Birds that often fly at heights where transmission lines are located, and are not familiar with local habitat features, have the greatest collision risk with transmission line infrastructure. Such birds include raptors, owls, cockatoos, and waterbirds. For species that are tied to terrestrial habitats, such as canopy, understorey or ground feeders, the risk of collision is low as they rarely fly at heights where they may encounter transmission lines.

In the Proposal Area, species considered at potential risk from collision with transmission lines include little eagle, superb parrot, gang-gang cockatoo and white-throated needletail. Neither the Superb Parrot Recovery Plan (CoA, 2021), Gang-gang Cockatoo Conservation Advice (DAWE, 2022) or the ACT Action Plan for Little Eagle (ACT Government, 2013) list the risk of collision with transmission lines as a threat to these species. Gang-gang cockatoo and superb parrot are unlikely to routinely fly at transmission line height whereas the little eagle would spend considerable time at heights where the risk of collision would be greater. White-throated needletail is predominantly aerial and highly mobile and there is the constant threat of collision with overhead lines when in Australia, however collision with transmission lines affects only a few individuals and is not a threat to the species overall (DCCEEW 2022).

For the Proposal Area, the risk of collision with overhead transmission lines is considered low. The construction of the transmission line is the realignment of existing lines and is not introducing a novel feature to the landscape. However, there would still be a risk of collision as birds local to the area become accustomed to their presence. This risk should reduce over time. Habitat in the area is already somewhat fragmented and the greatest area of connectivity is along the Murrumbidgee and Molonglo River corridors. The new transmission lines would be at their highest point above the rivers and the risk to birds moving along the corridors should be low.

6.0 Avoidance and Mitigation

6.1 Avoidance

Areas in the Proposal Area with high ecological values have largely been avoided through site selection and design. The location and design of the Proposed Alignment has been developed through an iterative options assessment process over several years to reduce environmental, cultural, and social impacts. Initially, four different realignment corridors were considered (A, B, C and D), as shown in Section 2.4 of the EIS:

- A. The northern-most option, extending from the ACT/NSW border to Stockdill Substation, crossing the Murrumbidgee River downstream of its confluence with the Molonglo River and north of the Lower Molonglo Water Quality Control Centre (LMWQCC). The Line 7 diversion was on the NSW side of the border, but the Line 1 diversion was on the ACT side.
- B. Similar to option A, but with both Line 1 and Line 7 diverting from the existing lines on the NSW side of the border.
- C. Located south of options A and B and diverting from the existing lines further west of option B. Crossed both the Molonglo and Murrumbidgee Rivers upstream of their confluence, passing to the north of the LMWQCC.
- D. The southern-most option, crossing both the Molonglo and Murrumbidgee Rivers south of option C and passing to the south of the LMWQCC. The Line 7 diversion was on the NSW side of the border, but the Line 1 diversion was on the ACT side.

Options A, B and D were rejected for various reasons with only Option C identified for further consideration. Option C was the only option considered acceptable by all impacted landholders, albeit with further investigation into visual, ecological and heritage impacts and minor alignment adjustments to avoid some areas (e.g. the LMWQCC property).

Five options based on the Option C alignment corridor were then identified, four of which were rejected for cultural reasons. A concept design was then prepared for the preferred alignment, which included three alternatives for the north-western section adjacent to the ACT/NSW border which were then investigated for ecological constraints.

Following initial field investigations, the Proposed Alignment used as the basis for this report was selected.

The final Proposed Alignment was specifically positioned to avoid impacts on mature hollow-bearing trees (in particular trees taller than 6 m). All trees to the west of the Molonglo River corridor have been avoided, while impacts on trees in the eastern portion of the Proposed Alignment (east of the Molonglo River) have been minimised such that six trees would be removed, and a further 10 would require modification (canopy reduction) to maintain standards for trees under or adjacent to powerlines. The final positioning of the new tower footings was also determined through avoiding impacts on patches of high quality, native vegetation, in particular ecological communities listed as threatened under the EPBC Act and NC Act.

The location of the tower footings means that almost all high quality BGW has been avoided, and impacts on lower quality BGW have been minimised. The avoidance of BGW is consistent with the BGW Recovery Plan, with the objective to achieve no net loss in extent and condition of the ecological community throughout its geographic distribution. Impacts on NTG have been minimised to 0.27 ha which includes a 30 m buffer as per the NTG Conservation Advice. The avoidance of NTG is consistent with the NTG Conservation Advice, with the conservation priority to avoid clearance and fragmentation of the ecological community as much as possible.

6.2 Mitigation

The Proposal would involve implementation of industry best practice measures to mitigate and manage direct and indirect impacts on biodiversity where possible (**Table 6.1**). Each of these control measures would contribute to the protection of habitat adjacent to the Impact Area and within the broader Proposal Area. These mitigation measures have been developed to ensure they are consistent with all relevant Commonwealth and Territory statutory documents, including conservation advices and recovery plans. In particular:

- The National Recovery Plan for White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (NSW Government, 2011) and Approved Conservation Advice for the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (TSSC, 2023).
- The Approved Conservation Advice (including listing advice) for Natural Temperate Grassland of the South Eastern Highlands (EC152) (TSSC, 2016).
- National Recovery Plan for Superb Parrot *Polytelis swainsonii* (DAWE, 2021b) and Conservation Advice *Polytelis swainsonii* superb parrot (TSSC, 2016a).
- Conservation Advice for *Callocephalon fibriatum* (Gang-gang Cockatoo) (DAWE, 2022).
- Conservation Advice *Aprasia parapulchella* Pink-tailed worm-lizard (TSSC, 2015).
- Conservation Advice for *Synemon plana* (Golden Sun Moth) (DAWE, 2021a).

The mitigation measures have also been developed to ensure they are not inconsistent with the relevant threat abatement plans (TAPs). In particular, the mitigation measures would ensure that the Proposal:

- Does not result in an increase in rabbit numbers within the Impact Area in accordance with the *Threat abatement plan for competition and land degradation by rabbits* (DoEE, 2016).
- Does not result in any actions that would cause an increase in feral pigs in accordance with the *Threat Abatement Plan for predation, habitat degradation, competition, and disease transmission by feral pigs* (*Sus scrofa*) (DoEE, 2017).
- Results in a reduction in the spread of weeds and pathogens such as *Phytophthora cinnamomi* in accordance with the *Threat abatement plan for disease in natural ecosystems caused by Phytophthora cinnamomi* (DoEE, 2018).

The mitigation measures would also ensure that the Proposal does not result in an increase in the spread of cane toads in accordance with the *Threat abatement plan for the biological effects, including lethal toxic ingestion, caused by cane toads* (DSEWPC, 2011). It is noted however, that the Proposal Area is several hundred kilometres from the predicted area of occurrence of the cane toad, as identified in the TAP, thus cane toads are not considered to pose a particular risk to the Proposal. This TAP has been considered as it is identified as relevant to BGW (DCCEE, 2024).

The Commonwealth statutory documents were all accessed via the SPRAT database to ensure the most current versions of the documents were used.

Table 6.1 details the specific measures that would be implemented to mitigate and manage biodiversity impacts. The measures would be documented in the CEMP. The persons and/or entity responsible for implementing these mitigation measures would be designated in the CEMP. The plans would be adaptive, with the effectiveness of the control measures monitored continuously to identify opportunities for improvement.

The overall effectiveness of control measures to achieve the desired biodiversity outcomes is considered high, as the measures are largely linked to standard construction management requirements, such as site access control and soil and weed management. Salvage prior to or during construction for fauna and hollow-bearing trees is frequently undertaken in the ACT, and standard procedures are available to ensure these activities are undertaken in an effective manner.

Table 6.1 Measures for Mitigating and Managing Potential Biodiversity Impacts

Mitigation Measure	Timing	Responsibility	Description	Relevant Impact Mitigated / Desired Outcome	Likely Effectiveness	Monitoring
Demarcation of approved clearance boundaries and avoidance areas	Prior to clearance during construction	GJV	All contractors would be informed of the Impact Area boundary and any relevant approval conditions prior to construction commencing.	Avoidance of inadvertent clearance of BGW, NTG, habitats and other any ecological values adjacent to the Impact Area.	High	- Site audit prior to commencement of construction to confirm clearance boundaries are marked correctly. - Site inductions and regular toolbox talks would reiterate exclusion zones.
Fencing and access control	Construction	GJV	- Signage and exclusion fencing would be used during construction to identify areas approved for clearance and areas not to be cleared, and to prevent vehicle access into no-go areas. - Where possible, fencing would not include barbed wire on the top line of the fence (if any) prior to commencing construction.	- Avoidance of inadvertent clearance of BGW, NTG, habitat and other ecological values adjacent to the Impact Area. - Minimisation of impacts on native fauna species by minimising the use of barbed-wire fences.	High	- Site inductions and regular toolbox talks would reiterate exclusion zones. - Monitoring checklists in the CEMP would include exclusion fencing and checking for evidence of unauthorised access.
Pest plant and animal management	Construction	GJV	Fauna spotter catchers would be present during the clearing of native vegetation, particularly any hollow-bearing trees, to ensure that no live animals or nests are harmed during construction. Tree clearance and lopping would occur outside of the breeding season for superb parrot and gang-gang cockatoo (September to January).	- Management of the risk of fauna mortality and nest disturbance during habitat clearance. - Minimisation of risk of introduction and spread of weeds from the Impact Area into adjacent BGW, NTG, habitats and other	High	Monitoring checklists in the CEMP would include regular visual inspections for weed establishment, evidence of pest animals (burrows, scats, other damage) and remedial actions.

Mitigation Measure	Timing	Responsibility	Description	Relevant Impact Mitigated / Desired Outcome	Likely Effectiveness	Monitoring
			- Invasive weeds in the Proposal Area would be managed annually using chemical and/or physical methods in accordance with the ACT Weeds Manual (Southern ACT Catchment Group, 2023). - Pest animals in the Proposal Area would be managed in accordance with the ACT Pest Animal Strategy (ACT Government, 2010), for example: - Control of feral pigs, e.g. through trapping and/or 1080 baits. - Control of rabbits, e.g. through warren destruction or poisoning. - Drones would be used to carry new conductors between towers for stringing across sensitive ecological areas, including the Murrumbidgee and Molonglo River corridors and no-go areas.	- ecological values adjacent to the Proposal Area. - Minimisation of risk of impacts from pest animals in the Proposal Area and adjacent habitats.		- During construction, vehicle movement and topsoil management would be the focus of monitoring. - Post construction, rehabilitated areas would be monitored regularly for 12 months, with weeds removed as identified. Following initial establishment, less frequent but regular monitoring would continue.
Phytophthora cinnamomi management	Construction	GJV	<i>Phytophthora cinnamomi</i> is not known to occur within the Proposal Area. Nevertheless, protocols would be implemented to reduce the potential risk of <i>Phytophthora cinnamomi</i> spreading into the Proposal Area or broader landscape, consistent with advice from the EPSDD.	Minimisation of risk of introduction and spread of <i>Phytophthora cinnamomi</i> from the Proposal Area into adjacent box gum woodland.	High	A monitoring program would be developed concurrently with the development of risk management protocols and would be outlined in the CEMP.
Erosion and sediment control	Construction	GJV	The CEMP would be accompanied by a detailed Erosion and Sediment Control Plan (ESCP) that details the erosion	Minimisation of potential indirect impacts resulting from	High	A program to monitor the effectiveness of the erosion and

Mitigation Measure	Timing	Responsibility	Description	Relevant Impact Mitigated / Desired Outcome	Likely Effectiveness	Monitoring
			and sediment controls to be implemented during construction of each component of the Proposal. The ESCP would detail the erosion and sediment controls to be implemented during Proposal construction, including: ○ Sediment fences to be installed downslope of areas to be disturbed. ○ Stabilised site access points to be installed as required to reduce the tracking of soil material off-site and to provide a stable surface for vehicle access to the construction site. ○ Clean water diversions to be installed as an earth bank upslope of areas to be disturbed. ○ Level spreaders to be installed at the end of the clean water diversions to dissipate concentrated flow paths where required. • The CEMP would also document the controls to be implemented for stockpile and spoil management, including separation of materials/waste types, sediment controls and stabilisation.	erosion and sedimentation on BGW, NTG, habitats and other ecological values adjacent to the Proposal Area. • Provides stability of the land surface and downslope water quality.		sedimentation controls would be outlined in the ESCP and would be subject to approval as part of the CEMP. • The effectiveness of erosion controls would be monitored regularly during construction through CEMP monitoring checklists, particularly following rain events. • Post construction monitoring would focus on successful revegetation and stabilisation.

Mitigation Measure	Timing	Responsibility	Description	Relevant Impact Mitigated / Desired Outcome	Likely Effectiveness	Monitoring
Noise and vibration management	Construction	GJV	- A Construction Noise and Vibration Management Plan (CNVMP) would be developed for the Proposal as a sub-plan to the CEMP. The CNVMP would contain controls for minimising noise and vibration generated during construction which could impact nearby threatened species, such as: - Low noise equipment and construction methodologies to be selected where possible. - Equipment and vehicles to be turned off when not in use. - Equipment and vehicles to be regularly serviced in accordance with manufacturer requirements. - Acoustic covers on machine engines to remain closed at all times. - Plant to be located and orientated to direct noise away from sensitive habitats where possible. - Noisy machinery to not be operated simultaneously or in a concentrated location where possible (e.g. for earthmoving and ground-impacting operations). In particular, overlapping construction stages would be undertaken in different locations	Minimisation of potential indirect impacts resulting from noise and vibration on fauna adjacent to the Proposal Area.	High	- A program to monitor the effectiveness of the noise and vibration controls would be outlined in the CNVMP and would be subject to approval as part of the CEMP. - Effectiveness of noise and vibration controls would be monitored regularly during construction through CEMP monitoring checklists, particularly during spring which coincides with the breeding season of threatened bird species.

Mitigation Measure	Timing	Responsibility	Description	Relevant Impact Mitigated / Desired Outcome	Likely Effectiveness	Monitoring
			of the Proposal Area to minimise impacts on sensitive habitats. Reversing of vehicles and plant to be avoided where possible, to minimise the noise emitted from reverse alarms.			
Site rehabilitation	Progressively throughout construction and at completion of construction	GJV	The CEMP would include a Site Rehabilitation Plan that details how the Proposal Area would be progressively rehabilitated throughout construction, including through the re-seeding of native grasses.	Rehabilitation of impacted areas.	High	- The Site Rehabilitation Plan / CEMP would outline the program to monitor the effectiveness of rehabilitation works against the defined management objectives. - Any improvement in the condition of the site would be measured against baseline conditions, which would be established prior to commencement of rehabilitation works. - Rehabilitation works would be monitored for a set period to ensure successful revegetation and stabilisation.

7.0 Conclusion

A biodiversity assessment within the Proposed Alignment and Impact Area was completed via desktop assessment and on-site assessment of ecological values. The assessment identified that 4.43 ha of native vegetation comprising 10 vegetation zones within three plant community types (ACT16 *Eucalyptus melliodora* – *E. blakelyi* Tableland Grassy Woodland, ACT01 Dry Tussock Grassland and ACT25 *Eucalyptus macrorhyncha* Tableland Grass/Shrub Forest). This represents an impact on 8% of native vegetation within the Proposal Area, based on ACTmapi (2023) mapping. A total of 16 mature trees may be impacted by the Proposal (six would be removed and an additional 10 would require canopy reduction).

A total of 2.37 ha of EPBC Act listed *White Box – Yellow Box – Blakely’s Red Gum Grassy Woodlands and Derived Native Grasslands* and NC Act listed *Yellow Box – Blakely’s Red Gum Grassy Woodland* critically endangered ecological community would be impacted by the Proposal. This represents 13% of potential threatened woodland in the Proposal Area, based on ACTmapi (2023) mapping. Due to the small extent (0.1 ha) supporting high quality understorey and the generally small scale of impact relative to the extensive areas of box-gum woodland remaining in the region, the Proposal is considered unlikely to have a significant impact on the threatened ecological community.

Less than 0.01 ha of the critically endangered EPBC Act listed *Natural Temperate Grassland of the South Eastern Highlands* and NC Act listed *Natural Temperate Grassland* would be impacted by the Proposal. This represents 0.3% of potential natural temperate grassland in the Proposal Area, based on ACTmapi (2023) mapping. As the patch was of high to very high condition and is in close proximity to exotic grasslands that pose a threat to the survival of the ecological community, a buffer zone has been established consistent with the NTG Conservation Advice. Therefore, the total area of NTG that would be impacted by the Proposal, including the buffer zone, is 0.55 ha. It is considered unlikely that the Proposal would fragment or increase fragmentation of NTG due to the presence of adjacent exotic grassland and the relatively small size of the impacted area. As such, it is considered unlikely that the Proposal would have a significant impact on the threatened ecological community.

The Proposal would remove grassy woodland habitat that may provide foraging and breeding opportunities for a range of threatened woodland bird species, including superb parrot, gang-gang cockatoo, hooded robin, scarlet robin, diamond firetail, varied sitella, white-winged triller, painted honeyeater and southern whiteface. For two of these threatened birds, superb parrot and gang-gang cockatoo, it was determined that impacts may be significant due to the loss of habitat that meets the definition of ‘habitat critical to the survival of the species’.

The Proposal would require the removal of three potential superb parrot movement trees located in the Superb Parrot Tree Assessment Area identified by the Conservator’s office as critical for superb parrot movement. An additional six movement trees would require canopy modification. The removal of foraging habitat and the loss or modification of trees identified as critical for superb parrot movement indicates that the Proposal may have a significant impact on the superb parrot. All native vegetation within the Impact Area is considered suitable foraging habitat for the superb parrot (4.9 ha made up of multiple areas distributed along the Proposed Alignment).

The Proposal would require the removal of six potential gang-gang cockatoo foraging trees, two of which are potential breeding trees. An additional 10 foraging trees would require canopy modification, one of which is a potential breeding tree. The removal of potential breeding and foraging habitat for gang-gang cockatoo indicates that the Proposal may have a significant impact on the species.

ACTmapi (2023) habitat and connectivity modelling indicates that the Impact Area includes areas of high connectivity value along the Murrumbidgee River for generalist, forest and woodland bird species. However, as the Proposal would not impact the native vegetation associated within the river corridors, it is unlikely to increase fragmentation of these connectivity links. Trees to be removed by the Proposal are located in an area of low connectivity value for woodland and forest birds and moderate connectivity value for generalist species.

A total of 1.09 ha of potential pink-tailed worm-lizard habitat would be impacted by the Proposal across 20 separate patches, only 0.15 ha of which is high quality. Considering the small area, low quality and number of separate patches of potential habitat to be impacted, the Proposal is unlikely to have a significant impact on pink-tailed worm-lizard.

A total of 4.09 ha of potential golden sun moth habitat would be impacted by the Proposal, only 0.33 ha of which is high quality. There are no records of golden sun moth occurring in the Impact Area, and the species was not found during targeted surveys across multiple years. The potential golden sun moth habitat in the Impact Area is not considered habitat critical to the survival of the species. As such, it is unlikely that the Proposal would result in a significant impact on golden sun moth.

The habitat range of the Perunga grasshopper includes the extent of ACT01.1, ACT16.4 and ACT16.5, which contain species considered to be Perunga grasshopper habitat. Due to the cryptic nature of the species and known surveying difficulties, its presence was able unable to be confirmed. However, it has been assumed present consistent with the precautionary principle. Therefore, the impact of the Proposal on Perunga grasshopper habitat aligns with the combined area of impact on ACT01.1, ACT16.4 and ACT16.5 (2.28 ha distributed across multiple small patches along the Proposed Alignment). No potential Perunga grasshopper habitat is mapped within the Proposal Area on ACTmapi (2023).

No threatened flora species assessed as having a moderate or high likelihood of occurrence were detected during species surveys in the Impact Area. The Proposal is therefore unlikely to impact any threatened flora species.

8.0 References

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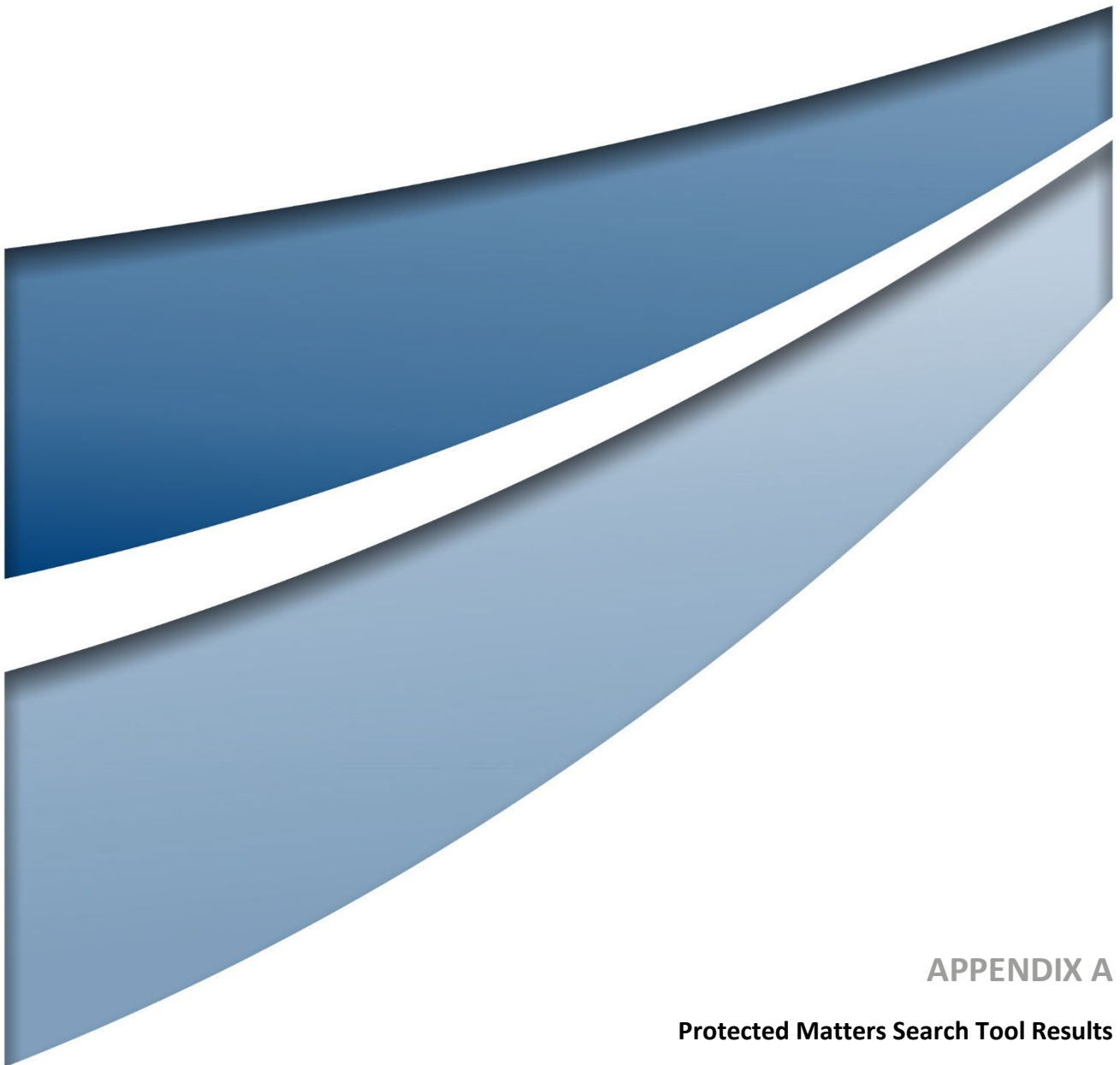
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APPENDIX A

Protected Matters Search Tool Results



Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

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

Report created: 21-Sep-2023

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

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Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance (Ramsar	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	62
Listed Migratory Species:	13

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	7
Commonwealth Heritage Places:	6
Listed Marine Species:	20
Whales and Other Cetaceans:	None
Critical Habitats:	1
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	16
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	64
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

National Heritage Places			[Resource Information]
Name	State	Legal Status	Buffer Status
Natural			
Australian Alps National Parks and Reserves	ACT	Listed place	In buffer area only

Wetlands of International Importance (Ramsar Wetlands)			[Resource Information]
Ramsar Site Name	Proximity		Buffer Status
Banrock station wetland complex	700 - 800km upstream from Ramsar site		In feature area
Hattah-kulkyne lakes	500 - 600km upstream from Ramsar site		In feature area
Riverland	700 - 800km upstream from Ramsar site		In feature area
The coorong, and lakes alexandrina and albert wetland	800 - 900km upstream from Ramsar site		In feature area

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

Community Name	Threatened Category	Presence Text	Buffer Status
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community known to occur within area	In buffer area only
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community likely to occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.			
Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
CRUSTACEAN			
Euastacus rieki Riek's Crayfish [83155]	Endangered	Species or species habitat may occur within area	In buffer area only
FISH			
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Critically Endangered	Species or species habitat may occur within area	In feature area
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat likely to occur within area	In feature area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat known to occur within area	In feature area
FROG			
Crinia sloanei Sloane's Froglet [59151]	Endangered	Species or species habitat may occur within area	In feature area
Litoria booroolongensis Booroolong Frog [1844]	Endangered	Species or species habitat likely to occur within area	In feature area
Litoria castanea Yellow-spotted Tree Frog, Yellow-spotted Bell Frog [1848]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area	In feature area
Pseudophryne pengilleyi Northern Corroboree Frog [66670]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
INSECT			
Keyacris scurra Key's Matchstick Grasshopper [89739]	Endangered	Species or species habitat may occur within area	In buffer area only
Synemon plana Golden Sun Moth [25234]	Vulnerable	Species or species habitat known to occur within area	In feature area
MAMMAL			
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
PLANT			
Ammobium craspedioides Yass Daisy [20758]	Vulnerable	Species or species habitat known to occur within area	In feature area
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area	In feature area
Calotis glandulosa Mauve Burr-daisy [7842]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Corunastylis ectopa Brindabella Midge-orchid, Ectopic Midge-orchid [78973]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Eucalyptus aggregata Black Gum [20890]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lepidium aschersonii Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium ginninderrense Ginninderra Peppercress [78474]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat likely to occur within area	In feature area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat known to occur within area	In feature area
Muehlenbeckia tuggeranong Tuggeranong Lignum [64934]	Endangered	Species or species habitat may occur within area	In feature area
Pimelea bracteata [8125]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Pomaderris cotoneaster Cotoneaster Pomaderris [2043]	Endangered	Species or species habitat likely to occur within area	In feature area
Pomaderris pallida Pale Pomaderris [13684]	Vulnerable	Species or species habitat known to occur within area	In feature area
Prasophyllum petilum Tarengo Leek Orchid [55144]	Endangered	Species or species habitat known to occur within area	In feature area
Pterostylis oreophila Blue-tongued Orchid, Kiandra Greenhood [22903]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Rutidosis leptorhynchoides Button Wrinklewort [67251]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Senecio macrocarpus Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Swainsona recta Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat known to occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Viola improcera Dwarf Violet [3879]	Endangered	Species or species habitat may occur within area	In buffer area only

REPTILE			
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat known to occur within area	In feature area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat known to occur within area	In feature area
Liopholis montana Mountain Skink [87162]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Listed Migratory Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name State Buffer Status

Defence

Defence - ADC / JSSC - WESTON [80034]	ACT	In buffer area only
Defence - BELCONNEN RADIO STATION ; BELCONNEN COMMUNICATIONS STATION [80039]	ACT	In buffer area only

Education, Science and Training - CSIRO

Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [15614]	NSW	In buffer area only
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [12329]	NSW	In buffer area only
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [12330]	NSW	In buffer area only

Unknown

Commonwealth Land - [12277]	NSW	In buffer area only
Commonwealth Land - [12276]	NSW	In feature area

Commonwealth Heritage Places [Resource Information]

Name State Status Buffer Status

Historic

Cameron Offices (Wings 3, 4 and 5, and Bridge)	ACT	Listed place	In buffer area only
Lake Burley Griffin and Adjacent Lands	ACT	Listed place	In buffer area only
Mount Stromlo Observatory Precinct	ACT	Listed place	In buffer area only
Royal Australian Naval Transmitting Station	ACT	Listed place	In buffer area only
Yarralumla and Surrounds	ACT	Listed place	In buffer area only

Natural

Synemon Plana Moth Habitat	ACT	Listed place	In buffer area only
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Listed Marine Species [Resource Information]

Scientific Name Threatened Category Presence Text Buffer Status

Bird

Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Critical Habitats		[Resource Information]	
Name	Type of Presence		Buffer Status
Lepidium ginninderrense (Ginninderra Peppercress) - Northwest corner Belconnen Naval Transmission	Listed Critical Habitat		In buffer area only

Name	Type of Presence	Buffer Status
Station, ACT		

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Aranda Bushland	Nature Reserve	ACT	In buffer area only
Black Mountain	Nature Reserve	ACT	In buffer area only
Brindabella	National Park	NSW	In buffer area only
Bullen Range	Nature Reserve	ACT	In buffer area only
Cooleman Ridge	Nature Reserve	ACT	In buffer area only
Dunlop Grassland	Nature Reserve	ACT	In buffer area only
Gossan Hill	Nature Reserve	ACT	In buffer area only
Jarramlee Grassland Reserve	Nature Reserve	ACT	In buffer area only
Kinleyside	Nature Reserve	ACT	In buffer area only
Molonglo River	Nature Reserve	ACT	In feature area
Mt Painter	Nature Reserve	ACT	In buffer area only
Namadgi	National Park	ACT	In buffer area only
Stony Creek	Nature Reserve	ACT	In feature area
Swamp Creek	Nature Reserve	ACT	In feature area
The Pinnacle	Nature Reserve	ACT	In buffer area only
Woodstock	Nature Reserve	ACT	In feature area

Regional Forest Agreements			[Resource Information]
Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.			

RFA Name	State	Buffer Status
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RFA Name	State	Buffer Status
Southern RFA	New South Wales	In feature area

EPBC Act Referrals

[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Belconnen Section 44 Block 11- Residential Towers	2023/09468		Completed	In buffer area only
Lawson North Residential Development	2022/09298		Assessment	In buffer area only
William Hovell Drive Duplication	2020/8703		Assessment	In buffer area only

Controlled action				
Abengoa Solar Project	2012/6469	Controlled Action	Completed	In buffer area only
Clarrie Hermes Drive Extension	2009/5156	Controlled Action	Post-Approval	In buffer area only
Construction of new substation and associated transmission line works, ACT	2016/7784	Controlled Action	Post-Approval	In feature area
Cotter Dam Expansion	2008/4524	Controlled Action	Post-Approval	In buffer area only
Development of future urban areas Jacka (North), Taylor and Kinlyside	2012/6350	Controlled Action	Completed	In buffer area only
dismantle & remove masts and aerials at Belconnen Naval Transmission Station	2005/2218	Controlled Action	Post-Approval	In buffer area only
Lawson South residential development	2010/5549	Controlled Action	Post-Approval	In buffer area only
MacGregor West 2 Estate	2010/5520	Controlled Action	Post-Approval	In buffer area only
Removal of Trees on National Land	2009/5204	Controlled Action	Post-Approval	In buffer area only
Soil remediation works	2008/4367	Controlled Action	Post-Approval	In buffer area only
Territory Battery Energy Storage System	2021/8884	Controlled Action	Assessment Approach	In feature area
University of Canberra Public Hospital	2013/6987	Controlled Action	Post-Approval	In buffer area only
Not controlled action				

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Belconnen Trunk Sewer Project, ACT	2018/8256	Not Controlled Action	Completed	In buffer area only
Benjamin Offices Redevelopment	2001/317	Not Controlled Action	Completed	In feature area
construct addition to Admin Annex	2004/1891	Not Controlled Action	Completed	In buffer area only
Construction of an Advanced Instrumentation and Technology Centre at the Mt Stro	2004/1748	Not Controlled Action	Completed	In feature area
construction of new admin bldg	2004/1731	Not Controlled Action	Completed	In buffer area only
Construction of office building and associated activities	2005/2383	Not Controlled Action	Completed	In buffer area only
Dunlop 4 Central Estate	2002/744	Not Controlled Action	Completed	In buffer area only
Dunlop 4 West Residential Development	2003/1055	Not Controlled Action	Completed	In buffer area only
Dunlop 5 (West) Residential Development	2007/3302	Not Controlled Action	Completed	In buffer area only
Dunlop 5 Estate	2000/37	Not Controlled Action	Completed	In buffer area only
East O'Malley Residential Estate	2003/1163	Not Controlled Action	Completed	In buffer area only
Extension to cooling towers at the rear of Old Parliament House	2004/1625	Not Controlled Action	Completed	In buffer area only
Gungaderra Creek Floodway Project	2005/1975	Not Controlled Action	Completed	In buffer area only
Gungaderra Trunk Sewer Stage 1	2003/1259	Not Controlled Action	Completed	In buffer area only
Gungahlin Drive Extension	2003/1156	Not Controlled Action	Completed	In buffer area only
Horse Park Drive Project	2001/323	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Kingston Foreshore Development - Reclamation and Filling Lake Burley Griffin	2004/1383	Not Controlled Action	Completed	In buffer area only
Land Divestment, Block 13, Section 9, Barton, ACT (bounded by Blackall Street, B	2005/2453	Not Controlled Action	Completed	In buffer area only
minor alterations to NE corner OPH	2004/1824	Not Controlled Action	Completed	In buffer area only
Molonglo 3 Water Supply Pipeline, ACT	2017/8061	Not Controlled Action	Completed	In buffer area only
National Gallery Upgrade	2001/295	Not Controlled Action	Completed	In buffer area only
Observatory Restoration Works	2004/1691	Not Controlled Action	Completed	In feature area
Recording and demolition of remains of former workshop	2004/1638	Not Controlled Action	Completed	In buffer area only
Redevelopment of Anzac Park East and West	2004/1470	Not Controlled Action	Completed	In buffer area only
Residential Housing Estate	2001/218	Not Controlled Action	Completed	In buffer area only
Residential subdivision and construction works	2003/1197	Not Controlled Action	Completed	In buffer area only
Residential Tower Development	2019/8461	Not Controlled Action	Completed	In buffer area only
Revocation of National Land status of Block 588 at Barton Hwy and Gundaroo Drive	2004/1527	Not Controlled Action	Completed	In buffer area only
Sale of land located at Blocks 11 and 13, Section 45, Division of Belconnen	2003/1049	Not Controlled Action	Completed	In buffer area only
Sale of part of Blkl3/Sct19 ACT Water Police HQ	2003/1057	Not Controlled Action	Completed	In buffer area only
Site Preparation of Inner Asset Protection Zone in three Canberra Nature Parks	2007/3531	Not Controlled Action	Completed	In buffer area only
Temporary Office Accommodation at Government House	2005/2344	Not Controlled Action	Completed	In buffer area only
upgrade mechanical services Reps & Senate Press Offices	2005/1933	Not Controlled Action	Completed	In buffer area only
Urban development in parts of the suburb of Wright and arterial road	2009/5041	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
btw Street				
Wallaroo Solar Farm	2021/8994	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Aerial baiting for wild dog control	2006/2713	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Brindabella Residential Development	2007/3734	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Canberra Centenary Trail Project	2012/6645	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Construct Bioscience Lab and assoc works	2005/2143	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Construction and operation of new National Portrait Gallery	2005/2327	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Construction of the Advanced Instrumentation & Technology Centre - Stage 2 at M	2010/5582	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
North Weston Residential Development	2011/6163	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
North Weston Residential Development, Canberra	2009/4752	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Upgrade of the Lower Molonglo Water Quality Control Centre/STP	2006/3194	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Urban development in parts of residential suburb of Coombs.	2009/5050	Not Controlled Action	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
Cotter Road		(Particular Manner)		
Referral decision				
Macgregor 3 Estate	2009/5197	Referral Decision	Completed	In buffer area only

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Please feel free to provide feedback via the [Contact us](#) page.

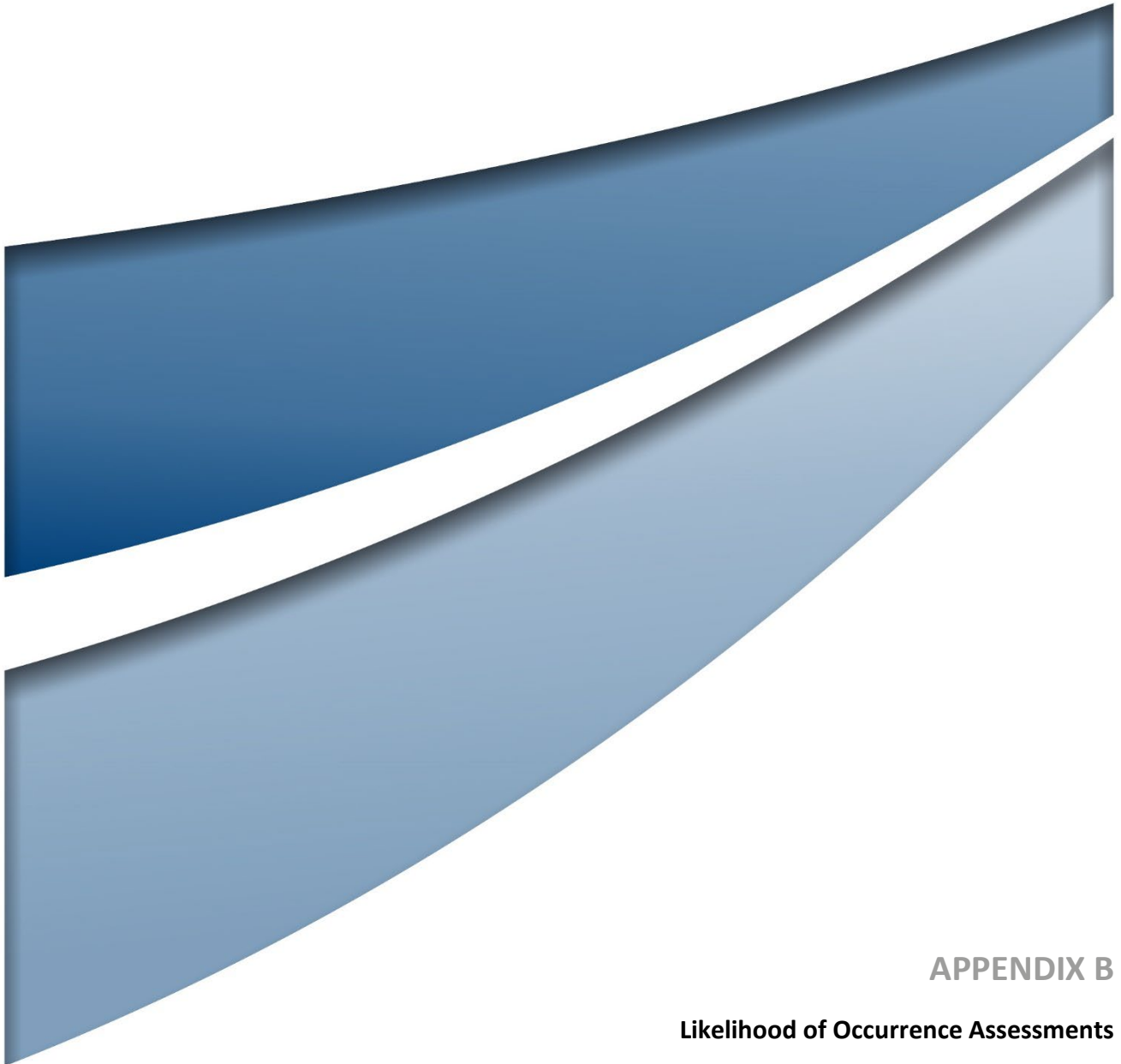
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APPENDIX B

Likelihood of Occurrence Assessments

Table B.1 Likelihood of Occurrence Assessment

Scientific Name	Common Name	EPBC Act	NC Act	Database	Likelihood of Occurrence
Threatened Ecological Communities					
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Box gum woodland	Critically endangered	Critically endangered	PMST; ACTmapi	High – Due to the position of the Impact Area relative to the current known distribution and assumed or known historic (pre-1750s) distribution of box gum woodland, the Impact Area is highly likely to support this ecological community.
Natural Temperate Grassland of the South Eastern Highlands	Natural temperate grassland	Critically endangered	Critically endangered	PMST; ACTmapi	High – Due to the position of the Impact Area relative to the current known distribution and assumed or known historic (pre-1750s) distribution of natural temperate grasslands, the Impact Area is highly likely to support this ecological community.
Birds					
<i>Actitis hypoleucos</i>	Common sandpiper	Migratory (Bonn, CAMBA, JAMBA, ROKAMBA)	Not listed	PMST; AoLA	Low – A limited amount of habitat likely to be present in the Impact Area. It is unlikely that this species occurs in the Impact Area as most populations of these species have been recorded in northern and Western Australia.
<i>Anthochaera phrygia</i>	Regent honeyeater	Critically endangered	Critically endangered	PMST; AoLA	Low – Foraging species are likely to be present within the Impact Area, however the species is very rare and unlikely to use the Impact Area for foraging and connectivity; however, the Impact Area is not considered important habitat.
<i>Aphelocephala leucopsis</i>	Southern whiteface	Vulnerable	Not listed	PMST; BioNet; AoLA; BirdLife Australia	High / Known – Potential habitat for this species exists within the Impact Area. Species has been recorded within the Impact Area.
<i>Apus pacificus</i>	Fork-tailed swift	Migratory (JAMBA, CAMBA, ROKAMBA)	Not listed	PMST; CNM; AoLA	Low – This species is a non-breeding visitor to the ACT during the summer. It may use the airspace above the Impact Area.
<i>Botaurus poiciloptilus</i>	Australasian bittern	Endangered	Endangered	PMST; AoLA	Low – Habitat for this species is unlikely to be present within the Impact Area.
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	Migratory (Bonn, JAMBA, CAMBA, ROKAMBA)	Not listed	PMST; AoLA	Low – Very little habitat for this species is likely to exist within the Impact Area. A section of the Murrumbidgee River and the Molonglo River runs through a portion of the Impact Area, which may be utilised on rare occasions.

Scientific Name	Common Name	EPBC Act	NC Act	Database	Likelihood of Occurrence
<i>Calidris ferruginea</i>	Curlew sandpiper	Critically endangered; migratory (Bonn, JAMBA, CAMBA, ROKAMBA)	Not listed	PMST; AoLA	Low – Very little habitat for this species is likely to exist within the Impact Area. A section of the Murrumbidgee River and the Molonglo River runs through a portion of the Impact Area, which may be utilised on rare occasions.
<i>Calidris melanotos</i>	Pectoral sandpiper	Migratory (Bonn, JAMBA, ROKAMBA)	Not listed	PMST	Low – Very little habitat for this species is likely to exist within the Impact Area. A section of the Murrumbidgee River and the Molonglo River runs through a portion of the Impact Area, which may be utilised on rare occasions.
<i>Collocephalon fimbriatum</i>	Gang-gang cockatoo	Endangered	Vulnerable	PMST; AoLA; BioNet	Moderate – Potential habitat for this species is likely to exist within the Impact Area. Species has been recorded within close proximity to the Impact Area, approximately 400 metres.
<i>Calyptorhynchus lathami</i>	Glossy black-cockatoo	Vulnerable	Vulnerable	PMST; AoLA; BioNet	Low – Foraging habitat for this species is unlikely to be found within the Impact Area. Species may use the Impact Area on a rare basis for foraging; however, the Impact Area is not considered important habitat.
<i>Climacteris picumnus</i>	Brown treecreeper	Vulnerable	Vulnerable	CNM; AoLA; BioNet	Low – Whilst potential habitat for this species may be present within the Impact Area, this species is generally absent from the ACT region.
<i>Daphoenositta chrysoptera</i>	Varied sittella	Not listed	Vulnerable	AoLA; BioNet; ACTmapi	Moderate – This species occurs in dry forest and woodland, which is supported in the local landscape.
<i>Falco hypoleucos</i>	Grey falcon	Vulnerable	Not listed	PMST	Low – No habitat for this species is likely to be present within the Impact Area.
<i>Gallinago hardwickii</i>	Latham's snipe	Migratory (Bonn, JAMBA, ROKAMBA)	Not listed	PMST; AoLA	Low – Very little habitat for this species is likely to exist within the Impact Area. A section of the Murrumbidgee River and the Molonglo River runs through a portion of the Impact Area, which may be utilised on rare occasions.
<i>Grantiella picta</i>	Painted honeyeater	Vulnerable	Vulnerable	PMST; CNM; AoLA	Moderate – This species generally occurs west of the Great Dividing Range and is strongly associated with the presence of mistletoe species. Habitat is likely to be present in Impact Area. The species has been recorded within close proximity to the Impact Area, approximately 500 metres.

Scientific Name	Common Name	EPBC Act	NC Act	Database	Likelihood of Occurrence
<i>Hieraetus morphnoides</i>	Little eagle	Not listed	Vulnerable	AoLA; BioNet, ACT Government	High / Known – This species has been recorded within the Impact Area.
<i>Hirundapus caudacutus</i>	White-throated needletail	Vulnerable; migratory (JAMBA, CAMBA, ROKAMBA)	Vulnerable	PMST; CNM; AoLA	Moderate – This species is a non-breeding visitor to the ACT during the summer. It may use the airspace above the Impact Area. The species has been recorded within the general vicinity to the Impact Area.
<i>Lathamus discolor</i>	Swift parrot	Critically endangered	Endangered	PMST; AoLA	Low – Foraging habitat may be present if there are winter flowering species. However due to the sparse population of the species it is unlikely that the species inhabits the Impact Area.
<i>Lalage tricolor</i>	White-winged triller	Not listed	Vulnerable	CNM	High / Known – This species has been recorded within the Impact Area. Potential habitat for this species is likely to be present within the Impact Area.
<i>Melanodryas cucullata</i>	Hooded robin	Endangered	Vulnerable	CNM; AoLA; BioNet	Moderate – Potential habitat for this species is likely to be present within the Impact Area.
<i>Monarcha melanopsis</i>	Black-faced monarch	Migratory (Bonn)	Not listed	PMST; AoLA	Low – Suitable habitat for this species is not likely present within the Impact Area though it may utilise the area during passage.
<i>Motacilla flava</i>	Yellow wagtail	Migratory (JAMBA, CAMBA, ROKAMBA)	Not listed	PMST	Low – This species is a summer migrant with most birds recorded in the north of Australia. It is unlikely to occur within the Impact Area.
<i>Myiagra cyanoleuca</i>	Satin flycatcher	Migratory (Bonn)	Not listed	PMST; CNM; AoLA	Low – Suitable habitat for this species is not likely present within the Impact Area though it may utilise the area during passage.
<i>Numenius madagascariensis</i>	Eastern curlew	Critically endangered; migratory (Bonn, JAMBA, CAMBA, ROKAMBA)	Not listed	PMST	Low – No habitat for this species is present within the Impact Area.
<i>Pandion haliaetus</i>	Osprey	Migratory (Bonn)	Not listed	PMST; AoLA	Low – This species is predominantly coastal in distribution and is highly unlikely to occur in the Impact Area.

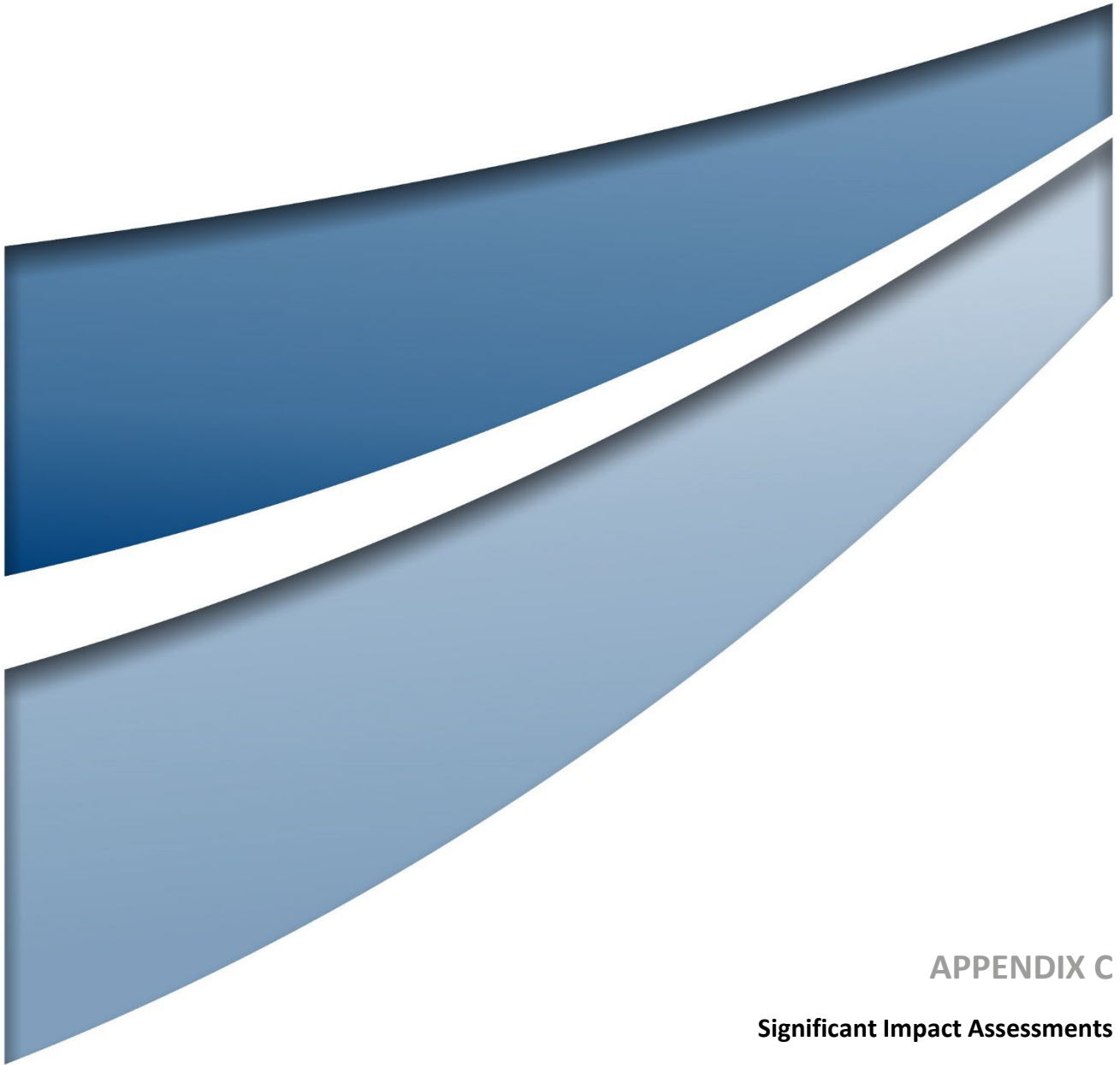
Scientific Name	Common Name	EPBC Act	NC Act	Database	Likelihood of Occurrence
<i>Petroica Boodang</i>	Scarlet robin	Not listed	Vulnerable	CNM; AoLA; BioNet	High / Known – This species has been recorded within the Impact Area. Potential habitat for this species is likely to be present within the Impact Area.
<i>Polytelis swainsonii</i>	Superb parrot	Vulnerable	Vulnerable	PMST; AoLA; BioNet	High – This species is likely to regularly disperse through the site and may occasionally forage in the Impact Area. Potential habitat for this species may exist within the area. The species has been recorded in the general vicinity of the Impact Area.
<i>Pycnoptilus floccosus</i>	Pilotbird	Vulnerable	Not listed	PMST; AoLA	Low – No habitat for this species is likely to be present within the Impact Area.
<i>Rhipidura rufifrons</i>	Rufous fantail	Migratory (Bonn)	Not listed	PMST; CNM; AoLA	Low – Suitable habitat for this species is not likely to be present within the Impact Area though it may utilise the area during passage.
<i>Rostratula australis</i>	Australian painted snipe	Endangered	Endangered	PMST; CNM; AoLA	Low – Very little habitat for this species is likely to exist within the Impact Area. A section of the Murrumbidgee River and the Molonglo River runs through a portion of the Impact Area which may be utilised on rare occasions.
<i>Stagonopleura guttata</i>	Diamond firetail	Vulnerable	Not listed	AoLA; BioNet	High / Known – This species has been recorded within the Impact Area. Potential habitat for this species is likely to be present within the Impact Area.
Fish					
<i>Bidyanus bidyanus</i>	Silver perch	Critically endangered	Endangered	PMST	Nil – No habitat for this species is present within the Impact Area.
<i>Maccullochella macquariensis</i>	Trout cod	Endangered	Endangered	PMST	Nil – No habitat for this species is present within the Impact Area.
<i>Maccullochella peelii</i>	Murray cod	Vulnerable	Not listed	PMST; AoLA	Nil - No habitat for this species is present within the Impact Area.
<i>Macquaria australasica</i>	Macquarie perch	Endangered	Endangered	PMST; AoLA	Nil - No habitat for this species is present within the Impact Area.
Amphibians					
<i>Crinia sloanei</i>	Sloane's froglet	Endangered	Not listed	PMST	Low - No habitat for this species is present within the Impact Area with the nearest record in Gungahlin.

Scientific Name	Common Name	EPBC Act	NC Act	Database	Likelihood of Occurrence
<i>Litoria aurea</i>	Green and golden bell frog	Vulnerable	Endangered	PMST; AoLA; BioNet	Low - A section of the Murrumbidgee River and the Molonglo River runs through a portion of the Impact Area that may be habitat. The species has been recorded in close proximity to the Impact Area in 1985.
<i>Litoria booroolongensis</i>	Booroolong frog	Endangered	Not listed	PMST; AoLA	Low – Habitat for this species is unlikely to be present in the Impact Area.
<i>Litoria castanea</i>	Yellow-spotted tree frog	Endangered	Critically endangered	PMST; AoLA	Low – Habitat for this species is unlikely to be present in the Impact Area.
<i>Litoria raniformis</i>	Growling grass frog	Vulnerable	Not listed	PMST	Low – Habitat for this species is unlikely to be present in the Impact Area.
<i>Pseudophryne pengilleyi</i>	Northern Corroboree frog	Critically endangered	Critically endangered	PMST	Nil – No suitable habitat is present within the Impact Area.
Invertebrates					
<i>Keyacris scurra</i>	Key's matchstick grasshopper	Endangered	Endangered	PMST	Low – No suitable habitat is likely to be present within the Impact Area.
<i>Synemon plana</i>	Golden sun moth	Vulnerable	Vulnerable	PMST; CNM; AoLA; BioNet	Moderate – Species habitat has been recorded within the Impact Area. The species has not been recorded in the Impact Area with the nearest records 3 km to the southeast. Surveys in nearby areas in 2021 failed to detect the species.
Mammals					
<i>Chalinolobus dwyeri</i>	Large-eared pied bat	Vulnerable	Not listed	PMST	Low – No habitat is likely to be present for this species within the Impact Area.
<i>Dasyurus maculatus</i>	Spotted-tail quoll	Endangered	Vulnerable	PMST; CNM; AoLA;	Low – There is likely foraging habitat within the Impact Area. The species may be an occasional visitor to the area but the habitat is widely distributed in the local area.
<i>Mastacomys fuscus</i>	Broad-toothed rat	Vulnerable	Vulnerable	PMST	Low – No habitat for this species is present within the Impact Area.

Scientific Name	Common Name	EPBC Act	NC Act	Database	Likelihood of Occurrence
<i>Petaroides volans</i>	Greater glider	Endangered	Endangered	PMST	Low – It is unlikely that arboreal fauna will be present in the Impact Area as there is minimal remnant vegetation in the Impact Area that would support hollows of a suitable size for this species. Additionally, if this species is present in the region, it is likely that they will be in more preferential habitat found approximately 4 km east (Brindabella National Park).
<i>Petaurus australis</i>	Yellow-bellied glider	Vulnerable	Vulnerable	PMST	Low – It unlikely that arboreal fauna will be present in the Impact Area as there is minimal remnant vegetation in the Impact Area that would support hollows of a suitable size for this species. Additionally, if this species is present in the region, it is likely that they will be in more preferential habitat found approximately 4 km east (Brindabella National Park).
<i>Phascolarctos cinereus</i>	Koala	Endangered	Endangered	PMST; AoLA; BioNet	Low – The species is unlikely to use the Impact Area as there is minimal remnant vegetation in the Impact Area that would support habitat for this species. Additionally, if this species is present in the region it is likely that they will be in more preferential habitat found approximately 4 km east (Brindabella National Park).
<i>Pseudomys fumeus</i>	Smoky mouse	Endangered	Critically endangered	PMST	Low – No habitat for this species is present within the Impact Area.
<i>Pteropus poliocephalus</i>	Grey-headed flying-fox	Vulnerable	Vulnerable	PMST; CNM; AoLA	Low – There are no roosting camps present within the Impact Area. Some foraging habitat for the species may be present within the Proposal area, however this habitat is dispersed around the local area
Reptiles					
<i>Aprasia parapulchella</i>	Pink-tailed worm-lizard	Vulnerable	Vulnerable	PMST; AoLA; ACTmapi; BioNet	Known / High – this species has been recorded immediately adjacent to the Impact Area. Mapped habitat for this species is present in the Impact Area.
<i>Delma impar</i>	Striped legless lizard	Vulnerable	Vulnerable	PMST, ACTmapi	Low – Mapped habitat for this species is not within the Impact Area.
<i>Liopholis montana</i>	Mountain skink	Endangered	Not listed	PMST	Low – No habitat for this species is present within the Impact Area.

Scientific Name	Common Name	EPBC Act	NC Act	Database	Likelihood of Occurrence
Flora					
<i>Ammobium craspedioides</i>	Yass daisy	Vulnerable	Not listed	PMST, CNM,	Low – May be habitat of Box gum Woodland present within the Impact Area. However, known distribution of this species is north of the Impact Area in the Yass region.
<i>Amphibromus flutians</i>	River swamp wallaby-grass	Vulnerable	Not listed	PMST	Low – Suitable habitat is not present within the Impact Area. Also outside of geographic range for this species.
<i>Calotis glandulosa</i>	Mauve burr-daisy	Vulnerable	Not listed	PMST; AoLA	Low – Suitable habitat is not present within the Impact Area.
<i>Corunastylis ectopa</i>	Brindabella midge-orchid	Critically endangered	Critically endangered	PMST	Low – Suitable habitat is not present within the Impact Area Also outside of geographic range for this species.
<i>Dodonea procumbens</i>	Trailing hop-bush	Vulnerable	Not listed	PMST; AoLA	Low – Just outside the geographic range, unlikely to have suitable habitat within the Impact Area.
<i>Eucalyptus aggregata</i>	Black gum	Vulnerable	Vulnerable	PMST	Low – Rare species habitat of the black gum may be present within the Impact Area, but the likelihood is low.
<i>Lepidium ginninderrense</i>	Ginninderra pepper-cress	Vulnerable	Endangered	PMST; AoLA	Low – Suitable habitat is not present within the Impact Area.
<i>Lepidium aschersonii</i>	Spiny pepper-cress	Vulnerable	Not listed	PMST	Low – Suitable habitat is not present within the Impact Area. Also outside of geographic range for this species.
<i>Lepidium hyssopifolium</i>	Basalt pepper-cress	Endangered	Not listed	PMST; AoLA	Low – Suitable habitat is not present within the Impact Area.
<i>Leucochrysum albicans</i>	Hoary sunray	Endangered	Not listed	PMST; CNM; AoLA	Moderate – Suitable habitat of Box gum Woodland is present within the Impact Area.
<i>Muehlenbeckia tuggeranong</i>	Tuggeranong lignum	Endangered	Endangered	PMST;	Low – Species may occur in a small portion of the Impact Area, but the likelihood is low due to the species known distribution.
<i>Pimelea bracteata</i>	-	Critically endangered	Not listed	PMST	Low – Suitable habitat is likely to be not present within the Impact Area. Also outside of geographic range for this species.

Scientific Name	Common Name	EPBC Act	NC Act	Database	Likelihood of Occurrence
<i>Pomaderris cotoneaster</i>	Cotoneaster pomaderris	Endangered	Not listed	PMST	Low – Suitable habitat is not likely to be present within the Impact Area. Also outside of geographic range for this species.
<i>Pomaderris pallida</i>	Pale pomaderris	Vulnerable	Vulnerable	PMST; CNM; AoLA; ACTmapi, BioNet	Moderate – Suitable habitat of Box gum Woodland is present within the Impact Area.
<i>Prasophyllum petilum</i>	Tarengo leek orchid	Endangered	Endangered	PMST	Low – Suitable woodland and grassland habitat may be present within the Impact Area. Likelihood of occurrence is low due to the known distribution of the species which shows it is unlikely to occur in proximity to the Impact Area.
<i>Pterostylis oreophila</i>	Blue-tongued orchid	Critically endangered	Critically endangered	PMST	Nil – Outside geographic range for this species.
<i>Rutidosis leptorrhynchoides</i>	Button wrinklewort	Endangered	Endangered	PMST; CNM; AoLA	Low – Some potential for this species to occur in a portion of the Impact Area. Given the distribution of this species, small likelihood the species is present in the Impact Area.
<i>Senecio macrocarpus</i>	Large-fruit fireweed	Vulnerable	Not listed	PMST	Low – Just outside the geographic range, unlikely to have suitable habitat within the Impact Area.
<i>Swainsona recta</i>	Small purple-pea	Endangered	Endangered	PMST; AoLA	Moderate – Suitable habitat of Box gum Woodland is likely to be present within the Impact Area.
<i>Thesium australe</i>	Austral toadflax	Vulnerable	Vulnerable	PMST	Moderate – Suitable habitat of Box gum Woodland is likely to be present within the Impact Area. Suitable rocky habitat is present within the Impact Area
<i>Viola improcera</i>	Dwarf violet	Endangered	Endangered	PMST	Low – Suitable habitat is not present within the Impact Area.
<i>Bossiaea grayi</i>	Murrumbidgee Bossiaea	Not listed	Endangered	CNM, AoLA	Low – A section of the Murrumbidgee River and Molonglo River runs through a portion of the Impact Area that may be habitat



APPENDIX C

Significant Impact Assessments

The following significant impact assessments have been undertaken following the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1* (DoE, 2013).

Significant Impact Assessment: White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered Ecological Community

Criteria	An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:
Reduce the extent of an ecological community	Yes. The Proposal would result in the loss of 2.37 ha across 11 areas (mainly in the east and western ends of the Proposed Alignment) that meet the condition thresholds for the <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> critically endangered ecological (EPBC Act BGW). The majority (2.28 ha) is in the derived state, with 0.1 ha supporting high quality understorey with multiple important species. All zones were assessed as Class B due to the sparse cover (or absence) of canopy species (Table 4.6). While the Impact Area been positioned to avoid areas of EPBC Act BGW (including areas supporting mature and hollow-bearing trees as much as possible), six trees would be permanently removed, and a further 10 are likely to be modified (canopy reduction) to maintain standards required under and adjacent to overhead powerlines. This impact is restricted to the eastern end of the Proposed Alignment where the powerline is closest to the ground. The patches of EPBC Act BWG form part of and are on the edge of a much larger patch of woodland and derived native grassland in the broader landscape, which includes areas protected in the Woodstock and Molonglo River Nature Reserves. The extent of reduction of the EPBC ACT BGW as a result of the Proposal is considered minimal in the context of the broader extent of this community, especially noting that they are made up of many small, dispersed locations.
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	No. The Proposal would result in the clearing 2.37 ha across 11 areas (mainly in the east and western ends of the Proposed Alignment) that meet the condition thresholds for the <i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i> critically endangered ecological (EPBC Act BGW). While the Impact Area been positioned to avoid areas of EPBC Act BGW (including areas supporting mature and hollow-bearing trees as much as possible), six trees would be permanently removed, and a further 10 are likely to be modified (canopy reduction) to maintain standards required under and adjacent to overhead powerlines. This impact is restricted to the eastern end of the Proposed Alignment where the powerline is closest to the ground. The patches of EPBC Act BWG form part of and are on the edge of a much larger patch of woodland and derived native grassland in the broader landscape, which includes areas protected in the Woodstock and Molonglo River Nature Reserves. Due to the small extent and wide distribution of the EPBC Act BGW within of the Proposed Alignment, the Proposal is unlikely to fragment or increase fragmentation of the critically endangered ecological community.

Criteria	An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:
Adversely affect habitat critical to the survival of an ecological community	Yes. The National Recovery Plan for <i>White Box – Yellow Box – Blakely’s Red Gum Grassy Woodland and Derived Native Grassland</i> (DECCW, 2011) identifies “habitat critical to the survival of Box-Gum Grassy Woodland is on the moderate to highly fertile soils of the western slopes of NSW and Queensland, the northern slopes of Victoria, and the tablelands of the Great Dividing Range from southern Queensland through NSW and the ACT. Given the currently highly fragmented and degraded state of this ecological community, all areas of Box-Gum Grassy Woodland that meet the minimum condition criteria ... should be considered critical to the survival of this ecological community”. Based on this advice, the Proposal would result in the loss of 2.37 ha of EPBC Act BGW that is considered critical to the survival of the ecological community. The total area of EPBC Act BGW is however small and distributed across 11 locations within Impact Area. The majority (2.29 ha) is in the derived state, with 0.1 ha supporting high quality understorey with multiple important species. On this basis the impact is not considered to be significant.
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community’s survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	No. The Proposal would not result in modification or destruction of abiotic (non-living) factors (such as water, nutrients, or soil) necessary for the survival of the community in adjacent areas. Impacts on abiotic factors potentially influencing adjacent areas would be managed to prevent impacts outside of the Impact Area, including controls for preventing the spread of invasive species and for managing erosion and sedimentation during construction. Refer to Section 6.2 for more information.
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	No. The Proposal would not cause changes that would result in broader changes in the species composition of an occurrence of the critically endangered ecological community. Following the clearance of the site there would be no ongoing disturbance to the community. No ongoing flora or fauna harvesting would occur. Areas of EPBC Act BGW along the Proposed Alignment that would not be impacted by the Proposal would be managed consistent with current practices (grazing). The regular burning would occur, and bushfire fuel management would occur within the inner asset protection zone located in the development site. This is discussed further in the Bushfire Risk Assessment report attached to the DA.
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: • assisting invasive species, that are harmful to the listed ecological community, to become established, or • causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which	No. The Impact Area is located in an agricultural landscape, and the critically endangered ecological community in this area is consequently subject to existing threats associated with invasive species and agricultural activities independent of the Proposal. The Proposal is unlikely to substantially change these threats. During construction there is increased risk of establishment of invasive weed species through soil disturbance and vehicle movement. This increased risk would be managed through the implementation of appropriate mitigation and management measures to prevent potential reductions in the quality or integrity of adjacent occurrences of the ecological community (see Section 6.2). Contamination risks associated with the storage and use of hazardous materials on site would also be managed throughout the lifetime of the Proposal.

Criteria	An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:
kill or inhibit the growth of species in the ecological community	The Proposal would therefore be unlikely to cause a substantial reduction in the quality or integrity of the ecological community where it occurs adjacent to the Impact Area.
Interfere with the recovery of an ecological community	No. Degradation of higher quality box-gum woodland remnants as a result of public infrastructure development is identified as a key threat to the EPBC Act BGW in the National Recovery Plan (DECCW, 2011). The impact to 0.1 ha of ACT16.1 (0.02 ha) and ACT16.4 (0.08 ha) is however small with the location of ACT16.1 and ACT16.4 within the impacted area spread across 11 areas within the eastern end of the Proposed Alignment. Due to the small extent and distribution of these areas the Proposal is unlikely to interfere with the recovery of the ecological community.
Conclusion	The Proposal would result in the clearing 2.37 ha across 11 locations within Impact Area. The majority (2.29 ha) is in the derived state, with 0.1 ha supporting high quality understorey with multiple important species. All zones were assessed as Class B due to the sparse cover (or absence) of canopy species (Table 4.6). While the Impact Area been positioned to avoid areas of EPBC Act BGW (including areas supporting mature and hollow-bearing trees as much as possible), six trees would be permanently removed, and a further 10 are likely to be modified (canopy reduction) to maintain standards required under and adjacent to overhead powerlines. This impact is restricted to the eastern end of the Proposed Alignment where the powerline is closest to the ground. The patches of EPBC Act BWG form part of and are on the edge of a much larger patch of woodland and derived native grassland in the broader landscape, which includes areas protected in the Woodstock and Molonglo River Nature Reserves. The extent of reduction of the EPBC ACT BGW as a result of the Proposal is considered minimal in the context of the broader extent of this community, especially noting that they are made up of many small, dispersed locations. As such, it is considered unlikely that the Proposal would have a significant impact on the EPBC Act BGW ecological community.

Significant Impact Assessment: Natural Temperate Grassland of the South Eastern Highlands – Critically Endangered Ecological Community

Criteria	An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:
Reduce the extent of an ecological community	Yes. The Proposal would result in the loss of 0.01 ha of high quality <i>Natural Temperate Grassland of the South Eastern Highlands</i> critically endangered ecological community (EPBC Act NTG). This patch is recognised to meet the high to very high condition threshold (patches with good native coverage and high native plant diversity) given that it has at least 12 non-grass native species and has over 50% ground cover foliage of kangaroo grass (Table 4.7). DoEE (2016) also considers areas that are critical to the survival of the ecological community to be all patches that meet the key diagnostic characteristics and condition thresholds for the ecological community plus buffer zones. A buffer zone is defined as a “..contiguous area immediately adjacent to a patch of the ecological community that is important for protecting its integrity. The purpose of the buffer zone is to help protect and manage the national ecological community. The recommended minimum buffer zone for the ecological community is 30 metres from the edge of a patch...[however]... a larger buffer zone may be applied, where practical, to protect patches that are of particularly high conservation value, or if patches are down slope of drainage lines or a source of nutrient enrichment...” Recognising the high quality of the patch of EPBC Act NTG within the Impact Area and the position of the patch downslope of exotic grassland, it has been determined that the width of the buffer zone should equal the distance from the EPBC Act NTG (ACT01.1) to the far edge of the adjacent grassland area (ACT01.4) (Figure 4.6). The total area of EPBC Act NTG to be impacted by the Proposal, including the buffer is therefore 0.55 ha.
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	No. The loss of 0.01 ha of EPBC Act NTG (0.55 ha with the buffer zones) would not fragment the ecological community noting that the area of EPBC Act NTG is located at the edge of a patch adjacent to exotic grassland (ACT01.4). The management of the adjacent grassland areas in the Proposed Alignment would be consistent with current practices. Other than the total impact area (including the buffer zone) no further impacts are likely. Given the relatively small size of the area affected it is not considered likely that the Proposal would fragment or increase fragmentation of the EPBC Act NTG ecological community.

Criteria	An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:
Adversely affect habitat critical to the survival of an ecological community	Yes. The Conservation Advice for the <i>Natural Temperate Grassland of the South Eastern Highlands</i> (DoEE, 2016) identifies “...areas considered critical to the survival of the ecological community cover all patches that meet the key diagnostic characteristics and condition thresholds for the ecological community plus buffer zones..” (see below). “This is because the ecological community has a restricted geographic extent and is highly fragmented. Additional areas, such as adjoining native vegetation and areas that meet the description of the ecological community but not the minimum condition thresholds may be critical to the survival of the ecological community depending on factors such as their size and shape, landscape linkages to other patches and landscape position. The surrounding environment and landscape context should also be considered.” Based on this advice, the Proposal would result in the loss of 0.01 ha of EPBC Act NTG that is considered critical to the survival of the ecological community.
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community’s survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	No. The Proposal would not result in modification or destruction of abiotic (non-living) factors (such as water, nutrients, or soil) necessary for the survival of the community in adjacent areas. Natural temperate grasslands have experienced declines due to substantial clearing and fragmentation, nutrient enrichment from fertilisers and livestock, invasive flora and fauna, livestock grazing and changed fire regimes. Current guidelines note that disturbances that alter the hydrology and nutrient status of a patch be avoided. These include steps such as avoiding the influx of nutrients and water to reduce the spread and establishment of invasive species and avoiding the use of fertilizers in and around patches of the ecological community. For a Proposal such as this one, while a portion of this community would be removed, it is less than 0.01 ha (0.55 ha including a buffer zone). Impacts on abiotic factors potentially influencing adjacent areas would be managed to prevent impacts outside of the Impact Area, including controls for preventing the spread of invasive species and for managing erosion and sedimentation during construction. Close attention would be paid to any soil disturbance caused because of the construction to avoid disturbing any areas which contain natural temperate grassland, which may cause a shift in nutrient levels and endanger the ecological community. Refer to Section 6.2 for more information.
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	No. The Proposal would not cause changes that would result in broader changes in the species composition of an occurrence of the critically endangered ecological community. Following the clearance of the site there would be no ongoing disturbance to the community. No ongoing flora or fauna harvesting would occur. Areas of EPBC Act NTG along the Proposed Alignment that would not be impacted by the Proposal would be managed consistent with current practices (grazing).

Criteria	An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: • assisting invasive species, that are harmful to the listed ecological community, to become established, or • causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community	No. The Impact Area is located in an agricultural landscape, and the critically endangered ecological community in this area is consequently subject to existing threats associated with invasive species and agricultural activities independent of the Proposal. The Proposal is unlikely to substantially change these threats. During construction there is increased risk of establishment of invasive weed species through soil disturbance and vehicle movement. This increased risk would be managed through the implementation of appropriate mitigation and management measures to prevent potential reductions in the quality or integrity of adjacent occurrences of the ecological community (see Section 6.2). Contamination risks associated with the storage and use of hazardous materials on site would also be managed throughout the lifetime of the Proposal. The Proposal would therefore be unlikely to cause a substantial reduction in the quality or integrity of the ecological community where it occurs adjacent to the Impact Area.
Interfere with the recovery of an ecological community	No. Loss due to clearing is a key threat to the EPBC Act NTG (DoEE, 2016). The loss of 0.01 ha of high quality NTG (0.55 ha including the buffer zone) is therefore likely to interfere with the recovery of the EPBC Act NTG. Due to the small of the loss, the Proposal is unlikely to interfere with the recovery of the ecological community.
Conclusion	The Proposal would result in the loss of 0.01 ha of high quality EPBC Act NTG, with a total of 0.55 ha to be affected including buffer zone. The area of EPBC Act NTG to be impacted is located at the edge of a patch adjacent to exotic grassland (ACT01.4). The management of the adjacent grassland areas in the Proposed Alignment would be consistent with current practices. No further impacts are therefore likely. Even in the context of the buffer zone the area of EPBC Act NTG to be affected is small. It is considered unlikely that the Proposal would fragment or increase fragmentation of the EPBC Act NTG ecological community. It is considered unlikely that the Proposal would have a significant impact on the EPBC Act NTG ecological community.

Significant Impact Assessment: Pink-tailed worm-lizard (*Aprasia parapulchella*)– Vulnerable

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Lead to a long-term decrease in the size of an important population of a species	No. The <i>Conservation Advice Aprasia parapulchella Pink-tailed Worm-lizard</i> (PTWL Conservation Advice) does not define any important populations of the species. The Impact Area supports a total of 1.09 ha of potential habitat for pink-tailed worm-lizard across 20 separate patches. Only 0.15 ha is considered high quality. Given the small amount of available habitat within the Impact Area, it is unlikely that it supports a population that would be considered important. Given the small impact to habitat for the species, and that there is no important population defined, it is unlikely that the Proposal would lead to a long term decrease in the size of an important population of pink-tailed worm-lizard.
Reduce the area of occupancy of an important population Response	No. The PTWL Conservation Advice does not define any important populations of the species and states that the species is distributed widely, but patchily. The Impact Area supports a total of 1.09 ha of potential habitat for pink-tailed worm-lizard across 20 separate patches. Only 0.15 ha of which is considered high quality. Given the small amount of available habitat within the Impact Area, it is unlikely that it supports a population that would be considered important. Given that there is suitable habitat in the broader region that is known to be utilised, are unlikely to reduce the area of occupancy of an important population of pink-tailed worm-lizard.
Fragment an existing important population into two or more populations	No. The PTWL Conservation Advice does not define any important populations of the species. The PTWL Conservation Advice states that the species is distributed widely, but patchily. The Impact Area supports a total of 1.09 ha of potential habitat for pink-tailed worm-lizard across 20 separate patches. Only 0.15 ha of which is considered high quality. Given the small amount of available habitat within the Impact Area, it is unlikely that it supports a population that would be considered important. Further, most of the known records within proximity to the Impact Area are located to the north, just over the NSW border. There is one isolated record to the south-west of the Impact Area along the Murrumbidgee River Corridor, and another on the western edge of the suburb of Macnamara. The Proposal would not fragment the known population in proximity to the Impact Area. As such, the Proposal is unlikely to fragment an existing important population, or any population, into two or more populations.
Adversely affect habitat critical to the survival of a species	No. The PTWL Conservation Advice does not define habitat critical to the survival of the species. It notes that pink-tailed worm-lizard habitat includes primary and secondary grassland, grassy woodland, and woodland communities, and that the species usually inhabits sloping sites that contain rocky outcrops or scattered, partially buried rocks. These rocks are considered important foraging and shelter sites.

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
	Given that the extent of the habitat in the Impact Area is small that it is broken up across 20 separate small patches, it is considered that its removal would not adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of an important population	No. The PTWL Conservation Advice does not define any important populations of the species. The PTWL Conservation Advice states that the species is distributed widely, but patchily. The Impact Area supports a total of 1.09 ha of potential habitat for pink-tailed worm-lizard across 20 separate patches. Only 0.15 ha of which is considered high quality. Given the small amount of available habitat within the Impact Area, it is unlikely that it supports a population that would be considered important. There is limited information available on the breeding cycle of the species. Given that the Impact Area is unlikely to support an important population of the species, it is unlikely that the Proposal would disrupt the breeding cycle of an important population of pink-tailed worm-lizard.
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No. The PTWL Conservation Advice notes that pink-tailed worm-lizard habitat includes primary and secondary grassland, grassy woodland, and woodland communities, and that the species usually inhabits sloping sites that contain rocky outcrops or scattered, partially buried rocks. These rocks are considered important foraging and shelter sites. The Impact Area supports a total of 1.09 ha of potential habitat for pink-tailed worm-lizard across 20 separate patches. Only 0.15 ha of which is considered high quality. There are no records of the species utilising the habitat available within the Impact Area. As such, the removal of 1.09 ha of potential habitat for the species, including 0.15 ha of high quality habitat, is unlikely to result in the decline of the species.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No. Indirect impacts on suitable habitat within proximity to the Impact Area would be minimised through exclusion fencing and pest plant and animal management. Hygiene protocols would be in place for vehicles during the construction phase, and vehicles would use existing roads where possible. Mitigation measures would be implemented in accordance with a CEMP. The nature of the Proposal, linear infrastructure for transmission lines, is unlikely to increase the existence of invasive animals such as feral cats or foxes, and the Proposal is not residential and is unlikely to increase domestic animals in the area. As such, the Proposal is unlikely to lead to invasive species becoming established in areas of pink-tailed worm-lizard habitat.
Response introduce disease that may cause the species to decline	No. Indirect impacts on suitable habitat within proximity to the Impact Area would be minimised through exclusion fencing and pest plant and animal management. Hygiene protocols would be in place for vehicles during the construction phase, and vehicles would use existing roads where possible. Mitigation measures would be implemented in accordance with a CEMP. As such, the Proposal is unlikely to introduce disease that may cause the species to decline.

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Interfere substantially with the recovery of the species	No. The PTWL Conservation Advice lists priority recovery actions for pink-tailed worm-lizard as avoiding and reducing the removal or modification of habitat, particularly through recreational activities, management actions for invasive species, reduction of impacts from domestic species, research into fire regimes and appropriate land management regimes for landholders. The Proposal would likely remove 1.09 ha of habitat for pink-tailed worm-lizard, only 0.15 ha of which is high quality. Habitat in the broader region has been avoided, including areas with known records of the species. The minimised impacts on pink-tailed worm-lizard of the Proposal are unlikely to interfere with the recovery of the species.
Conclusion	The Impact Area supports a total of 1.09 ha of potential habitat for pink-tailed worm-lizard across 20 separate patches. Only 0.15 ha of which is considered high quality. Given the small amount of available habitat within the Impact Area, it is unlikely that it supports a population that would be considered important, and its removal is unlikely to have an adverse impact on habitat critical to the survival of pink-tailed worm-lizard. As such, it is considered unlikely that the Proposal would have a significant impact on pink-tailed worm-lizard.

Significant Impact Assessment: Golden Sun Moth (*Synemon plana*)– Vulnerable

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Lead to a long-term decrease in the size of an important population of a species	No. The <i>Conservation Advice for Synemon plana</i> (Golden Sun Moth) (GSM Conservation Advice) does not define any important populations of the species, however, it notes that large subpopulations or smaller, well-connected subpopulations occurring in high quality habitat would classify for their importance in the long term maintenance of the species. It identifies that there are 78 known sites within the ACT, 104 in Victoria and 59 in NSW. There is 4.09 ha of potential golden sun moth habitat within the Impact Area, only 0.33 ha of which is of a high quality. Targeted surveys were undertaken for golden sun moth within the Impact Area, in accordance with modelling provided by the ACT Conservator for Flora and Fauna. No golden sun moth individuals were detected. There are no records of golden sun moth within the Impact Area. Given that there are no important populations defined for the species, and there is no known population likely to be impacted by the removal of 4.09 ha of potential habitat in the Impact Area, it is unlikely that the Proposal would lead to a long term decrease in the size of an important population of golden sun moth.
Reduce the area of occupancy of an important population	No. The GSM Conservation Advice does not define any important populations of the species; however, it notes that large subpopulations or smaller, well-connected subpopulations occurring in high quality habitat would classify for their importance in the long term maintenance of the species. There is 4.09 ha of potential habitat for golden sun moth within the Impact Area, only 0.33 ha of which is of a high quality. Targeted surveys were undertaken for golden sun moth within the Impact Area, in accordance with modelling provided by the ACT Conservator for Flora and Fauna. No golden sun moth individuals were detected. There are no records of golden sun moth within the Impact Area. There is a known population of golden sun moth approximately 3 km to the east of the Impact Area, however, it is not considered an important population. Given that only 0.33 ha of the potential habitat in the Impact Area is of a high quality, it is unlikely that the removal of 4.09 ha of potential golden sun moth habitat would reduce the area of occupancy of an important population.
Fragment an existing important population into two or more populations	No. The GSM Conservation Advice does not define any important populations of the species; however, it notes that large subpopulations or smaller, well-connected subpopulations occurring in high quality habitat would classify for their importance in the long term maintenance of the species. There is 4.09 ha of potential habitat for golden sun moth within the Impact Area, only 0.33 ha of which is of a high quality. Targeted surveys were undertaken for golden sun moth within the Impact Area, in accordance with modelling provided by the ACT Conservator for Flora and Fauna. No golden sun moth individuals were detected. There are no records of golden sun moth within the Impact Area.

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
	There is a known population of golden sun moth approximately 3 km to the east of the Impact Area, however, it is not considered an important population. The removal of 4.09 ha of potential golden sun moth habitat within the Impact Area would not fragment the known population to the east of the Impact Area, nor would it fragment an important population into two or more populations.
Adversely affect habitat critical to the survival of a species	No. The GSM Conservation Advice states that habitat critical to the survival of golden sun moth has yet to be define, but likely includes all native grassland and open grassy woodland habitat occupied by the species across its range. It also states that sites occurring towards the limit of the species range, or sites that are long distance from other known subpopulations are also likely to be defined as habitat critical to the survival of the species. There is 4.09 ha of potential golden sun moth habitat within the Impact Area, only 0.33 ha of which is considered to be high quality. The species range for golden sun moth spans from southern Victoria to north of Bathurst in NSW, and as such the Impact Area does not occur towards the limit of the species range. The potential golden sun moth habitat within the Impact Area is not considered habitat critical to the survival of the species, and its removal is unlikely to have an adverse impact on habitat critical to the survival of golden sun moth.
Disrupt the breeding cycle of an important population	No. The GSM Conservation Advice does not define any important populations of the species; however, it notes that large subpopulations or smaller, well-connected subpopulations occurring in high quality habitat would classify for their importance in the long term maintenance of the species. The breeding cycle for golden sun moth lasts for a few short days, in which male moths would emerge and patrol for the semi-flightless female. The underground life stages are not well understood. There is a known population of golden sun moth approximately 3 km to the east of the Impact Area, however, it is not considered an important population. Targeted surveys were undertaken for golden sun moth within the Impact Area, in accordance with modelling provided by the ACT Conservator for Flora and Fauna, across multiple years. No golden sun moth individuals were detected. There are no records of golden sun moth within the Impact Area. The removal of 4.09 ha of potential golden sun moth habitat within the Impact Area is unlikely to disrupt the breeding cycle of an important population of the species as there are no important populations identified and it is unlikely that golden sun moth are utilising the site.
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No. The GSM Conservation Advice identifies that there are 78 known sites within the ACT, 104 in Victoria and 59 in NSW, and the species range extends from southern Victoria to north of Bathurst in NSW. Targeted surveys were undertaken for golden sun moth within the Impact Area, in accordance with modelling provided by the ACT Conservator for Flora and Fauna. No golden sun moth individuals were detected. There are no records of golden sun moth within the Impact Area.

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
	The removal of 4.09 ha of golden sun moth habitat within the Impact Area, of which only 0.33 ha is high quality habitat, is unlikely to modify potential golden sun moth habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No. Indirect impacts on any adjacent or avoided habitat would be mitigated through exclusion fencing and pest plant and animal management. Hygiene protocols would be in place for vehicles during the construction phase, and vehicles would utilise existing roads where possible. Mitigation measures would be implemented in accordance with a CEMP. The nature of the Proposal, linear infrastructure for transmission lines, is unlikely to increase the existence of invasive animals such as feral cats or rabbits, and the Proposal is not residential and is unlikely to increase domestic animals in the area. As such, the Proposal is unlikely to lead to invasive species that are harmful to golden sun moth becoming established in golden sun moth habitat.
Introduce disease that may cause the species to decline, or	No. Indirect impacts on any adjacent or avoided habitat would be minimised through exclusion fencing and pest plant and animal management. Hygiene protocols would be in place for vehicles during the construction phase, and vehicles would utilise existing roads where possible. Mitigation measures would be implemented in accordance with a CEMP. As such, the Proposal is unlikely to introduce disease that may cause the species to decline.
Interfere substantially with the recovery of the species	No. The primary conservation outcome identified in the GSM Conservation Advice is to retain and protect native grassland remnants within the known distribution of the species, and to ensure remnant subpopulations remain connected or linked to each other. The Proposal would likely remove 4.09 ha of habitat for golden sun moth, only 0.33 ha of which is high quality. Habitat in the broader region has been avoided, including areas with known records of the species. The minimised impacts on golden sun moth of the Proposal are unlikely to interfere with the recovery of the species.
Conclusion	The Proposal would impact 4.09 ha of potential golden sun moth habitat, only 0.33 ha is high quality. There are no records of golden sun moth occurring within the Impact Area, and the species was not found during targeted surveys. It is unlikely that the Impact Area supports an important population of the species, nor contains habitat critical to the survival of the species. As such, it is unlikely that the Proposal would result in a significant impact to golden sun moth.

Significant Impact Assessment: Superb Parrot (*Polytelis swainsonii*) – Vulnerable

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Lead to a long-term decrease in the size of an important population of a species	No. The National Recovery Plan for the Superb Parrot <i>Polytelis swainsonii</i> (Superb Parrot Recovery Plan) (DAWE, 2021) does not define any important populations of the species. The distribution of the species extends from northern Victoria through to northern New South Wales, west of the Great Dividing Range, including the northern part of the ACT. In the ACT region, the Yellow Box-Red Gum Grassy Woodlands form the major habitat of the species, with large red gum (<i>Eucalyptus blakelyi</i>) and scribbly gum (<i>Eucalyptus rossii</i>) being the main source of nesting hollows. Although no individuals were recorded in the Impact Area, it is likely that the species utilises the Impact Area for foraging, including supporting breeding pairs from known breeding trees (superb parrot is known to breed in the lower Molonglo Valley approximately 5 km east of the Impact Area, and the species is known to travel up to 10 km from breeding sites to foraging areas). <i>Eucalyptus</i> and <i>Acacia</i> species recorded in the Impact Area provide superb parrot foraging habitat. As the species is also known to feed on native and exotic grass seed, it is likely that the superb parrot may also use the open grassland areas within these areas. As such all native vegetation within the Impact Area is considered suitable foraging habitat for the superb parrot (4.9 ha made up of multiple separate areas distributed along the Proposed Alignment). The Superb Parrot Recovery Plan states that clearing of foraging habitat has been followed by the abandonment of nearby traditional breeding areas, even where suitable nest trees remain, and that population size is primarily limited by clearing of woodland foraging habitat. This is especially for foraging habitat within 10 km of breeding trees. The removal of the suitable foraging habitat in the Impact Area may therefore adversely affect habitat critical to the species. The Superb Parrot Recovery Plan also states that the species requires vegetated corridors to move between breeding and foraging habitat and that degradation and destruction of movement corridors is a key factor implicated in the species' decline. The Proposal would impact three trees that were confirmed to be within the height range (10-15 m) identified as critical for superb parrot movement and require modification of a further six trees to comply with canopy height restrictions. While these factors may lead to a long term decrease in the local population, the Proposal is unlikely to disrupt the breeding cycle of an important population as no important population is defined. Additionally, the Proposal would not impact any potential superb parrot breeding trees.

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Reduce the area of occupancy of an important population	No. The Superb Parrot Recovery Plan does not define any important populations of the species. The area of occupancy for the superb parrot is currently estimated to be 7,900 km² and is considered stable (BATSC, 2021). The superb parrot is known to occur in the lower Molonglo River Corridor adjacent to the Impact Area. Although no individuals were recorded in the Impact Area, it is likely that the species utilises the Impact Area for foraging, including supporting breeding pairs from known breeding trees in the Molonglo Valley. The Superb Parrot Recovery Plan states that clearing of foraging habitat has been followed by the abandonment of nearby traditional breeding areas, even where suitable nest trees remain, and that population size is primarily limited by clearing of woodland foraging habitat. This is especially for foraging habitat within 10 km of breeding trees. While the removal of 4.9 ha of suitable foraging habitat in the Impact Area (which is within 10 km of known breeding trees) could impact the area of occupancy of the local population, the Proposal is unlikely to reduce the area of occupancy of an important population as no important population is defined.
Fragment an existing important population into two or more populations	No. The Superb Parrot Recovery Plan does not define any important populations of the species. The superb parrot has a breeding range that extends west of the Great Dividing Range, mostly within the South Western Slopes (NSW) and Riverina (NSW and VIC) bioregions (DAWE, 2021). The Proposal is for the construction of linear infrastructure within a large, contiguous area of woodland and cleared rural land. The total Impact Area (4.9 ha) is made up of multiple separate areas distributed along the Proposed Alignment, rather than one consolidated unit. The Proposal is therefore unlikely to fragment an existing important population into two or more populations.
Adversely affect habitat critical to the survival of a species	Yes. Habitat critical to the survival of the species is defined in the Superb Parrot Recovery Plan and includes both breeding and foraging habitat. In the ACT region, the Yellow Box-Red Gum Grassy Woodlands form the major habitat of the species, with large red gum (<i>Eucalyptus blakelyi</i>) and scribbly gum (<i>Eucalyptus rossii</i>) being the main source of nesting hollows. The superb parrot is known to breed in the lower Molonglo Valley approximately 5 km east of the Impact Area. It is therefore likely that the species utilises the Impact Area for foraging, including supporting breeding pairs from known breeding trees (the species is known to travel up to 10 km from breeding sites to foraging areas). <i>Eucalyptus</i> and <i>Acacia</i> species recorded in the Impact Area provide superb parrot foraging habitat. As the species is also known to feed on native and exotic grass seed, it is likely that the superb parrot may also use the open grassland areas within these areas. As such all native vegetation within the Impact Area is considered suitable foraging habitat for the superb parrot (4.9 ha made up of multiple separate areas distributed along the Proposed Alignment).

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
	The Superb Parrot Recovery Plan states that clearing of foraging habitat has been followed by the abandonment of nearby traditional breeding areas, even where suitable nest trees remain, and that population size is primarily limited by clearing of woodland foraging habitat. This is especially for foraging habitat within 10 km of breeding trees. The Superb Parrot Recovery Plan also states that the species requires vegetated corridors to move between breeding and foraging habitat and that degradation and destruction of movement corridors is a key factor implicated in the species' decline. The Proposal would impact three trees that were confirmed to be within the height range (10-15 m) identified as critical for superb parrot movement and would require modification of a further six trees to comply with canopy height restrictions. The Proposal would not impact any potential superb parrot breeding trees. The removal and/or modification of the suitable foraging and connectivity habitat may therefore adversely affect habitat critical to the species.
Disrupt the breeding cycle of an important population	No. The Superb Parrot Recovery Plan does not define any important populations of the species; however, the Superb Parrot is known to breed in the lower Molonglo Valley approximately 5 km east of the Impact Area. The Proposal would impact 4.9 ha of potential foraging habitat that may be used by the species during the breeding period, although no sightings of the species were recorded in targeted surveys during the breeding season. The Superb Parrot Recovery Plan states that clearing of foraging habitat has been followed by the abandonment of nearby traditional breeding areas, even where suitable nest trees remain, and that population size is primarily limited by clearing of woodland foraging habitat. This is especially for foraging habitat within 10 km of breeding trees. The removal of the suitable foraging habitat in the Impact Area may therefore adversely affect habitat critical to the species. The Superb Parrot Recovery Plan also states that the species requires vegetated corridors to move between breeding and foraging habitat and that degradation and destruction of movement corridors is a key factor implicated in the species' decline. The Proposal would impact three trees that were confirmed to be within the height range (10-15 m) identified as critical for superb parrot movement and modify a further six trees to comply with canopy height restrictions. While these factors may impact breeding success of the local population, the Proposal is unlikely to disrupt the breeding cycle of an important population as no important population is defined. Additionally, the Proposal would not impact any potential superb parrot breeding trees.
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Yes. The Superb Parrot Recovery Plan states that clearing of foraging habitat has been followed by the abandonment of nearby traditional breeding areas, even where suitable nest trees remain, and that population size is primarily limited by clearing of woodland foraging habitat. This is especially for foraging habitat within 10 km of breeding trees. The removal of 4.9 ha of suitable foraging habitat in the Impact Area may therefore adversely affect habitat critical to the species.

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
	The Superb Parrot Recovery Plan also states that the species requires vegetated corridors to move between breeding and foraging habitat and that degradation and destruction of movement corridors is a key factor implicated in the species' decline. The Proposal would impact three trees that were confirmed to be within the height range (10-15 m) identified as critical for superb parrot movement and modify a further six trees to comply with canopy height restrictions.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No. Indirect impacts on potential foraging trees in proximity to the Proposed Alignment would be minimised through exclusion fencing and pest plant and animal management. Hygiene protocols would be in place for vehicles during the construction phase, and vehicles would utilise existing roads where possible. Mitigation measures would be implemented in accordance with a CEMP. The nature of the Proposal, linear infrastructure for transmission lines, is unlikely to increase the existence of invasive animals such as feral cats or foxes, and the Proposal is not residential and is unlikely to increase domestic animals in the area. As such, the Proposal is unlikely to lead to invasive species becoming established in superb parrot habitat.
Introduce disease that may cause the species to decline, or	No. The superb parrot is susceptible to Psittacine beak and feather disease (PBFD). The loss of nest hollows is likely to intensify competition and use of nest trees, and thus may increase the likelihood of transmission of the disease. The Proposal would not impact any potential breeding trees, and the species was not observed in the Proposal Area during targeted surveys. The potential for the Proposal to increase the risk of PBFD is therefore considered low. Indirect impacts on potential foraging trees in proximity to the Proposed Alignment would be minimised through exclusion fencing and pest plant and animal management. Hygiene protocols would be in place for vehicles during the construction phase, and vehicles would utilise existing roads where possible. Mitigation measures would be implemented in accordance with a CEMP. As such, the Proposal is unlikely to introduce disease that may cause the species to decline.
Interfere substantially with the recovery of the species	Yes. The Superb Parrot Recovery Plan states that the removal of habitat critical to the survival of the species would likely interfere with the recovery of the superb parrot. The Proposal would remove three trees and modify an additional six trees that have been identified as important for superb parrot movement across the landscape. The Proposal would also impact 4.9 ha of potential foraging habitat. This habitat is considered critical to the survival of the species as defined in the Superb Parrot Recovery Plan. The Superb Parrot Recovery Plan states that clearing of foraging habitat has been followed by the abandonment of nearby traditional breeding areas, even where suitable nest trees remain, and that population size is primarily limited by clearing of woodland foraging habitat. This is especially for foraging habitat within 10 km of breeding trees. The removal of the suitable foraging habitat in the Impact Area may therefore interfere with the recovery of the species. The Superb Parrot Recovery Plan also states that the species requires vegetated corridors to move between breeding and foraging habitat and that degradation and destruction of movement corridors is a key factor implicated

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
	in the species' decline. The removal of trees identified as critical for superb parrot movement may also interfere with the recovery of the species.
Conclusion	In total, three potential superb parrot movement trees are within the Impact Area and would need to be removed, and an additional six potential movement trees would be modified (canopy reduced) to comply with canopy height restrictions. In addition, 4.9 ha of foraging habitat would be impacted. The species was not recorded within the Proposal Area during targeted surveys. However, it is likely that the species uses the Impact Area for foraging, including supporting breeding pairs from known breeding trees in the Molonglo Valley, around 5 km from the Proposal Area. The removal of 4.9 ha of foraging habitat and the loss and modification of trees identified as critical for superb parrot movement may adversely affect habitat critical to the survival of a species according to the Superb Parrot Recovery Plan. The Proposal may therefore have a significant impact on superb parrot.

Significant Impact Assessment: Gang-gang Cockatoo (*Callocephalon fimbriatum*) – Endangered

Criteria	An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:
Lead to a long-term decrease in the size of a population of a species	No. Gang-gang cockatoo is known to occur within the lower Molonglo River Corridor immediately adjacent to the Impact Area and five individuals were recorded within the Proposed Alignment during the field surveys. Six suitable foraging trees in the Impact Area, two of which also provide potential breeding habitat, were identified within the Impact Area and would need to be removed to comply with canopy height restrictions. In addition, 10 suitable foraging trees, one of which also provides potential breeding habitat, are close to the Impact Area and would be modified (canopy reduced) to comply with canopy height restrictions. The species distribution spans from northern NSW to southern Victoria and breeding pairs within the ACT are recognised to utilize a broad range of habitat across the ACT including woodland, mountain forests, and peri-urban spaces in suitable breeding and foraging tree species. As such, it is unlikely that the removal of six potential habitat trees and modification of 10 potential habitat trees would lead to a long-term decrease in the size of an important population.
Reduce the area of occupancy of a population	No. Gang-gang cockatoo is known to occur within the lower Molonglo River Corridor immediately adjacent to the Impact Area and five individuals were recorded within the Proposed Alignment during the field surveys. Further, the species is known to occupy a range of habitats in and around the ACT including woodland, mountain forests, and peri-urban spaces in suitable breeding and foraging tree species. If a population containing up to 40 breeding pairs is considered an 'important population' the removal of six potential foraging trees, including two potential breeding trees, that are not known to be utilised is unlikely to reduce the area of occupancy of an important population. Given the broad distribution of the species, the area of occupancy of the individuals occurring in the lower Molonglo Corridor is unlikely to be reduced as a result of the Proposal.
Fragment an existing population into two or more populations	No. The Gang-gang Cockatoo Conservation Advice does not define any important populations of the species. The Proposal is for the construction of linear infrastructure through a large, contiguous area of woodland and cleared rural land. The Gang-gang Cockatoo Conservation Advice notes that the total population of the species is not severely fragmented and is not subject to extreme fluctuations in extent of occurrence or area of occupancy. It also identifies habitat fragmentation as more likely to occur after land clearing or fire events. Land clearing associated with the Proposal has been minimised through the use of power poles, rather than towers, which have a smaller footprint and also reduce movement of the overhead cables which minimises the extent of tree lopping required. Given that fragmentation from linear infrastructure is not a key threat to the species, land clearing has been minimised and there are no important populations of gang-gang cockatoo identified in the ACT, the Proposal is unlikely to fragment an existing important population into two or more populations.

Criteria	An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:
Adversely affect habitat critical to the survival of a species	Yes. The Gang-gang Cockatoo Conservation Advice states that habitat critical to the survival of the gang-gang cockatoo includes all foraging habitat during both the breeding and non-breeding season (excluding exotic feeding grounds such as ornamental trees, shrubs, and hedges). It notes, habitat critical to the survival includes hollow-bearing trees with known or potential gang-gang cockatoo hollow chambers. Suitable foraging and breeding habitat present within the broader landscape has been avoided through the design of the Proposal, including through the refined placement of tower footings and the use of power poles rather than towers. Clearance boundaries would be enforced through fencing and the implementation of a CEMP. The Gang-gang Cockatoo Conservation Advice states that habitat critical to the survival of the species should not be destroyed or modified, and that indirect impacts on the species should be minimised. While impacts on habitat critical to the survival of the species have been avoided and minimised as much as reasonably practicable through the measures discussed above, six potential foraging trees, including two potential breeding trees (<i>Eucalyptus blakelyi</i>), within the Impact Area would be removed and 10 potential foraging trees, including one potential breeding tree adjacent to the Impact Area, would be modified. These trees are considered habitat critical to the survival of the species.
Disrupt the breeding cycle of a population	No. Two potential gang-gang cockatoo breeding trees are within the Impact Area and would be removed, and one additional potential breeding tree would be modified. No individuals were recorded utilising those breeding trees, although five individuals were recorded in the Proposed Alignment in foraging habitat. The Gang-gang Cockatoo Conservation Advice states that only about half of known nest trees are utilised each year, and that individuals may use the same breeding site for multiple years. Indirect impacts on potential breeding trees in proximity to the Impact Area would be minimised through exclusion fencing, pest plant and animal management and minimised light and noise. In a regional context, there is suitable habitat remaining in the landscape, including habitat already being utilised within the lower Molonglo River corridor. Given that there are no defined important populations of the species, and the breeding cycle of the general population is unlikely to be disrupted as a result of the Proposal, the breeding cycle of an important population is unlikely to be disrupted.
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No. The removal of six suitable foraging trees (including two potential breeding trees) in the Impact Area and modification of 10 suitable foraging trees (including one potential breeding tree) is not considered likely to isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. In a regional context, there is suitable habitat remaining in the landscape, including habitat already being utilised within the lower Molonglo River Corridor. As such, the Proposal is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

Criteria	An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	No. Indirect impacts on potential breeding trees in proximity to the Proposed Alignment would be minimised through exclusion fencing and pest plant and animal management. Hygiene protocols would be in place for vehicles during the construction phase, and vehicles would utilise existing roads where possible. Mitigation measures would be implemented in accordance with a CEMP. The nature of the Proposal, linear infrastructure for transmission lines, is unlikely to increase the existence of invasive animals such as feral cats or foxes, and the Proposal is not residential and is unlikely to increase domestic animals in the area. As such, the Proposal is unlikely to lead to invasive species becoming established in gang-gang cockatoo habitat.
Introduce disease that may cause the species to decline, or	No. Indirect impacts on potential breeding trees in proximity to the Proposed Alignment would be minimised through exclusion fencing and pest plant and animal management. Hygiene protocols would be in place for vehicles during the construction phase, and vehicles would utilise existing roads where possible. Mitigation measures would be implemented in accordance with a CEMP. As such, the Proposal is unlikely to introduce disease that may cause the species to decline.
Interfere substantially with the recovery of the species	Yes. The Gang-gang Cockatoo Conservation Advice states that actions that will remove habitat critical to the survival of the species would interfere with the recovery of gang-gang cockatoo. The Proposal would remove six suitable foraging trees (including two potential breeding trees) and modify 10 suitable foraging trees (including one potential breeding tree) adjacent to the Impact Area. This habitat is considered critical to the survival of the species and is therefore considered likely to interfere with the recovery of the species.
Conclusion	Six potential foraging trees, including two potential breeding trees, are within the Impact Area would be removed by the Proposal. An additional 10 potential foraging trees, including one potential breeding tree, are adjacent to the Impact Area and would require modification (canopy reduction). The Gang-gang Cockatoo Conservation Advice states that actions that would remove habitat critical to the survival of the species would likely interfere with the recovery of the species. Given the Proposal would remove habitat considered critical to the survival of the species, it is therefore considered that the Proposal may result in a significant impact upon the gang-gang cockatoo.

Significant Impact Assessment: Hooded Robin (*Melanodryas cucullata*) – Endangered

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Lead to a long-term decrease in the size of a population of a species	No. The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat that may provide foraging and breeding opportunities. Given the large distribution of the sub-species and the minimal extent of habitat removal, the Proposal is unlikely to lead to a long-term decrease in the size of a population of the species.
Reduce the area of occupancy of a population	No. The area of occupancy for the hooded robin (south-eastern) is currently estimated to be 30,000 km ² but it is considered to be contracting (Ford <i>et al.</i> 2021). The Proposal is unlikely to reduce the area of occupancy of the hooded robin (south-eastern), given the extent of potential habitat to be removed within the Impact Area (4.9 ha) relative to the species' broad range, and the presence of potential habitat in the surrounding landscape.
Fragment an existing population into two or more populations	No. The area to be impacted is part of a larger contiguous woodland and cleared rural area and is unlikely to fragment an existing important population.
Adversely affect habitat critical to the survival of a species	The hooded robin Conservation Advice (DCCEEW 2023c) states that habitat critical to the survival of the species include areas of: • dry eucalypt and acacia woodlands and shrublands remnants with an open understorey, some grassy areas and a complex ground layer, often in or near clearings or open areas • structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs, and a ground layer of moderately tall native grasses • standing dead or live trees and tree stumps are also essential for breeding, roosting, and foraging • moderately deep to deep soils, rocks and fallen timber which provides essential foraging habitat. The Proposal would remove 4.9 ha of potential foraging and breeding habitat for the hooded robin. The area to be modified is part of a broader and much larger mosaic of woodland and grassland areas thus the Proposal is unlikely to adversely impact critical habitat for the species.
Disrupt the breeding cycle of a population	No. The Hooded Robin Conservation Advice does not define any important populations for the species. Hooded robins (south-eastern) generally form monogamous pairs and occupy territories during the breeding season and non-breeding season (Fitri and Ford 2003). No individuals were observed during diurnal bird surveys in the Impact Area, nor have they been recorded in the surrounding area, thus it is unlikely that the subspecies is using the area for breeding. The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat that may provide breeding opportunities. Given the minimal extent of vegetation to be removed and the presence of habitat in the broader landscape, it is unlikely the Proposal would disrupt the breeding cycle of a population.

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No. The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat that may provide and breeding opportunities. Given the mobility of this species and the presence of alternative habitats within the broader area, the Proposal is unlikely to modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	No. Invasive weeds, particularly perennial grasses, can compromise habitat values (DCCEEW 2023c). With the implementation of appropriate controls, the Proposal is not anticipated to result in an increase or change in invasive species becoming established across the Impact Area. Best practice weed mitigation measures would be implemented during construction and operation to restrict or manage the spread of any new invasive plant species.
Introduce disease that may cause the species to decline, or	No. The Proposal would not lead to the introduction of disease that may cause the subspecies to decline.
Interfere substantially with the recovery of the species	No. A recovery plan for the hooded robin (south-eastern) has not been prepared. The loss of habitat through clearing and modification is the primary factor in the decline of the hooded robin (south-eastern). The subspecies has not been recorded within the Proposal area nor in the immediate vicinity. The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat. This is a small area in the context of the broader landscape and the Proposal is considered unlikely to interfere substantially with the recovery of the species.
Conclusion	Although the Impact Area supports habitat for the hooded robin, in the ACT the species has shown a consistent steady decline over recent decades (Bounds <i>et al.</i> 2021) and is now in very low abundance in the Canberra region and have been lost from peri-urban woodland sites. Surveys conducted as part of the Woodland Bird Monitoring Project by the Canberra Ornithologists Group (COG) have not recorded the species during surveys since 2014 (Bounds <i>et al.</i> 2021). The species has not been recorded within the vicinity of the Impact Area. The Proposal is not considered to be likely to have a significant impact on this species.

Significant Impact Assessment: Southern Whiteface (*Aphelocephala leucopsis*) – Vulnerable

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Lead to a long-term decrease in the size of an important population of a species	No. The Conservation Advice for the southern whiteface does not define any important populations for the species. The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat that may provide foraging and breeding opportunities. Given the large distribution of the species and the minimal extent of habitat removal, the Proposal is unlikely to lead to a long-term decrease in the size of an important population of the species.
Reduce the area of occupancy of an important population	No. The Conservation Advice for the southern whiteface does not define any important populations for the species. The area of occupancy for the southern whiteface is currently estimated to be 60,000 km ² but it is considered to be contracting (Ehmke <i>et al.</i> 2021). The Proposal is unlikely to reduce the area of occupancy of the southern whiteface, given the extent of potential habitat to be removed within the Proposal site (4.9 ha) relative to the species' broad range, and the presence of potential habitat in the surrounding landscape.
Fragment an existing important population into two or more populations	No. The Conservation Advice for the southern whiteface does not define any important populations for the species. In the ACT the species is thought to be sedentary and generally occurs in small groups (Bounds <i>et al.</i> 2021). Given the extent of the vegetation to be removed (4.9 ha) it is unlikely that the Proposal would fragment an existing population.
Adversely affect habitat critical to the survival of a species	No. The Conservation Advice for the species (DCCEEW 2023d) states that habitat critical to the survival of the southern whiteface includes areas of: - relatively undisturbed open woodlands and shrublands with an understorey of grasses or shrubs, or both - habitat with low tree densities and an herbaceous understorey litter cover which provides essential foraging habitat - living and dead trees with hollows and crevices which are essential for roosting and breeding. It also states that habitat critical to the survival of the species should not be destroyed or modified, and that indirect impacts on the species should be minimised. The Proposal would remove 0.08 ha of moderate to high quality ACT16.1 <i>Eucalyptus melliodora</i> – <i>E. blakelyi</i> Tableland Grassy Woodland as well as 0.28 ha of low quality ACT16.7 <i>Eucalyptus melliodora</i> – <i>E. blakelyi</i> Tableland Grassy Woodland which could provide potential foraging and breeding habitat for southern whitefaces. The area to be modified is part of a broader mosaic of woodland and grassland areas thus the Proposal is unlikely to adversely impact critical habitat for the species. No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat for the southern whiteface (DCCEEW 2023d).

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Disrupt the breeding cycle of an important population	No. The Conservation Advice for the southern whiteface does not define any important populations for the species. The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat that may provide breeding opportunities. Given the minimal extent of vegetation to be removed and the presence of habitat in the broader landscape, it is unlikely the Proposal would disrupt the breeding cycle of an important population.
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No. The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat that may provide foraging and breeding opportunities. Given the mobility of this species and the presence of alternative habitats within the broader area, the Proposal is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No. The Proposal would not result in an invasive species becoming established in southern whiteface habitat.
Introduce disease that may cause the species to decline, or	No. The Proposal would not lead to the introduction of disease that may cause the species to decline.
Interfere substantially with the recovery of the species	No. A recovery plan for the southern whiteface has not been prepared. The loss of habitat through clearing and modification is the primary factor in the decline of the southern whiteface. The Proposal is likely to remove 4.9 ha of grassy woodland habitat. This is a minimal extent in the context of the broader area and the Proposal is considered unlikely to interfere substantially with the recovery of the species.
Conclusion	The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat. The species was recorded near the western end of the Proposed Alignment but outside of the construction area during diurnal bird across the Proposal area. Given the minimal amount of vegetation to be removed and the remaining habitat in the broader area, it is considered that the Proposal is not likely to have a significant impact on the southern whiteface.

Significant Impact Assessment: Diamond Firetail (*Stagonopleura guttata*) – Vulnerable

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Lead to a long-term decrease in the size of an important population of a species	No. The <i>Conservation Advice for Stagonopleura guttata Diamond Firetail</i> (Diamond Firetail Conservation Advice) (DCCEEW 2023e) does not define any important populations for the species. The species was not recorded during diurnal bird surveys, but it has been recorded in the vicinity of the Impact Area. The Proposal is likely to remove 4.9 ha of grassy woodland habitat that provides potential foraging and breeding opportunities. Given the large distribution of the species and the minimal extent of habitat removal, the Proposal is unlikely to lead to a long-term decrease in the size of an important population of the species.
Reduce the area of occupancy of an important population	No. The Diamond Firetail Conservation Advice for the does not define any important populations for the species. The area of occupancy for the diamond firetail is currently estimated to be 25,000 km² but it is considered to be contracting (Hodder <i>et al.</i> 2021). The Proposal is unlikely to reduce the area of occupancy of the diamond firetail, given the extent of potential habitat to be removed within the Impact Area (4.9 ha) relative to the species' broad range, and the presence of potential habitat in the surrounding landscape.
Fragment an existing important population into two or more populations	No. The Diamond Firetail Conservation Advice does not define any important populations for the species. In the ACT the species typically occurs in small groups and is thought to move around to take advantage of different seed sources (Bounds <i>et al.</i> 2021). Given the extent of the vegetation to be removed (4.9 ha) and the mobility of the species it is unlikely that the Proposal would fragment an existing population.
Adversely affect habitat critical to the survival of a species	No. The Diamond Firetail Conservation Advice states that habitat critical to the survival of the species includes areas of eucalypt, acacia or casuarina woodlands, open forests, and other lightly timbered habitats, with low tree density, few large logs, and little litter cover but high grass cover for foraging, roosting and breeding. It also states that habitat critical to the survival of the species should not be destroyed or modified, and that indirect impacts on the species should be minimised. The Proposal would remove 0.08 ha of moderate to high quality ACT16.1 <i>Eucalyptus melliodora</i> – <i>E. blakelyi</i> Tableland Grassy Woodland as well as 0.28 ha of low quality ACT16.7 <i>Eucalyptus melliodora</i> – <i>E. blakelyi</i> Tableland Grassy Woodland, which could provide potential foraging and breeding habitat for diamond firetails. The area to be modified is part of a broader mosaic of woodland and grassland areas thus the Proposal is unlikely to adversely impact critical habitat for the species. No critical habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat for the diamond firetail (DCCEEW 2023e).

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Disrupt the breeding cycle of an important population	No. The Diamond Firetail Conservation Advice does not define any important populations for the species. The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat that may provide breeding opportunities. Given the minimal extent of vegetation to be removed and the presence of habitat in the broader landscape, it is unlikely the Proposal would disrupt the breeding cycle of an important population.
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No. The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat that may provide and breeding opportunities. Given the mobility of this species and the presence of alternative habitats within the broader area, the Proposal is unlikely to modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No. Weeds, particularly exotic annual grasses, altering habitat are listed as a severe threat in the conservation advice (DCCEEW 2023e). The replacement of native perennial grasses with exotic annual grasses can lead to food shortages if there are no alternative seed sources (Hodder et al. 2021). With the implementation of appropriate controls, the Proposal is not anticipated to result in an increase or change in invasive species becoming established across the Impact Area. Best practice weed mitigation measures would be implemented during construction and operation to restrict or manage the spread of any new invasive plant species.
Introduce disease that may cause the species to decline, or	No. The Proposal would not lead to the introduction of disease that may cause the species to decline.
Interfere substantially with the recovery of the species	No. A recovery plan for the diamond firetail has not been prepared. The loss of habitat through clearing and alteration is the primary factor in the decline of the diamond firetail. The Proposal is likely to remove 4.9 ha of grassy woodland habitat. This is a minimal extent in the context of the broader area and the Proposal is considered unlikely to interfere substantially with the recovery of the species.
Conclusion	The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat. No individuals were recorded utilising the habitat during diurnal bird surveys conducted across the Impact Area, however they have previously been recorded in the immediate vicinity at the eastern end of the Proposed Alignment. Given the minimal amount of vegetation to be removed and the remaining habitat in the broader area, it is considered that the Proposal is not likely to have a significant impact on the diamond firetail.

Significant Impact Assessment: Painted Honeyeater (*Grantiella picta*) - Vulnerable

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Lead to a long-term decrease in the size of an important population of a species	No. The <i>National Recovery Plan for the Painted Honeyeater (Grantiella picta)</i> (DAWE 2021c) (Painted Honeyeater Recovery Plan) does not define any important populations for the species. The entire population of the painted honeyeater is considered to be one subpopulation (Watson et al. 2021). The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat that may provide foraging and breeding opportunities. Given the large distribution of the species and the minimal extent of habitat removal, and the presence of potential habitat in the broader landscape, the Proposal is unlikely to lead to a long-term decrease in the size of an important population of the species.
Reduce the area of occupancy of an important population	No. The Painted Honeyeater Recovery Plan does not define any important populations for the species. The Area of Occupancy for the painted honeyeater is considered to be 1500 km² (Watson et al. 2021). The Proposal is unlikely to reduce the area of occupancy of the painted honeyeater, given the extent of potential habitat to be removed within the proposal site (4.9 ha) relative to the species' broad range, and the presence of potential habitat in the surrounding landscape.
Fragment an existing important population into two or more populations	No. The Painted Honeyeater Recovery Plan does not define any important populations for the species. The entire population of the painted honeyeater is considered to be one subpopulation (Watson et al. 2021). In the ACT, the species is a rare visitor with individuals being recorded every few years (COG 2018). Given the extent of the vegetation to be removed (4.9 ha) and the presence of potential habitat in the broader landscape, it is unlikely that the Proposal would fragment an existing population.
Adversely affect habitat critical to the survival of a species	No. Habitat critical to the survival of the Painted Honeyeater includes: - Known or likely breeding habitat in Boree/Weeping Myall, Brigalow woodlands, box-gum woodlands, and box-ironbark forests on the inland slopes of the Great Dividing Range in New South Wales, Victoria and southern Queensland. - All preferred foraging species within known and likely foraging habitat particularly mistletoes of the genus <i>Amyema</i> growing on forest and woodland eucalypts and acacias. The Proposal would likely remove 4.9 ha of grassy woodland which could provide potential foraging and breeding habitat for painted honeyeaters. Given that painted honeyeaters are only occasional visitors to the ACT and that the area to be modified is part of a broader mosaic of woodland and grassland areas, the proposal is unlikely to adversely impact critical habitat for the species.
Disrupt the breeding cycle of an important population	No. The Painted Honeyeater Recovery Plan does not define any important populations for the species. The painted honeyeater is only a sporadic visitor to the ACT and there are few breeding records (EPSDD 2019). The removal of 4.9 ha of potential grassy woodland habitat is unlikely to disrupt the breeding cycle of an important population of the species.

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No. The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat that may provide foraging and breeding opportunities. Given the mobility of this species and the presence of alternative habitats within the broader area, the proposal is unlikely to modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No. The Proposal is unlikely to result in invasive species that are harmful to painted honeyeater becoming established in painted honeyeater habitat.
Introduce disease that may cause the species to decline, or	No. The Proposal is unlikely to result the introduction of disease that may cause the species to decline.
Interfere substantially with the recovery of the species	No. A Recovery Plan has been prepared for the painted honeyeater (DAWE 2021c). Actions that remove habitat critical to the survival could interfere with the recovery of the painted honeyeater and reduce the area of occupancy of the species. However, only 4.9 ha of potential habitat is likely to be removed as part of the Proposal and this is unlikely to substantially interfere with the recovery of the species.
Conclusion	The Proposal is likely to remove 4.9 ha of potential grassy woodland habitat. No individuals were recorded utilising the habitat during diurnal bird surveys conducted across the Impact Area. The painted honeyeater is a rare visitor to the ACT. Given the minimal amount of vegetation to be removed and the remaining habitat in the broader area, it is considered that the proposal is not likely to have a significant impact on the painted honeyeater.

Significant Impact Assessment: White-throated Needle-tail (*Hirundapus caudacutus*) – Vulnerable

Criteria	An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:
Lead to a long-term decrease in the size of an important population of a species	No. The population size of the nominate subspecies that migrates to Australia is currently considered to be 41,000 mature individuals and comprise one population (Tarburton and Garnett, 2021). The Proposal is unlikely to modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the white-throated needle-tail is likely to decline. The Proposal would modify the airspace with the addition of aerial power cables such that individual white-throated needle-tails may face an increased risk of mortality due to collision with power cables whilst foraging or dispersing through the area.
Reduce the area of occupancy of an important population	No. The Proposal would not reduce the area of occupancy of an important population of the white-throated needle-tail. Currently the white-throated needle-tail is considered to be one population and its area of occupancy is estimated to be 10,000,000 km ² (Tarburton and Garnett, 2021).
Fragment an existing important population into two or more populations	No. The Proposal would not fragment an existing population of white-throated needle-tails into two or more populations given the species' mobility and its large area of occupancy.
Adversely affect habitat critical to the survival of a species	No. The Proposal is unlikely to affect habitat critical to the survival of the species. Due to the dispersed and aerial nature of white-throated needle-tails it is unlikely that there is any specific habitat critical for the survival of the species outside of their breeding range.
Disrupt the breeding cycle of an important population	No. The Proposal would not disrupt the breeding cycle of the white-throated needle-tail. The nominate subspecies is a trans-equatorial migrant which breeds in the northern hemisphere and migrates to Australia during the austral summer (Birdlife Australia, 2023).
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No. The Proposal is unlikely to modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the white-throated needle-tail is likely to decline. The Proposal would however modify the airspace such that white-throated needle-tails may be at risk of mortality resulting from collision with power cables.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No. The Proposal would not result in invasive species that are harmful to white-throated needle-tail becoming established in white-throated needle-tail habitat.
Introduce disease that may cause the species to decline, or	No. The Proposal is unlikely to result in the introduction of disease that may cause the white-throated needle-tail to decline.
Interfere substantially with the recovery of the species	No. The Proposal is unlikely to interfere substantially with the recovery of the species. There is a risk of mortality due to the potential for collision with power cables however the number of individuals that are likely to be impacted is unlikely, in isolation, to substantially interfere with the recovery of white-throated needle-tail.
Conclusion	Due to the dispersive and aerial nature of the white-throated needle-tail and its large area of occupancy, the Proposal is considered unlikely to have a significant impact upon the white-throated needle-tail. However, due to the modified airspace, there may be a risk of mortality due to collision with power cables.