BIODIVERSITY ASSESSMENT

Wagga Wagga South Solar Farm

November 2019

Project Number: 19-088

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W. www.nghconsulting.com.au

E. ngh@nghconsulting.com.au

BEGA - ACT & SOUTH EAST NSW
Suite 11, 89-91 Auckland Street (PO Box 470) Bega NSW 2550 **T.** (02) 6492 8333

NEWCASTLE - HUNTER & NORTH COAST
Unit 2, 54 Hudson Street
Hamilton NSW 2303 **T.** (02) 4929 2301

BRISBANE
Suite 4, Level 5, 87 Wickham Terrace
Spring Hill QLD 4000 **T.** (07) 3129 7633

SYDNEY REGION
Unit 18, Level 3, 21 Mary Street
Surry Hills NSW 2010 **T.** (02) 8202 8333

CANBERRA - NSW SE & ACT
8/27 Yallourn Street (PO Box 62)
Fyshwick ACT 2609 **T.** (02) 6280 5053

WAGGA WAGGA - RIVERINA & WESTERN NSW
Suite 1, 39 Fitzmaurice Street (PO Box 5464)
Wagga Wagga NSW 2650 **T.** (02) 6971 9696

GOLD COAST
PO Box 466
Tugun QLD 4224 **T.** (07) 3129 7633

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ABN 31 124 444 622 ACN 124 444 622

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ACRONYMS AND ABBREVIATIONS

AoS	Assessment of Significance
BC Act	*Biodiversity Conservation Act 2016* (NSW)
Cwth	Commonwealth
DBH	Tree Diameter at Breast Height (cm)
DPI	NSW Department of Primary Industry
EEC	Endangered ecological community – as defined under relevant law applying to the proposal
EPBC Act	(Cwth) *Environment Protection and Biodiversity Conservation Act 1999*
EP&A Act	(NSW) *Environmental Planning and Assessment Act 1979*
ha	hectares
IBRA	Interim Biogeographic Regionalisation for Australia
km	kilometres
LEP	Local Environment Plan
LGA	Local Government Area
m	Metres
NSW	New South Wales
OEH (DPIE)	(NSW) Office of Environment and Heritage, formerly Department of Environment, Climate Change and Water
PCT	Plant Community Type
SEPP	State Environmental Planning Policy (NSW)
Spp/Spps.	Species/plural species
Stag	Dead tree
TEC	Threatened Ecological Community
V	Vulnerable
E	Endangered
CE	Critically Endangered

1. INTRODUCTION

NGH was engaged by Premise to prepare a Biodiversity Assessment for the proposed Wagga Wagga South Solar Farm at Bomen, NSW.

Wagga Wagga City Council is the consent authority for the development, under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The biodiversity impacts of the proposal are therefore to be assessed under the provisions of the *Biodiversity Conservation Act 2016* (BC Act).

1.1. PURPOSE OF THIS REPORT

NGH was engaged by Premise to undertake a Biodiversity Assessment for this proposal. This report assesses the impacts of the proposed development on biodiversity values in the proposal area. The report identifies and describes biodiversity values in terms of vegetation structure, composition, type and condition, and fauna habitats, sightings and signs.

The potential for, and significance of, impacts to threatened species and communities listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) have been evaluated.

The report addresses the flora and fauna assessment requirements of clauses 1.7 and 4.15 of the *Environment Planning and Assessment Act 1979* (EP&A Act) and clause 7.3 of the Wagga Wagga Local Environmental Plan 2010. Where relevant, recommendations are provided to avoid and minimise flora and fauna impacts.

1.2. THE PROPOSAL

1.2.1. Site location and description

The works for the proposed Wagga Wagga South Solar Farm are located within Lot 15 DP1108978 within the Wagga Wagga Local Government Area (LGA). The works cover an area of approximately 47 hectares (ha), and are bounded by cropping and grazing agricultural land, Bomen industrial estate is located 1.5 km to the north and to the west of the proposal boundary (Figure 1-1, Figure 1-2)

The proposal area is located within the Lower Slopes of the NSW South Western Slopes IBRA biogeographic region. The subject site is zoned RU1 Primary Production under the Wagga Wagga Local Environment Plan (LEP 2010). The proposal area has been largely cleared for agricultural purposes. The majority of the land is assessed as category 1-exempt land according to the *Local Land Services Act 2013*, as indicated in Section 4.2.2. Some stands of mature paddock trees occur throughout the proposal area. Linear plantings occur throughout the proposal site (Figure 1-2, Figure 1-3, Figure 1-4).

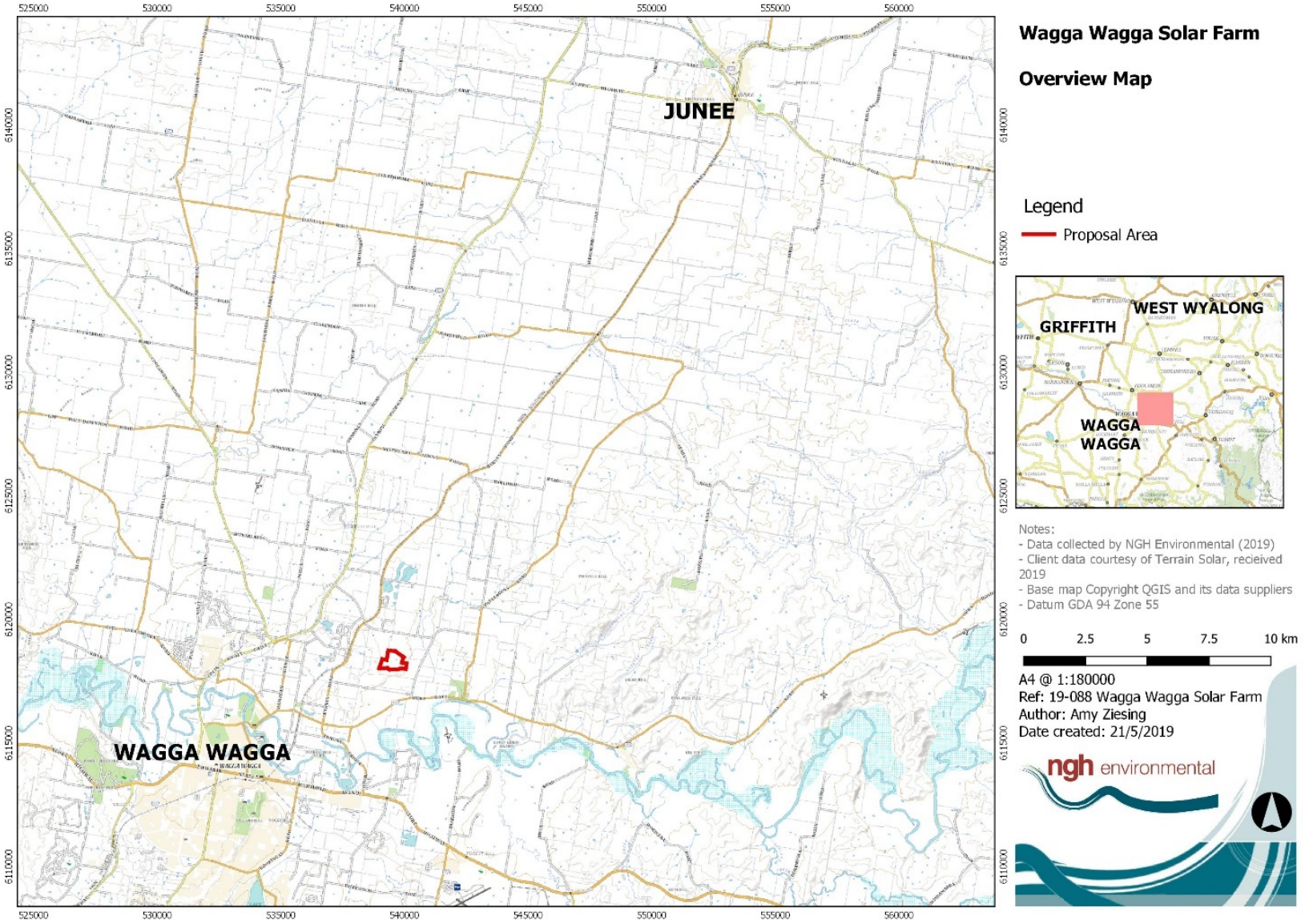

Figure 1-1 Locality map

Figure 1-2 Proposal area map

Figure 1-3 Linear strip of native tree plantings

Figure 1-4 Mature paddock trees in northern perimeter of proposal area

1.2.2. Proposal description

The proposed Wagga Wagga South Solar Farm would comprise the installation of solar panels and its associated infrastructure. The proposed solar farm would have an export capacity of 18.7 MW.

The power generated from the proposed Wagga Wagga South Solar Farm will be fed into the National Electricity Market (NEM) at the transmission level from the nearby Wagga Wagga North Zone Substation. The proposal will consist of the following components:

- Single axis tracker PV solar panels mounted on steel frames over most of the site.
- Electrical conduits and transformers.
- Invertor units.
- On-site or off-site substation.
- Site office, vehicle parking areas, internal access tracks and perimeter fencing.
- Overhead and underground electrical cable reticulation.
- 66 KV overhead cable run to connect the proposal to the nearby substation.

1.3. TERMS USED IN THIS DOCUMENT

The '**proposal area'** is defined as the maximum potential impact of the proposed works for which includes access roads to the proposed development from existing roads. The proposal area is the area surveyed for the assessment.

The '**development footprint**' encompasses the total area of land that will be directly impacted by the proposed development

The '**locality**' encompasses a 10 km radius of the proposal area.

2. STATUTORY CONSIDERATIONS

2.1. ENVIRONMENTAL PROTECTION AND BIODIVERSITY CONSERVATION (EPBC) ACT 1999 (CWTH)

The EPBC Act protects nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as matters of national environmental significance. Matters of national environmental significance relevant to biodiversity are:

- Wetlands of international importance
- Nationally threatened species and ecological communities
- Migratory species
- Commonwealth marine areas

Significance of impacts is determined in accordance with the Significance impact guidelines 1.1 – Matters of National Environmental Significance (DoE 2013). Where a proposal is likely to have a significant impact on a matter of national environmental significance, the proposal is referred to the Commonwealth Environment Minister via the Department of the Environment (DoE). The Minister then determines whether the proposal is a 'controlled action'. If a proposal is declared a controlled action, an assessment of the action is carried out and the Minister makes a decision to approve, approve with conditions, or not approve the proposed action.

This assessment considers the potential for the proposal to impact on Matters of National Environmental Significance relevant to biodiversity.

2.2. ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The *Environmental Planning and Assessment Act* 1979 (EP&A Act) provides the framework for the assessment of development activities. The proposed development would be considered by the consent authority under clause. 4.2 of this Act, being development that is permitted with consent.

Section 1.7 and Part 4.15 of the EP&A Act requires the consent authority to consider the significance of the impact of the proposal on terrestrial and aquatic threatened species, populations and endangered ecological communities in accordance with the provisions of Part 7 of the Biodiversity Conservation Act 2016).

The potential for, and significance of, impacts to threatened species and communities listed under the NSW BC Act and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) have been evaluated in this Biodiversity Assessment. Where relevant, recommendations are provided to avoid and minimise flora and fauna impacts.

2.3. BIODIVERSITY CONSERVATION ACT 2016

In respect of Part 4 developments, the *Biodiversity Conservation Act 2016* (BC Act) establishes a framework to avoid, minimise and offset the impacts of proposed development and land use change on biodiversity. It provides a scientific method for assessing the likely impacts of proposed development on biodiversity values, for calculating measures to offset those impacts and for assessing improvements in biodiversity values. The Act aims to maintain the diversity and quality of ecosystems and to support conservation and threat abatement action to slow the rate of biodiversity loss and conserve threatened species and ecological communities in nature.

The primary requirement under the BC Act, is to determine whether the development is likely to significantly affect threatened species. According to clause 7.7(2) of the BC Act, if the proposed development is likely to significantly affect threatened species, the development application is to be accompanied by a biodiversity

development assessment report (BDAR). According to this clause, development is considered likely to significantly affect threatened species if:

> *(a) it is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in section 7.3, (5-part Test) or,*
>
> *(b) the development exceeds the biodiversity offsets scheme threshold if the biodiversity offsets scheme applies to the impacts of the development on biodiversity values, or*
>
> *(c) it is carried out in a declared area of outstanding biodiversity value.*

The conclusion of this assessment is that the development is not likely to significantly affect threatened species. This is outlined in Section 5 of this report. Accordingly, a BDAR is not required to accompany the development application and the proposed development is not required to enter into the Biodiversity Offset Scheme (BOS).

Pursuant to clause 7.4, it is noted that any part of the proposed development that involves clearing on category 1-exempt land (within the meaning of Part 5A of the Local Land Services Act 2013) is to be disregarded for the purposes of determining whether proposed development exceeds the biodiversity offsets threshold (BOS). Part of the land is considered to be category 1-exempt land and has been disregarded from the BOS threshold calculations.

The minimum lot size for the subject land is 200 hectares and the relevant clearing threshold is therefore 1 hectare. The proposal comprises approximately 0.475 hectares of clearing and would not exceed the BOS clearing thresholds.

2.4. STATE ENVIRONMENTAL PLANNING POLICY NO. 44 – KOALA HABITAT PROTECTION

SEPP 44 encourages the conservation and management of natural vegetation areas that provide habitat for Koalas to ensure that permanent free–living populations will be maintained over their present range. Wagga Wagga LGA is listed as a Local Government Area to which the SEPP applies.

SEPP 44 aims to identify areas of potential and core Koala Habitat. These are described as follows:

- Core Koala Habitat is defined as an area of land with a resident population of Koalas, evidenced by attributes such as breeding females, and recent and historical records of a population.
- Potential Koala Habitat is defined as areas of native vegetation where the trees listed in Schedule 2 of SEPP 44 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.

This Flora and Fauna Assessment has considered the presence of core and potential Koala habitat at the site (refer to Section 4.3.1). On the basis of minimal habitat structure, no detectable signs during the field survey and no recent records, it is unlikely that the study area supports a resident Koala population and the site is not considered Core Koala Habitat.

2.5. NSW BIOSECURITY ACT 2015

The Biosecurity Act guides the management of weeds at the regional level throughout NSW. Under the Act, all plants are regulated with a ***general biosecurity duty*** to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant who knows or ought to know of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable. Individual landholders and managers are required under the Act to control priority weeds for their area according to the relevant biosecurity toolset.).

Two priority weeds were identified at the site. This is discussed further in section 4.2.5: Priority Weeds.

Table 2-1 Biosecurity Act 2015 toolset for weed management (Department of Primary Industry 2016)

Outcome category	*Biosecurity toolset*
Weeds excluded from entering state	Prohibited Matter: Declaration and management of significant weeds not present in NSW or part of NSW.
Weeds to be eradicated	Control Order: Management of weeds that are the targets of approved eradication programs. Although a Control Order is for a five–year period, this can be renewed for longer eradication programs.
Weeds to be effectively managed to reduce spread on regional basis	Biosecurity Zone: Weeds subject to ongoing 'strategic' regional management.
All Weeds	General Biosecurity Duty: Requires any person dealing with biosecurity matter or a carrier of biosecurity matter and who knows or ought to know of the biosecurity risks associated with that activity to take measures to prevent, minimise or eliminate the risk as far as is reasonably practicable. Specific measures to reduce the risk will be detailed in regional weeds plans for priority weeds. Note however, that the General Biosecurity Duty exists for all weeds that present a biosecurity risk.
Other Biosecurity tools	Mandatory Measures Regulation: May require persons to take specific actions with respect to weeds or carriers of weeds. Emergency Order: To respond to a current or imminent biosecurity risk that may have a significant impact. Biosecurity Direction: An enforceable instruction to a person or class of persons to take action to: Prevent, eliminate or minimise a biosecurity risk Prevent, manage or control a biosecurity impact Enforce any instrument under the Act. Biosecurity Undertaking: An authorised officer may accept in writing an undertaking by a person that sets out the measures a person has agreed to implement to remedy a contravention, a likely contravention, or suspected contravention of the Act.

3. METHODOLOGY

3.1. BACKGROUND REVIEW

3.1.1. Database searches and literature review

Database searches were undertaken on 29 March and 27 September 2019 to identify threatened species, populations and ecological communities known to occur, or with potential to occur, within a 10 km radius of the proposal area. The following online search tools were used:

- NSW Bionet Atlas database for species, populations and communities listed under the NSW BC Act and Commonwealth EPBC Act.
- Commonwealth *Protected Matters Search Tool* for threatened species and communities listed under the EPBC Act.
- Office of Environment and Heritage Interim Biogeographic Regionalisation (IBRA) search by region (Inland Slopes and Lower Slopes) and habitat (Western Slopes Grassy Woodlands) for threatened species and communities listed under the BC Act.
- Other background searches undertaken were:
    - NSW Government Biodiversity Values Map and Threshold Tool

3.1.2. Threatened species evaluation

Information was compiled on threatened species, populations, and communities which have potential to be present in the study area from current scientific publications and environmental survey and assessment reports. Online databases used include the OEH (DPIE) Threatened Biodiversity Data Collection, particularly the Vegetation Information System (VIS) and threatened species profiles, and the Commonwealth EPBC Act Species Profiles and Threats Database (SPRAT).

The results of the database searches and literature review have been used to evaluate the potential for threatened species, ecological communities and endangered populations to be present in the study area, and to be adversely affected by the works. The threatened species evaluation also considers field survey results in relation to habitat type and quality, and on–site records. The approach is consistent with the NSW Threatened Species Assessment Guidelines (DECC 2007). The Threatened Species Evaluation is included within Appendix B.

3.2. FIELD SURVEYS

The proposal area was surveyed by two ecologists on 5 April 2019 to assess the biodiversity values of the site. The survey was undertaken over a period of five hours (flora, ecological communities and fauna).

3.2.1. Flora

Random meander (Cropper 1993) and floristic plots under the Biodiversity Assessment Methodology (BAM – NSW Government 2017) were used to survey vegetation at the proposal area. These methods provide good coverage in terms of area and microhabitats and maximises opportunities for detecting rare or sparsely distributed species. Species were recorded progressively with abundance recorded within the proposal area. Any priority weeds were recorded opportunistically.

Plant Community Types (PCTs) were identified according to the OEH BioNet Vegetation Classification (OEH, 2017). Where relevant, Threatened Ecological Communities (TEC) were confirmed based on the relevant Scientific Committee – final determinations for each TEC. Botanical nomenclature follows Harden (1990–

2002) and the PlantNet website, updated with recent changes recognised in Angiosperm Phylogeny Group (2016) and the Australian Plant Census.

3.2.2. Fauna and Habitat

The terrestrial fauna survey was undertaken to record and assess the value of habitats at the site to fauna, particularly threatened species with potential to occur at the site. Fauna sign and key habitat features were recorded, including:

- hollows and fissures in standing trees and stags.
- large woody debris and litter.
- fauna signs such as nests, scratches, glider sap feed marks, scats and latrine sites.
- food tree species (for gliders and possums, Koala).
- microhabitats such as soaks, rock outcrops and dense understorey.

All trees were individually inspected for trunk or limb hollows and any signs of occupation or use. Any disturbances and active threats to fauna or habitats were also recorded during the survey.

3.3. ASSUMPTIONS AND LIMITATIONS

The flora assessment is based on single–visit random meander survey. It is unlikely that all plant species were detected that may be present at the site due to the time of year the survey was undertaken and only one short site visit being conducted. In particular, some inconspicuous or geophytic species which flower outside the survey period may not have been recorded. However, due to the ground cover being mostly exotic and highly disturbed it is unlikely geophytic threatened flora species would occur in the proposal area.

No targeted fauna surveys were undertaken. However, in view of the scale and disturbed context of the proposal area, and the assessed low potential for direct impacts to threatened species, the approach is considered adequate and appropriate for the identification and assessment of biodiversity impacts.

4. RESULTS

4.1. BACKGROUND SEARCHES

4.1.1. Threatened Species

The results of the desktop study identified 28 flora species, two Endangered Ecological Communities (EECs), 74 fauna species and one endangered population with the potential to occur within the locality.

No threatened flora species were determined to occur within the proposal area. The following threatened fauna, and one EEC were determined to have the potential to occur within the proposal area. Squirrel Glider's (*Petaurus norfolcensis*) within the Wagga Wagga Local Government Area (LGA) are listed as an Endangered Population under the BC Act.

Understory Birds:

- Hooded Robin (south-eastern form) (*Melanodryas cucullata cucullata)* - BC-V
- Scarlet Robin (*Petroica boodang)* - BC-V
- Flame Robin (*Petroica phoenicea)* - BC-V
- Diamond Firetail (*Stagonopleura guttata)* - BC-V
- Grey-crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis)* - BC-V

Aerial Birds:

- Dusky Woodswallow (*Artamus cyanopterus cyanopterus)* - BC-Vulnerable (V)
- Little Eagle (*Hieraaetus morphnoides)* - BC-V
- Spotted Harrier (*Circus assimilis*) - BC-V
- Black Falcon (*Falco subniger)* - BC – V
- White-bellied Sea-eagle (*Haliaeetus leucogaster)* - BC-V

Hollow Dependent Species:

- Barking Owl (*Ninox connivens)* - BC-V
- Swift Parrot (*Lathamus discolor*) – BC – Endangered (E), EPBC – Critically Endangered (CE)
- Superb Parrot (*Polytelis swainsonii*) – BC – V, EPBC – V
- Turquoise Parrot (*Neophema pulchella*) – BC – V
- Southern Myotis (*Myotis macropus)* - BC-V
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) - BC-V
- Little Pied Bat (*Chalinolobus picatus)* - BC-V
- Squirrel Glider (*Petaurus norfolcensis*) – BC – V

Endangered Ecological Communities and Populations:

- White Box Yellow Box Blakley's Red Gum Woodland (Box-Gum Woodland) – BC – EEC EPBC - CE
- Squirrel Glider in the Wagga Wagga LGA – BC – Endangered Population

Amphibians:

- Sloane's Froglet (*Crinia sloanei)* - BC – V, EPBC - E

A full list of the threatened species identified through these searches with further description is available in Appendix B1 and Appendix B2.

4.1.2. Biodiversity Values

The proposal area does not fall within an area of high or outstanding biodiversity value listed on the NSW Biodiversity Values Map (Appendix A.4).

4.1.3. Ground Water Dependent Ecosystems (GDE)

A search of the Australian Bureau of Meteorology Atlas of Groundwater Dependent Ecosystems determined no known terrestrial or aquatic Groundwater Dependent Ecosystems (GDEs) are present within the proposal area (Appendix A.6).

4.2. FLORA

4.2.1. Existing Environment

Remnant vegetation remaining in the locality is comprised of scattered and isolated paddock trees. The native vegetation communities remaining are isolated patches of open grassy woodlands. This vegetation type largely reflects the underlying geology and land use of the region. Open, grassy woodlands occur across a diversity of geologies however are usually found on the slopes or valleys of more deep and fertile soils.

The proposal area occurs in an undulating terrain which has been heavily cleared for agricultural purposes. Narrow linear plantings of native species occur along paddock boundaries. The proposal area has been largely cultivated or has experienced pasture improvement (Figure 4-1).

Figure 4-1 Heavily grazed exotic pastures with planted vegetation in the background

4.2.2. Category 1-exempt Land

Section 6.8(3) of the BC Act determines that the Biodiversity Assessment Method (BAM) is to exclude the assessment of the impacts of clearing of native vegetation on Category 1-exempt land (within the meaning of Part 5A of the Local Land Services Act 2013).

Category 1-exempt land is defined under the LLS act as;

- *Land cleared of native vegetation as at 1 January or lawfully cleared after 1 January 1990*
- *Low Conservation Grasslands (following commencement of BC Act on 25th August 2017)*
- *Land containing only low conservation groundcover (not being grasslands and following commencement of BC Act on 25th August 2017)*
- *Native vegetation identified as regrowth in a Property Vegetation Plan under the repealed Native Vegetation Act 2003*
- *Land biodiversity certified under the Biodiversity Conservation Act 2016.*

Mapping of Category 1-exempt land on the Native Vegetation Regulatory (NVR) map is not yet publicly available. During the transitional period, accredited assessors may establish the categorisation of land for the agency head to consider, following the method utilised to develop the Native Vegetation Regulatory Map.

An assessment was prepared by an NGH ecologist and accredited assessor and submitted to the Biodiversity Conservation Division (BCD). The BCD concurred with the assessment provided (Appendix G). The Category 1-exempt land is indicated in Figure 4-2.

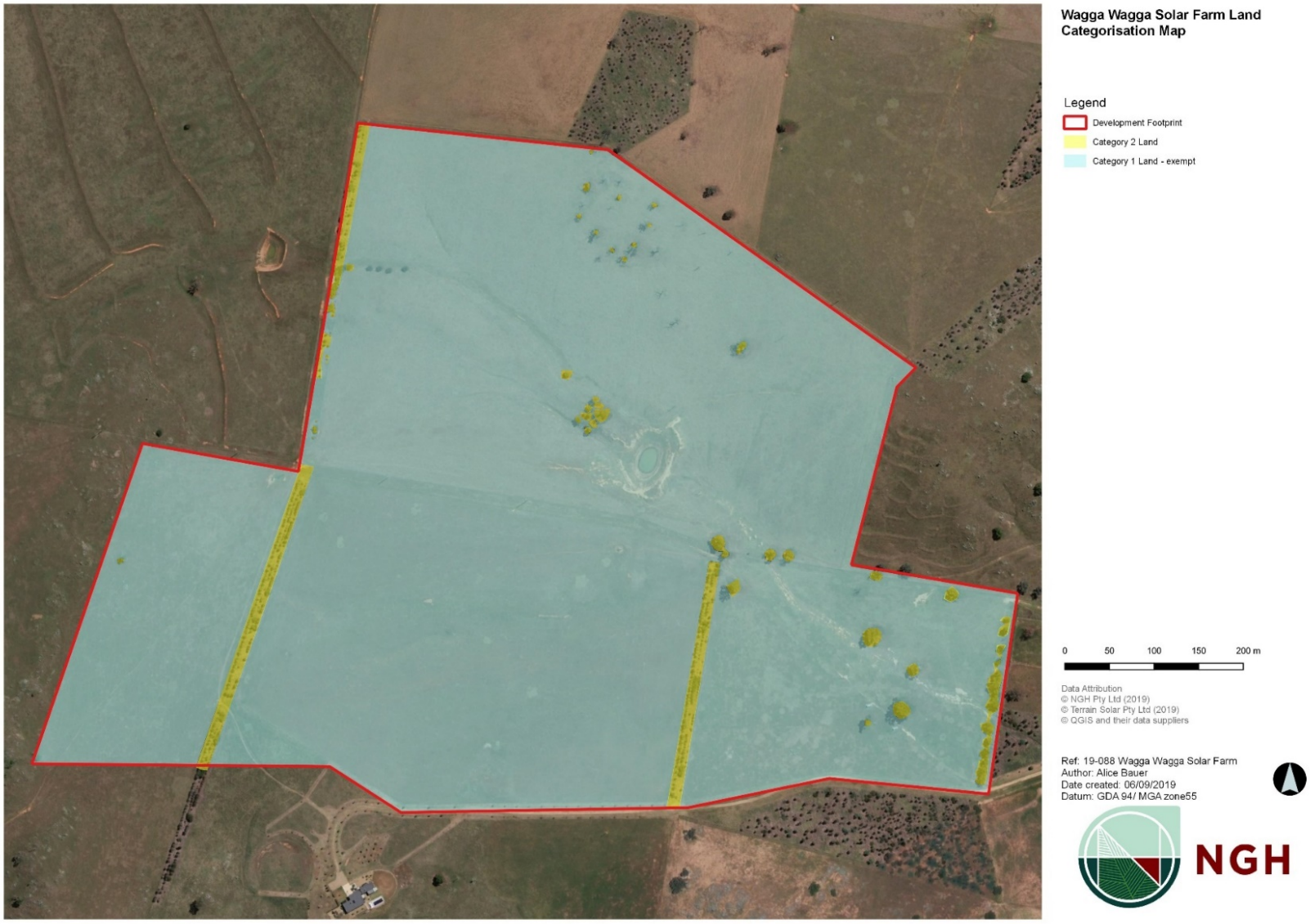

Figure 4-2 Land categorisation map.

4.2.3. Threatened Flora

No threatened flora species were identified in the proposal area during the field survey. Based on the heavily disturbed and modified environment, no threatened flora species were considered likely to occur in the habitats in the proposal area (B.1). A full list of flora species recorded within the study area are provided in D.2.

4.2.4. Species recorded

A total of 40 flora species were recorded during the flora surveys comprising 15 native and 25 exotic species. A complete list of all species recorded according are provided in Appendix D.2.

4.2.5. Plant community types

One Plant Community Type (PCT) was identified within the proposal area; **PCT 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion**; and is listed as Endangered under the NSW BC Act (2016), described within Table 4-1 below.

Table 4-1 The plant community type identified within the proposal area

***PCT 277:* Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion**	
Vegetation Formation	Grassy Woodlands
Vegetation Class	Western Slopes Grassy Woodlands
Description	Eucalypt woodland typically up to 20 m tall with a sparse shrub stratum and continuous groundcover of tussock grasses and a variety of herbs. Native grasses included native Red Grass (Bothriochloa macra), Snow grass (Poa sieberiana), Feathertop Wiregrass (Aristida latifolia), Purple Wiregrass (A. ramosa var. ramosa), Small-flowered Wallaby Grass (Austrodanthonia setacea), Plains Grass (Austrostipa aristiglumis), Rough Speargrass (A. scabra subsp. falcata), Queensland Bluegrass (Dichanthium sericeum), Wheatgrass (Elymus scaber), Western Rats-Tail Grass (Sporobolus creber), and Kangaroo Grass (Themeda australis). Occurs on fertile soils usually derived from basalt and low-quartz sedimentaries on flat to undulating terrain below 700 m elevation on the western fall of the Great Dividing Range. Mean annual rainfall varies from 550 to 800 mm. Occurs on Flats and on gentle slopes mainly in the upper slopes sub-region. PCT 277 occurs mainly in the upper slopes sub-region of the NSW South-Western Slopes Bioregion mainly east of Wagga Wagga. The combination Yellow Box- Blakely's Red Gum is one of the most widespread on the NSW slopes and tablelands gradually differing in floristics over its range with altitude, soil type and latitude. This community would have been one of the most widespread communities on the upper south western slopes and adjacent tablelands. Much of its extent has been cleared for crops and grazing. Remnants often contain aging trees and there is a lack of tree regeneration as the ground cover has been grazed and it is often heavily infested with weeds (OE&H 2019). The PCT was present within the proposal area as small patches of mature paddock trees over an exotic understory.
Approximate extent within study area	This vegetation community covers approximately 3.26 ha within the proposal area. This total area is made up of four patches of remnant PCT: • 0.85 ha patch (16 mature trees),

	• 0.38 ha; consisting of four large mature trees, and • 0.08 ha patch; consisting of two large mature trees. • 0.15 ha (consisting of two mature trees) The remaining extent of the remnant PCT occur as isolated mature paddock trees and stags (dead paddock trees). There are several patches of planted native vegetation representing this PCT equating to 1.8 ha. These plantings are about 10-20 years old.
Condition	The quality of this PCT habitat is low, dominated by exotic grasses, heavily disturbed by cropping and grazing activities, and lacking in understory cover (Figure 7-3). Large proportion of exotic ground cover is consistent with PCT description.
Conservation Status	This plant community type is consistent with the EEC White Box Yellow Box Blakely's Red Gum Woodland listed under the NSW BC Act. Based on the exotic dominated understory it does not meet the condition threshold for the White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland listed under the EPBC Act (1999). This is discussed further in Section 4.4.1.
Images	 

4.2.6. Priority Weeds

Of the exotic species recorded in the field survey no 'Priority Weeds' were identified.

4.2.7. Hollow-bearing Tree

Thirty-four hollow-bearing trees occur within the proposal area. Five of these hollow-bearing trees are stags (Figure 5-1). The hollow-bearing tree species are:

- White Box (*Eucalyptus albens*),
- Blakely's Red Gum (*E. blakelyi*), and
- Yellow Box (*E. melliodora*)

Nineteen hollow-bearing trees would not be impacted by the proposed development (Figure 4-4). Several threatened species with the potential to occur within the proposal area are hollow dependent (Section 4.1 Hollow-dependent Species).

Figure 4-3 Hollow-bearing Yellow Box within proposal area.

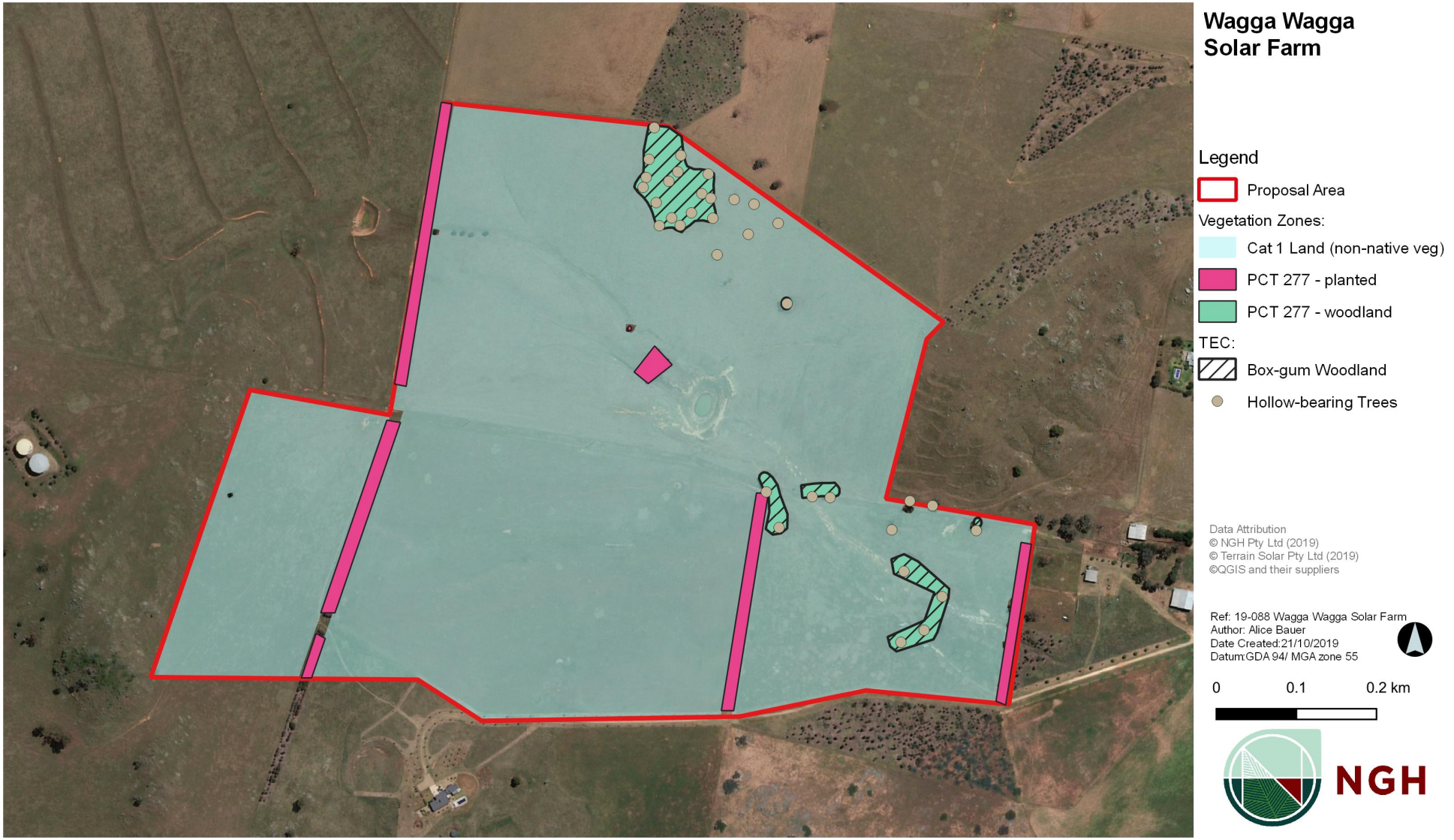

Figure 4-4 Vegetation Zones of Proposal Area

4.2.8. Endangered ecological communities

One endangered ecological community (EEC) was identified within the proposal area and identified as the White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland) listed under the BC Act.

4.2.9. Endangered populations

No listed endangered flora populations were observed during the field surveys, and none are predicted to occur in the study area.

4.2.10. Listed threatened species

No listed threatened flora species were observed during the field surveys, however 24 species are known to occur in the locality.

A background database search was completed using the following databases:

- BioNet Atlas of NSW Wildlife database
- EPBC Act Protected, and
- NSW OEH (DPIE) Threatened Species Search Matters Search Tool

Based on the habitat evaluation in Appendix B, no threatened flora species were considered likely to occur within the proposal area due to the high disturbance and cultivation of the proposal area.

4.3. FAUNA

No threatened fauna were detected during field surveys. This does not indicate fauna are not present or do not utilise habitat present within proposal area. The main fauna habitat types located within the proposal area were identified as:

- White Box Yellow Box Blakely's Red Gum Woodland,
- Mature hollow-bearing gum trees; and
- Planted native Melaleuca shrubs.

4.3.1. Threatened fauna

No BC listed fauna were identified during the field survey. However, 19 fauna species, and one endangered ecological population listed under the BC Act were determined to have the potential to occur within the proposal area. These were:

Understory Birds:

- Hooded Robin (south-eastern form) (*Melanodryas cucullata cucullata)* - BC-V
- Scarlet Robin (*Petroica boodang)* - BC-V
- Flame Robin (*Petroica phoenicea)* - BC-V
- Diamond Firetail (*Stagonopleura guttata)* - BC-V
- Grey-crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis)* - BC-V

Aerial Birds:

- Little Eagle (*Hieraaetus morphnoides)* - BC-V
- Spotted Harrier (*Circus assimilis*) - BC-V
- Black Falcon (*Falco subniger)* - BC – V
- White-bellied Sea-eagle (*Haliaeetus leucogaster)* - BC-V

- Dusky Woodswallow (*Artamus cyanopterus cyanopterus)* - BC-V

Hollow Dependent Species:

- Barking Owl (*Ninox connivens)* - BC-V
- Swift Parrot (*Lathamus discolor*) – BC – E, EPBC – CE
- Superb Parrot (*Polytelis swainsonii*) – BC – V, EPBC – V
- Turquoise Parrot (*Neophema pulchella*) – BC – V
- Southern Myotis (*Myotis macropus)* - BC-V
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) - BC-V
- Little Pied Bat (*Chalinolobus picatus)* - BC-V
- Squirrel Glider (*Petaurus norfolcensis*) – BC – V

Endangered Ecological Populations:

- Squirrel Glider in the Wagga Wagga LGA – BC – Endangered Population

Amphibians:

- Sloane's Froglet (*Crinia sloanei)* - BC – V, EPBC – E

A full list of the threatened species identified through these searches with further description is available in Appendix B1 and Appendix B2.

4.3.2. Aquatic habitat

A farm dam located in the north of the proposal area is the most stable aquatic habitat on site. The farm dam is small (approximately 12 m in diameter), lacks any native vegetation, and comprises of exotic annual grasses. Two ephemeral drainage lines are also located in the proposal area. These drainage lines are dry and are dominated by exotic groundcover.

Threatened Amphibians (Sloane's Froglet)

No impacts to the threatened frog species would occur as a result of the proposal. Although no targeted surveys were done, the nearest records of this species are located in Livingstone National Park (37 km from the proposal area). There is no suitable aquatic vegetation for this species in the farm dam of the proposal area. Therefore, it is considered unlikely for the Sloane's Froglet to occur in the proposal site.

4.4. EPBC MATTERS OF NATIONAL SIGNIFICANCE

The following matters of national significance relevant to biodiversity are considered to apply to the proposal. These matters are assessed further in this report.

4.4.1. Threatened Ecological Communities

One threatened Ecological Community was identified to have the potential to occur within the study area by the Protected Matters (EPBC Act) search.

White Box Yellow Box Blakely's Red Gum Grassy Woodland has the potential to occur in the proposal area based on the presence of remnant Yellow Box, White Box and Blakely's Red Gum trees. However, the remnant vegetation does not meet the condition threshold for the EPBC listed community due to the predominantly exotic understory. The understory is dominated by exotic annual species such as Barley Grass (*Hordeum leporinum*), Bromus species (*Bromus spps.*), and Ryegrass (*Lolium sp.*), with around 90 % ground cover.

The EPBC listed Box-Gum Woodland is not considered to occur within the proposal area.

4.4.2. EPBC Act Koala Habitat Assessment Tool

The proposal area has been assessed using the Koala Habitat Assessment Tool from the Commonwealth EPBC Act Referral Guidelines for the Vulnerable Koala (DOE 2014); refer Table 4-2. Two mature secondary food tree species are present within the proposal area: Blakely's Red Gum (*Eucalyptus blakelyi*) and Yellow Box (*E. melliodora*) (NSW South West Slopes). Nine of these mature and living trees are likely to be impacted.

The site qualifies as 'Koala Habitat' under the Guidelines, however it is not considered habitat critical to the survival of the Koala, having scored two using the Habitat Assessment Tool (Table 4-2). The referral guidelines indicate that proposals involving less than two hectares of habitat clearing and a score of five or less are not recommended for referral to the Commonwealth. Therefore, an Assessment of Significance is not required.

Table 4-2 Koala Habitat Assessment Tool

Attribute	*Score*	*Inland*	*Applicable to the proposal?*
Koala occurrence	+2 (high)	Evidence of one or more koalas within the last 5 years.	
	+1 (medium)	Evidence of one or more koalas within 2 km of the edge of the impact area within the last 10 years.	
	0 (low)	None of the above.	✓ Not recorded within last five years or within 2 km of the impact area.
Vegetation composition	+2 (high)	Has forest, woodland or shrubland with emerging trees with 2 or more known koala food tree species, OR 1 food tree species that alone accounts for >50% of the vegetation in the relevant strata.	✓ More than two feeding trees present within proposal area. Five secondary feed species.
	+1 (medium)	Has forest, woodland or shrubland with emerging trees with only 1 species of known koala food tree present.	
	0 (low)	None of the above.	
Habitat connectivity	+2 (high)	Area is part of a contiguous landscape ≥ 1000 ha.	
	+1 (medium)	Area is part of a contiguous landscape < 1000 ha, but ≥ 500 ha.	
	0 (low)	None of the above.	✓

Attribute	*Score*	*Inland*	*Applicable to the proposal?*
			Vegetation patch is small <1ha and does not directly connect to continuous landscape.
Key existing threats	+2 (high)	Little or no evidence of koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence. Areas which score 0 for koala occurrence and have no dog or vehicle threat present.	
	+1 (medium)	Evidence of infrequent or irregular koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence, OR Areas which score 0 for koala occurrence and are likely to have some degree dog or vehicle threat present.	
	0 (low)	Evidence of frequent or regular koala mortality from vehicle strike or dog attack in the study area at present, OR Areas which score 0 for koala occurrence and have a significant dog or vehicle threat present.	✓ Area scored zero for Koala occurrence and have significant dog or vehicle threat present due to urban development in the locality.
Recovery value	+2 (high)	Habitat is likely to be important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1 of the EPBC Act referral guidelines for the vulnerable koala.	
	+1 (medium)	Uncertain whether the habitat is important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1 of the EPBC Act referral guidelines for the vulnerable koala.	
	0 (low)	Habitat is unlikely to be important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1 of the EPBC Act referral guidelines for the vulnerable koala.	✓ Study area not considered habitat refuge. Doesn't provide important connectivity to large areas surrounding a habitat refuge.
Total	**2**	**Decision: Habitat is not critical to the survival of the Koala— Assessment of Significance is not required.**	

State Environmental Planning Policy – 44 Koala Habitat Protection

There is one Koala record within 10 kilometres of the proposal area. Two records are from 2006, one record is from 1965. The 2006 records are between three to four km from the proposal area. The 1966 record was approximately eight km from the proposal area. No signs of Koalas (deep scratches on tree trunks) were observed during the survey. While suitable food trees are present, the structure of the potential habitat is not ideal. No Koala's were observed during the surveys.

On the basis of minimal habitat structure, no detectable signs during the field survey and no recent records, it is unlikely that the study area supports a resident Koala population and the site is not considered Core Koala Habitat.

4.4.3. Threatened Species

The Koala (*Phascolarctos cinereus*) is listed as Vulnerable under the EPBC Act. The EPBC Act assessment tool has determined that no further assessment of this species is required.

No EPBC listed flora or fauna were identified during the field survey. However, three fauna species, listed under the EPBC Act were determined to have the potential to occur within the proposal area. These were:

Hollow dependent birds:

- Swift Parrot – CE
- Superb Parrot – V

Amphibians:

- Sloane's Froglet (*Crinia sloanei)* - E

Significance of impact on these species has been discussed further within Appendix C.2.2.

4.4.4. Migratory Species

Migratory species are protected under the EPBC Act. Ten species listed as Migratory under the EPBC Act were determined by the EPBC protected Matters Search Tool as having potential habitat or occurrence within the area. Based on the habitat assessment (Appendix B.2), no habitat is present that would indicate the likely occurrence of these species. As such, no assessments of significance would need to be conducted for these species.

5. ASSESSMENT OF IMPACTS

5.1. CONSTRUCTION IMPACTS

5.1.1. Vegetation Loss

The proposed development would have a direct impact on vegetation communities and fauna habitat in the proposal area as a result of habitat removal and temporary disturbance to groundcover, as indicated in Figure 5-1. Approximately 0.475 ha of native vegetation would be impacted, as detailed in the table below. Additionally, 11 isolated native trees (consisting of five stags and six living trees) would be impacted.

Table 5-1 Two types of native habitat removed

Vegetation	*TEC*	*Area within Study Area*	*Area of Impact of Proposal Footprint (ha)*
PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Yes- White Box Yellow Box Blakely's Red Gum Woodland (BC Act)	1.46 ha	0.475 ha of contiguous vegetation and 11 isolated native trees (consisting of five stags and six living trees).
PCT 277: planted native vegetation (juvenile trees)	No	1.8 ha	Nil.
		TOTAL:	**0.475 ha**

5.1.2. Aquatic Habitat

No impacts to threatened aquatic species is expected to occur as a result of the construction phase of the proposal. The proposal would not impact on the aquatic habitat near the farm dam in the proposal site.

There is potential for sediment laden run off to impact the planting areas during construction. Groundcover in these areas is predominantly exotic however could have the potential to be smothered with sediment laden run off. These impacts can be avoided with the implementation of appropriate erosion and sediment controls and standard construction safeguards.

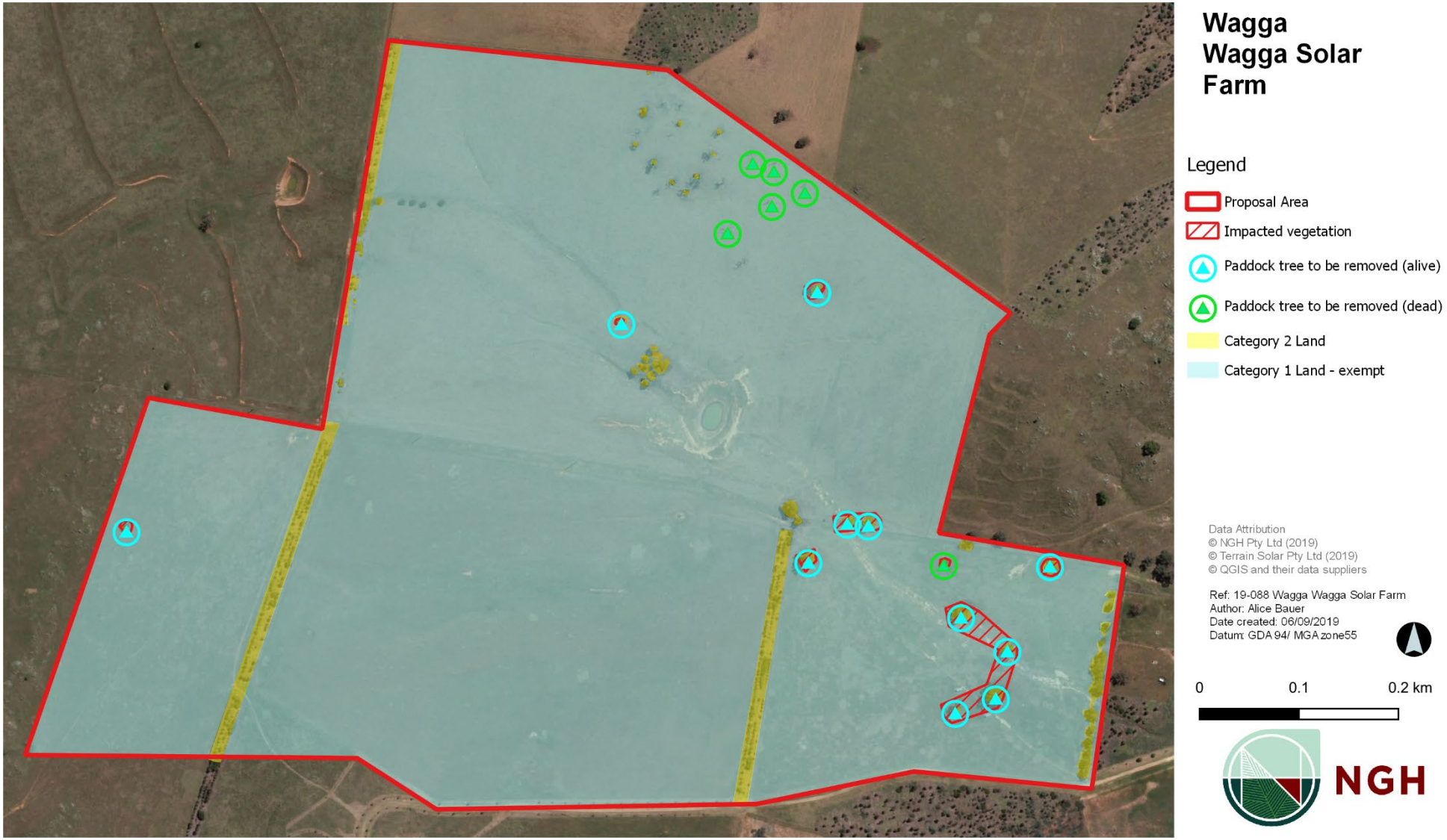

Figure 5-1 Proposal impact area map

5.1.3. Threatened Species

There are potential impacts to a range of threatened species, ecological communities and populations due to impacts on potential habitat including foraging, roosting and nesting habitat.

Detailed assessments of significance for species with the potential to occur and be impacted by the proposal are provided in Appendix C. These assessments are summarised below.

Biodiversity and Conservation Act 2016

Threatened Ground/Understory Birds

- Hooded Robin (south-eastern form) – V
- Scarlet Robin – V
- Flame Robin – V
- Diamond Firetail – V
- Grey-crowned Babbler (eastern subspecies) – V

Potential impacts to the above listed threatened ground/understory birds may occur as the result of the proposal from construction disturbance, habitat removal and land use change. These species utilise open pastures for foraging in areas close to dense vegetation for protection.

An Assessment of Significance was carried out to determine if any potential impacts are likely to be significant (Appendix C). A significant impact was concluded to be unlikely because:

- Similar quality habitat (agricultural matrix) is widespread in the locality.
- Important habitat (planted vegetation) for these species would be retained.
- The vegetation removed is of low quality and lacks understory cover.
- Once operational, the proposed solar farm would be likely to provide similar groundcover foraging habitat from beneath the panels.

Threatened Aerial Birds

- Little Eagle – V
- Spotted Harrier – V
- Black Falcon – V
- White-bellied Sea-eagle – V
- Dusky Woodswallow – V

Impacts to threatened canopy birds including the Dusky Woodswallow, Little Eagle, Spotted Harrier, Black Falcon and White-bellied Sea-eagle may occur as the result of the proposal due to construction disturbance, habitat removal and land use change. These birds utilise large paddock trees for breeding and canopy, and woodland edge for foraging.

An Assessment of Significance was carried out to determine if any potential impacts are likely to be significant (Appendix C). The assessment concluded that there is unlikely to be a significant impact on the Dusky Woodswallow, Little Eagle, Spotted Harrier, Black Falcon and White-bellied Sea-eagle because;

- The habitat quality is poor in the proposal area.
- The species are highly mobile and would utilise surrounding habitat of similar quality.
- Twenty hollow-bearing trees would be retained in the proposal area.
- Habitat is heavily fragmented, with no woodland patches or watercourses within 2 km.

Threatened Hollow-dependent Species

- Barking Owl – V
- Swift Parrot – E

- Superb Parrot – V
- Turquoise Parrot – V
- Southern Myotis – V
- Yellow-bellied Sheathtail-bat – V
- Little Pied Bat – V
- Squirrel Glider – V

There are potential impacts to hollow dependent species due to the loss of potential nesting and foraging resources. Approximately 15 hollow-bearing trees that may provide suitable roosting and feeding sites for these species would be removed as a result of the proposal, although 19 would be retained.

An Assessment of Significance was carried out for these species (Appendix C), and a significant impact was concluded to be unlikely because:

- Breeding resources would be retained in the study area (19 hollow-bearing trees) and similar habitats are widespread in the locality.
- A significant area of foraging resources would be retained within the study area (approximately 2.7 ha of vegetation).
- These species are highly mobile and occupies a large range of habitat types over large areas, therefore would not be restricted to the habitats in the proposal area.

Endangered Ecological Communities and Populations

- Squirrel Glider in the Wagga Wagga LGA – Endangered population

There are potential impacts to the endangered population of Squirrel Glider in the Wagga Wagga LGA due to the loss of potential nesting and foraging resources. Approximately 15 hollow-bearing trees that may provide suitable nesting and feeding sites for this population would be removed as a result of the proposal, although 19 would be retained.

Impacts to the Squirrel Glider have been assessed under Hollow dependent Species (Appendix C), and a significant impact was concluded to be unlikely because:

- The Box-gum habitat in the proposal site is of low quality. It is dominated by exotic grasses, lacks any understory cover, and has been heavily disturbed by cropping activities.
- The amount of the EEC to be removed or disturbed by the proposal is relatively small (0.475 ha) in the local context.
- Nineteen hollow-bearing trees would be retained in the study and similar better-quality habitats are widespread in the locality.
- A significant area of the EEC would be retained within the study area (approximately 1 ha).

- White Box Yellow Box Blakley's Red Gum Woodland (Box-Gum Woodland) - EEC

There are potential impacts to the EEC Box-Gum Woodland. Impacts to the EEC have been assessed under, and a significant impact was concluded to be unlikely due to:

- The small amount of area being cleared (0.475 ha).
- The local occurrence of this EEC to the south of this proposal, where it exists in more substantial and better condition stands.
- The cropping history in the proposal area (see Appendix H). A long cropping history causes displaced the seed bank, as such the understory vegetation, tree seeds, and ground layer species are unlikely to grow back.

Amphibians

- Sloane's Froglet – V

Impacts to the Sloane's Froglet have been assessed under Amphibians (Appendix C), and a significant impact was concluded to be unlikely because:

- The nearest records of this species are located in Livingstone National Park (37 km from the proposal area).
- There is no suitable aquatic vegetation for this species in the farm dam of the proposal area.

Environmental Protection and Biodiversity Act 1999

The Koala (*Phascolarctos cinereus*) is listed as Vulnerable under the EPBC Act. The EPBC Act assessment tool has determined that no further assessment of this species is required.

No EPBC listed flora or fauna were identified during the field survey. However, three fauna species, listed under the EPBC Act were determined to have the potential to occur within the proposal area. These were:

Hollow Dependent Birds:

- Swift Parrot – CE
- Superb Parrot – V

There are potential impacts to hollow dependent species due to the loss of potential nesting and foraging resources. Approximately 15 hollow-bearing trees that may provide suitable roosting and feeding sites for these species would be removed as a result of the proposal, although 19 would be retained.

An Assessment of Significance was carried out for these species under the EPBC Act (refer to Appendix C), and a significant impact was concluded to be unlikely because:

- The amount of habitat to be removed or disturbed by the proposal is relatively small in the local context.
- The proposal area is small, and no fragmentation or isolation of habitat would occur.
- No interference with the recovery of these species would occur.
- Mitigation measures would be implemented to prevent disruptions to these species.

Amphibians

- Sloane's Froglet – V

Impacts to the Sloane's Froglet have been assessed under the EPBC Act (refer to Appendix C), and a significant impact was concluded to be unlikely because:

- The nearest records of this species are located in Livingstone National Park (37 km from the proposal area).
- There is no suitable aquatic vegetation for this species in the farm dam of the proposal area.
- No interference with the recovery of this species would occur.

5.1.4. Priority Weeds

Although no priority weeds were identified during the field survey, the spread of priority weeds may occur during the construction of the proposal, through construction machinery bringing in and spreading seeds.

Priority weeds require particular treatments in order to mitigate risk of spread. Detailed information on managing this species can be sought from the Noxious and Environmental Weed Control Handbook (DPI 2015). Refer to Appendix I to see priority weeds common to the Riverina region, as listed under (LLS 2017).

5.1.5. Key Threatening Processes

Key threatening processes relevant to the proposed development are listed below (Table 5-2 Key threatening processes and their relevance to the proposed development.) with a description of how the proposal is expected to impact the process. Thirty-nine Key Threatening Processes are listed by the OEH (DPIE) within NSW.

Table 5-2 Key threatening processes and their relevance to the proposed development.

Key Threatening Processes (KTPs)		
BC Act	**EPBC Act**	**Relevance**
Clearing of native vegetation	***Land clearance***	The clearing of native vegetation is considered a major contributor to the loss of biodiversity. In the determination, the NSW Scientific Committee found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity'. Clearing can lead to direct habitat loss, habitat fragmentation and associated genetic impacts, habitat degradation and off-site impacts such as downstream sedimentation. Approximately 0.475 ha of native vegetation would be impacted.
Competition and grazing by feral European Rabbit (Oryctolagus cuniculus)	***Competition and land degradation by European Rabbit***	Disturbance to vegetation and soil may attract this species to the study area. However, as the study area is already agricultural land it is expected the population numbers of European Rabbit will not increase.
Infection of native plants by Phytophthora cinnamomi	***Dieback caused by the root–rot fungus (Phytophthora cinnamomi)***	The proposed works are not considered likely to exacerbate this KTP. No native plants would be impacted by this KTP.
Invasion and establishment of exotic vines and scramblers		No exotic vines or scramblers were observed in the proposal area. The proposal has the potential to contribute to the spread of exotic species in the proposal area through the transfer and introduction of plant material and soil on machinery. Mitigation measures have been recommended to prevent the spread of weeds on site.
Invasion of native plant communities by exotic perennial grasses		Rehabilitation works and regular weed management at the site would help prevent these species from spreading further, and recommendations have been made accordingly.
Loss of hollow–bearing trees		Several large hollow-bearing gum trees are present within the proposal area and 15 are likely to be removed. The proposed works are likely to exacerbate this KTP. Mitigation measures have been recommended in relation to the removal of hollow-bearing trees.
Predation by European Red Fox (Vulpes vulpes)	***Predation by European Red Fox***	Disturbance to native fauna and their habitat may attract this species to the study area or modify its current population density. However, as the study area is already developed agricultural land, it is expected the population numbers of European red Fox will not increase.
Predation by Feral Cat (Felis catus)	***Predation by Feral Cat***	Disturbance to native fauna and their habitat may attract this species to the study area or modify its current population density. However, as the study area is already developed

		agricultural land, it is expected the population numbers of Feral Cat will not increase.
Removal of dead wood and dead trees		Five large dead standing trees are to be impacted by the proposed works. The proposed works will increase the risk of this KTP. Mitigation measures will be to retain dead trees on site
Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	***Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species***	The proposed works are not considered likely to exacerbate this KTP. The proposed works will not increase the risk of this KTP.

5.2. OPERATIONAL IMPACTS

Activity associated with operation of the proposal includes noise, light spill, and foot traffic. As the proposal area is already highly disturbed by a similar level of activity, it is unlikely that these activities would further reduce the value of the site for fauna sensitive to such activities.

These impacts are expected to be very limited geographically to the area surrounding the development footprint. Given the existing agricultural farmed area, impacts from the proposal on fauna are expected to be very minor and limited.

5.2.1. Operational Impacts to Aquatic Species

No impacts to threatened aquatic species is expected to occur as a result of the operational phase of the proposal. The proposal would not impact on any aquatic habitat, reducing any potential risks of erosion in the gully areas and retaining threatened species habitat. Fauna including potential amphibian species are expected to utilise the remaining habitat.

5.3. BIODIVERSITY CONSERVATION ACT THRESHOLDS

A summary of the potential impacts from the proposal against the BC Act thresholds is provided in Table 5-3 on the following page.

As indicated in Section 4.2.2 the majority of the development site is considered Category 1-exempt land, exempt from consideration against the BOS thresholds. Pursuant to clause 7.4, it is noted that any part of the proposed development that involves clearing on category 1-exempt land (within the meaning of Part 5A of the Local Land Services Act 2013) is to be disregarded for the purposes of determining whether proposed development exceeds the biodiversity offsets threshold (BOS). Part of the land is considered to be category 1-exempt land and has been disregarded from the BOS threshold calculations.

Table 5-3 Impact assessment against the BC Act Thresholds.

<table>
<tr><th>Threshold</th><th>Application to the Proposal</th><th>Threshold Exceeded?</th></tr>
<tr><td>The development is likely to significantly affect threatened species, populations or ecological communities (clause 7.2(1)(a))</td><td>There is unlikely to be any impact on threatened species (refer to Appendix C).</td><td>No</td></tr>
<tr><td colspan="3">The development exceeds the biodiversity offsets scheme threshold (clause 7.2(1)(b))
Note; there are two potential BOS thresholds, pursuant to clause 7.1(1) of the BC Regulation.</td></tr>
<tr><td><table><tr><th>Minimum lot size associated with the property</th><th>Threshold for clearing of native vegetation</th></tr><tr><td>200 ha</td><td>1 ha or more</td></tr></table></td><td>The minimum lot size specified for the property is 200 hectares. Less than 1 ha of native vegetation would be removed, which is below the threshold.</td><td>No</td></tr>
<tr><td>The clearing of native vegetation, or other action prescribed by clause 6.1, on land identified on the Biodiversity Values map;</td><td>The land is not identified on the Biodiversity Values map.</td><td>No</td></tr>
<tr><td>The development is in an area of Outstanding Biodiversity Value (clause 7.2(1)(c))</td><td>None occur in the proposal area.</td><td>No</td></tr>
</table>

The proposal does not trigger the BC Act thresholds. Therefore, a BDAR is not required to accompany the development application and the proposed development is not required to enter into the Biodiversity Offset Scheme (BOS).

6. MITIGATION MEASURES

These safeguards are a tool to assist with minimising the impacts on biodiversity during maintenance works and construction of the proposal (Table 6-1).

Table 6-1 Safeguards for Protection of Flora and Fauna.

Impact	*Environmental safeguards*	*Responsibility*	*Timing*
Introduction and spread of priority weeds	• Declared priority weeds should be managed according to the requirements stipulated by the Biosecurity Act, and recommendations made by the local control authority (Riverina LLS) and the Noxious and Environmental Weed Handbook (DPI, 2015), which contains details as to the management of specific noxious weeds. • All herbicides should be used in accordance with the requirements on the label. Any person undertaking pesticide (including herbicide) application should be trained to do so and have the proper certificate of completion/ competency or statement of attainment issued by a registered training organisation. • Construction vehicles should be washed down prior to entering the proposal area.	Contractor	Construction Operation Construction Construction
Unexpected threatened species finds	• The site induction should include measures to make employees aware of potential threatened flora and fauna during works and understand the procedures if threatened fauna are detected, this will be recorded as a part of the induction procedure and toolbox talks: o Stop work, o Alert an Ecologist for assessment and possible re–location during works.	Contractor	Construction
Removal of hollow-bearing tree	• Clearing of hollow-bearing trees should be undertaken in accordance with the hollow-bearing tree clearing protocol outlined in Appendix E. • Hollow-bearing tree removal should not be undertaken during the breeding season of hollow-dependent species.	Contractor	Prior to construction

	• Hollow branches from felled tree should be relocated from within the development site to an adjacent area where possible.		
Removal of dead wood and dead trees	• The five large, hollow bearing stags to be removed should be retained on site. They could be transported to the patch of mature trees in the top of the proposal area or areas of planted vegetation.	Contractor	Prior to construction
Clearing of native vegetation and EEC (Box-Gum Woodland)	• Vegetation clearing of EEC is to be limited to the minimum extent necessary. • Prior to construction commencing, exclusion fencing, and signage would be installed around EEC to be retained. • No stockpiling or storage to occur within this area	Contractor	Construction
Erosion and sediment run-off	• Sediment barriers and spill management protocols to control the quality of water runoff from the site into the receiving environment.	Contractor	Prior to construction

7. REFERENCES

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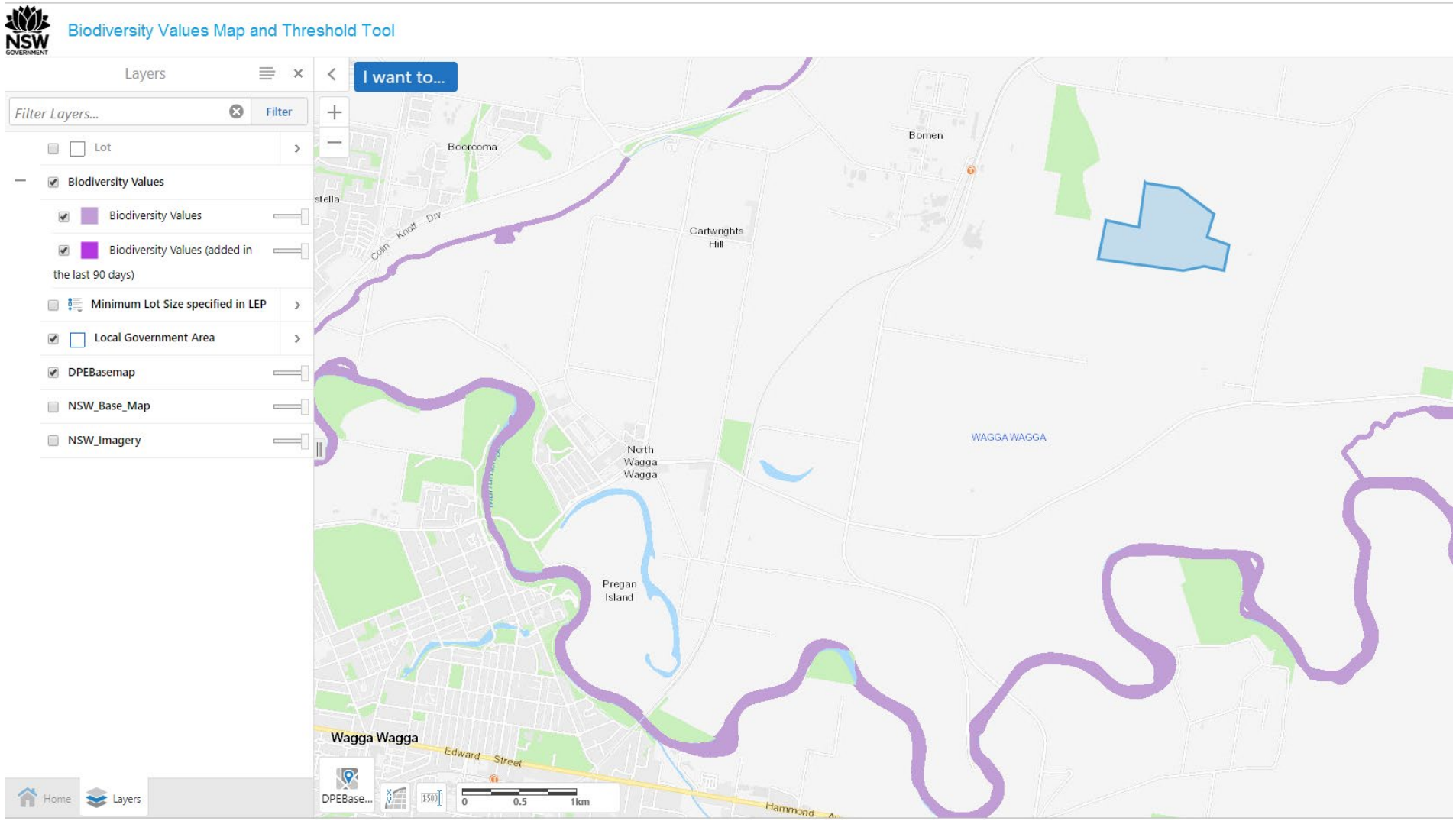
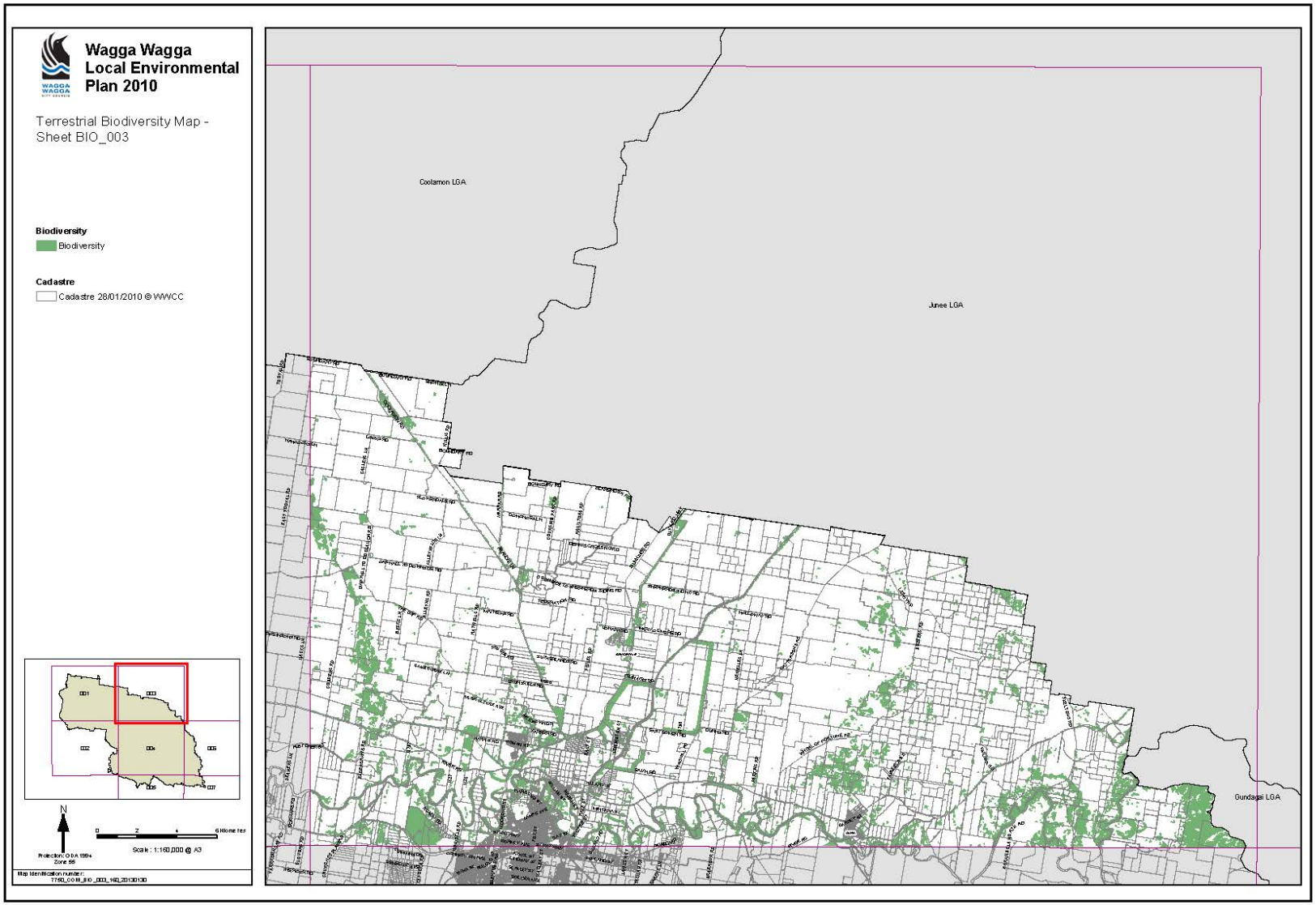
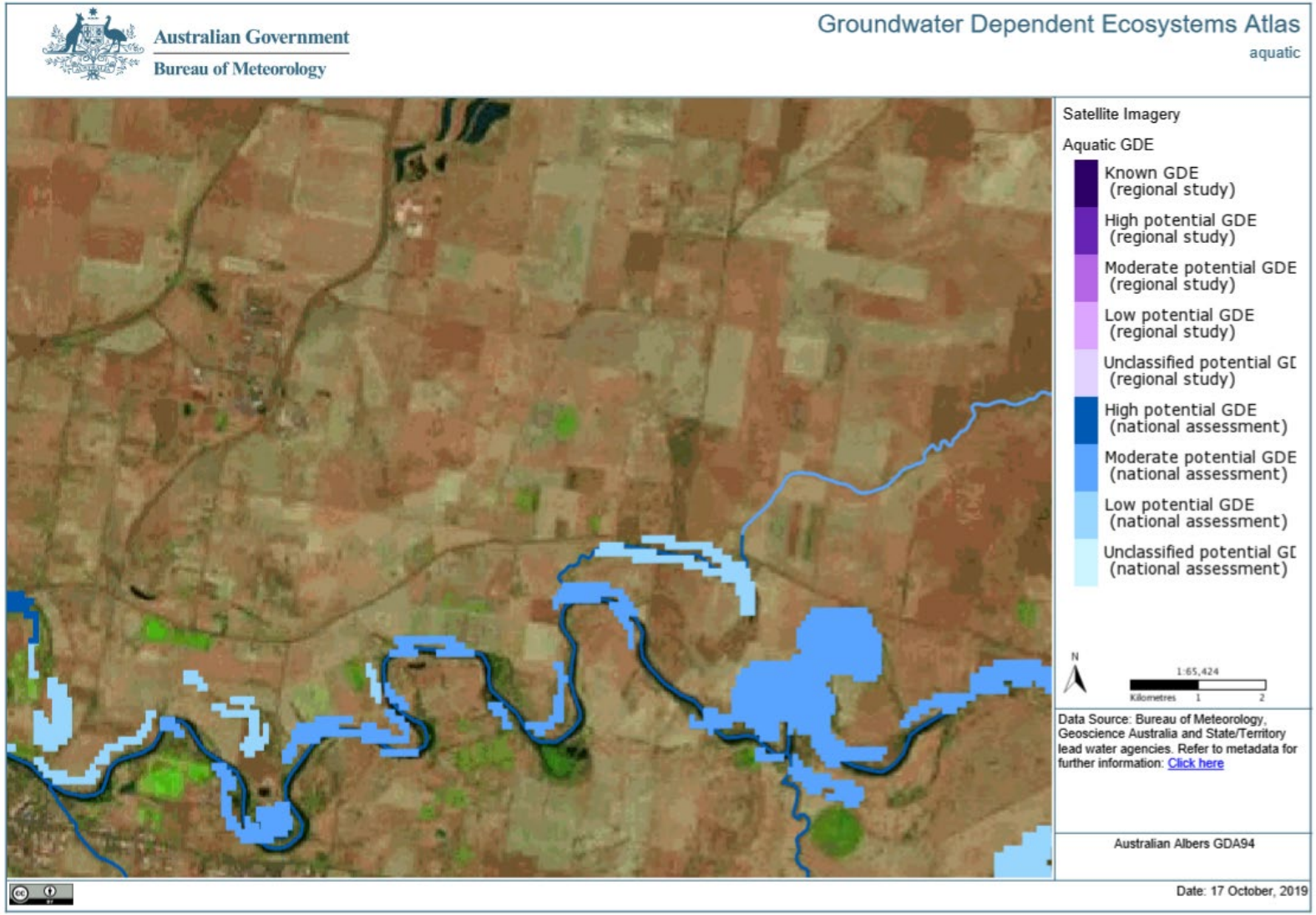
A.4 BIODIVERSITY VALUES MAP AND THRESHOLD TOOL



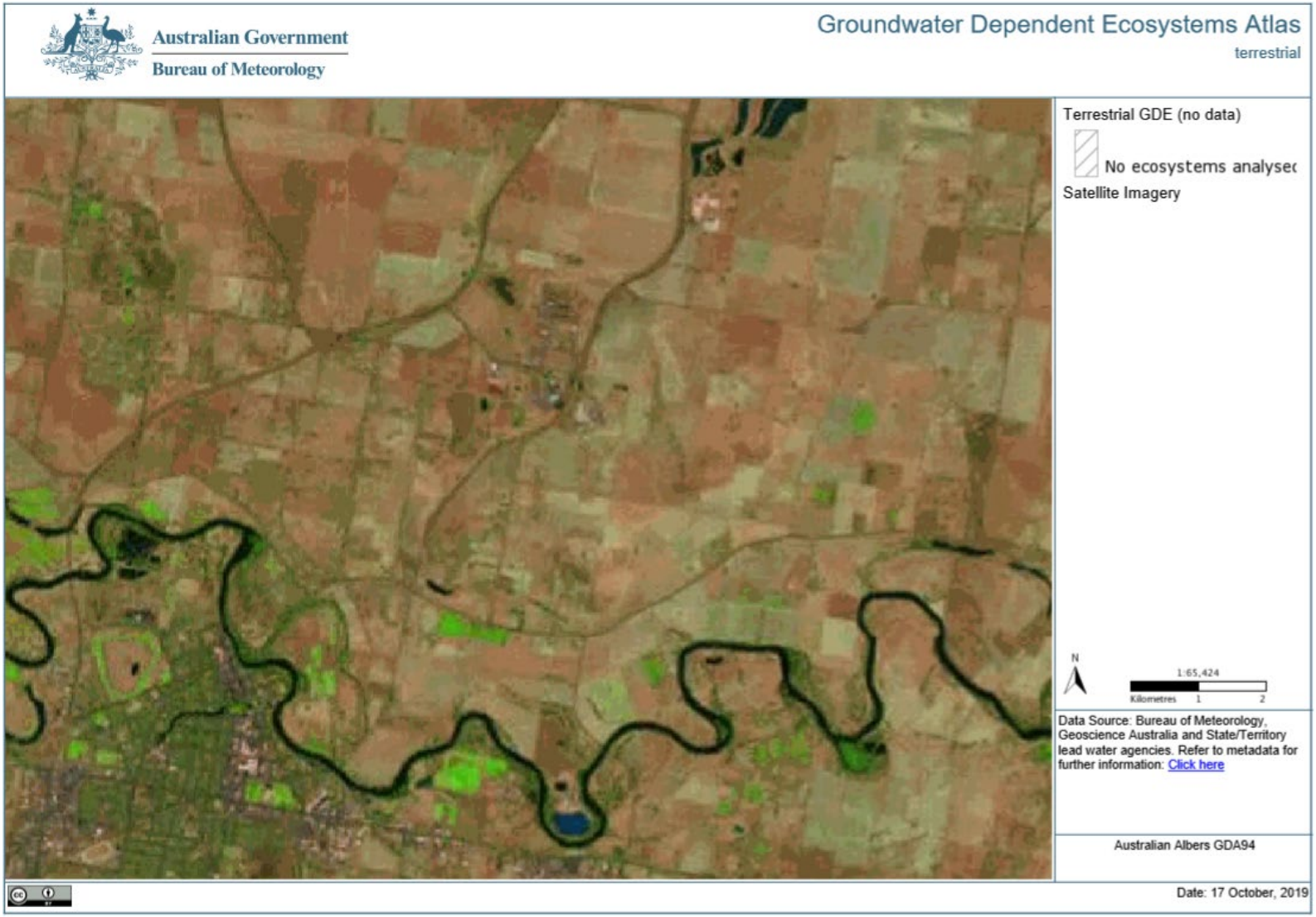
A.5 WAGGA WAGGA LEP 2010 "TERRESTRIAL BIODIVERSITY MAP" BIO-003



A.6 AQUATIC GROUND WATER DEPENDENT ECOSYSTEM (GDE) ATLAS



A.7 TERRESTRIAL GROUND WATER DEPENDENT ECOSYSTEM (GDE) ATLAS



APPENDIX B THREATENED SPECIES EVALUATIONS

The tables in this appendix present the habitat evaluation for threatened species, ecological communities and endangered populations listed within 10km of the proposal area in the *NSW BioNet* [1], those identified as potentially occurring in the area according to the Commonwealth EPBC *Protected Matters Search Tool*[2] and those identified in the *Wagga Wagga IBRA Sub–region*[3]*and Floodplain Transition Woodlands (OEH habitat and region search).* .

The likelihood of occurrence is based on presence of habitat, proximity of nearest records and mobility of the species (where relevant). The assessment of potential impact is based on the nature of the proposal, the ecology of the species and its likelihood of occurrence. The following classifications are used:

Presence of habitat:

Present: Potential or known habitat is present within the study area

Absent: No potential or known habitat is present within the study area

Likelihood of occurrence

Unlikely: Species known or predicted within the locality but unlikely to occur in the study area

Possible: Species could occur in the study area

Present: Species was recorded during the field investigations

Possible to be impacted

No: The proposal would not impact this species or its habitats. No Assessment of Significance (AoS) is necessary for this species.

Yes: The proposal could impact this species or its habitats. An AOS has been applied to these entities

[1] The *NSW BioNet* is administered by the NSW Office of Environment and Heritage (OEH (DPIE)) and is an online database of fauna and flora records that contains over four million recorded sightings.

[2] This online tool is designed for the public to search for matters protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It is managed by the Commonwealth Department of the Environment, Water, Heritage and the Arts.

[3] This online tool is administered by the NSW Office of Environment and Heritage (OEH (DPIE)) and is designed for the public to search the data base of threated flora and fauna in NSW by geographic region and habitat.

B.1 EVALUATION OF THE LIKELIHOOD AND EXTENT OF IMPACT ON THREATENED FLORA SPECIES

Species	*Description of habitat*[4]	*Presence of habitat*	*Likelihood of occurrence*	*Possible impact?*
Trees/shrubs				
Scant Pomaderris *Pomaderris queenslandica* **BC-E**	Widely scattered but not common in north-east NSW and in Queensland. It is known from several locations on the NSW north coast and a few locations on the New England Tablelands and North West Slopes, including near Torrington and Coolata. Found in moist eucalypt forest or sheltered woodlands with a shrubby understorey, and occasionally along creeks.	**Absent** No moist eucalypt forest or sheltered woodlands with a shrubby understorey.	**Unlikely** No historical records. Not recorded during site survey.	**No** Land heavily cleared and grazed. The proposal would not impact this species or its habitats.
Woolly Ragwort *Senecio garlandii* **BC-V**	This daisy is found between Temora, Bethungra and Albury and possibly Burrinjuck near Yass. The largest populations are at The Rock and Mt Tabletop (and surrounds). There is a single population in Victoria at Chiltern. Woolly Ragwort occurs on sheltered slopes of rocky outcrops.	**Absent** No sheltered slopes of rocky outcrops.	**Unlikely** No historical records. Not recorded during site survey.	**No** Land heavily cleared and grazed. The proposal would not impact this species or its habitats.
Ausfeld's Wattle *Acacia ausfeldii* **BC-V**	Found to the east of Dubbo in the Mudgee-Ulan-Gulgong area of the NSW South Western Slopes bioregion, with some records in the adjoining Brigalow Belt South, South Eastern Highlands and the Sydney Basin bioregions. A large population is also known from Tuckland State Forest to the northwest of Gulgong.	**Absent** Incorrect location.	**Unlikely** No historical records. Not recorded during site survey.	**No** Land heavily cleared and grazed. The proposal would not impact this species or its habitats.
Bossiaea *Bossiaea fragrans* **BC-CE**	Currently only known from the Abercrombie Karst Conservation Reserve, south of Bathurst on the NSW central tablelands. It is highly restricted, with only a small number of known populations.	**Absent** Incorrect location.	**Unlikely** No historical records. Not recorded during site survey.	**No** Land heavily cleared and grazed. The proposal would not impact this species or its habitats.

[4] Information sourced from species profiles on NSW OEH (DPIE)'s threatened species database or the Australian Government's Species Profiles and Threats database (SPRAT) unless otherwise stated.

OEH (DPIE) threatened species database: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx
SPRAT: http://www.environment.gov.au/cgi–bin/sprat/public/sprat.pl

Species	*Description of habitat*[4]	*Presence of habitat*	*Likelihood of occurrence*	*Possible impact?*
EPBC-CE				
Capertee Stringybark *Eucalyptus cannonii* **BC-V**	The Capertee Stringybark is predominantly restricted to the central tablelands and slopes of NSW between the Golden Highway in the north, and the Mitchell Highway in the south.	**Absent** Incorrect location.	**Unlikely** No historical records. Not recorded during site survey.	**No** Land heavily cleared and grazed. The proposal would not impact this species or its habitats.
Tumut Grevillea *Grevillea wilkinsonii* **BC-E** **EPBC-E**	The Tumut Grevillea has a highly restricted distribution in the NSW South-west Slopes region. Its main occurrence is along a 6 km stretch of the Goobarragandra River approximately 20 km east of Tumut where about 1,000 plants are known. The other occurrence is a small population that straddles the boundary of two private properties at Gundagai where only eight mature plants survive.	**Absent** Incorrect location.	**Unlikely** No historical records. Not recorded during site survey.	**No** Land heavily cleared and grazed. The proposal would not impact this species or its habitats.
Fairy Bells *Homoranthus darwinioides* **BC-V** **EPBC-V**	Rare in the central tablelands and western slopes of NSW, occurring from Putty to the Dubbo district. It is found west of Muswellbrook between Merriwa and Bylong, and north of Muswellbrook to Goonoo SCA. Grows in in various woodland habitats with shrubby understoreys, usually in gravely sandy soils. Landforms the species has been recorded growing on include flat sunny ridge tops with scrubby woodland, sloping ridges, gentle south-facing slopes, and a slight depression on a roadside with loamy sand. Flowers in spring or from March to December.	**Present** Western slopes of NSW.	**Unlikely** No historical records.	**No** Unlikely to still occur within the area due to cropping and grazing impacts.
Herbs & Forbs				
Yam Daisy *Ammobium craspedioides* **BC-V** **EPBC-V**	Found from near Crookwell on the Southern Tablelands to near Wagga Wagga on the South Western Slopes. Most populations are in the Yass region.	**Present** Southern Tablelands near Wagga Wagga.	**Unlikely** No historic records. Not detected during site surveys. Highly modified landscape that has been heavily cleared and grazed.	**No** Unlikely to still occur within the area due to cropping and grazing impacts.

Species	*Description of habitat*[4]	*Presence of habitat*	*Likelihood of occurrence*	*Possible impact?*
Spiny Peppercress *Lepidium aschersonii* **BC-V** **EPBC-V**	Not widespread, occurring in the marginal central-western slopes and north-western plains regions of NSW (and potentially the south western plains). In the north of the State recent surveys have recorded a number of new sites; including Brigalow Nature Reserve, Brigalow State Conservation Area, Leard State Conservation Area and Bobbiwaa State Conservation Area. Also known from the West Wyalong in the south of the State. Records from Barmedman and Temora areas are likely to be no longer present. Approximately 50% of the total Lepidium aschersonii recorded for Australia occurs in NSW.	**Present** Southern Tablelands near Wagga Wagga.	**Unlikely** No historic records. Not detected during site surveys. Highly modified landscape that has been heavily cleared and grazed.	**No** Unlikely to still occur within the area due to cropping and grazing impacts.
Slender Darling Pea *Swainsona murrayana* **BC-V** **EPBC-V**	Found throughout NSW , it has been recorded in the Jerilderie and Deniliquin areas of the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill and in various localities between Dubbo and Moree.	**Present** Southern Tablelands.	**Unlikely** No records.	**No** Unlikely to still occur within the area due to cropping and grazing impacts.
Eyebrights *Euphrasia arguta* **BC-CE** **EPBC-CE**	*Euphrasia arguta* was rediscovered in the Nundle area of the NSW north western slopes and tablelands in 2008. Prior to this, it had not been collected for 100 years. Historically, *E. arguta* has only been recorded from relatively few places within an area extending from Sydney to Bathurst and north to Walcha.	**Present** Southern Tablelands.	**Unlikely** No records.	**No** Unlikely to still occur within the area due to cropping and grazing impacts.
Obcordate-leafed Zieria *Zieria obcordata* **BC-E** **EPBC-E**	Occurs at two sites with a geographic range of 105 km. These are in the Wuuluman area near Wellington, comprising of a single subpopulation over three sites comprising 209 plants and Crackerjack Rock/Rock Forests area NW of Bathurst, with a subpopulation comprising of 14 sites, totalling to approximately 700 adults plants.	**Present** Southern Tablelands.	**Unlikely** No records.	**No** Unlikely to still occur within the area due to cropping and grazing impacts.
Claypan Daisy *Brachyscome muelleroides* **BC-V**	Recorded primarily in clay soils on Bladder Saltbush and Leafless Bluebush plains, but also in grassland and in Inland Grey Box - Cypress Pine woodland.	**Absent** Grey Box - Cypress Pine woodland, Bladder Saltbush and	**Unlikely** Recorded once at nine km of proposal area in 1889. Unlikely to still occur within the area due to cropping and	**No** The proposal would not impact this species or its habitats.

Species	*Description of habitat*[4]	*Presence of habitat*	*Likelihood of occurrence*	*Possible impact?*
EPBC-V		Leafless Bluebush plains.	grazing impacts. Historic record more than 100 years old.	
Small Purple Pea *Swainsona recta* **BC-E** **EPBC-E**	Small Purple-pea occurs predominantly in grassy woodlands, but sometimes extends into grassy open forest, usually with tree cover including Blakely's Red Gum, Yellow Box, and White Box.	**Present** Box-Gum Woodland.	**Unlikely** Recorded twice within 10 km of proposal. Closest record at 6.5 km from the proposal area in 1900. Records greater than 10 years old. Unlikely to still occur within the area due to cropping and grazing impacts.	**No** Preferred habitat is not present. Known to be associated with PCT present however PCT quality is low, trees are sparsely distributed among cropping and grazing farmland.
Dwarf Bush-pea *Pultenaea humilis* **BC-V**	*Pultenaea humilis* is rare in New South Wales and Tasmania, but relatively common in Victoria. In NSW, *Pultenaea humilis* is currently known from three confirmed localities in the NSW South Western Slopes bioregion. The extent of occurrence of *Pultenaea humilis* in NSW is estimated to be approximately 6000 km^2. However, the total population of *Pultenaea humilis* in NSW is not known. *Pultenaea humilis* is found in isolated remnants of native woodland and forest communities that occur in extensively cleared agricultural landscapes.	**Present** NSW South West Slopes. Isolated remnants of native woodland and forest communities that occur in extensively cleared agricultural landscapes.	**Unlikely** Unlikely to still occur within the area due to cropping and grazing impacts. No historic records. Not recorded during the on-site survey.	**No** The habitat in the site and its locality is of low quality due to cropping and grazing farmland.
Silky Swainson-pea *Swainsona sericea* **BC-V**	Silky Swainson-pea has been recorded from the Northern Tablelands to the Southern Tablelands and further inland on the slopes and plains. There is one isolated record from the far north-west of NSW. Its stronghold is on the Monaro. Also found in South Australia, Victoria and Queensland. Found in Natural Temperate Grassland and Snow Gum (*Eucalyptus pauciflora)* Woodland on the Monaro. Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes.	**Present** NSW South West Slopes.	**Unlikely** No historic records.	**No** Unlikely to still occur within the area due to cropping and grazing impacts.
Small Scurf-pea *Cullen parvum* **BC - E**	Found primarily in grassland, River Red Gum Woodland and Box-Gum Woodland. Also found on grazed land and next to drainage lines and watercourses. More easily found in winter or spring because dies back in dry seasons.	**Present** Grazed land. Box-Gum Woodland	**Unlikely** Unlikely to still occur within the area due to cropping and grazing impacts. No historic records.	**No** Preferred habitat is not present. Known to be associated with PCT present however PCT quality is low, trees are

Species	*Description of habitat*[4]	*Presence of habitat*	*Likelihood of occurrence*	*Possible impact?*
				sparsely distributed among cropping and grazing farmland. Despite the White Box, no other associated woodland plants found on the site.
Tylophora linearis *Tylophora linearis* **BC-V** **EPBC - E**	An herbaceous climber with clear latex that grows to about 2 m long. Known from eight localities in the Dubbo area and Mt Crow near Barraba in NSW, and "Myall Park" near Glenmorgan in Queensland. This species is conserved within Goobang National Park, Eura State Forest, Goonoo SF, Pilliga West SF and Coolbaggie Nature Reserve. Grows in dry scrub, open forest and woodlands associated with *Melaleuca uncinata*, *Eucalyptus fibrosa*, *E. sideroxylon*, *E. albens*, *Callitris endlicheri*, *C. glaucophylla*, *Allocasuarina luehmannii*, *Acacia hakeoides*, *A. lineata*, *Myoporum* spp., and *Casuarina* spp. The distribution of this species overlaps with the following EPBC Act-listed threatened ecological communities: Brigalow (*Acacia harpophylla* dominant and co-dominant), and White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland. Flowers in spring, with flowers recorded in November or May with fruiting probably 2 to 3 months later.	**Present** White Box present in study area.	**Unlikely** No historic records.	**No** Despite the White Box, no other associated woodland plants found on the site. Preferred habitat is not present.
Hoary Sunray *Leucochrysum albicans var. tricolor* **EPBC - E**	Endemic to south-eastern Australia, where it is currently known from three geographically separate areas in Tasmania, Victoria and south-eastern NSW and ACT. In NSW it currently occurs on the Southern Tablelands adjacent areas in an area roughly bounded by Albury, Bega and Goulburn, with a few scattered localities know from beyond this region. Can occur within a variety of grassland, woodlands and forests. Generally found on heavy soils. Known to occur within modified habitat (roadsides and semi-urban). Disturbance and bare ground required for germination.	**Present** Correct location; Southern Tablelands adjacent areas in an area roughly bounded by Albury, Bega and Goulburn.	**Unlikely** No historic records.	**No** Preferred habitat is not present. Unlikely to still occur within the area due to cropping and grazing impacts.
Orchids				
Wybong Leek Orchid *Prasophyllum Wybong* **EPBC - CE**	Endemic to NSW. Known populations occur near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell, Tenterfield, Currabubula and the Pilliga area. Occurs within open eucalypt woodland and grassland.	**Present** Box-Gum Woodland.	**Unlikely** No historic records. Unlikely to still occur within the area due to cropping and grazing impacts.	**No** Preferred habitat is not present. Known to be associated with PCT present however PCT quality is low, trees are

Species	*Description of habitat*[4]	*Presence of habitat*	*Likelihood of occurrence*	*Possible impact?*
				sparsely distributed among cropping and grazing farmland.
Pine Donkey Orchid *Diuris tricolor* **BC-V**	The Pine Donkey Orchid (formerly known as *Diuris sheaffiana*) is a terrestrial species that has a flower stalk 20-40 cm high. It is sporadically distributed on the western slopes of NSW, extending from south of Narrandera all the way to the far north of NSW. Localities include the Condobolin-Nymagee road, Wattamondara towards Cowra, Cooyal, Adelong, Red Hill north of Narrandera, Coolamon, near Darlington Point, Eugowra, Girilambone, Dubbo, Muswellbrook, and several sites west of Wagga Wagga. Disturbance regimes are not known, although the species is usually recorded from disturbed habitats. Associated species include *Callitris glaucophylla, Eucalyptus populnea, Eucalyptus intertexta*, Ironbark and Acacia shrubland. The understorey is often grassy with herbaceous plants such as Bulbine species. Flowers from September to November or generally spring. The species is a tuberous, deciduous terrestrial orchid and the flowers have a pleasant, light sweet scent. It is found in sandy soils, either on flats or small rises. Also recorded from a red earth soil in a Bimble Box community in western NSW. Usually recorded as common and locally frequent in populations, however only one or two plants have also been observed at sites. The species has been noted as growing in large colonies.	**Present** Disturbed habitat with Acacia shrubland.	**Unlikely** No historic records. Unlikely to still occur within the area due to cropping and grazing impacts.	**No** Preferred habitat is not present. Unlikely to still occur within the area due to cropping and grazing impacts.
Sand-hill Spider-orchid *Caladenia arenaria* **BC-E** **EPBC-E**	Sand-hill Spider-orchid are found mostly on the south west plains and western south west slopes. The original description is of a plant from Nangus, west of Gundagai (1865) and there is a report of the species from Adelong near Tumut. A record near Cootamundra needs verifying. The Sand-hill Spider Orchid is currently only known to occur in the Riverina between Urana and Narrandera. Occurs in woodland with sandy soil, especially that dominated by White Cypress Pine (*Callitris glaucophylla*).	**Absent** No cypress pine habitat.	**Unlikely** No historic records. Unlikely to still occur within the area due to cropping and grazing impacts.	**No** The proposal would not impact this species or its habitats.
Greencomb Spider-orchid *Caladenia tensa* **EPBC-E**	The rigid spider-orchid has been recorded in Victoria, southeast South Australia and central west of New South Wales. In 2000, the species was considered to be widespread at locations in Victoria and eastern South Australia. Habitat fragmentation, trampling and road maintenance are	**Present** Correct location.	**Unlikely** No historic records. Unlikely to still occur within the area due to cropping and grazing impacts.	**No** Preferred habitat is not present. Unlikely to still occur within the area due to

Species	*Description of habitat*[4]	*Presence of habitat*	*Likelihood of occurrence*	*Possible impact?*
	threats to some populations and weed invasion is a known threat to all known populations.			cropping, grazing and weed impacts.
Tarengo Leek Orchid *Prasophyllum petilum* **BC-E** **EPBC-E**	Natural populations are known from a total of five sites in NSW; Boorowa, Captains Flat, Ilford, Delegate and a newly recognised population c.10 k SE of Muswellbrook. It also occurs at Hall in the ACT. This species has been recorded at Bowning Cemetery where it was experimentally introduced, though it is not known whether this population has persisted. Grows in grassy woodland in association with River Tussock *Poa labillardieri*, Black Gum *Eucalyptus aggregata* and tea-trees *Leptospermum* spp. at Captains Flat and within the grassy ground layer dominated by Kangaroo Grass under Box-Gum Woodland.	**Absent** Incorrect location, lacks associated plant species.	**Unlikely** Unlikely to still occur within the area due to cropping and grazing impacts. No historic records.	**No** The proposal would not impact this species or its habitats.
Crimson Spider Orchid *Caladenia concolor* **BC-E** **EPBC-V**	The current NSW Scientific Committee listing incorporates two populations which have each been described as separate species by D.L. Jones. One of these populations comprises a few hundred plants on private property near Bethungra and the other of about 100 plants occurs in Burrinjuck Nature reserve. The other occurrences of the Crimson Spider Orchid in NSW are from the Nail Can Hill Crown Reserve near Albury. The species also occurs at two localities in Victoria near Beechworth and Chiltern.	**Absent** Incorrect location, lacks associated plant species.	**Unlikely** Unlikely to still occur within the area due to cropping and grazing impacts. No historic records.	**No** The proposal would not impact this species or its habitats.
Grasses				
A spear-grass *Austrostipa wakoolica* **BC-E** **EPBC-E**	A densely-tufted, perennial spear-grass, growing to one m tall. Confined to the floodplains of the Murray River tributaries of central-western and south-western NSW, with localities including Manna State Forest, Matong, Lake Tooim, Merran Creek, Tulla, Cunninyeuk and Mairjimmy State Forest. Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise. Associated species include *Callitris glaucophylla, Eucalyptus microcarpa, E. populnea, Austrostipa eremophila, A. drummondii, Austrodanthonia eriantha* and *Einadia nutans*. Flowers from October to December, mainly in response to rain. Seed dispersal is mainly by wind, rain and flood events; the awn and sharp point of the floret appear to be an adaptation for burying the seed	**Absent** Associated plant species not present.	**Unlikely** No historic records and not detected during site surveys	**No** The proposal would not impact this species or its habitats.

Species	*Description of habitat*[4]	*Presence of habitat*	*Likelihood of occurrence*	*Possible impact?*
	into the soil; grass seed is traditionally believed to be viable for three to five years, so a long-lived seed bank is considered unlikely for this species. Recorded as common in the Mairjimmy State Forest population.			
A spear-grass *Austrostipa metatoris* **BC-V** **EPBC-V**	Most records occur in the Murray Valley with sites including Cunninyeuk Station, Stony Crossing, Kyalite State Forest (now part of Murrumbidgee Valley Regional Park) and Lake Benanee. Scattered records also occur in central NSW including Lake Cargelligo, east of Goolgowi, Condobolin and south west of Nymagee. Otherwise only known from near Bordertown in south east South Australia, where it may be locally extinct.	**Present** Correct location.	**Unlikely** No historic records. Unlikely to still occur within the area due to cropping and grazing impacts.	**No** Preferred habitat is not present. Unlikely to still occur within the area due to cropping, grazing and weed impacts.
Bluegrass *Dichanthium setosum* **BC-V** **EPBC - V**	Bluegrass is an upright grass less than 1 m tall. Occurs on the New England Tablelands, North West Slopes and Plains and the Central Western Slopes of NSW, as well as in Queensland and Western Australia. It occurs widely on private property, including in the Inverell, Guyra, Armidale and Glen Innes areas. Flowering time is mostly in summer. Associated with heavy basaltic black soils. Often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture. (Often collected from disturbed open grassy woodlands on the northern tablelands, where the habitat has been variously grazed, nutrient-enriched and water-enriched). It is open to question whether the species tolerates or is promoted by a certain amount of disturbance, or whether this is indicative of the threatening processes behind its depleted habitat. Associated species include *Eucalyptus albens, Eucalyptus melanophloia, Eucalyptus melliodora, Eucalyptus viminalis, Myoporum debile, Aristida ramosa, Themeda triandra, Poa sieberiana, Bothriochloa ambigua, Medicago minima, Leptorhynchos squamatus, Lomandra aff. longifolia, Ajuga australis, Calotis hispidula and Austrodanthonia, Dichopogon, Brachyscome, Vittadinia, Wahlenbergia* and *Psoralea* species. Locally common or found as scattered clumps in populations.	**Absent** Associated plant species not present.	**Unlikely** No historic record and not detected during site surveys.	**No** The proposal would not impact this species or its habitats.
Endangered Ecological Communities (EEC's)				
White Box Yellow Box Blakely's Red Gum Grassy Woodland **BC-EEC**	White Box Yellow Box Blakely's Red Gum EEC occurs in areas with moderate to highly fertile soils, on the tablelands and western slopes of NSW from the Queensland border to the Victorian border. This ecological community can occur as either a woodland or a derived grassland (a grassy woodland for which the trees have been removed). It	**Present** Known habitat present within study area.	**Present** Key species for the EEC; Yellow Box, *White Box* and Blakely's Red Gum were	**Yes** AoS completed for BC Act for this species. Refer to Section C.1.

Species	*Description of habitat*[4]	*Presence of habitat*	*Likelihood of occurrence*	*Possible impact?*
EPBC-CE	has a ground layer of native tussock grasses and herbs, and a sparse, scattered shrub layer. White Box (*Eucalyptus albens),* Yellow Box *(E. melliodora),* or Blakely's Red Gum *(E. blakelyi)* dominate the ecological community, where a tree layer still occurs.		identified during the site survey.	
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions **BC-EEC**	Tall woodland or open forest dominated by Fuzzy Box *Eucalyptus conica*, often with Grey Box *Eucalyptus microcarpa*, Yellow Box *Eucalyptus melliodora*, or Kurrajong *Brachychiton populneus*. Buloke, *Allocasuarina luehmannii* is common in places. Shrubs are generally sparse, and the groundcover moderately dense, although this will vary with season. Community occurs on brown loam or clay, alluvial or colluvial soils on prior streams and abandoned channels or slight depressions on undulating plains or flats of the western slopes.	**Absent** Key plant species not present within study area.	**Unlikely** Key species Fuzzy Box not seen during site survey.	**No** The proposal would not impact this species or its habitats.

E BC = listed as Endangered under Schedule 1 of the NSW *Biodiversity Conservation Act 2016.*

E EPBC = listed as Endangered under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

V EPBC = listed as Vulnerable under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

V BC = listed as Vulnerable under Schedule 2 of the NSW *Biodiversity Conservation Act 2016.*

EEC BC = Endangered Ecological Community listed under Schedule 1 of the NSW *BC Act 2016.*

CE EPBC = listed as Critically Endangered under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

CE BC = listed as Endangered Ecological Community under the NSW *Biodiversity Conservation Act 2016.*

B.2 EVALUATION OF THE LIKELIHOOD AND EXTENT OF IMPACT ON THREATENED FAUNA SPECIES

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
Aves				
Australian Painted Snipe *Rostratula australis* **BC-E** **EPBC-E, M**	Feed in shallow water or at waters' edge and on mudflats. Mostly in temporary or infrequently filled freshwater wetlands. Inhabits inland and coastal shallow freshwater wetlands. Occurs in ephemeral and permanent wetlands, particularly with cover of vegetation, including grasses, Lignum and Samphire. Known to use artificial habitats, such as sewage ponds, dams and waterlogged grassland.	**Absent** No wetlands with cover of vegetation.	**Unlikely** No appropriate habitat.	**No** The proposal would not impact this species or its habitats.
Superb Parrot *Polytelis swainsonii* **BC-V** **EPBC-V**	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In Riverina nest in hollows of large trees mainly in tall riparian River Red Gum Forest or Woodland. On South West Slopes nest trees in open Box-Gum Woodland or isolated paddock trees.	**Present** Box-Gum Woodland.	**Possible** Recorded 30 times within 10 km of proposal area. Closest record two km from proposal boundary.	**Yes** AoS completed for this species. Refer to Appendix C.
Malleefowl *Leipoa ocellata* **BC-E** **EPBC-V**	Inhabit mallee communities, prefers tall, dense, floristically rich mallee in higher rainfall areas. Uses mallee with spinifex understorey, but lower densities than areas with shrub understorey. Prefers light sandy to sandy loam soils with dense discontinuous canopy and diverse shrub and herb layers.	**Absent** Floristically rich mallee in higher rainfall areas.	**Unlikely** No appropriate habitat.	**No** The proposal would not impact this species or its habitats.
Freckled Duck *Stictonetta naevosa* **BC-V**	Primary distribution in south-eastern and south-western Australia. Breeds within large temporary swamps created by floods within the Bulloo, Lake Eyre Basins and Murray-Darling systems. Disperses during periods of inland drought. Wetlands in Murray River basin provide important habitat during these periods. Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi,	**Absent** No wetlands with heavy cover of vegetation.	**Unlikely** One record (2003) approximately 7.5 km from proposal area within waterbody, however no suitable habitat.	**No** The proposal would not impact this species or its habitats.

[5] Information sourced from species profiles on NSW OEH (DPIE)'s threatened species database or the Australian Government's *Species Profiles and Threats* database (SPRAT) unless otherwise stated.

OEH (DPIE) threatened species database: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx
SPRAT: http://www.environment.gov.au/cgi–bin/sprat/public/sprat.pl

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
	Lignum and Tea-tree. Nests located within dense vegetation and near water level.			
Swift Parrot *Lathamus discolor* **BC-E** **EPBC-CE**	Occur in areas where eucalypts are flowering profusely or with abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood, Mugga Ironbark, and White Box, and lerp-infested trees Grey Box, Grey Box and Blackbutt.	**Present** Whit Box present and also feeds on Yellow Box and many records nearby.	**Possible** Recorded eight times within 10 km of proposal area. Closest record is three km from proposal area.	**Yes** AoS completed for this species. Refer to Appendix C.
Painted Honeyeater *Grantiella picta* **BC-V** **EPBC-V**	Inhabits Boree/ Weeping Myall, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. Specialist feeder on fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of genus Amyema.	**Absent** Box-Gum Woodland present, however very few mistletoes present on site	**Unlikely** No records within 10km of proposal area.	**No** Species may occur within the area; however unlikely species relies upon or regularly utilises habitat within the proposal area. Preferred nesting habitat is not present. Vegetation is isolated. Known to be associated with PCT present however PCT quality is low and is not likely to be preferred habitat for this species.
Australasian Bittern *Botaurus poiciloptilus* **BC-E** **EPBC-E**	In NSW, occurs along coast and frequently recorded in Murray-Darling Basin, notably in floodplain wetlands of Murrumbidgee, Lachlan, Macquarie and Gwydir Rivers. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bulrushes (*Typha sp.*) and spike-rushes (*Eleocharis sp.*).	**Absent** No wetlands with tall dense vegetation.	**Unlikely** No appropriate habitat.	**No** The proposal would not impact this species or its habitats.
Regent Honeyeater *Anthochaera phrygia* **BC-CE** **EPBC-CE**	Semi-nomadic, occurs in temperate eucalypt woodlands and open forests. Most records from box-ironbark eucalypt forest associations and wet lowland coastal forests. Once recorded between Adelaide and the central coast of Queensland, its range has contracted dramatically in the last 30 years to between north-eastern Victoria and south-eastern Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the	**Absent**	**Unlikely** One record in 1980, 7.5 km from proposal area. Preferred habitat with large numbers of mature trees, high canopy cover and	**No** The proposal would not impact this species or its habitats.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
	distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes.		abundance of mistletoes not present in study area.	
Dusky Woodswallow *Artamus cyanopterus cyanopterus* **BC-V**	The Dusky Woodswallow are widespread in eastern, southern and south western Australia. The species occurs throughout most of NSW, but is sparsely scattered in, or absent from much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understory of eucalypt saplings, acacias and other shrubs, and groundcover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland. Primarily eats invertebrates, mainly insects, which are captured whilst hovering or sallying above the canopy or over water. Depending on location and local climatic conditions (primarily temperature and rainfall), the Dusky Woodswallow can be resident year-round or migratory. In NSW, after breeding, birds migrate to the north of the state and to southeastern Queensland, while Tasmanian birds migrate to southeastern NSW. Migrants generally depart between March and May, heading south to breed again in spring. There is some evidence of site fidelity for breeding. Nest is an open, cup-shape, made of twigs, grass, fibrous rootlets and occasionally casuarina needles, and may be lined with grass, rootlets or infrequently horsehair, occasionally unlined. Nest sites vary greatly, but generally occur in shrubs or low trees, living or dead, horizontal or upright forks in branches, spouts, hollow stumps or logs, behind loose bark or in a hollow in the top of a wooden fence post.	**Present** Box-Gum Woodland and farmland present.	**Possible** Two records within 10 km of proposal area. Recorded in 1989 and 1977.	**Yes** Nesting habitat of shrubs and low trees present in vegetation areas. Also likes farmland areas. AoS completed for this species. Refer to Appendix C.
Bush Stone-curlew *Burhinus grallarius*	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and	**Absent** Box-Gum Woodland, however no fallen timber in	**Unlikely** PCT present is of low quality. No historic records.	**No**

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
BC-E	Tasmania. Only in northern Australia is it still common, however, and in the south-east it is either rare or extinct throughout its former range. Inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber. Largely nocturnal, being especially active on moonlit nights. Feeds on insects and small vertebrates, such as frogs, lizards and snakes. Nests on the ground in a scrape or small bare patch. Two eggs are laid in spring and early summer.	site and ground layer heaily cleared and grazed		The proposal would not impact this species or its habitats.
Gang-gang Cockatoo *Callocephalon fimbriatum* **BC-V**	The Gang-gang Cockatoo is distributed from southern Victoria through south and central-eastern NSW. In NSW it is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the ACT. It is rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee. In summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, may occur at lower altitudes in drier, more open eucalypt forests and woodlands, and often found in urban areas. May also occur in sub-alpine Snow Gum (*Eucalyptus pauciflora)* woodland and occasionally in temperate rainforests. Moves to lower altitudes in winter, preferring more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. Favours old growth attributes for nesting and roosting.	**Present** Mature eucalypts trees with hollows present.	**Unlikely** Recorded once at nine km from proposal area in 1979. Record is very old.	**No** Preferred habitat is not present. Known to be associated with PCT present, however PCT quality is low. It is not likely to be preferred habitat for this species.
Hooded Robin (south-eastern form) *Melanodryas cucullata cucullata* **BC-V**	The Hooded Robin is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. However, it is common in few places, and rarely found on the coast. It is considered a sedentary species, but local seasonal movements are possible. The south-eastern form (subspecies cucullata) is found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies picata. Two other subspecies occur outside NSW.	**Present** Box-Gum Woodland and farmland present.	**Possible** Two records within 10 km of proposal area. Recorded in 1989 and 1977.	**Yes** Nesting habitat of shrubs and low trees present in vegetation areas. Also likes farmland areas. AoS completed for this species. Refer to Appendix C.
Glossy Black-cockatoo *Calyptorhynchus lathami* **BC-V**	The Glossy Black-cockatoo inhabits open forest and woodland of the coast and Great Dividing Range where stands of Sheoak occur. Inland populations feed on a wide range of she-oaks. In the Riverina, birds are associated with hills and rocky rises supporting Drooping Sheoak, and	**Present** No foraging habitat but suitable breeding habitat (Mature eucalypts trees with hollows present).	**Unlikely** Hills and rocky rises supporting Drooping Sheoak and open woodlands dominated by	**No** The proposal would not impact this species or its habitats.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
	in open woodlands dominated by Belah. They are dependent on large hollow-bearing eucalypts for nesting.		Belah not present within study area.	
Speckled Warbler *Chthonicola sagittata* **BC-V**	The Speckled Warbler lives in a wide range of eucalypt dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth, and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	**Present** Box-Gum Woodland.	**Unlikely** One record, 1997, nine km from proposal area. Record older than 10 years.	**No** Known to be associated with PCT present however PCT quality is low, and the mature trees are sparsely dispersed. Not likely to be preferred habitat for this species.
Spotted Harrier *Circus assimilis* **BC-V**	Occurs in grassy open woodland including acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.	**Present** Agricultural land.	**Possible** Recorded within 10 km of proposal area. One record eight km from proposal area. Recorded in 2013.	**Yes** AoS completed for this species. Refer to Appendix C.
Brown Treecreeper (eastern subspecies) *Climacteris picumnus victoriae* **BC-V**	The Brown Treecreeper is found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains west of the Great Dividing Range, mainly in woodlands dominated by Stringybarks or other rough-barked eucalypts, usually with an open grassy understorey and sometimes with one or more shrub species. They are also found in Mallee and River Red Gum forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses. They are not usually found in woodlands with a dense shrub layer. Fallen timber is an important habitat component for foraging, and hollows in standing dead or live trees and tree stumps are essential for nesting.	**Present** Box-Gum Woodland, and hollows in standing dead or live trees.	**Unlikely** Recorded 10 times within 10 km of proposal area. The closest being 900 m of proposal area, recorded in 1993. However, habitat is not favourable, species is unlikely to reside within or frequent proposal area.	**No** Known to be associated with PCT present however PCT quality is low, and the hollow-bearing trees are sparsely dispersed. Not likely to be preferred habitat for this species.
Varied Sittella *Daphoenositta chrysoptera* **BC-V**	The Varied Sittella inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, Mallee and Acacia woodland.	**Absent** Rough-barked eucalyptus species.	**Unlikely** No historic records.	**No** The proposal would not impact this species or its habitats.
Purple-crowned Lorikeet	The Purple-crowned Lorikeet is found in open forests and woodlands, particularly where there are large flowering eucalypts, and in Mallee	**Present** Large eucalypts.	**Unlikely**	**No**

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
Glossopsitta porphyrocephala **BC-V**	habitats. They feed primarily on the nectar and pollen of flowering eucalypts, including planted trees in urban areas.		No records within 10 km of proposal area.	Known to be associated with PCT present however PCT quality is low. Not likely to be preferred habitat for this species.
Little Lorikeet *Glossopsitta pusilla* **BC-V**	The Little Lorikeet forages primarily in the canopy of open *Eucalyptus* forest and woodland, and finds food in *Angophora, Melaleuca* and other tree species. Riparian habitats are particularly used due to higher soil fertility and resulting greater productivity. Isolated flowering trees in open country, including paddocks, roadside remnants, and urban trees are also used. They typically select nesting hollows in the limbs and trunks of smooth-barked eucalypts, often in riparian areas, which are known to be used repeatedly for decades.	**Present** Box-Gum Woodland. Three km from Murrumbidgee River.	**Unlikely** One record, over 10 years old. Associated with PCT present within proposal area. However, feeding tree species are not present, species is unlikely to reside within or frequent proposal area.	**No** Known to be associated with PCT present however PCT quality is low. Not likely to be preferred habitat for this species.
Little Eagle *Hieraaetus morphnoides* **BC-V**	The Little Eagle is a medium-sized bird of prey that is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. She oak or acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. Lays two or three eggs during spring, and young fledge in early summer. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion.	**Present** Box-Gum Woodland. Three km from Murrumbidgee River.	**Possible** Six records within 10 km of proposal area. Closest being at three km from proposal site. Possible foraging and roosting habitat.	**Yes** AoS completed for this species. Refer to Appendix Appendix C.
Magpie Goose *Anseranas semipalmata* **BC-V**	The Magpie Goose is still relatively common in the Australian northern tropics but had disappeared from south-east Australia by 1920 due to drainage and overgrazing of reed swamps used for breeding. Since the 1980s there have been an increasing number of records in central and northern NSW. Vagrants can follow food sources to south-eastern NSW. Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges.	**Absent** Shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges.	**Possible** One record within 6.7 km of proposal area 2014. Unlikely to occur as proposal area lacks wetland with dense aquatic vegetation.	**No** The proposal would not impact this species or its habitats.
Major Mitchell's Cockatoo *Lophochroa leadbeateri*	Found across the arid and semi-arid inland, from south-western Queensland south to north-west Victoria, through most of South Australia, north into the south-west Northern Territory and across to the west coast between Shark Bay and about Jurien. In NSW it is found	**Present** Semi-arid region of the NSW north western slopes.	**Unlikely** Two records. 1999 and 1998. Over five km from	**No** Favourable food sources; native and exotic melons, saltbush and cypress pines

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
BC-V	regularly as far east as about Bourke and Griffith, and sporadically further east than that. Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. Feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines. Normally found in pairs or small groups, though flocks of hundreds may be found where food is abundant. Nesting in tree hollows, occurs throughout the second half of the year; nests are at least 1 km apart, with no more than one pair every 30 km^2.		proposal area. Records are more than 10 years old.	are not present in study area. Not likely to be preferred habitat for this species.
Square-tailed Kite *Lophoictinia isura* ***BC-V***	The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW and Victoria. In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland. Is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage. Appears to occupy large hunting ranges of more than 100km^2. Breeding is from July to February, with nest sites generally located along or near watercourses, in a fork or on large horizontal limbs.	**Present** Box-Gum Woodland. Three km from Murrumbidgee River.	**Unlikely** Associated with PCT present within proposal area. However, PCT is of low quality, and feeding habitat is not preferable.	**No** Known to be associated with PCT present however PCT quality is low. Not likely to be preferred habitat for this species.
Black-chinned Honeyeater (eastern subspecies) *Melithreptus gularis gularis* **BC-V**	Black-chinned Honeyeater occupy mostly the upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark, White Box, Grey Box, Yellow Box, Blakely's Red Gum, and Forest Red Gum. They also inhabit open forests of smooth-barked gums, stringybarks, ironbark's, tea trees, and river she-oaks.	**Present** Box-Gum Woodland.	**Unlikely** Recorded twice at three and nine km from proposal area in 1977 and 1979 respectively. Records older than 10 years. Unlikely habitat within proposal is frequented by this species.	**No** The proposal would not impact this species or its habitats.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
Turquoise Parrot *Neophema pulchella* **BC-V**	Lives on edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Nests in tree hollows, logs or posts, from August to December.	**Present** Hollow-bearing tree.	**Possible** Recorded twice within 10 km of proposal area. One record three km from proposal area in 2007, the other in 2014.	**Yes** AoS completed for this species. Refer to Appendix Appendix C.
Barking Owl *Ninox connivens* **BC-V**	Inhabits eucalypt woodland, open forest, swamp woodlands and, especially in inland areas, timber along watercourses. Denser vegetation is used occasionally for roosting. During the day they roost along creek lines, usually in tall understorey trees with dense foliage such as *Acacia* and *Casuarina* species, or the dense clumps of canopy leaves in large *Eucalypts*. Feeds on a variety of prey, with invertebrates predominant for most of the year, and birds and mammals such as smaller gliders, possums, rodents and rabbits becoming important during breeding. Lives alone or in pairs. Territories range from 30 to 200 ha and birds are present all year. Three eggs are laid in nests in hollows of large, old eucalypts including River Red Gum (*Eucalyptus camaldulensis*), White Box (*Eucalyptus albens*), Red Box (*Eucalyptus polyanthemos)* and Blakely's Red Gum (*Eucalyptus blakelyi*). Breeding occurs during late winter and early spring.	**Present** Hollow-bearing White Box (*Eucalyptus albens*), Red Box (*Eucalyptus polyanthemos)* and Blakely's Red Gum (*Eucalyptus blakelyi*) present in study site.	**Possible** No historic records, but habitat suitable.	**Yes** AoS completed for this species. Refer to Appendix Appendix C.
Powerful Owl *Ninox strenua* **BC-V**	The Powerful Owl is endemic to eastern and south-eastern Australia, mainly on the coastal side of the Great Dividing Range from Mackay to south-western Victoria. In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains suggesting occupancy prior to land clearing. Now at low densities throughout most of its eastern range, rare along the Murray River and former inland populations may never recover. The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest.	**Absent** Mainly found on the coastal side of the Great Dividing Range from Mackay to south-western Victoria.	**Unlikely** No historic records. Incorrect location and habitat.	**No** The proposal would not impact this species or its habitats.
Gilbert's Whistler *Pachycephala inornata* **BC-V**	Gilbert's Whistler are sparsely distributed over much of the arid and semi-arid zone of inland southern Australia, from the western slopes of NSW to the Western Australian wheatbelt. The species was probably once distributed almost continuously across the woodlands and mallee of southern NSW, but this range has been greatly reduced, chiefly by clearance of habitat. The Gilbert's Whistler occurs in a range of habitats	**Absent** No dense shrub layer in development site.	**Unlikely** No historic records. Incorrect habitat.	**No** The proposal would not impact this species or its habitats.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
	within NSW, though the shared feature appears to be a dense shrub layer.			
Scarlet Robin *Petroica boodang* **BC-V**	Scarlet Robin are found from SE Queensland to SE South Australia and also in Tasmania and SW Western Australia. In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robin disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter. The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat. The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 m in altitude. The Scarlet Robin is primarily a resident in forests and woodlands, but some adults and young birds disperse to more open habitats after breeding. In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees. Birds forage from low perches, fenceposts or on the ground, from where they pounce on small insects and other invertebrates which are taken from the ground, or off tree trunks and logs; they sometimes forage in the shrub or canopy layer. Scarlet Robin pairs defend a breeding territory and mainly breed between the months of July and January; they may raise two or three broods in each season. This species' nest is an open cup made of plant fibres and cobwebs and is built in the fork of tree usually more than two m above the ground; nests are often found in a dead branch in a live tree, or in a dead tree or shrub. Birds usually occur singly or in pairs, occasionally in small family parties; pairs stay together year-round. In autumn and winter, the Scarlet Robin joins mixed flocks of other small insectivorous birds which forage through dry forests and woodlands.	**Present** Box-Gum Woodland. This species lives in both mature and regrowth vegetation.	**Possible** Recorded three times within 10 km of proposal area. One record from 2007.	**Yes** AoS completed for this species. Refer to Appendix Appendix C.
Flame Robin *Petroica phoenicea* **BC-V**	Flame Robin breed in upland tall moist eucalypt forests and woodlands, often on ridges and slopes, where they prefer clearings or areas with open understoreys. In winter, they migrate to drier and more open	**Present** Pastures and native grasslands with or without scattered tree.	**Possible** Five records within 10 km of proposal area. Recorded	**Yes** AoS completed for this species. Refer to Appendix Appendix C.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
	habitats in the lowlands, including dry forests, open woodlands, and pastures and native grasslands with or without scattered trees.		at 4.5 km from the proposal site in 2011.	
Grey-crowned Babbler (eastern subspecies) *Pomatostomus temporalis temporalis* **BC-V**	Grey-crowned Babbler Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. They feed on invertebrates, either by foraging on the trunks and branches of eucalypts and other woodland trees or on the ground, digging and probing amongst litter and tussock grasses. Nests are usually located in shrubs or sapling eucalypts, although they may be built in the outermost leaves of low branches of large eucalypts.	**Present** Box-Gum Woodland present.	**Possible** Recorded once in 2008 at 2.5 km from proposal site.	**Yes** AoS completed for this species. Refer to Appendix Appendix C.
Diamond Firetail *Stagonopleura guttata* **BC-V**	Diamond Firetail are found in grassy eucalypt woodlands, including Box-Gum Woodlands, as well as open forest, Mallee, natural temperate grassland, secondary grassland derived from other communities, and lightly wooded farmland.	**Present** Box-Gum Woodland.	**Possible** Four records within nine km of proposal area. One record from 2007.	**Yes** AoS completed for this species. Refer to Appendix Appendix C.
Masked Owl *Tyto novaehollandiae* **BC-V**	Masked Owl extend from the coast where it is most abundant to the western plains. Lives in dry eucalypt forests and woodlands from sea level to 1100 m. Habitat for this species is also widespread throughout the dry eucalypt forests of the tablelands, western slopes and the undulating wet-dry forests of the coast. Optimal habitat includes an open understorey and a mosaic of sparse (grassy) and dense (shrubby) groundcover on gentle terrain. Roosts in hollows in live or occasionally dead eucalypts; dense foliage in gullies; and caves. Nest in old hollow eucalypts, live or dead, in a variety of topographic positions, with hollows greater than 40 cm wide and greater than 100 cm deep. Hollow entrances are at least 3 m above ground in trees of at least 90 cm diameter at breast height. A specialist predator of terrestrial mammals, particularly native rodents. Home range has been estimated as 400-1000 ha according to habitat productivity.	**Absent** Incorrect habitat.	**Unlikely** No records within 10km of proposal area. Habitat present is not favourable for the species, unlikely it resides within or frequents proposal area.	**No** The proposal would not impact this species or its habitats.
Black Falcon *Falco subniger* **BC - V**	Widely but sparsely distributed within NSW. Mostly occurs within inland regions. Easily and often confused with Brown Falcon. Highly mobile known to travel hundreds of kilometres. Often found around tree-lined watercourses and in isolated woodlands, mainly in arid and semi-arid areas. Most common in the sheep-wheat belt region of NSW.	**Present** Isolated woodlands, sheep-wheat belt region of NSW.	**Unlikely** Recorded five times. The closest record was 3.7 km from the proposal site in 2016. Other records are from 1978.	**Yes** AoS completed for this species. Refer to Appendix Appendix C.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
White-bellied Sea-eagle *Haliaeetus leucogaster* **BC-V**	The White-bellied Sea-eagle is distributed around the Australian coastline, including Tasmania, and well inland along rivers and wetlands of the Murray Darling Basin. In New South Wales it is widespread along the east coast, and along all major inland rivers and waterways. Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass.	**Present** Proposal area is 2.5 km from the Murrumbidgee River.	**Possible** Possible foraging and breeding habitat.	**Yes** AoS completed for this species. Refer to Appendix Appendix C.
White-throated Needletail *Hirundapus caudacutus* **EPBC - V**	The White-throated Needletail is widespread in eastern and south-eastern Australia. In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. Further south on the mainland, it is widespread in Victoria, though more so on (and south of) the Great Divide, with few records in western Victoria outside the Grampians and the South West. The species occurs in adjacent areas of south-eastern South Australia, where it extends west to the Yorke Peninsula and the Mount Lofty Ranges. It is widespread in Tasmania. In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks. In coastal areas, they are sometimes seen flying over sandy beaches or mudflats and often around coastal cliffs and other areas with prominent updraughts, such as ridges and sand-dunes.	**Present** Open farmland.	**Unlikely** Recorded three times within 10 km proposal area. One record at 800 m from proposal site in 1992. Other sightings recorded from 1996 and 1978. Records older than 10 years.	**No** Records older than 10 years. Unlikely that the proposal would impact this species or its habitats.
White-fronted Chat *Epthianura albifrons*	Damp, open habitat. Includes saltmarsh, coastal dunes, edges of marshland and pastures. Predominately wetland habitat.	**Absent**	**Unlikely**	**No**

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
BC-V		Damp habitat, wetland habitat not present in study area.	Recorded once 900 m from proposal area in 1992.	The proposal would not impact this species or its habitats.
Fish				
Flathead Galaxias *Galaxias rostratus* **EPBC-CE**	Below 150 m in altitude. Billabongs, lakes, swamps, and rivers, with preference for still or slow-flowing waters.	**Absent** No billabongs, lakes, swamps, and rivers in study area.	**Unlikely** No historic records.	**No** The proposal would not impact this species or its habitats.
Murray Cod *Maccullochella peelii* **EPBC-V**	Lived in wide range of habitats from clear, rocky streams to slow flowing, turbid rivers and billabongs of western plains. Generally found in waters up to 5m deep and in sheltered areas with cover.	**Absent** Incorrect habitat in study area.	**Unlikely** No historic records.	**No** The proposal would not impact this species or its habitats.
Macquarie Perch *Macquaria australasica* **FM-E** **EPBC-E**	Found in Murray-Darling Basin (particularly upstream reaches) of Lachlan, Murrumbidgee and Murray Rivers, and parts of south-eastern coastal NSW, including Hawkesbury and Shoalhaven.	**Absent** Incorrect habitat in study area.	**Unlikely** No historic records.	**No** The proposal would not impact this species or its habitats.
Mammals				
Koala *Phascolarctos cinereus* **BC-V** **EPBC-V**	Koalas inhabit a range of temperate, subtropical and tropical eucalypt woodlands and forests where suitable food trees grow, of which there are more than 70 eucalypt species and 30 non-eucalypt species that are particularly abundant on fertile clay soils.	**Present** Correct location and habitat in study area.	**Possible** One record recorded within 7.5 km of the proposal area in 1966.	**No** Refer to section 4.4.2.
Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris* BC-V	The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and North West Slopes. It can be relatively abundant in some tall forests of northern Australia, likely ranging several tens of kilometres each night. Uses large trees in	**Present** Correct location and habitat. Riparian habitat is three km from proposal area. Hollow-bearing trees present in study area.	**Unlikely** No historic records. The species is more common in tall forests of northern Australia.	**Yes** AoS completed for this species. Refer to Appendix Appendix C.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
	riparian areas to expand its range into woodlands with relatively low tree height. This species occupies most wooded habitats, including both wet and dry sclerophyll forest, mallee and Acacia shrubland, desert, and open woodland. They are a hollow-roosting species, so tend to be found in proximity of adequate old-growth trees.			
Eastern False Pipistrelle *Falsistrellus tasmaniensis* **BC-V**	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania.	**Absent** No potential/known habitat in study area.	**Unlikely** Not predicted to occur in study area.	**No** The proposal would not impact this species or its habitats.
Corben's Long-eared Bat *Nyctophilus corbeni* **BC-V** **EPBC-V**	Corben's Long-eared Bats inhabit a variety of vegetation types, most commonly Mallee, Bulloke, and Box-dominated communities, but are most common in vegetation which has a distinct canopy and dense understorey. They roost in tree hollows, crevices, and under loose bark.	**Absent** No habitat with distinct canopy and dense understory in study area.	**Unlikely** No historic records.	**No** The proposal would not impact this species or its habitats.
Large-eared Pied Bat *Chalinolobus dwyeri* **BC-V**	Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Hirundo ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves. Found in well-timbered areas containing gullies. This species probably forages for small, flying insects below the forest canopy. Likely to hibernate through the coolest months. It is uncertain whether mating occurs early in winter or in spring.	**Absent** No caves in study area.	**Unlikely** No historic records. No caves within locality of study area.	**No** The proposal would not impact this species or its habitats.
Little Pied Bat *Chalinolobus picatus* **BC-V**	The Little-Pied Bat is found in inland Queensland and NSW (including Western Plains and slopes) extending slightly into South Australia and Victoria. Occurs in dry open forest, open woodland, mulga woodlands, chenopod shrublands, cypress-pine forest, mallee, Bimbil box. Roosts in caves, rock outcrops, mine shafts, tunnels, tree hollows and buildings. Can tolerate high temperatures and dryness but need access to nearby open water. Feeds on moths and possibly other flying invertebrates.	**Present** Correct location and habitat. Riparian habitat is three km from proposal area. Hollow-bearing trees present in study area.	**Possible** No historic records.	**Yes** AoS completed for this species. Refer to Appendix Appendix C.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
Large Bent-winged Bat *Miniopterus orianae oceanensis* **BC- V**	Primary roost habitat are caves, also use mines, storm-water tunnels and other man-made structures. Young are also raised within caves. Maternity caves have specific temperature and humidity regimes. Outside of breeding season populations can disperse up to 300 m from maternity caves. Breeding colonies can reach numbers up to 150, 000 individuals. Foraging occurs within forest areas above treetops where insects are a primary food source.	**Absent** No caves, tunnels, mines or other man-made structures suitable for breeding.	**Unlikely** One record from 2013. 4.5km from proposal area. However incorrect habitat type within proposal area.	**No** The proposal would not impact this species or its habitats.
Southern Myotis *Myotis macropus* **BC-V**	Rarely found more than 100 km inland, except along major rivers. Roost in groups close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, dense foliage and under bridges.	**Present** Hollow-bearing trees present in development site.	**Possible** Recorded at six km from proposal area in 2000.	**Yes** AoS completed for this species. Refer to Appendix Appendix C.
Spotted-tailed Quoll *Dasyurus maculatus* **BC-V** **EPBC-E**	Spotted-tailed Quolls have been recorded in a range of habitat types, including open forest, woodland, and inland riparian forest, where they use hollow-bearing trees, fallen logs, small caves, rock outcrops, and rocky cliff faces as den sites. Females occupy home ranges of up to about 750 ha and males up to 3500 ha.	**Present** Box-Gum Woodland. Hollow-bearing trees.	**Unlikely** No historic records within 10 km of study site.	**No** The PCT present is of low quality, and it is unlikely that this species would choose the grazed and cropped study site as preferred habitat.
Grey-headed Flying-fox *Pteropus poliocephalus* **BC-V** **EPBC-V**	It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feeds on commercial fruit crops and on introduced tree species in urban areas. The primary food source is blossom from Eucalyptus and related genera. Roost sites are usually near water, including lakes, rivers, and coastlines.	**Present** Box-Gum Woodland present.	**Unlikely** Mature trees within the study area are isolated and limited in number. This species would have to cross open paddock spaces to access suitable habitat. Highly unlikely it resides within the proposal area.	**No** The proposal would not impact this species or its habitats.
Eastern Pygmy-possum *Cercartetus nanus* **BC - V**	Rainforest, sclerophyll forest, heath. Woodland and heath appear to be preferred. Feeds largely on banksia, eucalypts and bottlebrush. Shelters (goes into torpor during winter) in tree hollows, rotten stumps, ground holes, abandoned bird nests, or vegetation thickets. Breeds in tree hollows or in spherical nests under tree bark.	**Present** Eucalyptus species and tree hollows present on site.	**Unlikely** Hollow-bearing trees within the study area are isolated. This species would have to cross open paddock spaces to access suitable	**No** The proposal would not impact this species or its habitats.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
			habitat. Highly unlikely it resides within the proposal area.	
Brush-tailed Rock-wallaby *Petrogale penicillata* BC-E **EPBC - V**	The range of the Brush-tailed Rock-wallaby extends from south-east Queensland to the Grampians in western Victoria, roughly following the line of the Great Dividing Range. The species' range is now fragmented, particularly in the south where they are now mostly found as small isolated populations dotted across their former range. In NSW they occur from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges facing north. Throughout their range, Brush-tailed Rock-wallabies feed on a wide variety of grasses and shrubs and have flexible dietary requirements. Shelter or bask during the day in rock crevices, caves and overhangs and are most active at night. Highly territorial and have strong site fidelity with an average home range size of about 15 ha. Live in family groups of 2 - 5 adults and usually one or two juvenile and sub-adult individuals. Dominant males associate and breed with up to four females. Breeding is likely to be continuous, at least in the southern populations, with no apparent seasonal trends in births.	**Absent** Rocky escarpments, outcrops and cliffs.	**Unlikely** No suitable habitat.	**No** The proposal would not impact this species or its habitats.
Brush-tailed Phascogale *Phascogale tapoatafa* **BC-V**	Brush-tailed Phascogales prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs, or leaf litter. Females have exclusive territories of around 20 - 40 ha, while males have overlapping territories often greater than 100 ha.	**Present** Box-Gum Woodland.	**Unlikely** Unlikely to still occur within the area due to cropping and grazing impacts. No records.	**No** The PCT present is of low quality, and it is unlikely that this species would occur within the study area.
Greater Bilby *Macrotis lagotis* **BC - Presumed Extinct** **EPBC – V**	A hundred years ago, Bilbies were common in many habitats throughout Australia, from the dry interior to temperate coastal regions. Changes to the Bilby's habitat have seen their numbers greatly reduced and today the species is nationally listed as vulnerable and is presumed extinct in NSW. They now occur in fragmented populations in mulga shrublands and spinifex grasslands in the Tanami Desert of the Northern Territory; in the Gibson and Great Sandy Deserts and the Pilbara and Kimberley regions of Western Australia; and the Mitchell Grasslands of southwest Queensland.	**Absent** Spinifex grass and acacia shrub.	**Highly Unlikely** One historic record from 1912. Species presumed extinct within NSW.	**No** Incorrect habitat. Record represents a prior range of this species (from 107 years ago), it no longer occurs in this area.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
	Once widespread in arid, semi-arid and relatively fertile areas, the Bilby is now restricted to arid regions and remains a threatened species. The Bilby prefers arid habitats because of the spinifex grass and acacia shrub.			
Squirrel Glider Petaurus norfolcensis **BC-V**	The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia mid-storey. They nest in bowl-shaped, leaf lined nests in tree hollows. Diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.	**Present** Box-Gum Woodland.	**Possible** Recorded nine times within 10 km of proposal area. One record, 4 km from proposal area was recorded in 2017.	**Yes** Not enough vegetation connectivity for this species exists between known population location and proposal area to assume presence is possible.
Amphibians				
Booroolong Frog *Litoria booroolongensis* BC-E EPBC-E	The Booroolong Frog is restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. It has disappeared from much of the Northern Tablelands, however several populations have recently been recorded in the Namoi catchment. The species is rare throughout most of the remainder of its range. Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses.	**Absent** No streams.	**Unlikely** Incorrect habitat.	**No** The proposal would not impact this species or its habitats.
Growling Grass Frog / Southern Bell Frog *Litoria raniformis* **EPBC - V** **BC - E**	Southern Bell Frogs are only known to exist in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain, and around Lake Victoria. The species is usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps or billabongs along floodplains and river valleys, and where there is no available natural habitat, they may occur in irrigated rice crops.	**Absent** No streams.	**Unlikely** Incorrect habitat.	**No** The proposal would not impact this species or its habitats.
Sloane's Froglet *Crinia sloanei* **BC - V** **EPBC - E**	Associated with periodically inundated areas in grassland, woodland and disturbed habitats. Floodplains. Known historic distribution within central Victoria and central western NSW as far north as the QLD border. Little is currently known about the species. Eggs are laid on substrate or attachment to submerged vegetation. Within NSW this species is the most infrequently recorded. Species distribution may have some links to Box-Gum Woodland, however this has not been	**Present** Box-Gum Woodland.	**Possible** One dam present in study area.	**Yes** AoS completed for this species. Refer to Appendix Appendix C.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
	researched. Significant known populations for species recovery are located within Albury, particularly Thurgoona, Corowa and north-east Victoria.			
Reptiles				
Rosenberg's Goanna *Varanus rosenbergi* BC-V	Rosenberg's Goanna occurs on the Sydney Sandstone in Wollemi National Park to the north-west of Sydney, in the Goulburn and ACT regions and near Cooma in the south. There are records from the South West Slopes near Khancoban and Tooma River. Also occurs in South Australia and Western Australia. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component	**Absent** No termite mounds. Incorrect location.	**Unlikely** Incorrect habitat.	**No** The proposal would not impact this species or its habitats.
Pink-tailed Legless Lizard *Aprasia parapulchella* **BC-V** **EPBC-V**	Pink-tailed Legless Lizards inhabit sloping open woodland areas with groundcover dominated by native grasses, typically those which are well-drained with rocky outcrops or scattered, partly-buried rocks.	**Absent** Groundcover not dominated by native grasses.	**Unlikely** Incorrect habitat.	**No** The proposal would not impact this species or its habitats.
Striped Legless Lizard *Delma impar* **BC-V** **EPBC-V**	Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass *Themeda australis*, spear-grasses *Austrostipa spp.* and poa tussocks *Poa spp*., and occasionally wallaby grasses *Austrodanthonia spp*. Sometimes present in modified grasslands with a significant content of exotic grasses such as *Phalaris aquatica, Nasella trichotoma* and *Hypocharis radicata*. Sometimes found in grasslands with significant amounts of surface rocks, which are used for shelter.	**Absent** Native Temperate Grasslands not present in study area.	**Unlikely** Incorrect habitat.	**No** The proposal would not impact this species or its habitats.
Pale Headed Snake *Hoplocephalus bitorquatus* **BC-V**	A patchy distribution from north-east Queensland to north-east NSW. In NSW it occurs from the coast to the western side of the Great Divide as far south as Tuggerah. Found mainly in dry eucalypt forests and woodlands, cypress woodland and occasionally in rainforest or moist eucalypt forest. Favours streamside areas, particularly in drier habitats. Shelter during the day between loose bark and tree-trunks, or in hollow	**Present** Box-Gum Woodland.	**Unlikely** Associated with PCT present, Murrumbidgee River within 3 km of study	**No** Unlikely to occur within study area.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
	trunks and limbs of dead trees. The main prey is tree frogs although lizards and small mammals are also taken.		site, however not suitable habitat in study area.	
Endangered Populations				
Squirrel Glider's in wagga Local Government Area BC - Endangered Population	Woodland and open forest with eucalypts. Often with mid-story of Acacia and Banksia. Prefers mature old growth box, box-ironbark woodland, River Red Gum forest. Requires hollow-bearing tree's, for refuge, resting and breeding. Feeds on Acacia gum, Eucalypt sap, nectar, honeydew and mana. Feeds on invertebrates and pollen for protein.	**Present** Box-Gum Woodland.	**Possible** Recorded nine times within 10 km of proposal area. One record, 4 km from proposal area was recorded in 2017.	**Yes** Not enough vegetation connectivity for this species exists between known population location and proposal area to assume presence is possible.
Migratory				
Glossy Ibis *Plegadis falcinellus* **EPBC - M**	Within Australia, the Glossy Ibis is generally located east of the Kimberley in Western Australia and Eyre Peninsula in South Australia. The species is also known to be patchily distributed in the rest of Western Australia. The species is rare or a vagrant in Tasmania. The Glossy Ibis' preferred habitat for foraging and breeding are freshwater marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation.	**Absent** No freshwater marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation on study site.	**Unlikely** Three records recorded within 10 km from proposal area, the most recent being 1978. Record more than 10 years old.	**No** Unlikely that this species would choose the grazed and cropping farmland of this study site.
Common Greenshank *Tringa nebularia* **EPBC - M**	The Common Greenshank does not breed in Australia, however, the species occurs in all types of wetlands and has the widest distribution of any shorebird in Australia. The species has been recorded in most coastal regions. It is widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and salt flats.	**Present** Dam on study site.	**Unlikely** The Species Profile and Threats Database recommends Wagga Wagga as being outside its predicted or known habitat. Recorded at nine km from the study area in 1979. This record is more than 10 years old.	**No** Unlikely that this species would choose the grazed and cropping farmland of this study site.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
Red-necked Stint *Calidris ruficollis* **EPBC - M**	In Australasia, the Red-necked Stint is mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been recorded on exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals. They also occur in saltworks and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in salt flats. They sometimes use flooded paddocks or damp grasslands.	**Absent** No coastal areas, or sewage plant in study area.	**Unlikely** Recorded once at Kooringal Sewage Farm, nine km from proposal site in 1979. No suitable habitat. The paddocks of the study site are sloped and unlikely to remain damp or flood.	**No** The proposal would not impact this species or its habitats.
Common Sandpiper *Actitis hypoleucos* **EPBC - M**	Wide range of coastal wetlands and some inland wetlands, with varying salinity, mostly found around muddy margins or rocky shores and rarely on mudflats. Recorded in estuaries and deltas of streams and on banks upstream, around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. Muddy margins often narrow and may be steep. Often associated with mangroves, sometimes areas of mud littered with rocks or snags.	**Present** Dam on site.	**Possible** Could occur in study area.	**No** Species may occur within the area; however unlikely species relies upon or regularly utilises the heavily grazed and cropping habitat of the study site.
Marsh Sandpiper *Tringa stagnatilis* **EPBC - M**	The Marsh Sandpiper lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks.	**Absent** No suitable habitat in study area.	**Unlikely** Recorded once at Wagga Wagga Sewage Treatment Works, nine km from proposal site in 1979.	**No** Preferred habitat is not present. The proposal would not impact this species or its habitats.
Sharp-tailed Sandpiper *Calidris acuminata* **EPBC - M**	Prefers muddy edges of shallow wetlands, with inundated or emergent sedges, grass, saltmarsh, or other low vegetation. Inland, includes dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline lakes, saltworks and sewage farms, flooded paddocks, sedge lands and other ephemeral wetlands, leaving when dry, and swamps and creeks with mangroves.	**Absent** No suitable habitat in study area.	**Unlikely** Recorded twice within 10 km from the proposal area. At sewage farm in 1979.	**No** Preferred habitat is not present. The proposal would not impact this species or its habitats.
Curlew Sandpiper *Calidris ferruginea* **EPBC - CE** **EPBC - M**	Mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and around non-tidal swamps, lakes and lagoons near coast, and ponds in saltworks and sewage farms. Also recorded inland, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand.	**Absent** No suitable habitat in study area.	**Unlikely** Recorded once within 10 km from the proposal area. At sewage farm in 1978.	**No** Preferred habitat is not present. The proposal would not impact this species or its habitats.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*
Pectoral Sandpiper *Calidris melanotos* **EPBC - M**	Breeds in high-arctic tundra in Siberia and arctic Alaska and Canada. Small number known to reach Australia and believed to be concentrated in south-eastern Australia. Prefers freshwater mudflats.	**Absent** No suitable habitat in study area.	**Unlikely** No historic records.	**No** Preferred habitat is not present. The proposal would not impact this species or its habitats.
Latham's Snipe, *Gallinago hardwickii* **EPBC - M**	Occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. Usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies). Can occur in modified or artificial habitats, close to humans or human activity.	**Absent** No suitable habitat in study area.	**Unlikely** Recorded twice at Wagga Wagga Sewage Treatment Works in 1978 and 1977, nine km from proposal site.	**No** Preferred habitat is not present. The proposal would not impact this species or its habitats.
Eastern Curlew, *Numenius madagascariensis* **EPBC - CE** **EPBC - M**	Sheltered coasts including estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds seagrass.	**Absent** No suitable habitat in study area.	**Unlikely** No historic records.	**No** Preferred habitat is not present. The proposal would not impact this species or its habitats.
Invertebrates				
Golden Sun Moth *Synemon plana* **BC-E** **EPBC-CE**	The Golden Sun Moth's NSW populations are found in the area between Queanbeyan, Gunning, Young and Tumut. The species' historical distribution extended from Bathurst (central NSW) through the NSW Southern Tablelands, through to central and western Victoria, to Bordertown in eastern South Australia. Habitat may contain several wallaby grass species, which are typically associated with other grasses particularly spear-grasses *Austrostipa* spp. or Kangaroo Grass *Themeda australis*.	**Absent** Key grass species required by species not present in study area.	**Unlikely** No historic records.	**No** The proposal would not impact this species or its habitats.

Species and Status	*Description of habitat*[5]	*Presence of habitat*	*Likelihood of occurrence*	*Potential for impact?*

E BC = listed as Endangered under Schedule 1 of the NSW *Biodiversity Conservation Act 2016.*

E EPBC = listed as Endangered under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

V EPBC = listed as Vulnerable under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

V BC = listed as Vulnerable under Schedule 2 of the NSW *Biodiversity Conservation Act 2016.*

CE EPBC = listed as Critically Endangered under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

CE BC = listed as Endangered Ecological Community under the NSW *Biodiversity Conservation Act 2016.*

M EPBC = listed as Marine and/or Migratory under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999.*

APPENDIX C ASSESSMENTS OF SIGNIFICANCE

C.1 BIODIVERSITY CONSERVATION ACT 5 PART TEST

Section 7.3 of the *Biodiversity Conservation Act 2016* specifies five factors to be taken into account in deciding whether a development is likely to significantly affect threatened species, populations or ecological communities, or their habitats, listed at the state level under the Act. This Five Part Test characterises the significance of likely impacts associated with the proposal on the following species:

Threatened Species

The results of the desktop study identified 28 flora species, two Endangered Ecological Communities (EECs), 74 fauna species and 1 endangered population with the potential to occur within the locality.

No flora species with the potential to occur within the proposal area were determined likely to incur an impact. The following fauna were determined to have the potential to occur within the proposal area. Squirrel Glider's (*Petaurus norfolcensis*) within the Wagga Wagga Local Government Area (LGA) are listed as an Endangered Population under the BC act. A full list of the threatened species identified through these searches with further description is available in Appendix B.

Understory Birds:

- Hooded Robin (south-eastern form) (*Melanodryas cucullata cucullata)* - V
- Scarlet Robin (*Petroica boodang)* - V
- Flame Robin (*Petroica phoenicea)* - V
- Diamond Firetail (*Stagonopleura guttata)* - V
- Grey-crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis)* - V

Arial Birds:

- Dusky Woodswallow (*Artamus cyanopterus cyanopterus)* - V
- Little Eagle (*Hieraaetus morphnoides)* - V
- Spotted Harrier (Circus assimilis) - V
- Black Falcon (*Falco subniger)* - V
- White-bellied Sea-eagle (*Haliaeetus leucogaster)* - V

Hollow Dependent Species:

- Barking Owl (*Ninox connivens)* - V
- Swift Parrot (*Lathamus discolor*) - E
- Superb Parrot (*Polytelis swainsonii*) - V
- Turquoise Parrot (*Neophema pulchella*) - V
- Southern Myotis (*Myotis macropus)* - V
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) - V
- Little Pied Bat (*Chalinolobus picatus)* - V
- Squirrel Glider (*Petaurus norfolcensis*) - V

Endangered ecological communities and populations:

- White Box Yellow Box Blakley's Red Gum Woodland (Box-Gum Woodland) - EEC
- Squirrel Glider in the Wagga Wagga LGA - Endangered Population

Amphibians:

- Sloane's Froglet (*Crinia sloanei)* - V

a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Understory Birds

Potential foraging habitat for the Hooded Robin, Scarlet Robin, Flame Robin, Diamond Firetail and Grey-crowned Babbler (eastern subspecies) occurs within the proposal area in the form of PCT 277 (White Box Yellow Box Blakley's Red Gum Woodland) and several native trees. These species were not detected on site, during the site survey, but targeted surveys were not undertaken There are records for Scarlet Robin, Flame Robin, Diamond Firetail and Grey-crowned Babbler within a 10 km radius of the study area.

These species are known or considered likely to occur in the study area. However, the quality of potential habitat is low, dominated by exotic grasses, heavily disturbed by cropping and grazing activities, and lacking understory cover (see Figure 7-1 and Figure 7-2).

The proposal would involve the clearing of 0.475 ha of native vegetation. A total of 2.68 ha of native vegetation would be retained and continue to provide habitat. Grasses will re-establish within the solar farm after construction is completed.

While there is potential for these species to occur in the proposal area, the proposal would impact only a small area of suitable habitat which is not likely to support a significant portion of a viable local population of these species. It is therefore unlikely that the proposal would have an adverse impact on the life cycle of these species, such that a viable local population is likely to be placed at risk of extinction.

Figure 7-1 Planted native vegetation lacking understory

Figure 7-2 Low quality PCT

Aerial birds

Potential foraging habitat for the Dusky Woodswallow, Little Eagle, Spotted Harrier, Black Falcon and White-bellied Sea-eagle occurs within the proposal area in the form of PCT 277 and several native trees. These species were not detected during the site survey, but targeted surveys were not done. There are records for Dusky Woodswallow, Little Eagle, Spotted Harrier and Black Falcon within a 10 km radius of the study area.

The proposal would involve the clearing of 0.475 ha of native vegetation. A total of 2.68 ha of native vegetation would be retained and continue to provide habitat.

While there is potential for these species to occur in the proposal area, the proposal would impact only a small area of suitable habitat which is not likely to support a significant portion of a viable local population of these species, which are all wide-ranging and highly mobile. It is therefore unlikely that the proposal would have an adverse impact on the life cycle of these species, such that a viable local population is likely to be placed at risk of extinction.

Hollow Dependent Species

Potential foraging and nesting habitat for the Barking Owl, Swift Parrot, Superb Parrot, Turquoise Parrot, Southern Myotis, Yellow-bellied Sheathtail-bat, Little Pied Bat and Squirrel Glider occurs within the proposal area in the form of PCT 277 and mature hollow-bearing trees. These species were not detected during the site survey, but targeted surveys were not done. There are records for Barking Owl, Swift Parrot, Superb Parrot and Turquoise Parrot within a 10 km radius of the study area.

The proposal would involve the clearing of 0.475 ha of native vegetation. A total of 2.68 ha of native vegetation would be retained and continue to provide habitat.

While there is potential for these species to occur in the proposal area, the proposal would impact only a small area of suitable habitat which is not likely to support a significant portion of a viable local population of these species, which are all wide-ranging and highly mobile. It is therefore unlikely that the proposal would have an adverse impact on the life cycle of these species, such that a viable local population is likely to be placed at risk of extinction.

Endangered Population

Squirrel Glider in the Wagga Wagga LGA are listed as an Endangered population under the BC Act. Impacts to the Squirrel Glider have been assessed under Hollow dependent Species.

Amphibians

Potential habitat for Sloane's Froglet occurs at the small dam in the study area. This species was not detected during the site survey, but this was not conducted during optimal survey conditions, and no targeted surveys were done.

The proposal would involve the clearing of 0.475 ha of native vegetation. A total of 2.68 ha of native vegetation would be retained and continue to provide habitat. A small area of the farm dam could be impacted.

The nearest records of this species are located in Livingston National Park (37 km from the proposal area). There is no suitable aquatic vegetation for this species in the farm dam of the proposal area. It is therefore unlikely that the proposal would have an adverse impact on the life cycle of the Sloane's Froglet, such that a viable local population of the species is likely to be placed at risk of extinction.

b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

- ***a. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction.***
- ***b. Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.***

EEC: White Box Yellow Box Blakley's Red Gum Woodland (Box-Gum Woodland)

a) The proposal would require the removal of two patches of PCT: one 0.08 ha, and one 0.38 ha patch of remnant PCT trees (consisting of two, and four trees respectively). In addition, 11 isolated paddock trees (six living and five stags) will be cleared (Figure 4-4, and Figure 5-1). A total of 1 ha of EEC will be retained within the proposal area.

   The quality of the Box-Gum Woodland is low. It is dominated by exotic grasses, heavily disturbed by cropping and grazing activities, and lacks any understory cover (Figure 7-3). Patches of Box-Gum Woodland occur to the south of the proposed site, which are much larger and in better condition than the PCT in the study site. It is unlikely the PCT to be cleared is contributing greatly to the long-term survival of the local occurrence. Given this, and that majority of the local occurrence would not be impacted, the proposal is considered unlikely to place the local occurrence of the community at risk of extinction.

b) The removal of up to 0.475 ha of the local occurrence of Box-Gum Woodland is considered unlikely to modify the composition of the local occurrence such that it is likely to be placed at risk of extinction.

Figure 7-3 Patch of EEC (0.38 ha) to be removed

c) In relation to the habitat of a threatened species or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long–term survival of the species or ecological community in the locality.

Understory Birds

i. The proposal would result in the removal of around 0.475 ha of native vegetation (PCT 277), which could impact on foraging and nesting resources for these species.

ii. These species prefer woodland with an understory cover. The development area has been highly damaged due to agricultural grazing and cropping and lacks any understory vegetation. The patch of woodland to the north and south of the proposal area that provides habitat connectivity in the locality would not be impacted. A total of 2.68 ha of PCT will not be impacted. It is considered unlikely for the area of habitat to become further fragmented or isolated from other areas as a result of the proposal.

iii. The proposed works are unlikely to impact the long-term survival of the species in the locality as the habitat in the study area has been previously disturbed, and the amount to be removed is small in the local context.

Aerial birds

i. The proposal would result in the removal of around 0.475 ha of native vegetation (PCT 277), which could impact on foraging and nesting resources for these species.

ii. These species prefer woodland with a healthy understory cover. The development area has been highly damaged due to agricultural grazing and cropping. The PCT is fragmented and of low quality. The patch of woodland to the north and south of the proposal area that provides habitat connectivity in the locality would not be impacted. A total of 2.68 ha of PCT will not be impacted. Therefore, it is considered unlikely for the area of habitat to become further fragmented or isolated from other areas as a result of the proposal.

iii. The proposed works are unlikely to impact the long-term survival of the species in the locality as the habitat in the study area has been previously disturbed, and the amount to be removed is small in the local context.

Hollow Dependent Species

. The proposal would result in the removal of around 0.475 ha of native vegetation (PCT 277), and 15 hollow-bearing trees which could impact on foraging and nesting resources for these species.

. These species are dependent of hollow-bearing trees for breeding and seeking shelter. The development area has been highly damaged due to agricultural grazing and cropping. The PCT is fragmented and of low quality. The patch of woodland to the north and south of the proposal area that provides habitat connectivity in the locality would not be impacted. A total of 2.68 ha of PCT will not be impacted. Therefore, it is considered unlikely for the area of habitat to become further fragmented or isolated from other areas as a result of the proposal.

. Hollows are an important habitat type. The amount of habitat is small in the context of habitat remaining in the locality. Thus, the hollow-bearing habitat is considered unlikely to sustain or be relied upon by the hollow dependent species within the locality.

Endangered Population

Squirrel Glider in the Wagga Wagga LGA are listed as an Endangered population under the BC Act. Impacts to the Squirrel Glider have been assessed under Hollow dependent Species.

Amphibians

i. The proposal would modify a small section of the Sloane's Froglet habitat, the farm dam that occurs in the centre of the study site.

ii. It is considered unlikely for the area of habitat to become further fragmented or isolated from other areas as a result of the proposal.

iii. The proposed works are unlikely to impact the long-term survival of the species in the locality as the habitat necessary for the Sloane's Froglet (aquatic vegetation) does not occur in the farm dam in the proposal area. No targeted surveys were completed, but the nearest records for the species occur over 35 km away. It is considered unlikely that the Sloane's Froglet occurs in the proposal area.

d) Whether the action proposed is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).

No areas of outstanding biodiversity value occur within or adjacent to the proposal area. There would be no adverse direct or indirect effects on any declared areas of outstanding biodiversity value.

e) Whether the action proposed constitutes or is part of a key threatening process or is likely to increase the impact of a key threatening process.

Key Threatening Processes (KTPs) relevant to the proposal include the following:

I. Clearing of native vegetation

The clearing of native vegetation is considered a major contributor to the loss of biodiversity. In the Scientific Committee's determination, it was found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity.' Clearing can lead to direct habitat loss, habitat fragmentation and associated genetic impacts, habitat degradation and off–site impacts such as downstream sedimentation. Around 0.475 ha of PCT would be cleared as a result of the proposal alongside 11 paddock trees.

The proposal has the potential to increase the impact of this KTP. However, the contribution of this proposal would be relatively minor given the relatively small amount of fragmented PCT to be removed and the area of habitat that would remain in the study area (2.68 ha of native vegetation).

II. Invasion and establishment of exotic vines and scramblers

The proposal has the potential to contribute to the spread of exotic species in the proposal area through the transfer and introduction of plant material and soil on machinery. Mitigation measures have been recommended to prevent the spread of weeds on site. The proposal would be likely to make only a minor contribution to this KTP.

III. Invasion of native plant communities by exotic perennial grasses

Exotic perennial grasses are currently dominant throughout the proposal area. The proposal has the potential to contribute to the introduction or spread of exotic perennial grasses to the study area through the transfer and introduction of plant material and soil on machinery. Mitigation measures have been recommended to prevent the spread of weeds on site. The proposal would be likely to make only a minor contribution to this KTP.

IV. Loss of hollow-bearing trees

The proposal has the potential to contribute to the loss of hollow-bearing trees. Fifteen hollow-bearing trees within the proposal area would be removed as part of the proposed developments. However, 19 hollow-bearing trees will be retained.

The proposal has the potential to increase the impact of this KTP. However, mitigation measures have been recommended in accordance with the potential removal of the hollow-bearing trees, and the re-location of the stags.

Conclusion

The impacts of the proposal on the assessed threatened species listed under the BC Act are considered to be manageable. A significant threat is considered unlikely based on the following conclusions:

1 The amount of habitat to be removed or disturbed by the proposal is relatively small in an already fragmented area.
2 No further fragmentation of the habitat would occur.
3 No substantial contribution to any key threatening process would be expected.
4 Mitigation measures listed in Section 6 would be implemented to prevent disruptions to the life cycle or harm to individual animals of these species.

C.2 2 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT PRINCIPAL SIGNIFICANT IMPACT ASSESSMENT

The *Environment Protection and Biodiversity Conservation Act 1999* specifies factors to be taken into account in deciding whether a development is likely to significantly affect Endangered Ecological Communities, threatened species and migratory species, listed at the Commonwealth level. These assessments characterise the significance of likely impacts associated with the proposal on the following **Vulnerable** species:

Hollow Dependent Species:

- Superb Parrot (*Polytelis swainsonii*) – V

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

a) Will the action lead to a long–term decrease in the size of an important population of a species?

Hollow Dependent Species - Superb Parrot

Potential nesting habitat and feeding habitat for the Superb Parrot occurs within the study area in the form of PCT 277. The proposal would result in the clearance of 0.475 ha of native vegetation, and the removal of 11 paddock trees which contain tree hollows.

While it is likely for the Superb Parrot to occur in the development footprint, this species is highly mobile, and the proposal would impact only a small area of suitable habitat which would predominantly be used for foraging given the disturbed environment associated with the agricultural habitat.
Given the small area of habitat to be removed and the implementation of the safeguards and mitigation measures, it is considered unlikely that the proposal would to have an adverse effect on this species such that is would lead to a long-term decrease in the size of a population.

b) Will the action reduce the area of occupancy of an important population of a species?

Hollow Dependent Species - Superb Parrot

The proposal would result in the removal of around 0.475 ha of potential foraging habitat for this species, which exists in a 0.08 ha (consisting of two native hollow-bearing trees), and a 0.38 ha patch (of four native hollow-bearing trees). A total of 2.68 ha of native vegetation, and 19 hollow-bearing trees would be retained.

The proposal area is not located in a known important population of this species. In this context, the removal of a relatively small area of foraging and potential breeding habitat as a result of the proposal is considered unlikely to reduce the area of occupancy of an important population of this species.

c) Will the action fragment an existing important population into two or more populations?

Hollow Dependent Species - Superb Parrot

The proposal would result in the removal of around 0.475 ha of potential foraging habitat for this species, which exists in a 0.08 ha (consisting of two native hollow-bearing trees), and a 0.38 ha patch (of four native hollow-bearing trees). A total of 2.68 ha of native vegetation would be retained.

The proposal would involve the removal of 15 hollow-bearing trees, and 19 hollow-bearing trees will be retained. The Superb Parrot requires an abundance of hollow-bearing trees for nesting as they nest colonially. Which will remain as a patch of PCT in the northern section of the proposal area.

Therefore, it is unlikely to impact on any potential breeding habitat for this species. There is a remnant native vegetation within the locality. The proposal area is not located in a known important population of this species. The proposal would not fragment an existing important population into two or more populations.

d) Will the action adversely affect habitat critical to the survival of a species?

Hollow Dependent Species - Superb Parrot

Critical breeding habitat for the Superb Parrot is located within the Riverina is Box-Gum Woodlands along the Murrumbidgee River, large trees, including River Red Gum (*E. camaldulensis*) with many hollows, typically located an average of 25 m from watercourses (Baker-Gabb, 2011).

The proposal area contains Box-Gum Woodland and several large hollow-bearing native gum trees. However, it is approximately four km from the Murrumbidgee River. The hollow-bearing trees within the proposal site are not preferred breeding habitat for the Superb Parrot as they are too far from the watercourse. This indicates the proposal area does not contain habitat that is critical to the survival of the species and would thus not adversely affect any habitat critical for the survival of this species.

e) Will the action disrupt the breeding cycle of an important population?

Hollow Dependent Species - Superb Parrot

The proposal would involve the removal of 15 hollow-bearing trees, but 19 will remain intact.

The habitat within the proposal area is not directly connected to adequate breeding habitat for this species. This Species requires an abundance of hollow-bearing trees, near a watercourse for nesting. Therefore, the proposed works will not disrupt the breeding cycle of this species.

f) Will the action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

Hollow Dependent Species - Superb Parrot

The proposal would result in the removal of around 0.475 ha of potential foraging habitat for this species, which exists in a 0.08 ha (consisting of two native hollow-bearing trees), and a 0.38 ha patch (of four native hollow-bearing trees). A total of 2.68 ha of native vegetation would be retained.

The proposal would involve the removal of 15 hollow-bearing trees, and 19 hollow-bearing trees will be retained. The Superb Parrot requires an abundance of hollow-bearing trees for nesting as they nest colonially. Which will remain as a patch of PCT in the northern section of the proposal area.

The habitat within the proposal area is not considered habitat critical to the survival of this species. This species is not known to reside within the proposal area. This Species prefers an abundance of hollow-bearing trees for nesting as they are known to nest colonially in pairs of up to nine (Baker-Gabb, 2011). However, they are also known, less commonly, to nest singly.

The removal of 0.475 ha of native vegetation from the proposed works is unlikely to impact the distribution of this species. The proposed works will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

The proposal has the potential to contribute to the spread of invasive species in the proposal area through the transfer and introduction of plant material and soil on machinery. Mitigation measures have been recommended to prevent the spread of weeds on site. The proposal would therefore be unlikely to result in invasive species that are harmful to the Superb Parrot becoming established in their potential habitat.

h) Will the action introduce disease that may cause the species to decline?

There is a risk that pathogens could be established or spread in the proposal area via machinery during construction. However, with the recommended mitigation measures, the action would be unlikely to introduce any disease which may cause the Superb Parrot to decline.

i) Will the action interfere substantially with the recovery of the species?

Hollow Dependent Species - Superb Parrot

The National Recovery Plan for Superb Parrot lists the following specific objectives:

1. Determine population trends in the Superb Parrot.
2. Increase the level of knowledge of the Superb Parrot's ecological requirements.
3. Develop and implement threat abatement strategies.
4. Increase community involvement in and awareness of the Superb Parrot recovery program.

The proposal would not interfere with any of these objectives.

Conclusion

The impacts of the proposal on the assessed vulnerable species listed under the EPBC Act are considered to be manageable. A significant impact is considered unlikely based on the following conclusions:

1. The amount of habitat to be removed or disturbed by the proposal is relatively small in the context of the greater area of habitat that would remain.
2. No further fragmentation of habitat would occur.
3. No substantial contribution to any key threatening process would be expected.

4. Mitigation measures would be implemented to prevent significant impact to The Superb Parrot.

The *Environment Protection and Biodiversity Conservation Act 1999* specifies factors to be taken into account in deciding whether a development is likely to significantly affect Endangered Ecological Communities, threatened species and migratory species, listed at the Commonwealth level. These assessments characterise the significance of likely impacts associated with the proposal on the following **Endangered or Critically Endangered** species:

Hollow Dependent Species:

- Swift Parrot (*Lathamus discolor*) – CE

Amphibians:

- Sloane's Froglet (*Crinia sloanei) – E*

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

a) Will the action lead to a long-term decrease in the size of a population of a species?

Hollow Dependent Species - Swift Parrot

The proposal would result in the removal of around 0.475 ha of potential foraging habitat for this species, which exists in a 0.08 ha (consisting of two native hollow-bearing trees) and a 0.38 ha patch (of four native hollow-bearing trees). A total of 2.68 ha of native vegetation, and 19 hollow-bearing trees would be retained.

While it is likely for the Swift Parrot to occur in the development footprint, this species is highly mobile, and the proposal would impact only a small area of suitable habitat which would predominantly be used for foraging given the disturbed environment associated with the agricultural habitat.

Given the small area of habitat to be removed and the implementation of the safeguards and mitigation measures, it is considered unlikely that the proposal would to have an adverse effect on this species such that is would lead to a long-term decrease in the size of a population.

Amphibian - Sloane's Froglet

No impacts to the threatened frog species would occur as a result of the proposal. There is no suitable aquatic vegetation for this species in the farm dam of the proposal area. Although no targeted surveys were done, the nearest records of this species are located in Livingston National Park (37 km from the proposal area). Therefore, it is considered unlikely for the Sloane's Froglet to occur in the proposal site. It is considered unlikely that the proposal would to have an adverse effect on this species such that is would lead to a long-term decrease in the size of a population.

b) Will the action reduce the area of occupancy of the species?

Hollow Dependent Species - Swift Parrot

Potential foraging habitat for the Swift Parrot within the proposal area is present in the form of PCT 277 and several native trees.

This species was not detected during the field survey. Swift Parrots have been recorded approximately four to seven km from the proposal area. This migratory species breeds in Tasmania and migrates to mainland Australia during non-breeding months. This species' population is considered as occurring as one single migratory population. Protection of recurring visited sites are highly important for the recovery of this species. No favoured feed tree species are located within the proposal area. One commonly used lerp infested tree species (Yellow Box) is present in the proposal site. The proposal area is not a known and is unlikely to be an important foraging site for this species.

Given the small amount habitat present within the proposal area is considered low to moderate in condition, it is unlikely these threatened species rely upon and/or frequent the habitat within the proposal area. The proposal is therefore not considered likely to reduce the area of occupancy of this species.

Amphibian - Sloane's Froglet

No impacts to the threatened frog species would occur as a result of the proposal. There is no suitable aquatic vegetation for this species in the farm dam of the proposal area. Although no targeted surveys were done, the nearest records of this species are located in Livingstone National Park (37 km from the proposal area). The proposal is considered unlikely to reduce the area of occupancy of an important population of this species.

c) Will the action fragment and existing population into two or more populations?

Hollow Dependent Species - Swift Parrot

Swift Parrots have been recorded approximately four to seven km from the proposal area. This migratory species breeds in Tasmania and migrates to mainland Australia during non-breeding months. This species' population is considered as occurring as one single migratory population. Given this species migratory nature and that the proposal area is not considered or known as an important foraging site for this species, the proposed development is not considered an action that would fragment existing populations of this species.

Amphibian – Sloane's Froglet

No impacts to the threatened frog species would occur as a result of the proposal. There is no suitable aquatic vegetation for this species in the farm dam of the proposal area. Although no targeted surveys were done, the nearest records of this species are located in Livingstone National Park (37 km from the proposal area). The proposal would not fragment an existing important population into two or more populations.

d) Will the action adversely affect habitat critical to the survival of a species?

Hollow Dependent Species - Swift Parrot

Habitat critical to the survival of the Swift Parrot includes those areas of priority habitat for which the Swift Parrot has a level of site fidelity or possess phenological characteristics likely to be of importance to the Swift Parrot.

The habitat within the proposal area is not considered critical habitat for his species, due to the low quality PCT, small number of mature trees (needed for foraging). This species breeds in north-west Tasmania. As such, the proposal would not result in loss of habitat in, or adjacent to critical foraging, nesting sites, as these areas do not occur in the proposal site. The proposal will not adversely affect habitat critical to the survival of this species.

Amphibian – Sloane's Froglet

No impacts to the threatened frog species would occur as a result of the proposal. There is no suitable aquatic vegetation for this species in the farm dam of the proposal area. Although no targeted surveys were done, the nearest records of this species are located in Livingstone National Park (37 km from the proposal area). The proposal would not adversely affect habitat critical to the survival of this species.

e) Will the action disrupt the breeding cycle of a population?

Hollow Dependent Species - Swift Parrot

This migratory species breeds in Tasmania and migrates to mainland Australia during non-breeding months. The habitat within the proposal area is not considered critical feeding habitat for his species, due to the low

quality PCT, and small number of mature trees (needed for foraging). Therefore, the proposal will not disrupt the breeding cycle of a population.

Amphibian – Sloane's Froglet

No impacts to the threatened frog species would occur as a result of the proposal. There is no suitable aquatic vegetation for this species in the farm dam of the proposal area. Although no targeted surveys were done, the nearest records of this species are located in Livingstone National Park (37 km from the proposal area). The proposal would not disrupt the breeding cycle of a population of Sloane's Froglet.

f) Will the action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

Hollow Dependent Species - Swift Parrot

Potential foraging habitat for the Swift Parrot within the proposal area is present in the form of PCT 277 and several native trees.

This species was not detected during the field survey. Swift Parrots have been recorded approximately four- seven km from the proposal area. This migratory species breeds in Tasmania and migrates to mainland Australia during non-breeding months. Protection of recurring visited sites are highly important for the recovery of this species. The proposal area is not a known and is not likely to be an important foraging site for this species.

Given the small amount of habitat present within the proposal area is considered low to moderate in condition, it is unlikely these threatened species rely upon and/or frequent the habitat within the proposal area. Therefore, the proposed development will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

Amphibian – Sloane's Froglet

No impacts to the threatened frog species would occur as a result of the proposal. There is no suitable aquatic vegetation for this species in the farm dam of the proposal area. Although no targeted surveys were done, the nearest records of this species are located in Livingstone National Park (37 km from the proposal area). Therefore, the proposed development will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) Will the action result in invasive species that are harmful to a critically endangered or endangered/vulnerable species becoming established in the endangered / critically endangered /vulnerable species habitat?

Hollow Dependent Species - Swift Parrot

The proposal has the potential to contribute to the spread of invasive species in the proposal area through the transfer and introduction of plant material and soil on machinery. Mitigation measures have been recommended to prevent the spread of weeds on site. The proposal would therefore be unlikely to result in invasive species that are harmful to the Swift Parrot becoming established in their potential habitat.

Amphibian – Sloane's Froglet

The proposal has the potential to contribute to the spread of invasive species in the proposal area through the transfer and introduction of plant material and soil on machinery. Mitigation measures have been recommended to prevent the spread of weeds on site. The proposal would therefore be unlikely to result in invasive species that are harmful to the Sloane's Froglet becoming established in their potential habitat.

h) Will the action introduce disease that may cause the species to decline?

Hollow Dependent Species - Swift Parrot

There is a risk that pathogens could be established or spread in the proposal area via machinery during construction. However, with the recommended mitigation measures, the action would be unlikely to introduce any disease which may cause the Swift Parrot to decline.

Amphibian – Sloane's Froglet

There is a risk that pathogens could be established or spread in the proposal area via machinery during construction. However, with the recommended mitigation measures, the action would be unlikely to introduce any disease which may cause the Sloane's Froglet to decline.

i) Will the action interfere with the recovery of the species?

Hollow Dependent Species - Swift Parrot

The objectives for The National recovery Plan for the Swift Parrot *are as follows:*

- To identify an prioritise habitats and sites used by the species across its range, on all land tenures
- To implement management strategies to protect and improve habitats and sites on all land tenures
- To monitor and manage the incidence of collisions, competition and Beak and Feather Disease (BFD)
- To monitor population trends and distribution throughout the range

The proposal would not interfere with these objectives.

Amphibian – Sloane's Froglet

No national recovery plan for this species currently exists, as the Sloane's Froglet Conservation Advice sufficiently outlines the priority research and conservation actions needed to support the recovery of this species. A publication by Alexandra Knight through the OEH (2014) contains management recommendations for this species, these are as follows:

- Slashing: Slashing may be a useful to reduce thick tall vegetation adjacent to suitable waterbodies.
- Herbicide: No research has been conducted on the effect herbicides have on this species. It is recommended to assume direct or indirect effects impact this species. Herbicide usage should be kept to a minimum or avoided where possible within or near suitable habitat.
- Grazing: This species occurs within grazed sites, however abundance is higher with low or no grazing. Grazing should be managed to allow for a minimum 70% ground cover is retained within suitable habitat.
- Revegetation: Revegetation of areas that are seasonally inundated and may provide habitat for this species with trees and shrubs should be avoided. Establishment of a diverse range of aquatic vegetation is preferred.
- Predation by Fish: It is highly likely that introduced fish species predate upon and compete with this species. Control of this species within suitable habitat is highly recommended.

Conclusion

The impacts of the proposal on the assessed critically endangered species listed under the EPBC Act are considered to be manageable. A significant impact is considered unlikely based on the following conclusions:

1. The amount of habitat to be removed or disturbed by the proposal is relatively small in the local context.
2. The proposal area is small, and no fragmentation or isolation of habitat would occur.
3. No interference with the recovery of these species would occur.
4. Mitigation measures would be implemented to prevent disruptions to these species.

APPENDIX D SPECIES LISTS

D.1 FAUNA SPECIES RECORDED WITHIN THE STUDY AREA

No fauna species were detected during the field survey.

D.2 FLORA SPECIES RECORDED WITHIN STUDY AREA

*% = percentage foliage cover in 20 m X 20 m plot, # = number of individuals in 20 m X 20 m plot, * Indicates Exotic Species*

Family	Exotic	Scientific Name	Common Name	Plot 1		Plot 2		Plot 3	
				PCT 277_woodland		PCT 277_planted		PCT 277_woodland	
				%	#	%	#	%	#
TREES									
Myrtaceae		*Eucalyptus blakelyi*	Blakely's Red Gum			25	10	10	1
Myrtaceae		*Eucalyptus melliodora*	Yellow Box	30	1	15	10		
Myrtaceae		*Eucalyptus microcarpa*	Western Grey Box			2	2		
Myrtaceae		*Eucalyptus populnea subsp. bimbil*	Bimble Box			2	3		
Myrtaceae	*	*Eucalyptus cladocalyx*	Sugar Gum						
Myrtaceae	*	*Corymbia citriodora*	Lemon-scented Gum						
SHRUBS									
Fabaceae (Mimosoideae)		*Acacia doratoxylon*	Currawang						
Fabaceae (Mimosoideae)		*Acacia buxifolia*	Box-leaved Wattle						
Myrtaceae		*Callistemon spp.*							
Sapindaceae		*Dodonaea viscosa*	Sticky Hop-bush						
Fabaceae (Faboideae)	*	*Robinia pseudoacacia*	Black Locust						
FORBS									

Amaranthaceae		*Amaranthus spp.*	Amaranth	0.1	1				
Nyctaginaceae		*Boerhavia dominii*	Tarvine	0.1	1	0.1	1	0.2	80
Asteraceae	*	*Carthamus lanatus*	Saffron Thistle						
Asteraceae	*	*Centaurea solstitialis*	St Barnabys Thistle						
Asteraceae	*	*Chondrilla juncea*	Skeleton Weed						
Cucurbitaceae	*	*Citrullus lanatus var. lanatus*	Camel Melon	10	200			0.1	2
Chenopodiaceae		*Dysphania pumilio*	Small Crumbweed	0.1	2	0.1	20	0.1	50
Boraginaceae	*	*Echium plantagineum*	Patterson's Curse	0.1	2				
Poaceae	*	*Eragrostis cilianensis*	Stinkgrass						
Boraginaceae	*	*Heliotropium europaeum*	Potato Weed	4	100				
Malvaceae	*	*Malva parviflora*	Small-flowered Mallow	0.1	100	0.1	500	0.1	500
Lamiaceae	*	*Marrubium vulgare*	White Horehound	0.1	2				
Polygonaceae	*	*Polygonum aviculare*	Wireweed					0.1	1
Portulacaceae		*Portulaca oleracea*	Pigweed						
Polygonaceae	*	*Rumex spp.*	Dock			0.1	1		
Malvaceae		*Sida corrugata*	Corrugated Sida			0.1	3		
Brassicaceae	*	*Sisymbrium erysimoides*	Smooth Mustard					0.1	100
Solanaceae	*	*Solanum elaeagnifolium*	Silver-leaved Nightshade						
Solanaceae	*	*Solanum nigrum*	Black-berry Nightshade	0.1	2				
Asteraceae	*	*Taraxacum officinale*	Dandelion						
Zygophyllaceae	*	*Tribulus terrestris*	Cat-head	1	20	0.1	1	0.2	20
Fabaceae (Faboideae)	*	*Trifolium spp.*	A Clover			0.5	1000		
GRASSES									
Poaceae		*Bothriochloa macra*	Red Grass						
Poaceae	*	*Bromus molliformis*	Soft Brome						
Poaceae	*	*Bromus sp.*	Brome						
Poaceae	*	*Hordeum leporinum*	Barley Grass	4	1000	0.5	1000	11	1000
Poaceae	*	*Lolium spp.*	A Ryegrass					0.1	1

Poaceae		*Cynodon dactylon*	Common Couch	0.1	5			1	30
Poaceae	*	*Vulpia spp.*	Rat's-tail Fescue						

APPENDIX E HABITAT RECOMMENDATIONS

E.1 HOLLOW-BEARING TREE CLEARING PROTOCOL

The clearing of hollow-bearing trees (HBTs) is to be done in accordance with the following protocols.

Clearing hollow-bearing trees

1. Prior to works commencing, the tree spotter[6] is to undertake a brief site inspection to ensure that each HBT to be removed is (still) clearly marked so that machinery operators and site construction workers are well of their presence so as to avoid any indirect impacts occurring beyond, or in a manner not consistent with the methodology specified in this document. Marking of the HBTs to be removed and/or retained is to be clear and must differentiate between removed/retained trees such as through the use of different coloured flagging tape or spray paint.
2. Once the tree is identified, using an excavator (preferable) or dozer, gently shake/tap the HBT to encourage any resident fauna to vacate the tree. The tree is then to be left overnight (at a minimum) before being removed. Any HBT that has been left for longer than 48 hours since being shaken/tapped, is to be re-shaken/tapped at least the day prior to removal.
3. When removing hollow-bearing trees, a spotter should be present at each tree to be removed to look for signs of animal movement in the tree to be cleared. The spotter should be able to communicate directly with plant operators.
4. Prior to clearing hollow-bearing trees, use an excavator or loader to hit the trunk as high up the tree as possible several times. Wait at least 30 seconds. Repeat this process several times.
5. The tree would be felled, in a controlled manner with an excavator to minimise break up of tree, and impact/crushing risk to fauna
6. Once the hollow-bearing limbs or hollow-bearing tree are on the ground, the spotter must check each hollow for signs of wildlife before the next limb/tree is removed.
7. If taking the tree down in stages, remove non-hollow-bearing limbs first. Then remove hollow-bearing limbs
8. Records of any animals removed or injured must be retained.

Fallen trees would be left in place or moved to a nearby area to retain fauna habitat.

Handling wildlife

1. Direct contact with any wildlife should be avoided wherever possible.
2. Any uninjured wildlife must be encouraged to leave the site.
3. If wildlife is injured, WIRES or similarly qualified and licensed personnel should be contacted to collect and treat any injured individuals.

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6 The 'spotter' needs to be experienced and qualified to handle fauna, have experience in undertaking fauna surveys, and recognise fauna attributes and habitats

APPENDIX F HOLLOW-BEARING TREE INVENTORY

Species	*Average diameter at breast height (cm) (DBH)*	*Average hollow height (m)*	*To be removed or retained*
Blakely's Red Gum	90	5	Retained
Blakely's Red Gum	100	7	Retained
Blakely's Red Gum	90	4	Retained
Blakely's Red Gum	80	4	Retained
Blakely's Red Gum	100	5	Retained
Stag	50	4	Retained
Stag	70	2	Retained
Stag	50	5	Retained
Stag	90	6	Retained
Stag	100	3	Retained
Stag	60	3	Retained
Stag	60	5	Removed
Stag	100	6	Retained
Stag	90	5	Retained
Stag	110	4	Retained
White Box	50	4	Retained
White Box	100	3	Retained
White Box	70	4	Removed
White Box	50	3	Removed
Yellow Box	100	4	Retained
Yellow Box	150	4	Retained
Yellow Box	90	4	Retained
Yellow Box	200	6	Retained
Yellow Box	80	4	Retained
Yellow Box	100	6	Retained
Yellow Box	150	6	Retained
Yellow Box	100	6	Removed
Yellow Box	140	8	Removed
Yellow Box	200	2	Retained
Yellow Box	110	5	Retained
Yellow Box	80	6	Removed
Blakely's Red Gum	90	5	Retained
Blakely's Red Gum	100	7	Retained

APPENDIX G LETTER FROM OEH IDENTIFICATION OF CATEGORY 1–EXEMPT LAND

Our ref: DOC19/838077
Senders ref: 19-088

Julie Gooding

Environmental Consultant - Ecologist

NGH Environmental

WAGGA WAGGA NSW 2650

Via email: julie.g@nghenvironmental.com.au

13 November 2019

Dear Julie

RE: Proposed Wagga Wagga South Solar Farm – Identification of category 1-exempt land

Thank you for your letter dated 9 September 2019 seeking comment on the above matter from the Biodiversity and Conservation Division of the Department of Planning, Industry and Environment (the Department).

The Biodiversity and Conservation Division was formerly part of the Office of Environment and Heritage (OEH). It forms part of the new Environment, Energy and Science Group in the Department (see https://intranet.dpie.nsw.gov.au/). The Environment, Energy and Science Group works to protect and strengthen NSW's natural environment by managing the conservation of our environment and energy resources. We support the community, as well as business and government, in developing their ability to achieve these outcomes

The Biodiversity and Conservation Division has statutory responsibilities relating to biodiversity (including threatened species, populations, ecological communities, or their habitats), Aboriginal cultural heritage and flooding. For matters relating to national parks estate matters please refer these to the National Parks and Wildlife Service.

We have reviewed the method used to evaluate land categorisation for the subject site. Detailed comments are provided at **Attachment A**.

We consider the determination of category 1-exempt and category 2-regulated land as shown in Figure 12 'Land Categorisation Map' to be a reasonable approximation of how those categories are likely to appear on the Native Vegetation Regulatory map.

Please note that while development on category 1-exempt land does not require application of the Biodiversity Assessment Method, the consent authority may require other forms of biodiversity assessment and remediation consistent with Commonwealth and other legislation, including local Environmental Planning Instruments.

Furthermore, under section 4.15 of the *Environmental Planning and Assessment Act 1979,* the consent authority may require assessment of any matter it deems appropriate, regardless of the development being on category 1 land.

If you have any questions regarding this matter, please contact Marcus Wright, Senior Conservation Planning Officer on (02) 6893 4917 or email rog.southwest@environment.nsw.gov.au.

Yours sincerely

Andrew Fisher

Senior Team Leader Planning

South West Branch

Biodiversity and Conservation Division

Department of Planning, Industry and Environment

ATTACHMENT A Detailed comments on the determination of 'category 1-exempt land' for proposed Wagga Wagga South Solar Farm

ATTACHMENT A Detailed comments on the determination of 'category 1-exempt land' for proposed Wagga Wagga South Solar Farm

1. The area of land determined to be category 1-exempt land should be clearly indicated in the application for planning approval submitted to a consent authority.

We are satisfied that Figure 12 'Land Categorisation Map' provides a clear indication of land categorisation consistent with this requirement. We note that the Native Vegetation Regulatory (NVR) Map already indicates the Category 2-sensitive land associated with two linear plantings of trees on the south of the subject land, with some slight correction of georeferencing error due to scaling.

2. According to s 60H(1)(a) of the *Local Land Services Act 2013,* land may be designated category 1-exempt land if it was cleared of native vegetation as at 1 January 1990 (not 1 January 2019 as indicated in the NGH Environmental cover letter).

As recommended in previous correspondence from OEH (Walla Walla Solar Farm and Finley South Solar Farm), the method used for determining these categories includes multiple lines of evidence, as described in the Methodology used by NGH Environmental. These include aerial imagery with multiple dates; Aerial imagery of historical land use (sourced from Google Earth), 2017 land use data (OEH 2017), NSW Woody Vegetation Extent and FPC 2011 (OEH 2015), and various information from the NVR map portal. Despite the oldest image being 2003, we are satisfied that the subject land was likely to have been lawfully cleared of native vegetation as at 1 January 1990. The applicant is advised to supplement the imagery provided where possible, to better indicate the extent of vegetation at 1 January 1990. This will negate the need for further evidence relating to the conservation value of the groundcover at the site.

3. According to s 60H(2) of the *Local Land Services Act 2013*, land may be designated as category 1-exempt land if:
    - 60H(2)(a) it contains low conservation value grasslands, or
    - 60H(2)(c) it is of a kind prescribed by the regulations as category 1-exempt land.

The only evidence provided relating to the floristics of the subject land relies on the 2017 Land Use Data set, which implies that the land has been used for grazing and cropping, and the apparent lack of woody vegetation. No empirical evidence is provided to indicate the conservation value of the ground cover at the site as either low conservation value grassland or other groundcover, if it is not grassland consistent with cl.109(2) of the *Local Land Services Regulation 2014*.

Use of mapping products to determine presence of exotic vegetation does not follow the NVR map method and cannot be relied upon when determining land categorisation consistent with s 60H(2).

We consider the Result provided to be insufficient evidence to determine the conservation value of the groundcover on the subject land. Should the applicant not be able to rely on aerial imagery to demonstrate vegetation extent as at 1 January 1990, the Department recommends a flora assessment to ascertain the conservation value of the ground cover at the site, consistent with Stage 1 of the BAM as an indicator of vegetation integrity, to determine whether the subject land meets the definition of category 1.

4. According to s 60H(2)(b) of the *Local Land Services Act 2013*, land may be designated as category 1-exempt land if it is identified as regrowth in a Property Vegetation Plan (PVP) referred to in section 9(2)(b) of the *Native Vegetation Act 2003*.

Should the applicant not be able to rely on aerial imagery to demonstrate vegetation extent as at 1 January 1990, the Department cannot assume that the land contains native vegetation that was identified as regrowth in a PVP. The applicant should confirm this in the Results if this is the case.

5. According to s 60H(3) of the *Local Land Services Act 2013*, land may be designated category 1-exempt land if the land is biodiversity certified under Part 8 of the *Biodiversity Conservation Act 2016* or under any Act repealed by that Act.

Regardless of any land that was subject to the Order conferring biodiversity certification on the Wagga Wagga LEP in 2010 under the *Threatened Species Conservation Act 1995*, the subsequent Order of 2017 limits biodiversity certification to land that is excluded from the *Local Land Services Act 2013*. In this way none of the subject land can be both biodiversity certified (LLS excluded) and category 1 land (LLS included).

6. The application should provide evidence that the subject land is not better classified as category 2 consistent with s 60I(2)(a)-(n) inclusive.

7. For the information of the applicant, according to s 60H(5) the *Local Land Services Regulations 2014* are currently being reviewed for the purpose of making provisions to determine the conservation value of grasslands.

8. cl6.1 of the *Biodiversity Conservation Regulation 2017* prescribes a series of biodiversity impacts which must be assessed under the Biodiversity Offset Scheme when they occur on land mapped in the Biodiversity Values Map. No such land is present on the subject site, but according to cl6.1(2)(b) may be taken into account by the consent authority when issuing an approval. The applicant is encouraged to consider these matters and to clarify with the consent authority whether they need to be assessed in the Biodiversity Assessment Method (BAM).

9. While the BAM is not required for clearing on category 1-exempt land, it is recommended that the applicant undertake a Test of Significance on the subject land to determine whether the proposed development has the potential to significantly harm any threatened species or ecological communities at the site. The test should be performed according to s 7.3 of the *Biodiversity Conservation Act* 2016 and be consistent with the Minister's Guidelines.

10. A permit is required to remove certain trees as per the Wagga Wagga Development Control Plan. regardless of the land categorisation in the *Local Land Services Act 2013*. It is recommended that the applicant gain the necessary approval before clearing any trees associated with the development. Penalties apply at the discretion of Wagga Wagga City Council.

APPENDIX H NGH IDENTIFICATION OF CATEGORY 1 LAND ASSESSMENT

9 September 2019

Andrew Fisher
Senior Team Leader Planning
South West Branch
Department of Planning Industry and Environment
PO Box 1040
ALBURY NSW 2640

Andrew.Fisher@environment.nsw.gov.au

Dear Andrew,

Re: 19-088 Wagga Wagga South Solar Farm

NGH has been engaged to prepare a Biodiversity Assessment for the proposed Wagga Wagga South Solar Farm. The development site is located on Lot 15 DP1108978 (Figure 1).

Section 6.8(3) of the *Biodiversity Conservation Act 2016* determines that the Biodiversity Assessment Method (BAM) is to exclude the assessment of the impacts of clearing of native vegetation on Category 1-exempt land (within the meaning of Part 5A of the *Local Land Services Act 2013*). Boundaries mapping Category 1-exempt land on the Native Vegetation Regulatory Mapping are not yet publicly available. During the transitional period, accredited assessors may establish the categorisation of land for the agency head to consider, following the method utilised to develop the Native Vegetation Regulatory Map.

Category 1-exempt land is defined under the LLS act as;

- Land cleared of native vegetation as at 1 January or lawfully cleared after 1 January 2019
- Low Conservation Grasslands
- Land containing only low conservation groundcover (not being grasslands)
- Native vegetation identified as regrowth in a Property Vegetation Plan under the repealed Native Vegetation Act 2003
- Land biodiversity certified under the *Biodiversity Conservation Act 2016*.

This letter report establishes the methodology, results and conclusions to evaluate the land categorisation for the development site. It is anticipated that OEH would support this approach and provide endorsement for the land categorisation of the development site for Wagga Wagga South Solar Farm.

If you have any questions, please contact me on the number below. I would be pleased to discuss this matter with you further.

Yours sincerely,
NGH Pty Ltd

Julie Gooding
Environmental Consultant – Ecologist
Accredited Assessor BAAS 18074
Ph: 6923 1534

Attachment 1

Methodology

An initial field assessment was undertaken over the development site to determine the ecological constraints and native vegetation communities on site. Assessment of the development site as Category 1-exempt and Category 2-regulated land was undertaken using the following data sources:

- Aerial imagery of historical land use (Sourced from Google Earth)
- 2017 Land Use Dataset (Australian Land Use and Management (ALUM) Classification Version 7 (OEH, 2017)
- NSW Woody vegetation extent and FPC 2011 (OEH, 2015)
- Sensitive regulated and vulnerable regulated lands on the Native Vegetation Regulatory Map portal

Results

The analysis of the above sources identified the following in support of the assessment:

- Aerial imagery shows the proposal area has been used continuously for cropping and grazing over the past 29 years
    - Evidence of grazing is present in 1990 (Figure 2).
- Another determining feature of constant agricultural use is a lack of woody vegetation regrowth, as represented through the above aerial images.
- The 2017 Land Use Dataset reveals the western portion of Lot 15 DP1108978 as 'Grazing modified pastures' and the remaining area as 'Cropping' (Figure 3).
- Field surveys identified evidence of cropping in the western portion of the site (Figure 6, Figure 7, Figure 8).
- 2011 Woody Vegetation extent shows scattered paddock trees in the proposal area (Figure 3).
- Native Vegetation Regulatory Map identifies three longitudinal strips of planted vegetation as Category 2-Sensitive Regulated Land (Figure 4).

Conclusion

Based on the above data sources, there is evidence to suggest that Lot 15 DP1108978 within the Wagga Wagga Local Government Area (LGA), has been under regular rotational cropping or pasture improvement.

The 2017 Land Use Mapping data supports the primary land use for this Lot as Cropping. The 2017 Land Use map shows the western block of the site to be 'Grazing modified pastures', but site visits found evidence of cropping in this block (Figure 3, Figure 6, Figure 7, Figure 8). These areas are considered to meet the definition of Category 1-exempt Land. Woody vegetation and strips of tree plantings in the proposal site are considered to meet the definition of Category 2 Land.

A draft map of areas considered to be Category 1 land and Category 2 land has been produced and shown in Figure 5.

Figures

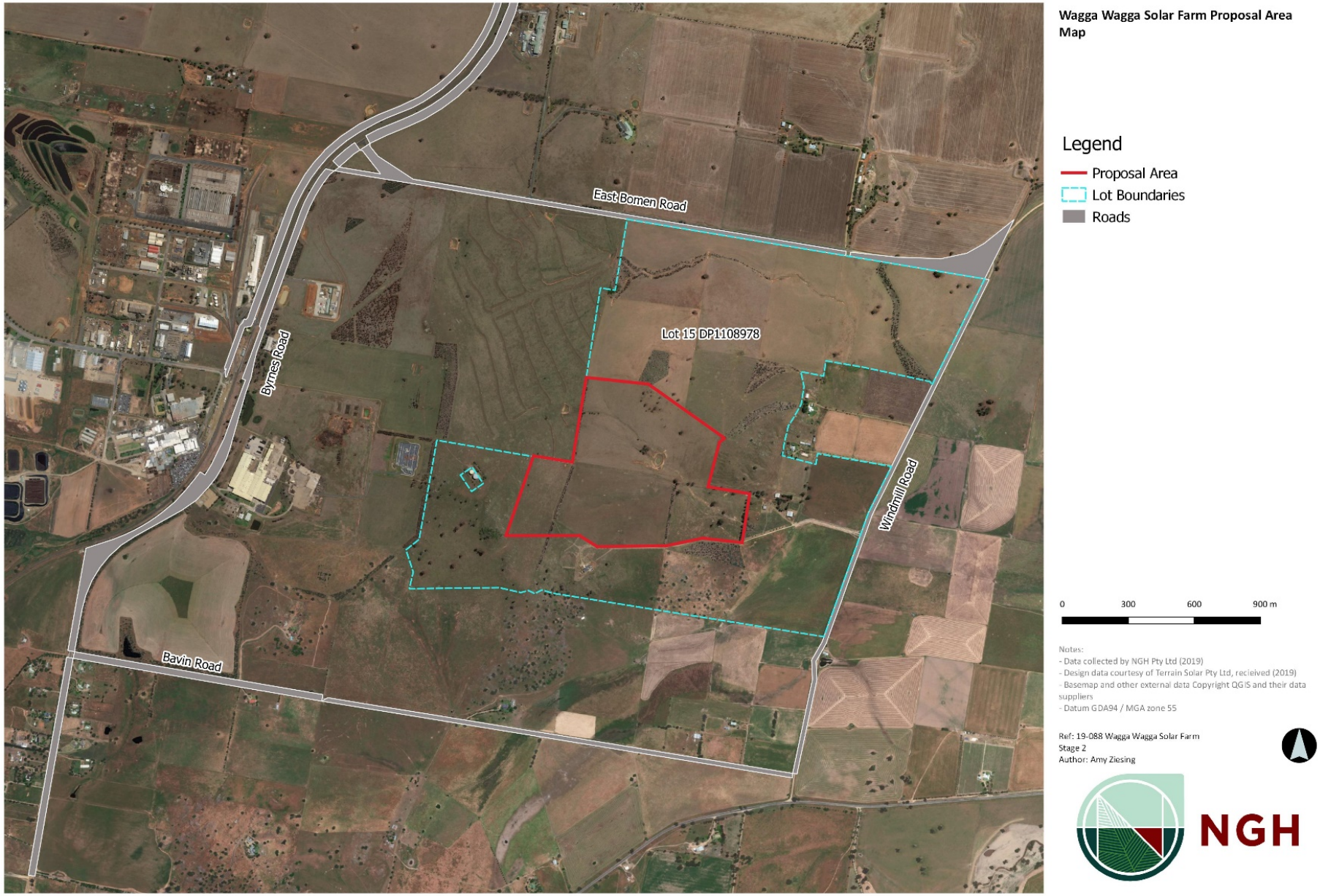


Figure 1 Wagga Wagga South Solar Farm Proposal Area Map

Figure 2 Aerial Imagery 1990 (Source: Dept. Spatial Services)

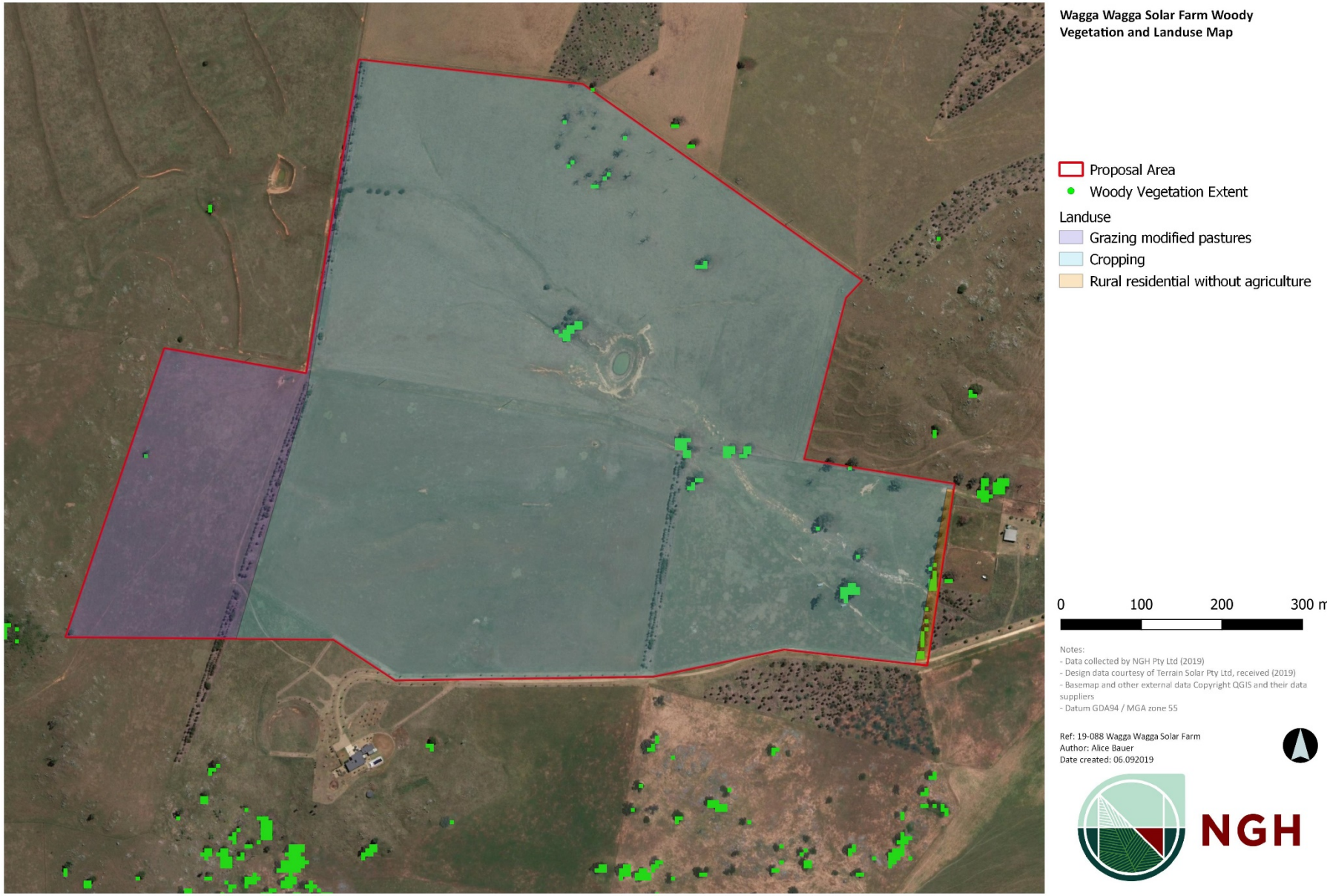


Figure 3 Woody Vegetation and 2017 Land Use Map

Figure 4 Native Vegetation Regulatory Mapping

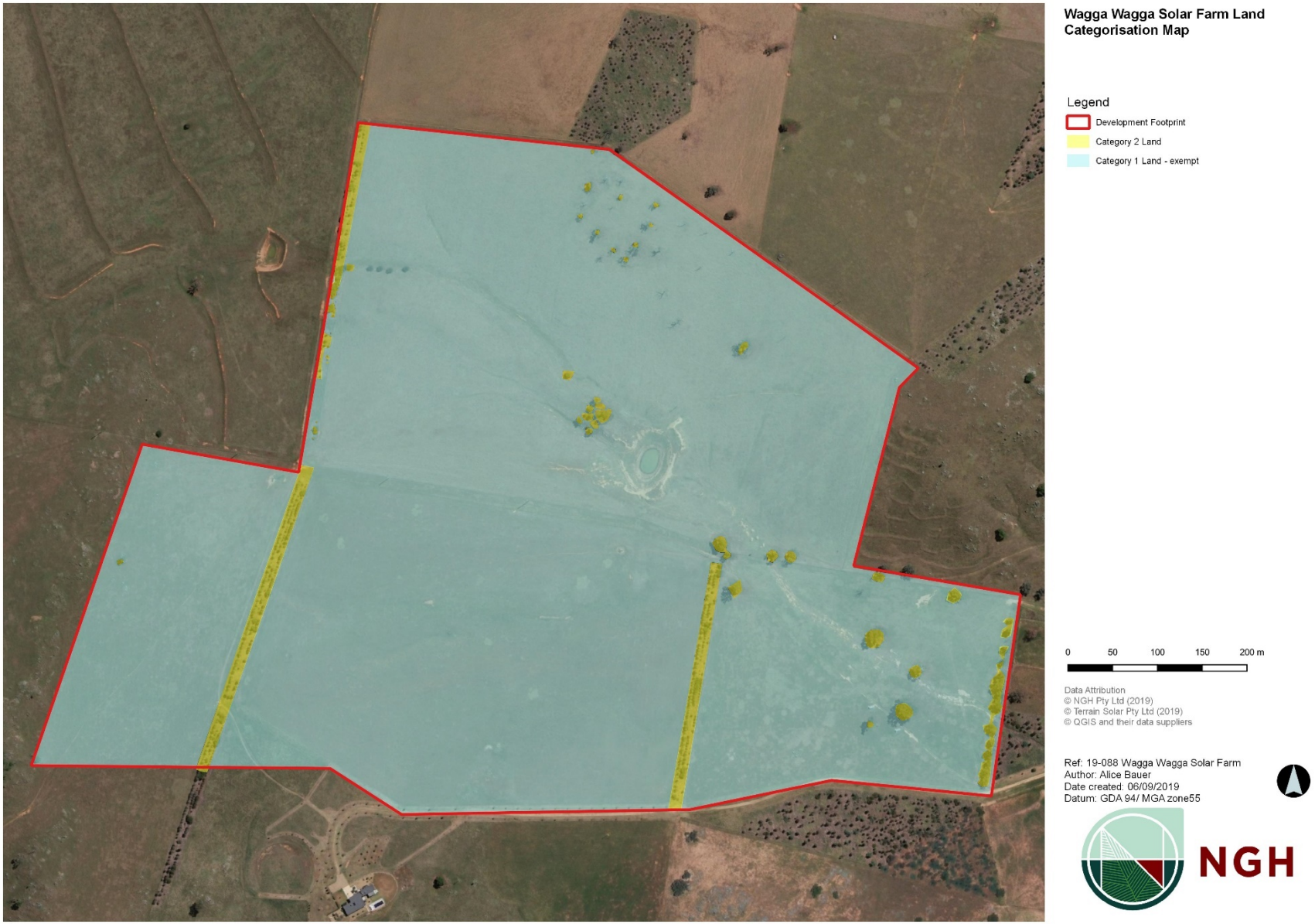


Figure 5 Land Categorisation Map

Figure 6 Photo of cropping in the western block

Figure 7 Photo of cropping in the western block

Figure 8 Photo of cropping in the western block

15 April 2020

David Walker
Premise
154 Peisley Street
ORANGE NSW 2800

David.Walker@premise.com.au

Dear David,

Re: 19-088 Biodiversity Assessment for Wagga Wagga Solar Farm South

We refer to correspondence from Wagga Wagga City Council dated 27 March 2020 in relation to the Biodiversity Assessment (dated 14 November 2019) prepared by NGH for the proposed Wagga Wagga Solar Farm South. We provide the following updated information and clarification as requested by Council.

Remnant vegetation on the site was classed as PCT 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion**.** This PCT was considered consistent with the EEC 'White Box Yellow Box Blakely's Red Gum Woodland listed under the NSW *Biodiversity Conservation Act 2016*. Based on the exotic dominated understory it does not meet the condition threshold for the White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

A total of fourteen (14) trees would be cleared. This comprises eight (8) isolated trees, as well as six (6) non-isolated trees within two patches of remnant EEC vegetation (total 0.46 ha). The two patches consist of:

- 0.38 ha; including four large mature HBT trees.
- 0.08 ha, including two large mature HBT trees.

Of the 14 trees proposed to be cleared, eleven (11) are Hollow Bearing Trees (HBTs). Appendix F of the Biodiversity Assessment (updated attached) confirms thirty-four (34) HBTs were recorded at the subject site. Twenty-three (23) of these will be unaffected by the proposed works.

All felled trees shall be relocated to the northern remnant vegetation patch or along the riparian zone, to retain as habitat for native fauna.

We trust this resolves Council's questions.

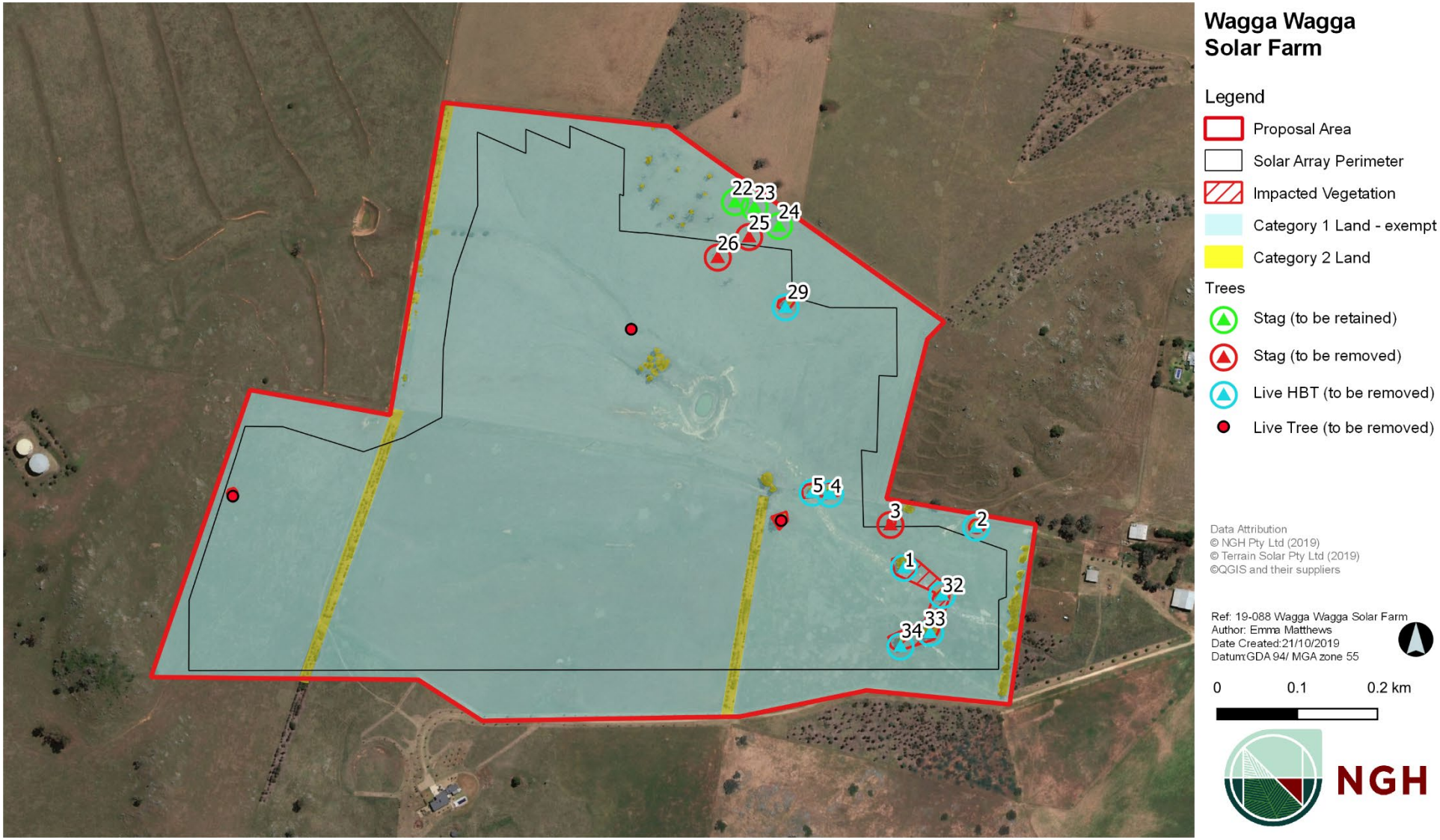
Yours sincerely,

Stephanie Anderson
Senior Town Planner
6923 1538
NGH

Appendix F Hollow Bearing Tree Inventory

Appendix F Hollow Bearing Tree Inventory has been updated, refer below Table and accompanying map. Note; Stags 22, 23, 24 were indicated in the BA as being removed. Through further design refinement, the proponent has identified these would be retained, along with 17 other HBTs (20 in total).

NGH Identifier	*Species*	*Average diameter at breast height (cm) (DBH)*	*Average hollow height (m)*	*To be removed (otherwise retained)*
14	Blakely's Red Gum	80	4	
16	Blakely's Red Gum	100	5	
17	Blakely's Red Gum	90	5	
20	Blakely's Red Gum	100	7	
21	Blakely's Red Gum	90	4	
3	Stag	60	5	Removal
8	Stag	110	4	
12	Stag	60	3	
13	Stag	50	4	
22	Stag	50	5	
23	Stag	100	3	
24	Stag	90	6	
25	Stag	90	5	Removal
26	Stag	100	6	Removal
28	Stag	70	2	
2	White Box	70	4	Removal
4	White Box	50	3	Removal
9	White Box	100	3	
10	White Box	50	4	
1	Yellow Box	150	6	Removal
5	Yellow Box	100	6	Removal
6	Yellow Box	100	4	
7	Yellow Box	140	8	
11	Yellow Box	80	4	
15	Yellow Box	100	6	
18	Yellow Box	90	4	
19	Yellow Box	200	6	
27	Yellow Box	200	2	
29	Yellow Box	80	6	Removal
30	Yellow Box	110	5	
31	Yellow Box	150	4	
32	Yellow Box	150	5	Removal
33	Yellow Box	150	8	Removal
34	Yellow Box	100	6	Removal


Wagga Wagga
Solar Farm
Legend
Proposal Area
Solar Array Perimeter
Impacted Vegetation
Category 1 Land - exempt
Category 2 Land
Trees
Stag (to be retained)
Stag (to be removed)
Live HBT (to be removed)
Live Tree (to be removed)
22
23
24
25
26
29
5
4
3
2
1
32
33
34
Data Attribution
© NGH Pty Ltd (2019)
© Terrain Solar Pty Ltd (2019)
©QGIS and their suppliers
Ref: 19-088 Wagga Wagga Solar Farm
Author: Emma Matthews
Date Created:21/10/2019
Datum:GDA 94/ MGA zone 55
0
0.1
0.2 km
NGH