Appendix C3 BDAR

Daroobalgie Solar Farm

Biodiversity Development Assessment Report

Pacific Hydro Pty Ltd

22 November 2022

→ The Power of Commitment

Certification under Section 6.15 of the *Biodiversity Conservation Act 2016*

I, Kath Chesnut (BAAS17031) certify that this Biodiversity Development Assessment Report and the accompanying finalised credit report dated 17 November 2022 has been prepared in accordance with the requirements of (and information provided under) the Biodiversity Assessment Method.

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Kath Chesnut – BAAS17031

17 November 2022

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Acknowledgement of Country

GHD acknowledges Aboriginal and Torres Strait Islander peoples as the Traditional Custodians of the land, water and sky throughout Australia on which we do business. We recognise their strength, diversity, resilience and deep connections to Country. We pay our respects to Elders of the past, present and future, as they hold the memories, knowledges and spirit of Australia. GHD is committed to learning from Aboriginal and Torres Strait Islander peoples in the work we do.

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1. Introduction

1.1 Overview

Pacific Hydro proposes to construct and operate a 100 megawatt (MW) solar farm (approximately) and associated transmission line at Daroobalgie, about 11 kilometres north-east of Forbes (referred to as the 'proposal').

The proposal requires development consent from the Minister for Planning under Part 4.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The Secretary's Environmental Assessment Requirements (SEARs) for an environmental impact statement (EIS) were provided on 19 December 2019 by the Department of Planning, Industry and Environment (DPIE). The proposal is listed as State Significant Development (SSD) 10387.

This Biodiversity Development Assessment Report (BDAR) considers the assessment requirements of the NSW *Biodiversity Conservation Act 2016* (BC Act), *Fisheries Management Act 1994* (FM Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), as well as the relevant SEARs. This BDAR has been prepared by an accredited assessor in accordance with the Biodiversity Assessment Method (BAM).

1.2 Key features of the proposal

The proposal comprises the construction, operation and eventual decommissioning or reconditioning of a 100 MW photovoltaic (PV) solar farm (approximate capacity) at Daroobalgie, about 11 kilometres north-east of Forbes in the NSW South Western Slopes.

The key features of the proposal include:

- A network of solar arrays comprised of about 420,000 PV solar panels and Power Conversion Units (PCUs) (DC-AC inverters). The panels would be mounted on either fixed-tilt or single-axis-tracking structures about four metres in maximum height when tilted.
- Electrical collection systems, substation and control room. This would enable conversion of the power generated from the solar panels to be converted at the substation to be transmissible along the 132 kV network. The substation has a footprint approximately 140 metres by 40 metres.
- Battery energy storage system (BESS) with embedded storage, to be housed in a 150 metre by 75 metre compound.
- Construction of an electricity transmission line (ETL) of 132 kilovolt (kV) capacity, connecting the solar farm to a switchyard near the existing 132 kV transmission line about 500 metres to the west of the Newell Highway. The ETL would be about 8.5 kilometres in length and constructed from monopole structures about 25 to 30 metres in height. The ETL easement would be 45 metres wide. Stay-wires would be required to support poles at locations where the transmission line changes direction. No formal access track would be required for the transmission line, which would be accessed approximately two to three times per year. Access would be along existing roads and farm tracks.
- Construction of a switchyard to connect the ETL to existing TransGrid infrastructure. This is likely to be within a 90 metre by 55 metre area and has been included in the ETL proposal footprint calculations throughout this report.
- Underground electrical cabling to connect the solar panels.
- Upgrades to the existing Troubalgie Road and the intersection of Back Yamma Road and Troubalgie Road, with about 1.7 km of road needing to be upgraded.
- Operations and maintenance facility, including demountable offices, amenities, equipment sheds, storage and parking areas.
- Internal access roads to provide access throughout the solar farm site during operation.
- Perimeter security fencing.
- Temporary construction compound.

Construction of the proposal would take about 12 to 18 months to complete.

The proposed solar arrays and associated components are expected to operate for up to 35 years. At the end of its operational life, the proposal would be either reconditioned or decommissioned. Decommissioning would remove all above ground infrastructure and rehabilitating the site to allow it to be used for purposes such as agriculture.

The proposal site and key features are mapped on Figure 1.1 and Figure 1.2. The proposal site comprises the development area that would be directly impacted by construction and operation of the proposal and is the subject of the impact assessment and BAM credit calculations included in this BDAR. It encompasses the solar farm proposal site and the electricity transmission line (ETL) proposal site.

1.3 Secretary's environmental assessment requirements

This BDAR addresses the relevant SEARs for the EIS, related to the assessment of biodiversity values and impacts as outlined in the requirements of the NSW Department of Planning, Industry and Environment (DPIE), and relevant guidelines and policies. The Biodiversity SEARs are detailed in Table 1.1.

Table 1.1: Secretary's environmental assessment requirements relevant to biodiversity

Section	Where addressed in this report
The EIS must address the following specific issues:	
an assessment of the biodiversity values and the likely biodiversity impacts of the project in accordance with Section 7.9 of the *Biodiversity Conservation Act 2016* (NSW), the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment Report (BDAR), unless DPIE determine that the proposed development is not likely to have any significant impacts on biodiversity values	This report is the BDAR prepared in accordance with the BAM
the BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM	Section 9.1.1 (avoid impacts) Section 9.1.2 and Section 10 (mitigate impacts) Sections 9.7, 9.2 and 9.4 (assess direct, indirect and prescribed impacts) Section 11 (offset impacts)
the BDAR must include details of the measures proposed to address the offset obligation	Section 11.1.3

1.4 Purpose of this report

The purpose of this report is to assess the potential biodiversity impacts from the construction and operation of the proposal. The report:

- Addresses the relevant SEARs listed in Section 1.3 and responds to the Biodiversity, Conservation and Science Directorate of the Department of Planning and Environment (BCS) comments on the BDAR that accompanied the EIS Exhibition – Daroobalgie Solar Farm (SSD – 10387).
- Outlines the methods used in the biodiversity assessment.
- Describes the existing environment of the study area, including the results of the desktop assessment and site surveys.
- Assesses the value and conservation significance of native vegetation and habitats at the proposal site and the potential for threatened biota and matters of national environmental significance (MNES) to occur at the proposal site or be affected by the proposal.
- Provides a description of the proposal, including potential impacts on biodiversity values and measures to avoid or mitigate impacts.
- Assesses the significance of impacts on threatened biota and MNES.

– Presents the data used to perform the BAM credit calculations for the proposal.
– Calculates the number and type of biodiversity credits that would be required to offset impacts of the proposal in accordance with the BAM.

1.5 Glossary of terms and acronyms

Table 1.2: Terms and acronyms used in this report

Term	Definition
AOBV	Areas of Outstanding Biodiversity Value
BAM	Biodiversity Assessment Method 2020 The rules for biodiversity assessment established under the BC Act that determine credits created, credits required and the circumstances that improve or maintain biodiversity values.
BAM-C	Biodiversity Assessment Method Calculator
BAR	Biodiversity Assessment Report
BC Act	*Biodiversity Conservation Act 2016*
BC Regulation	Biodiversity Conservation Regulation 2017
BCS	Biodiversity, Conservation and Science Directorate of the Department of Planning and Environment
BCT	Biodiversity Conservation Trust
BDAR	Biodiversity Development Assessment Report
Biodiversity credit	A unit of biodiversity value to measure specific development impacts or conservation gains in accordance with the BAM. Includes ecosystem credits and species credits.
Biodiversity credit report	Specifies the number and type of biodiversity credits: required to offset the impacts of a development to obtain a Biodiversity Certification Agreement; or that would be generated through conservation and management of a Stewardship site under a Biodiversity Stewardship site agreement.
Biodiversity offsets	Specific measures that are put in place to compensate for impacts on biodiversity values.
Biodiversity values	The composition, structure and function of ecosystems, including threatened species, populations and ecological communities, and their habitats.
BOM	Bureau of Meteorology
BOS	Biodiversity Offset Scheme
CEEC	Critically endangered ecological community
CEMP	Construction Environmental Management Plan
CMA	Catchment Management Authority
DAWE	Department of Agriculture, Water and the Environment (Commonwealth) (former, now DCCEEW)
DBH	Diameter at breast height
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DEE	Department of Environment and Energy (Commonwealth) (former, now DCCEEW)
DEWHA	Department of Environment, Water, Heritage and the Arts (Commonwealth) (former, now DCCEEW)
DoE	Department of Environment (Commonwealth) (former, now DCCEEW)
DPE	Department of Planning and Environment (NSW)
DPI	Department of Primary Industries (NSW)
DPIE	Department of Planning, Industry and Environment (NSW) (former, now DPE)
Ecosystem credit	A credit that relates to a vegetation type and the threatened species that are reliably predicted by that vegetation type (as a habitat surrogate).

Term	Definition
EEC	Endangered ecological community
EIS	Environmental Impact Statement
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
ETL	Electricity transmission line
FFMP	Flora and Fauna Management Plan
FM Act	*Fisheries Management Act 1994* (NSW)
GDE	groundwater dependent ecosystems
GIS	geographic information system
GPS	global positioning system
ha	hectare
HTE	High threat exotic (weed)
IBRA	Interim Biogeographic Regionalisation for Australia
km	kilometre
LEP	Local Environment Plan
LGA	Local Government Area
Locality	The area within a 10 km radius of the proposal site.
m	metre(s)
Migratory species	Species listed under listed under international agreements (i.e Ramsar, JAMBA, CAMBA and ROKAMBA conventions) to which Australia is a party
MNES	Matters of National Environmental Significance
NPW Act	*National Parks and Wildlife Act 1974*
NSW	New South Wales
OEH	Office of Environment and Heritage (former, now BCS)
PCT	Plant community type
PMST	Protected Matters Search Tool
Proposal site	The area that would be directly impacted by construction and operation of the proposal. Encompasses the solar farm site and the transmission line corridor. Comprises the 'development site' as referenced in the BAM
SAII	Serious and irreversible impact
SAII entity	Species and ecological communities that are likely to be the subject of serious and irreversible impacts (SAIIs)
SEARs	Secretary Environmental Assessment Requirements
SEED	Sharing and Enabling Environmental Data
SEPP	State Environment Planning Policy
Species credit	A credit that relates to an individual threatened species that cannot be reliably predicted based on habitat surrogates. Threatened species that require species credits are identified in the Threatened Biodiversity Data Collection
SPRAT	Species Profile and Threats Database
Study area	The area that was subject to a site survey and assessed for direct or indirect impacts arising from construction and operation of the proposal. This included the properties on which the solar farm will be constructed, as well as publicly accessible sections of several transmission line options. Comprises the 'subject land' as referenced in the BAM. A buffer of 1,500 metres has been used in desktop assessments in accordance with the BAM.
TBDC	Threatened Biodiversity Data Collection

Term	Definition
TEC	Threatened ecological community
Threatened biota	Threatened species, populations or ecological communities listed under the BC Act, FM Act and/or the EPBC Act.
TSR	Travelling stock route
VI	Vegetation integrity
VIS	Vegetation information system

1.6 Scope and limitations

This report: has been prepared by GHD for Pacific Hydro Pty Ltd and may only be used and relied on by Pacific Hydro Pty Ltd for the purpose agreed between GHD and Pacific Hydro Pty Ltd as set out in section 1.4 of this report.

GHD otherwise disclaims responsibility to any person other than Pacific Hydro Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 1 and 3 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

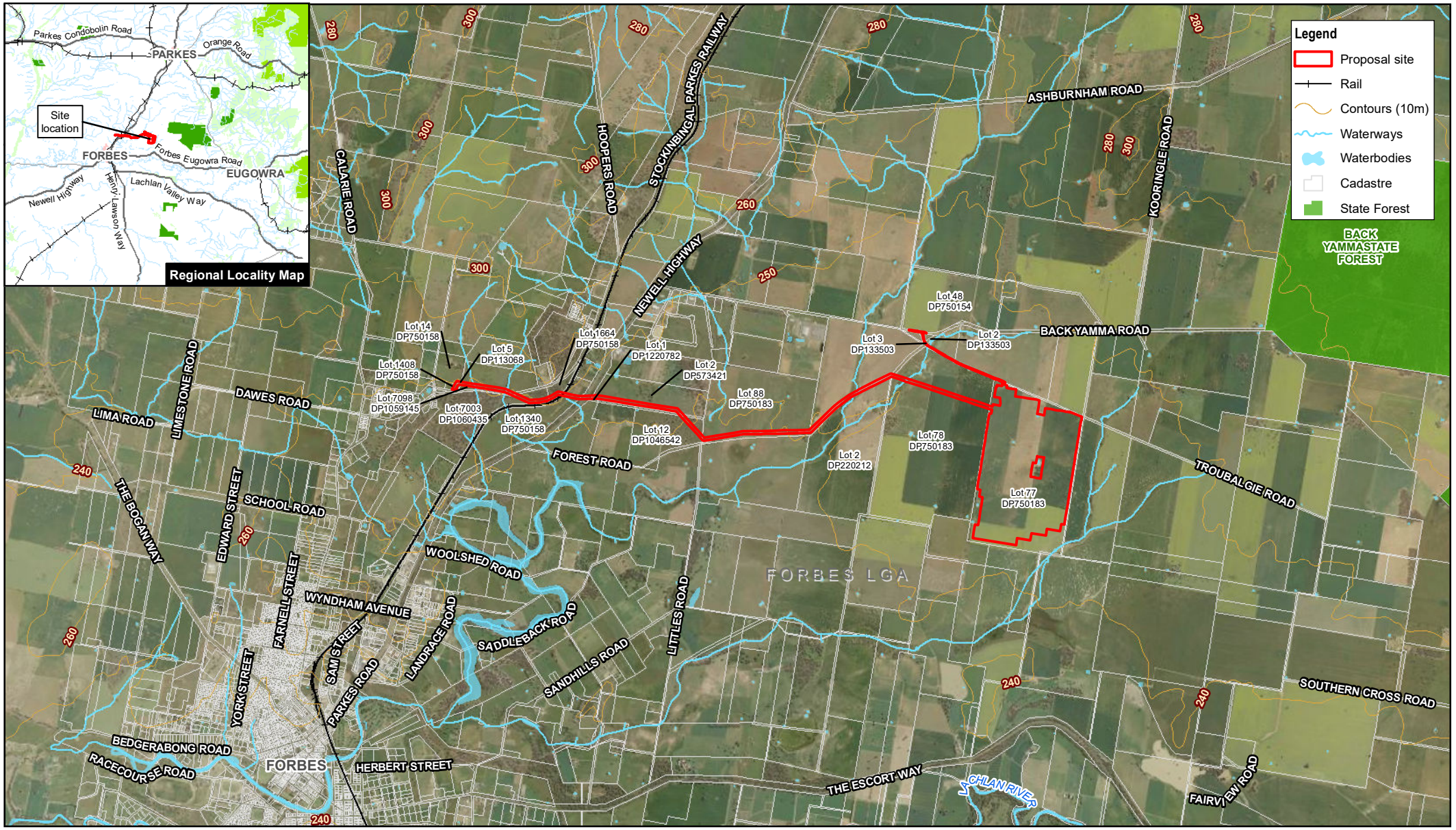
The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

GHD has prepared this report on the basis of information provided by Pacific Hydro Pty Ltd and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.



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Grid: GDA 1994 MGA Zone 55

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Daroobalgie Solar Farm
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Site map

Figure 1.1

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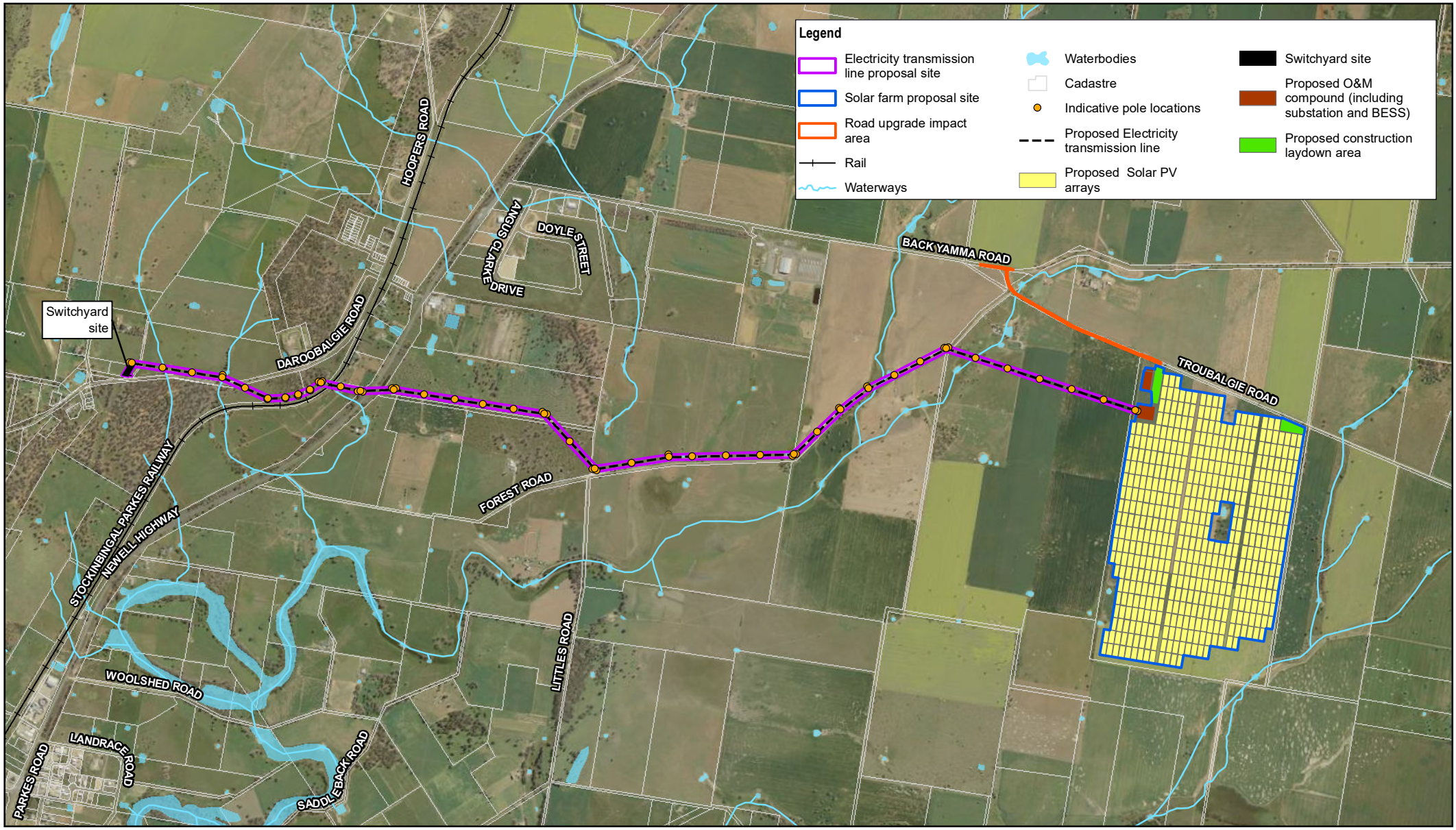

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Grid: GDA 1994 MGA Zone 55

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Proposal layout

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Figure 1.2

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2. Legislative context

2.1 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) provides legal protection for biota of conservation significance in NSW. The BC Act aims to, amongst other things, 'maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development'. It provides for the listing of threatened species and communities, establishes a framework to avoid, minimise and offset the impacts of proposed development (the Biodiversity Offsets Scheme), and establishes a scientific method for assessing the likely impacts on biodiversity values and calculating measures to offset those impacts (the Biodiversity Assessment Method, BAM). These are discussed further below.

2.1.1 Biodiversity Offset Scheme and Biodiversity Assessment Methodology

The BC Act, together with the *Biodiversity Conservation Regulations 2017*, provides a mechanism to address impacts on biodiversity from land clearing associated with development. Under this legislation, there are provisions for a Biodiversity Offsets Scheme (BOS), which includes a framework to avoid, minimise and offset impacts of development on biodiversity.

The aim of the BOS is to provide a transparent, consistent and scientifically based approach to biodiversity assessment and offsetting. It also allows for the establishment of biodiversity stewardship agreements, which are in-perpetuity agreements entered into by landholders, to secure offset sites and generate biodiversity credits, which can be used to offset impacts of development. The aim of the BOS is to ensure that the impacts of development, clearing or biodiversity certification will result in no net loss of biodiversity.

The Biodiversity Assessment Method (BAM) was established by OEH as a standard method to implement the aims of the BOS and to address the loss of biodiversity and threatened species. The scheme creates a market framework for the conservation of biodiversity values and the offsetting of development impacts. It also provides the mechanisms to offset impacts of development, clearing or biodiversity certification such that there is no loss of biodiversity values.

The BAM sets out how biodiversity values will be assessed, prescribes requirements to avoid and minimise impacts, establishes rules for calculating the number and class of credits required for unavoidable impacts, and determines the trading rules that will apply. The methodology includes a software package known as the Biodiversity Assessment Method Calculator (the BAM calculator) which processes site survey and assessment data. The BAM calculator specifies the type and extent of surveys required for a biodiversity assessment and then processes survey data to calculate the number and type of biodiversity credits that are either required at a development site or will be generated at a stewardship site. The BAM must be applied by a person accredited under the BC Act.

The Biodiversity Conservation Trust Fund (BCTF) ensures that landowners have the funds needed to carry out the management actions required each year and provides a financial incentive to landowners to carry out those actions. The scheme is administered by DPIE and ensures accountability and compliance through legislation, regular reporting requirements and financial measures. Under certain circumstances a developer may make a payment directly into the BCTF to offset the impacts of a proposed development in lieu of purchasing and retiring biodiversity credits. The BCT must then use funds in the BCTF to purchase and retire appropriate biodiversity credits.

The BOS and BAM have been addressed in accordance with the project SEARs through the preparation of this BDAR by accredited assessors.

2.2 Fisheries Management Act 1994

The objects of the *Fisheries Management Act* 1994 (FM Act) are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. It provides for the listing of threatened

species, populations and ecological communities, listing of 'Key Threatening Processes', and the requirements or otherwise for the preparation of a Species Impact Statement (SIS).

One of the objectives of the FM Act is to 'conserve key fish habitats ' which includes aquatic habitats that are important to the maintenance of fish populations generally and the survival and recovery of threatened aquatic species. To assist in the protection of key fish habitats, DPI has produced the Policy and guidelines for fish habitat conservation and management (DPI 2013). This policy applies to the following developments, works or activities, each of which can impact on key fish habitat:

– Dredging or reclamation
– Impeding fish passage
– Damaging marine vegetation
– De-snagging

The FM Act has been considered in this assessment through:

– Desktop review to determine the threatened biota that are predicted to occur within the locality of the proposal and hence could occur, subject to the habitats present.
– Aquatic habitat assessment.
– Assessment of potential impacts on threatened biota and key fish habitat.
– Identification of suitable impact mitigation and environmental management measures for aquatic habitats, where required.

2.3 Biosecurity Act 2015

The *Biosecurity Act 2015* provides for risk-based management of biosecurity in NSW. It provides a statutory framework to protect the NSW economy, environment and community from the negative impact of pests, diseases and weeds.

The primary object of the Act is to provide a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers.

In NSW, 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.

One priority weed for the North West region was recorded in the proposal site. Legal requirements to minimise the potential for the introduction and/or spread of weeds as a result of the proposal are discussed in Section 5.3.1.

2.4 Environment Protection and Biodiversity Conservation Act 1999

The purpose of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is to ensure that actions likely to cause a significant impact on ‘matters of national environmental significance’ undergo an assessment and approval process. Under the EPBC Act, an action includes a project, a development, an undertaking, an activity or a series of activities, or an alteration of any of these things. An action that ‘has, will have or is likely to have a significant impact on a matter of national environmental significance (MNES)’ is deemed to be a ‘controlled action’ and may not be undertaken without prior approval from the Australian Minister for the Environment. MNES relevant to this report include threatened species and ecological communities and migratory species.

The NSW Government and Australian Government finalised amendments to the Assessment Bilateral Agreement after changes to NSW legislation, and the Amending Agreement no. 1 was signed on 24 March 2020. The Australian Government formally endorsed the NSW BOS through the *EPBC Act Condition-setting Policy* (DAWE 2020).

Under the bilateral agreement, only one decision including conditions on approval is made by NSW, accounting for impacts to MNES occurring in NSW. Specific consideration of the assessment, approval and offsetting requirements for MNES under the bilateral agreement is only required for controlled actions, The EPBC Act condition setting policy (DAWE 2020) notes that where a project demonstrates compliance with an endorsed state or territory policy, the proponent will not be required to simultaneously comply with the corresponding Australian Government policy. As such, a proponent is not required to calculate offsets separately using the EPBC Act offsets policy (DSEWPAC 2012) and associated calculator, unless offsets are required for a species not listed under the BC Act.

The EPBC Act has been considered in this assessment through:

– Desktop review to determine the listed biodiversity matters that are predicted to occur within the locality of the proposal and hence could occur, subject to the habitats present
– Targeted field surveys for listed threatened biota and migratory species
– Assessment of potential impacts on threatened and migratory biota, including assessments of significance in accordance with the EPBC Act Significant Impact Guidelines 3.1 (DotE 2013)
– Identification of suitable impact mitigation and environmental management measures for threatened and migratory biota, where required.

Based on the assessments of significance of impacts on MNES presented in this BDAR the proposal would not result in a significant impact on any MNES. Therefore, no further assessment or consideration of biodiversity offset requirements under the EPBC Act or bilateral agreement is required.

2.5 Assessment guidelines and information

This report has been prepared in accordance with the Biodiversity Assessment Method (DPIE 2020a) and with reference to the following guidelines:

– Surveying threatened plants and their habitats – NSW survey guide for the Biodiversity Assessment Method (DPIE 2020b)
– NSW survey guide for threatened frogs – A guide to the survey of threatened frogs and their habitats for the Biodiversity Assessment Method (DPIE 2020c).
– Survey guidelines for Australia's threatened bats – Guidelines for detecting bats listed as threatened under the Environmental Protection and Biodiversity Conservation Act 1999 (DEWHA 2010)

3. Methods

3.1 Desktop assessment

3.1.1 Data review

A desktop database review was undertaken to identify threatened flora and fauna species, populations and ecological communities (threatened biota) listed under the BC Act and EPBC Act, that could be expected to occur in the locality, based on previous records, known distribution ranges, and habitats present. These were also used to obtain the necessary site data to perform BAM calculations.

A 20 kilometre search radius from the proposal site was used to identify threatened species that were previously recorded in the locality. A larger search radius than the standard 10 kilometres was used to overcome the risk of potentially low survey effort in the region suggesting lower occurrence of threatened species.

Information sources used in the preparation of this report include:

– NSW Department of Planning, Industry and Environment (DPIE) BioNet Atlas for records of threatened biota previously recorded in the locality (website for the Atlas of NSW Wildlife) (OEH 2021a) and *Threatened Biodiversity Data Collection* (TBDC) profiles of threatened species listed under the BC Act (DPIE 2021a)
– DPIE *Threatened biodiversity profile search* online database for threatened ecological communities and species listed under the BC Act (OEH 2021b)
– NSW *BioNet Vegetation Classification* (OEH 2021c) to identify matching plant community types (PCTs) in the study area
– DAWE (2021a) EPBC Act Protected Matters Search Tool – for a 20 kilometre radius around the proposal site (searched August 2020)
– DAWE (2021b) Species profile and threats database, online profiles
– The list of species credit-type species and predicted species identified by the BAM calculator (DPIE 2021b)

The threatened biota and migratory species identified in the desktop assessment are presented in Appendix A. Following collation of database records and threatened species and community profiles, a 'likelihood of occurrence' assessment was prepared for threatened biota and migratory species with reference to the broad vegetation types and habitats contained within the study area. This was further refined following field surveys and verification of vegetation types and identification and assessment of habitat present within the proposal site. A likelihood of occurrence ranking was attributed to these biota based on this information.

3.1.2 Background research

Background research was conducted to identify:

– Landscape-scale features of the study area in accordance with Subsection 3.1.3 of the BAM (DPIE 2020)
– Site context of the study area that includes assessing vegetation cover and patch size as required under Section 3.2 and Subsections 4.3.2 of the BAM (DPIE 2020)
– The likely distribution of native vegetation and threatened ecological communities, based on previous mapping and aerial photograph interpretation, for targeted field verification as required under Section 4 of the BAM (DPIE 2020)
– A list of predicted and candidate threatened species and populations of flora and fauna to assess the habitat suitability and threatened biodiversity data collection as required under Section 5 of the BAM (DPIE 2020)
– Availability of baseline information to determine whether additional surveys, mapping and reporting is required to support project approval.

The background research included analysis of the following information sources:

– Aerial photographic imagery
– The transitional Native Vegetation Regulatory (NVR) map (DPE 2022)

– NSW Landuse mapping 2017 v1.2
– NSW Native Vegetation Extent 5m Raster v1.2 (2018 woody extent layer)
– NSW (Mitchell) Landscapes mapping and landscape descriptions (DECC 2008b; a)
– Interim Biogeographic Regionalisation of Australia (IBRA version 7.0) mapping
– Initial BAM calculations
– State Vegetation Type Map: Central West / Lachlan Region Version 1.4. VIS_ID 4468 (DPE 2015)
– Atlas of Groundwater Dependent Ecosystems (GDE) (BOM 2021a)
– Directory of Important Wetlands of Australia (DIWA) (DEWHA 2008)
– Aerial photographs and satellite imagery of the proposal site and buffer area.

3.1.3 Land use categorisation

Land in NSW is categorised into various categories under the *Local Land Services Act 2016* (LLS Act):

– Category 1 (Exempt land) – land that allows native vegetation clearing without approval from Local Land Services
– Category 2 (Regulated land) – which is any category 2 land that is not Vulnerable or Sensitive regulated land. Authorisation for native vegetation clearing may be required from Local Land Services
– Category 2 (Vulnerable regulated land) – is land where clearing of native vegetation may not be permitted under the Land Management (Native Vegetation) Code 2018, and a limited suite of allowable activities apply
– Category 2 (Sensitive regulated land) – where clearing is not permitted.
– Excluded land – refers to land outside of the land management framework.

Categorisation of land provides certainty to landholders and defines options available for each category for native vegetation management. The impacts from clearing native vegetation and loss of habitat on category 1 exempt land is excluded from assessment under the BAM, and therefore no biodiversity credit obligation is created.

Category 1 – exempt land is defined in Part 5A, Division 2, s60H of the LLS Act as being:

– Land cleared of native vegetation as at 1 January 1990 or lawfully cleared after 1 January (but before 25 August 2017)
– Low conservation value 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 BC Act.

Given the large tracts of cropping land and other land heavily modified for agricultural purposes within the proposal site that support very limited (if any) biodiversity values, it was considered appropriate to perform a land categorisation assessment to determine portions of the proposal site to which the BAM would apply, and portions that could be excluded from the assessment. In addition to cropping land, some patches of land within road reserves were also subject to land use categorisation, given evidence of repeated clearing, as outlined in section 4.2.

In line with advice received from BCS, land within the proposal site was first compared with the definition of category 2 – regulated land, rather than category 1 – exempt land, based on the definition provided in Section 60I of the LLS Act and cl.113 of the Local Land Services Regulation 2014. Once that comparison was made, assessors then looked to designate some of the remaining land to category 1. The *Native vegetation regulatory map method statement* (DPE 2022b) was also reviewed prior to designating land to specific categories.

The following spatial datasets were accessed to assist with the categorisation of land within the proposal site:

– 2017 Landuse map v1.2
– NSW Native Vegetation Extent 5m Raster v1.2 (2018 woody extent layer)
– Category 2 – sensitive regulated and category 2 – vulnerable regulated land from the Native Vegetation Regulatory Map.

Any land that was mapped as ‘tree cover’ or ‘tree cover matrix’ on the 2018 woody extent layer were assigned to category 2 - regulated land, to which the BAM applies. These areas were then sanity checked via GIS and aerial photo interpretation, as well as ground truthing where necessary to confirm the presence or absence of trees. Any areas that were mapped as ‘candidate native grasslands’, ‘tree cover’ or ‘tree cover matrix’ but that were found to be cropped or did not support any native vegetation as verified during field surveys were assigned to category 1 land. It was assumed that any trees that had once been there had been removed or died, or that the coarseness of the scale of the 2018 woody extent layer had resulted in some areas being assigned to ‘tree cover’, ‘tree cover matrix’ or ‘candidate native grasslands’ when they were actually cropped or hardstand. There were several instances within the solar farm proposal site where the 2018 woody extent layer indicated there should be tree cover present, but upon inspection during field surveys, the area was cropped and there were no signs of trees in the immediate area.

The next stage in the process was to overlay the 2017 Landuse map v1.2, and compare areas mapped as cropping with what was evident on site and on aerial photos of the site. Areas that were mapped as cropped on the 2017 Landuse map v1.2, but which were found to support native vegetation were mapped as category 2 land; for instance, several patches towards the western end of the ETL were mapped as cropping, but actually supported derived native grasslands. Similarly, some areas were mapped as ‘grazing modified pastures’, but were actually found to be cropped upon inspection during field surveys. Mapping included as part of the land use categorisation assessment completed as part of this BDAR has been updated and adjusted accordingly.

Where there was uncertainty over the appropriate land category, ie the 2017 Landuse map indicated land was cropped, but the woody extent layer indicated there was some form of native vegetation present, a conservative approach was taken and land was mapped as category 2 - regulated land unless cropping was confirmed by field surveys or aerial photograph interpretation. The above mapping sets can be inaccurate at a fine scale, and at times, areas mapped as tree cover or native vegetation overlapped with areas that should obviously be excluded such as roads and rail lines. In these instances, the woody extent and landuse mapping layers were refined to exclude hardstand areas from the category 2 mapping.

Once all areas of land that corresponded with the definition of category 2 land within the proposal site had been mapped as such, remaining land was considered against the definition of category 1 land. Land within the proposal site was designated category 1 – exempt land, with reference to the methods identified in section 2.2 of the *Native vegetation regulatory map method statement* (DPE 2022b).

Areas designated as category 1 land were:

– mapped as ‘cropping’ on the NSW Land Use 2017 map, and/or
– overlapped areas mapped as ‘not native’ on the NSW Native Vegetation Extent 5m Raster v1.2 (2018 woody extent layer) and/or
– shown on aerial photographs to support evidence of cropping and/or were visually inspected during field surveys for evidence of cropping.

A single GIS layer with attributes that identified land according to the classifications was produced.

3.1.4 Scattered tree assessment

The proposal site contains large tracts of land used for cropping and agricultural practices. These areas have been subject to historical and ongoing disturbance and have been largely cleared of native vegetation, and are cropped and harvested, in line with standard agricultural procedures. Areas of cropland and land that has been cleared of native vegetation were subject to a land use categorisation, as outlined above. The areas which lack native vegetation, and which have been cleared or cropped were assigned to category 1 land. Within these patches of category 1 land, there are occasional scattered native canopy trees.

Scattered trees within the solar farm proposal site were assigned to category 2 land, as they appear as ‘tree cover’ on the NSW Native Vegetation Extent 5m Raster v1.2 (2018 woody extent layer). Scattered trees within the road upgrade footprint were also assigned to category 2 land, as they also met the above description. The streamlined assessment module presented in Appendix B of the BAM (Scattered trees assessment) was employed for the trees that met the definition of scattered trees, namely they “*have a percent foliage cover that is less than 25% of the benchmark for tree cover for the most likely plant community type and are on category 2-regulated land and*

surrounded by category 1-exempt land on the Native Vegetation Regulatory Map under the LLS Act" (DPIE 2020a).

The methodology presented in Appendix B.2 of the BAM was employed (see Section 3.2.2). A BAM calculator case for each scattered tree assessment was established to determine the number and type of credits that would be required to offset the impacts of the proposal on scattered trees.

3.1.5 Planted native vegetation assessment

The study area includes large areas of land that have been subject to substantial historical disturbance typical of agricultural landscapes used for cropping and grazing.

There are several non-native vegetation types within the proposal site. Where appropriate, some of these areas have been assigned to category 1 - exempt land based on the methodology outlined in Section 3.1.3. There are also several patches of planted non-locally native vegetation, that did not align with any local PCT types. In this instance, the vegetation was assessed in accordance with Appendix D of the BAM; Streamlined assessment module – planted native vegetation.

The decision-making key in Appendix D.1 of the BAM was applied and any vegetation that met the definition of planted vegetation was assessed in line with Appendix D.2 of the BAM (see Section 6.3).

3.2 Site survey

3.2.1 Survey overview

Staged surveys of the proposal site were conducted in accordance with the BAM and with reference to appropriate threatened species survey guidelines for targeted species. Site surveys included:

– Initial site stratification and vegetation mapping
– Sampling of vegetation integrity plots
– Habitat assessments, including hollow-bearing tree assessments
– Scattered tree assessments
– Targeted surveys for threatened flora
– Targeted surveys for threatened fauna.

Survey effort was formally stratified across the proposal site in accordance with the BAM. Survey effort that has directly contributed to this BDAR is summarised in Table 3.1, mapped on Figure 3.1 and Figure 3.2 and is described in detail below.

Table 3.1: Survey techniques and timing

Stage	Date	Survey Technique
Project inception meeting and rapid site inspection	24 September 2018	Initial site overview
Initial site stratification and vegetation mapping / BAM assessment survey	30 September 2018	Vegetation mapping Targeted threatened flora searches Opportunistic fauna survey Threatened flora and fauna habitat assessment (including searches for signs of nest trees and stick nests for raptors, owls and parrots) Diurnal bird surveys
BAM assessment survey	18-19 December 2018	Vegetation mapping Vegetation integrity plots Opportunistic fauna survey Threatened flora and fauna habitat assessment (including searches for signs of nest trees and stick nests for raptors, owls, and parrots)

Stage	Date	Survey Technique
		Targeted threatened flora searches Targeted threatened fauna survey Call playback (frogs only) Spotlighting (frogs only) Diurnal bird surveys
Candidate species credit fauna surveys	14-15 August 2019	Call playback Spotlighting Opportunistic fauna survey
BAM assessment survey	7-8 September 2020	Vegetation integrity plots Targeted threatened flora searches Threatened flora and fauna habitat assessment (including searches for signs of nest trees and stick nests for raptors, owls and parrots) Targeted threatened fauna survey Call playback Opportunistic fauna survey
BAM assessment survey and candidate species credit flora and fauna survey	25-26 August 2020	Vegetation integrity plots Targeted threatened flora searches Call playback Spotlighting Threatened flora and fauna habitat assessment (including searches for signs of nest trees and stick nests for raptors, owls and parrots) Opportunistic fauna survey
Candidate species credit flora survey and additional plots	7-8 December 2020	Vegetation integrity plots Targeted threatened flora searches Anabat recordings Opportunistic fauna survey
Scattered tree assessment of solar farm and supplementary BAM assessment survey of ETL	14 and 16 June 2022	Vegetation integrity plots Threatened flora and fauna habitat assessment (including searches for signs of nest trees and stick nests for raptors, owls and parrots) Diurnal bird surveys Scattered tree mapping
Scattered tree assessment and supplementary BAM assessment survey of road upgrade impact area	9 September 2022	Vegetation integrity plots Threatened flora and fauna habitat assessment (including searches for signs of nest trees and stick nests for raptors, owls and parrots) Diurnal bird surveys Scattered tree mapping

3.2.2 Vegetation and flora surveys

3.2.2.1 Vegetation mapping

Vegetation was assessed with reference to the BAM (DPIE 2020). Regional vegetation mapping (VIS_ID 4468) was ground-truthed in the field via driven and walked transects across the study area to verify community type and boundaries, floristic and structural homogeneity within patches and to update mapping as required. Accessible portions of the proposed transmission alignment was inspected via parallel walked transects. Where access was not available (e.g. to private land), visual inspection of vegetation (using binoculars if necessary) from publicly accessible areas such as roads and travelling stock routes was completed.

Native vegetation communities in the study area were assigned to the closest equivalent Plant Community Type (PCT) held in the BioNet Vegetation Classification database (OEH 2021c). The closest equivalent PCT for each vegetation community was determined through a comparison of the floristic descriptions of PCTs in the database with the vegetation integrity plot data collected from the site. In addition to floristic and structural similarity, the landscape position, soil type and other diagnostic features of the vegetation communities on the sites were also compared to the descriptions in the database to determine the most suitable PCT. Areas of planted trees were mapped as the closest matching PCT. Threatened ecological communities (TECs) as defined in NSW and Commonwealth legislation were also identified.

The native vegetation in the proposal site was then stratified into vegetation zones in accordance with Section 4.3 of the BAM (DPIE 2020). A vegetation zone is defined in the BAM as a relatively homogenous area that is the same PCT and has the same broad condition state. Each vegetation zone was assigned a patch size in accordance with Subsection 4.3.2 of the BAM (DPIE 2020). Scattered trees were excluded from the patch size calculations.

3.2.2.2 Scattered tree assessment

The scattered tree assessment focused on the paddock trees within the solar farm proposal site and road upgrade footprint.

The methodology described in Appendix B.2 of the BAM was used, and the following steps were completed for each scattered tree:

– Each tree was mapped with a handheld GPS unit
– The genus and species of the tree was recorded
– The DBH of each tree was recorded
– The presence of any hollows, and the size of any hollows was recorded
– Each tree was inspected for signs of use by native fauna species, with a particular emphasis on any signs of use by threatened fauna species.

The 2018 woody extent layer was used as a guide as to where potential scattered trees may be located, however all paddock/scattered trees were mapped. In some instances, the 2018 woody extent layer and aerial photos indicated that a tree should be present, however the tree was not able to be located during field surveys. The reason for the lack of tree was unknown. Many large trees appeared to have undergone some stress following years of drought followed by substantial rain prior to the 2022 field surveys.

The trees were assigned to the most likely PCT, and the large tree threshold size for that PCT was obtained from the NSW VIS. Following the field survey, trees were assigned to:

– Class 1 – trees that are < 20cm DBH and without hollows
– Class 2 – trees that are ≥ 20cm DBH and less than the large tree benchmark for the most likely PCT or trees that are < 20cm DBH that contain at least one hollows
– Class 3 – trees that are greater than or equal to the large tree benchmark for the most likely PCT

During the process of identifying the presence/absence of hollows and recording the DBH of each tree, field staff visually assessed each tree for signs of use by fauna species, with particular reference to signs of roosting or nesting by birds or arboreal mammals. The results of previous field surveys were also considered for assessment of use of scattered trees as habitat features by threatened species. The scattered tree assessments were completed within the solar farm proposal site, and along the road leading to the solar farm proposal site, which had been subject to numerous opportunistic and targeted surveys of these footprints, over various seasons over multiple years. This, along with detailed searches during the scattered tree assessment surveys, meant assessors were confident in excluding them as habitat features used by threatened species.

3.2.2.3 Vegetation integrity survey plots (assessing site condition)

Following the stratification of the proposal site into vegetation zones, plot surveys were conducted in accordance with Section 4.3.3 and Section 4.3.4 the BAM (DPIE 2020) to obtain vegetation integrity data for the calculation of biodiversity credits. The field data sheets are provided in Appendix C.

The location of vegetation integrity plots across the study area is shown on Figure 3-1 and stratification between vegetation zones is shown on Figure 5-1. Vegetation integrity plot survey requirements and effort are summarised in Table 3.2.

As far as possible plots were located within the proposal site to comply with the minimum number of plots required by Table 3 in the BAM (DPIE 2020). Due to refinements of the proposal site boundary as part of efforts to reduce impacts on native vegetation, some plots sampled are outside the current proposal site. Table 3.9 provides a summary of plots sampled outside the proposal site but entered in the BAM-C to meet the minimum requirements of the BAM based on accredited assessors' use of judgement while completing this BDAR. Plots sampled outside the proposal site but surplus to the minimum requirement have not been included in the BAM-C but have informed the general vegetation zone descriptions.

Table 3.2: Vegetation integrity plot survey effort

Vegetation zone`	Area in proposal site (ha)	Minimum number of plots required	Number of plots sampled	Plot IDs within proposal site and/or included in the BAM-C	Plot IDs from broader study area to inform general vegetation zone descriptions
Solar farm					
PCTID 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – planted	0.22	1	1	P3	-
ETL					
PCTID 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	0.65	1	1	2	P5, P10,
PCTID 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – planted	0.01	1	1	P3*	
PCTID 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – good	0.62	1	1	P4	P2, DAR001S, PE
PCTID 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions - derived native grassland	2.14	2	2	1, P9	P7, P8
PCTID 80 – Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion - good	0.44	1	1	PD	-
PCTID 80 – Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion - derived native grassland	2.62	2	2	JP02, JP08	PF
PCTID 80 – Western Grey Box – White Cypress Pine tall woodland	1.64	1	1	3	DAR002S

Vegetation zone`	Area in proposal site (ha)	Minimum number of plots required	Number of plots sampled	Plot IDs within proposal site and/or included in the BAM-C	Plot IDs from broader study area to inform general vegetation zone descriptions
on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion - derived scrub					
PCTID 244 – Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) - planted	0.07	1	1	4	-
PCTID 360 – Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion - poor	2.54	2	2	PB, PA	P1
PCTID 360 – Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion – very poor	3.96	2	3	JP03, PC, JP04	-

Note: * plot P3 was sampled in the solar farm site and the data were extrapolated to the small area of the equivalent vegetation zone in the ETL proposal site.

Plots were sampled at random locations within each of the vegetation zones by walking a random distance into the vegetation zone and then locating the plot on a randomly generated compass bearing, this was then repeated for subsequent plots within the vegetation zone. Where possible, plots were not located near ecotones, tracks and their edges or other locally disturbed areas, however given the generally modified and fragmented nature of vegetation within the study area, this was not always possible.

The site value was determined by assessing ten attributes used to assess function, composition and structure of vegetation within a 50 metre by 20 metre plot. These attributes were then assessed against benchmark values. Benchmarks are quantitative measures of the range of variability in condition in vegetation with relatively little evidence of alteration, disturbance or modification by humans since European settlement (DECC, 2009).

Attributes assessed within each plot are listed in Table 3.3. All flora species within a 20 metre by 20 metre quadrat nestled within the 50 metre by 20 metre plot were identified according to the nomenclature of the Royal Botanic Gardens and Domain Trust (RBGT 2021). Each species identified was allocated a growth form group[1] and designated as either native, exotic or high threat exotic in accordance with the lists accessed by assessors via the BAM calculator.

The overall condition of vegetation was assessed through general observation and comparison against the PCT condition benchmark data as well as using parameters such as species diversity, history of disturbance, weed invasion and canopy health.

Table 3.3: Site data collected within each plot

Attribute	Area assessed
Native plant species richness	20 X 20 metre plot
Percentage foliage cover for each species	20 X 20 metre plot
Estimated number of individuals for each species	20 X 20 metre plot
Number of large trees	50 X 20 metre plot
Tree regeneration (presence/absence)	50 X 20 metre plot
Tree stem size class	50 X 20 metre plot
Total length of fallen logs	50 X 20 metre plot

[1] TG – tree, SG – shrub, GG – grass/grasslike, FG – forb, EG – fern, OG – other (Table 2 of the BAM, DPIE 2020)

Attribute	Area assessed
Litter cover	5 times 1 X 1 metre plot
High threat exotic vegetation cover	50 X 20 metre plot
Hollow bearing trees	50 X 20 metre plot

3.2.2.4 Threatened plant surveys

Potential candidate species credit entities for the proposal site were identified and assessed in accordance with Section 5.2 and Section 5.3 of the BAM (DPIE 2020). All threatened plants are classified under the BAM as species credit entities as their occurrence cannot be reliably predicted based on vegetation type.

The suite of threatened plants with potential to occur in the proposal site was identified based on the desktop assessment results and the species credit entities identified by preliminary BAM Calculations (see Appendix A).

A likelihood of occurrence ranking was attributed to potential candidate species based on this information and used to compile lists of 'confirmed candidate threatened species' (that is, threatened flora requiring targeted survey) according to Step 2 'assess the habitat constraints and vagrant species on the subject land' of Section 5.2.2 of the BAM (see Appendix A).

Habitat for these species was identified and assessed based on threatened species profiles and the experience and judgement of GHD ecologists. A large area of the proposal site, particularly the solar farm site, has been mapped as category 1 land and is highly modified and is dominated by exotic species, grazed and cropped, and can be readily discounted as supporting populations of threatened plant species. Areas of native woodland and grassland in reasonable condition that were not subject to obvious signs of grazing provide potential habitat for select threatened flora species to occur.

Threatened flora species associated with clay soils, gilgais and/or vegetation types present on site were considered to have potential habitat within the eucalypt and acacia woodland types and associated derived native grassland areas, or gilgai habitats of the proposal site. These were mainly woodland forb species, including Slender Darling Pea (*Swainsona murrayana*), Mossgiel Daisy (*Brachyscome papillosa*) and Silky Swainson-pea (*Swainsona sericea*). Appendix A provides a full list of the species known or predicted to occur within the locality of the proposal site, based on the results of the desktop searches.

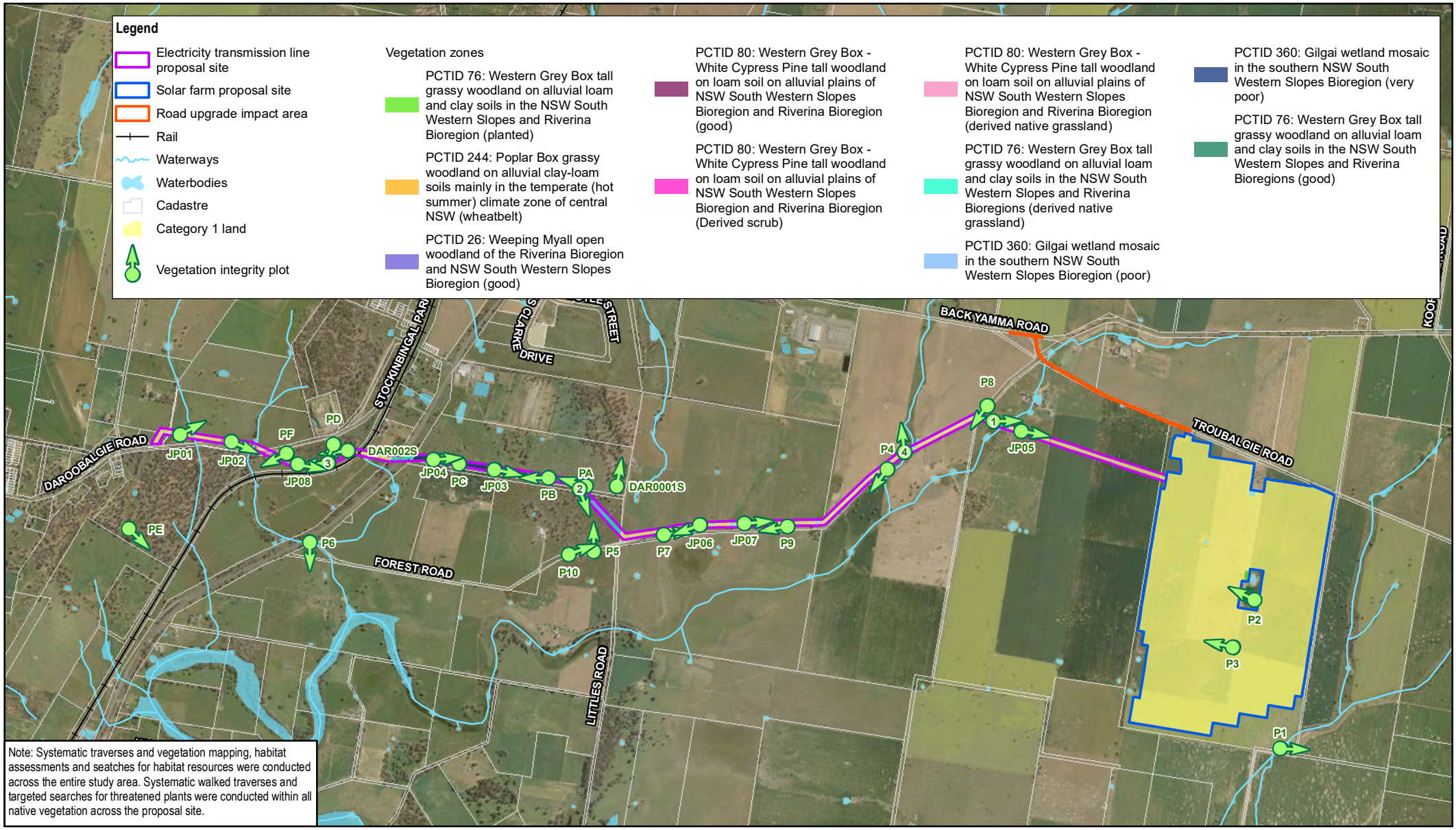
Searches were undertaken with due consideration of threatened species survey guidelines (DPIE 2020b), by completing meandering traverses within accessible areas of potential habitat within the proposal site. Traverses involved two site staff walking in generally parallel lines along the target area. This survey effort was generally limited to portions of the proposal site that supported native vegetation, as cropped areas did not support suitable habitat for threatened flora species. Surveys focused on areas of native vegetation along the ETL proposal site as well as the various alternative transmission line options within the study area that have been considered as part of the avoid and minimise process.

Pursuant to section 5.2.3 of the BAM "*A candidate species credit species is considered unlikely to occur on the subject land (or specific vegetation zones) if…ii. the assessor determines that the habitat constraints or microhabitats are degraded to the point that the species is unlikely to use the subject land (or specific vegetation zones)*" (DPIE 2020a p22). The 'habitat degraded' button was selected in the BAM C for all flora species considered unlikely to occur due to habitat degradation, or when specific microhabitat requirements of species were not present within the proposal site. Survey timing shown in red text indicates that surveys were undertaken outside the appropriate survey period according to the TBDC (DPIE 2021a).

Table 3.4: Candidate flora species credit entities targeted during surveys

Scientific name	Common name	Portion of the proposal site associated with (Solar farm or ETL or both)	Appropriate survey period	Months surveys conducted
Amphibromus fluitans	Floating Swamp Wallaby-grass	ETL	December to March	December

Scientific name	Common name	Portion of the proposal site associated with (Solar farm or ETL or both)	Appropriate survey period	Months surveys conducted
Austrostipa metatoris	A spear-grass	ETL	October to November	September and December
Diuris tricolor	Pine Donkey Orchid	ETL and solar farm	September to October	September
Eleocharis obicis	Spike Rush	ETL	October to November	September and December
Lepidium aschersonii	Spiny Peppercress	ETL and solar farm	November to April	December
Lepidium monoplocoides	*Lepidium monoplocoides*	ETL	September to December	September and December
Pilularia novae-hollandiae	Austral Pillwort	ETL	October to December	December
Swainsona murrayana	Slender Darling Pea	ETL and solar farm	September	September
Swainsona recta	Small Purple-pea	ETL and solar farm	September to November	September
Swainsona sericea	Silky Swainson-pea	ETL and solar farm	September to November	September



Paper Size ISO A4

0 300 600 900 1,200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

GHD

Pacific Hydro
Daroobalgie Solar Farm
Biodiversity Development Assesssment Report

Flora survey effort

Project No. **23-16511**
Revision No. **0**
Date **20 Oct 2022**

Figure 3.1

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3.2.3 Terrestrial fauna surveys

3.2.3.1 Fauna habitat assessment

Fauna habitat assessments were undertaken throughout the proposal site during all survey periods, including observation of potential shelter, basking, roosting, nesting and/or foraging sites. Specific habitat features and resources such as water bodies, fallen timber, mistletoes, food trees, the density of understorey vegetation, the composition of ground cover, the soil type, presence of hollow-bearing trees, leaf litter and ground debris were noted.

Indicative habitat criteria for targeted threatened species (i.e. those determined as having the potential to occur within the proposal site following the desktop review) were identified prior to fieldwork. Habitat criteria were based on information provided in DPE and DAWE threatened species profiles, field guides, and the knowledge and experience of GHD field ecologists.

Habitat assessments included searches for resources of potential value to threatened fauna including:

– Trees with bird nests or other potential fauna roosts
– Rock outcrops or overhangs providing potential shelter sites for fauna
– Burrows, dens and warrens
– Distinctive scats or latrine sites, owl whitewash and regurgitated pellets under roost sites
– Tracks or animal remains
– Evidence of activity such as feeding scars, scratches and diggings
– Specific food trees and evidence of foraging (chewed *Allocasuarina* cones)

The locations and quantitative descriptions of significant habitat features were captured with a handheld GPS unit and photographed where appropriate. The field survey effort included dawn and dusk observations of hollows for evidence of occupancy.

Opportunistic and incidental observations of fauna species were recorded at all times during field surveys. This included a conscious focus on suitable areas of habitat during flora surveys, for instance fallen timber was scanned and/or turned for reptiles and mature trees (including scattered paddock trees) and stags were scanned for roosting birds, nests, or signs of use such as whitewash, scats, pellets, scratches etc.

3.2.3.2 Targeted surveys

Under the BAM, targeted surveys are not required for threatened fauna species that can be reliably predicted to occur at the proposal site based on habitat surrogates (predicted / ecosystem credit species). These species are assumed to be present within certain PCTs, given a certain patch size and condition. Nonetheless these species and their habitats were recorded along with fauna that are not listed as threatened, as a general guide to the condition and biodiversity value of the proposal site.

Targeted, seasonal surveys are required for candidate threatened species entities i.e. species credit species and specific habitat resources such as nesting or roosting habitat for dual credit species. Potential candidate species credit matters were identified in accordance with Section 6.3 and Section 6.4 of the BAM, based on:

– The results of the desktop assessment (see Section 3.1)
– Identification of PCTs at the study area
– Initial BAM credit calculations
– Fauna habitat assessment.

A likelihood of occurrence ranking was attributed to potential candidate species based on this information and used to compile lists of confirmed candidate species.

Confirmed candidate species credit matters that were considered to have a moderate potential to occur within the proposal site (refer to Appendix A) were targeted with specific survey techniques and are listed in Table 3.5.

Targeted surveys appropriate to each species credit matter must be planned and conducted with reference to the DEC (2004) threatened species survey guidelines and the various BAM threatened species survey and assessment guidelines. Surveys were planned and undertaken using the following framework:

– Habitat resource assessment to confirm the presence (or otherwise) and condition of habitat resources for the candidate species credit matter. This stage may be conducted at any time of year.
– Stratification of habitat resources based on extent and quality of habitat and planning of targeted seasonal survey techniques appropriate to each confirmed candidate species and habitat type.
– Delivery of targeted seasonal survey techniques appropriate to each confirmed candidate species.

Targeted fauna survey techniques and effort conducted in the study area are summarised in Table 3.5 and discussed further below. Survey effort was stratified across the entire study area where possible given property access constraints and noting that fauna species are mobile and may rely upon habitat resources in the proposal site even if not directly observed. Fauna survey effort is mapped on Figure 3.2.

Targeted threatened fauna surveys were conducted in the following months:

– September 2018
– December 2018
– August 2019
– August 2020
– December 2020
– June 2022

Further detail regarding candidate fauna species targeted during surveys is provided in Section 6.1. Survey timing shown in red text indicates that surveys were undertaken outside the required survey months.

Table 3.5: Candidate fauna species credit entities targeted during surveys

Common name	Scientific name	Portion of proposal site associated with	BAM survey months	Survey method / timing
Barking Owl (Breeding)	*Ninox connivens*	Solar farm ETL	May to December	Call playback, spotlighting – August Searches for candidate nest trees – all survey rounds
Bush Stone-curlew	*Burhinus grallarius*	Solar Farm ETL	All year	Call playback – August Diurnal bird surveys – June, August, September and December
Eastern Pygmy-possum	*Cercartetus nanus*	ETL	October to March	Spotlighting – August
Glossy Black-Cockatoo (Breeding)	*Calyptorhynchus lathami*	Solar farm ETL	January to September	Diurnal bird surveys – June and August Searches for candidate nest trees – all survey rounds
Little Eagle (Breeding)	*Hieraaetus morphnoides*	Solar farm ETL	August to October	Diurnal bird surveys – August and September Searches for candidate nest trees – all survey rounds
Major Mitchell's Cockatoo (Breeding)	*Lophochroa leadbeateri*	Solar farm ETL	September to December	Diurnal bird surveys – September and December Searches for candidate nest trees – all survey rounds
Masked Owl (Breeding)	*Tyto novaehollandiae*	Solar farm ETL	May to August	Call playback, spotlighting – August

Common name	Scientific name	Portion of proposal site associated with	BAM survey months	Survey method / timing
				Searches for candidate nest trees – all survey rounds
Sloane's Froglet	*Crinia sloanei*	Solar farm ETL	July and August	Call playback, spotlighting – August
Southern Bell Frog	*Litoria raniformis*	ETL	October to January	Call playback, spotlighting – December
Square-tailed Kite (Breeding)	*Lophoictinia isura*	Solar farm ETL	September to January	Diurnal bird surveys – September and December Searches for candidate nest trees – all survey rounds
Squirrel Glider	*Petaurus norfolcensis*	ETL	All year	Call playback, spotlighting – August
Superb Parrot (breeding)	*Polytelis swainsonii*	Solar farm ETL	September to November	Diurnal bird surveys – September Searches for candidate nest trees – all survey rounds
White-bellied Sea-Eagle (Breeding)	*Haliaeetus leucogaster*	Solar farm ETL	July to December	Diurnal bird surveys – August, September and December Searches for candidate nest trees – all survey rounds

Table 3.6: Targeted fauna survey techniques and effort

Survey technique	Key target species	Survey effort	Dates
Daytime traverses Active reptile/ amphibian searches	Sloan's Froglet	Targeted searches of suitable habitat. Active searches of woody debris, under rocks and other ground litter. Total effort = 12 person hours	14-15 August 2019 25-26 August 2020 7-8 December 2020
Active searches for nest trees and signs of hollow use	Barking Owl Glossy Black-Cockatoo Little Eagle Major Mitchell's Cockatoo Masked Owl Square-tailed Kite Superb Parrot White-bellied Sea-Eagle	Searches of hollows and stags for signs of fauna occupation. Searches for evidence of feeding, foraging and signs of bird presence (such as pellets, whitewash, nests etc.) and other biota (scats, scratches, diggings, nests etc.). Searches for nest trees/large stick nests Total effort = 22 person hours	14-15 August 2019 25-26 August 2020 7-8 September 2020 7-8 December 2020 14 and 16 June 2022 9 September 2022
Spotlighting	Barking Owl Eastern Pygmy-possum Masked Owl Sloan's Froglet Squirrel Glider	Two consecutive nights of walked spotlighting transects conducted between 7 – 9 PM per survey round Total effort = 16 person hours.	14-15 August 2019 25-26 August 2020
Call Playback	Barking Owl Bush Stone-curlew Masked Owl Sloan's Froglet Squirrel Glider	Two consecutive nights of call playback (4 person hours each night) per survey round Total effort = 16 person hours.	14-15 August 2019 25-26 August 2020

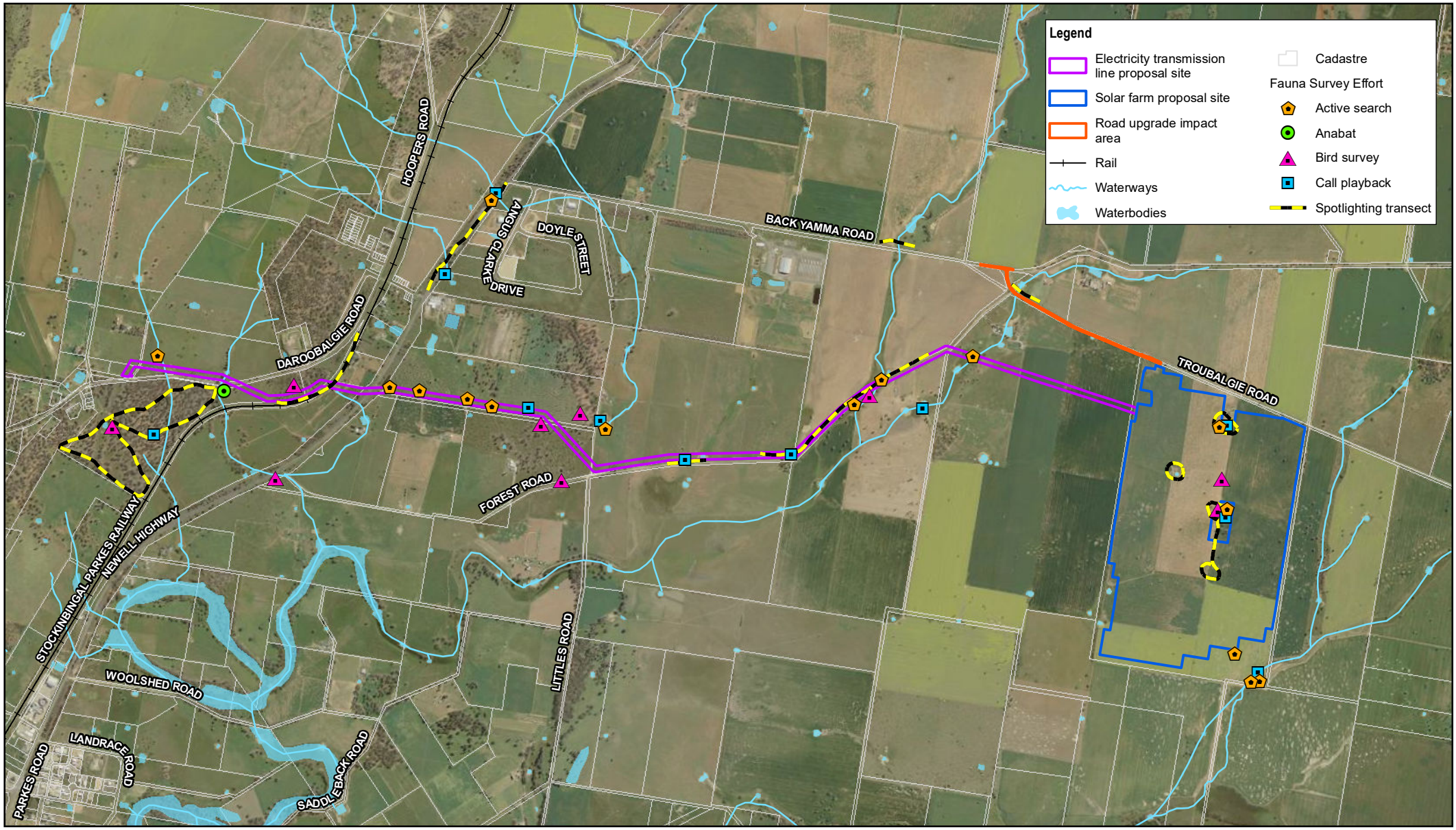
Survey technique	Key target species	Survey effort	Dates
Ultrasonic call recordings (Anabat)	Southern Myotis	1 x Anabat positioned in a potential bat flyway in different locations over two nights (12 hours each night). Total effort = 24 hours.	7-8 December 2020
Diurnal bird surveys	Bush Stone-curlew Glossy Black-Cockatoo Little Eagle Major Mitchell's Cockatoo Square-tailed Kite Superb Parrot White-bellied Sea-Eagle	2 person hours on each of 14 days Total effort = 28 person hours.	30 September 2018 18-19 December 2018 14-15 August 2019 25-26 August 2020 7-8 September 2020 7-8 December 2020 14 and 16 June 2022 9 September 2022
Opportunistic fauna surveys	All entities	Fauna surveys in conjunction with plot/transects, scattered tree assessments and threatened flora searches on 14 survey days.	30 September 2018 18-19 December 2018 14-15 August 2019 25-26 August 2020 7-8 September 2020 7-8 December 2020 14 and 16 June 2022 9 September 2022

3.2.4 Aquatic habitat assessment

A rapid aquatic habitat assessment was undertaken along the drainage lines and at farm dams in the proposal site. The character and condition of the waterways was noted.

An assessment of potential habitat for threatened aquatic species was based on the habitat assessments undertaken during the field survey and published habitat preferences of threatened biota. Key fish habitat maps for the Forbes area (DPI, 2007) were reviewed and key fish habitat was identified according to the following classifications as detailed in (DPI, 2013):

– Type 1 – highly sensitive fish habitat (includes freshwater habitats that contain in-stream gravel beds, rocks greater than 500 mm in two dimensions, snags greater than 300 mm in diameter or three metres in length, or native aquatic plants; known or expected protected or threatened fish habitat; and areas of critical habitat).
– Type 2 – moderately sensitive key fish habitat (freshwater habitats other than those defined in Type 1).
– Type 3 – minimally sensitive key fish habitat (ephemeral aquatic habitat not supporting native aquatic or wetland vegetation).
– Not key fish habitat (includes first and second order streams on gaining streams).



Paper Size ISO A4

0 300 600 900 1,200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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GHD

Pacific Hydro
Daroobalgie Solar Farm
Biodiversity Development Assesssment Report

Fauna survey effort

Project No. **23-16511**
Revision No. **0**
Date **20 Oct 2022**

Figure 3.2

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3.3 Survey conditions

The field surveys were undertaken between September 2018 and December 2020. Bureau of Meteorology (BOM) records for the survey dates are outlined in Table 3.7. These records were taken at Forbes Bimbimbi weather station (065113) located approximately 10 kilometres south west of the proposal site (BOM 2021b).

Table 3.7: Daily weather observations during the survey period

Date	Minimum temperature (Deg Celsius)	Max temperature (Deg Celsius)	Rainfall (mm)
24 September 2018	5.8	23.5	0
30 September 2018	0.5	22.4	0
18 December 2018	17.5	35.8	0
19 December 2018	-	38.0	0
14 August 2019	-3.3	14.9	0
15 August 2019	-1.3	18.4	0
25 August 2020	-0.2	12.9	0
26 August 2020	-1.1	14.9	0
7 September 2020	7.3	22.9	0
8 September 2020	8.7	24.8	0
7 December 2020	10.0	26.3	0
8 December 2020	10.1	23.7	0
14 June 2022	0.6	13.4	0
16 June 2022	4.4	14.6	0
9 September 2022	9.5	11.3	20

3.4 Survey limitations

Access was not available to all properties along the alignment during all survey stages. The ETL is generally situated on private property, and restrictions on access due to land use (ie harvest, sowing, livestock concerns etc), weather limitations (e.g. flooding), or lack of approval from property owners prevented surveys from being undertaken across the entire ETL.

Where access was not available, mapping of vegetation type and condition was based on extrapolated data, informed by visually scanning the site from public land using binoculars, aerial photo interpretation, existing regional vegetation mapping, and consideration of landscape position. Habitat assessments were completed for this land based on the extrapolated vegetation mapping.

For the above reasons, the impact assessment and conclusions of this report draw upon information obtained from a variety of sources in addition to the field survey data. Where it is considered that the likelihood of observing a particular threatened species was diminished due to the extent of survey effort or seasonal or climatic factors, then this has been indicated, and where appropriate, a species has been assumed present in accordance with the BAM.

An assessment of the likelihood of occurrence of threatened species has been provided, on the basis of known distributional ranges, previous records in the locality, and habitat and resource availability within the site. The assessment of impacts includes those threatened species recorded within the proposal site during the field surveys as well as those species not detected but considered likely to occur or to be impacted by the project.

The recommended survey timing has been met where possible for all species, with the exception of:

– *Austrostipa metatoris* (a spear grass)
– *Diuris callitrophilla* (Oaklands Diuris)

– *Eleocharis obicis* (pike-rush)
– *Cercartetus nanus* (Eastern Pygmy-possum).

Targeted searches for the threatened flora species were conducted in the months either side of the recommended survey period. The table below provides a summary of the limitations around survey for these species, and also considers whether they are likely to occur within the proposal site at all.

Survey effort for the Eastern Pygmy-possum was conducted outside the nominated warmer-season survey period for this species and did not include appropriate targeted techniques to reliably discount its presence at the proposal site (see Table 3.5). Therefore, the Eastern Pygmy-possum has been assumed present at the proposal site and species credits calculated accordingly (see section 6.1.3 and section 11.1.2).

Table 3.8: Survey limitations for candidate species

Species	Recommended survey period	Actual survey period	Justification
Austrostipa metatoris	October – November	30 September 2018 7-8 December 2020	While field surveys were completed outside the specified survey months, they were completed in the months either side of the recommended survey period, with the September 2018 survey missing the recommended survey period by only one day, and the December survey missing the recommended survey period by only seven days. While no reference populations were available for verification, the presence of other *Austrostipa* species that were flowering during the field survey periods was considered a suitable indication that, while the survey was between 1 and 7 days outside the recommended survey period, conditions were suitable to detect the targeted threatened species. Irrelevant of the above, as outlined in Appendix A, the likelihood of the species occurring within the proposal site is very low, given the only occurrence of the associated PCT is a planted form of the community with a modified understorey.
Diuris callitrophilla	November	7-8 December 2020	While field surveys were completed outside the specified survey month, they were completed in the month immediately after the recommended survey period, with the December 2020 survey period missing the recommended survey period by only seven days. Notwithstanding, recently published literature (Copeland and Backhouse, 2022) as well as historical published material (Bishop, 2000; Jones, 2003) on this species indicates that it does flower from November into December, meaning surveys at the start of December are appropriate for detection. Additionally, if the species had been present and flowered in November, there would still be evidence of its presence, with seed capsules still present in early December when field surveys were completed. Nevertheless, as outlined in Appendix A, this species is considered unlikely to occur within the proposal site, based on the soil landscape and underlying geology, and the likely soil associations of this species.
Eleocharis obicis	October - November	30 September 2018 7-8 December 2020	While field surveys were completed outside the specified survey months, they were completed in the months either side of the recommended survey period, with the September 2018 survey missing the recommended survey period by only one day, and the December survey period missing the recommended survey period by only seven days. While no reference populations were available for verification, the presence of other *Eleocharis* species that were flowering during the field survey periods (refer to Appendix B for species list that includes several other *Eleocharis* species) was considered a suitable indication that, while the survey was between 1 and 7 days outside the recommended survey period, conditions were suitable to detect the targeted threatened species. Should the species have been present and flowered in October or November, there would still be evidence of its presence, with material still present in early December when field surveys were completed that

Species	Recommended survey period	Actual survey period	Justification
			would have indicated the presence of an *Eleocharis* species. The TBDC notes that very little is known about the species and that the Conservation Advice (DEWHA 2008c) is the source of information for the species notes included in the TBDC. The Conservation Advice notes that the species is known to flower in November, based on information provided in (Cunningham *et al*., 1992). Given that 30 years have elapsed since that guidance was published, we have considered flowering period advice provided in another, more recent publication; VICFLORA (Royal Botanic Gardens Victoria 2014) which indicates flowering from spring – summer. Similarly, while the survey effort for the species was conducted just outside the survey period for the species, the potential habitats present are of poor quality for this species, and it is unlikely to have persisted in the proposal site and surrounding area. The known threats to the species are "habitat clearing and degradation due to agriculture, grazing and trampling by stock, weed invasion and grazing by exotic species" and the potential threats are identified as "habitat fragmentation and altered hydrology (and subsequent increased salinity)" (DEWHA 2008c). All of these threats are present within proposal site and wider study area and locality, and as such, it is unlikely that the species would even occur in the area. Despite this, targeted surveys were completed, despite falling just outside the recommended survey period. Given the degree of vegetation clearing, degradation due to agriculture, grazing and trampling by stock, weed invasion, habitat degradation and altered hydrology, this species is considered unlikely to occur, and has been excluded from the BAM-C case due to habitat degradation.
Cercartetus nanus Eastern Pygmy-possum	October to March	August	This species was originally considered unlikely to occur within the proposal site, given the degree of fragmentation and general lack of connectivity in the surrounding landscape, and so targeted surveys in the warmer months (ie spotlighting and camera trapping etc) were not completed. Following receipt of comments from BCS which indicate the fragmented landscape is not a sufficient rationale to exclude the species, it has been assumed to occur. Spotlighting surveys completed as part of searches for other species that focused on areas of vegetation that would comprise potential habitat for this species were completed in August, which is outside the required survey period of the warmer months of October to March.

3.5 Geographical Information System (GIS) analysis

GIS was used to:

– Plot the proposal site on a high resolution aerial photo base and to map vegetation zones, survey effort, habitat resources and biodiversity values across the site
– Calculate the extent of native vegetation to be impacted
– Identify patch sizes relevant to the proposal site
– Confirm the relevant IBRA bioregion, IBRA subregion and NSW (Mitchell) Landscape for the site.

Additional GIS analysis was used to plot a 1,500 metre buffer area surrounding the solar farm site and a 500 metre buffer around the transmission line alignment in which site context components were calculated. Native vegetation cover, extent and connectivity were assessed using aerial photography. Aerial photo interpretation was used to identify and record distinct vegetation patches, determine the broad condition state of vegetation types and the location and extent of vegetated habitat corridors. Aerial photography was examined at scales between 1:2000 and 1:4000. No buffer area was applied to the road upgrade footprint given a scattered tree assessment was applied to this portion of the proposal footprint, and no patch size is required to be entered into the BAM-C.

The buffer area and GIS area calculations were used to enter information about landscape value and to determine the change in Landscape Value score by assessing the impact of the proposal on native vegetation cover and connectivity as well as the patch size.

3.6 BAM calculations

The proposal was assessed according to the methodology presented in the BAM (DPIE 2020), and the Biodiversity Assessment Methods Calculator Users Guide (OEH, 2017b). The BAM calculator is a software application that is used to apply the BAM. Data is entered into the BAM calculator based on information collected in the desktop assessment, site surveys and from using GIS mapping software.

Due to the transmission line being a linear development and requiring a different buffer area for the landscape assessment to the solar farm, two calculator cases were assessed: one for the solar farm site using a 1,500 metre buffer; and second for the transmission line using a 500 metre buffer for a linear development. A third calculator case was set up for the scattered tree assessment on the solar farm proposal site. A fourth calculator case was set up for the scattered tree assessment along the proposed road upgrade footprint, to allow clear review of the different components of the proposal.

Initial BAM calculations were performed by Melissa Cotterill using calculator version 1.4.0.00. Revised BAM calculations, completed after receipt of comments from BCS were completed by Kath Chesnut using calculator version 1.4.0.00. Data entered into the BAM calculator is provided in Appendix D. The biodiversity credit reports are included in Appendix F.

3.6.1 Assessor's use of judgement

The narrow, linear nature of the transmission line alignment posed some challenges to siting vegetation integrity survey plots, as there was sometimes not a sufficient area of a particular vegetation zone within the proposal site to sample a plot. Similarly, the final transmission line route was not confirmed until late in the assessment process, with multiple options considered by the proponent, as part of the process of avoiding and minimising impacts. As such, some plots were sampled within areas that were once part of the anticipated proposal site but are no longer part of the footprint.

Certain vegetation integrity plots were sampled in vegetation adjacent to the proposal site, or within other vegetation that was representative of the narrow patches of vegetation within the footprint itself. Many of the vegetation integrity plots sampled outside of the proposal site informed the general descriptions of vegetation zones and assisted with vegetation zone mapping. Table 3.2. provides a summary of which plots were entered into the BAM-C, and which were only used to inform vegetation zone descriptions.

Table 3.9 provides a summary of plots sampled outside the proposal site but entered in the BAM-C based on accredited assessors' use of judgement while completing this BDAR.

Table 3.9: Justification for use of data from plots sampled outside the proposal site

Vegetation zone	Plots outside the proposal site	Justification
PCT 80 good	Plot PD	Sampled on an alternative alignment, within the centre of a patch of PCT 80 in good condition. A previous iteration of the ETL ran through this patch, which has since been largely avoided as part of footprint refinements. Sampled within a connected patch of vegetation that is representative of vegetation in this zone being impacted by the proposal, as there was not enough vegetation within the proposal site to sample.
PCT 76 good	Plot P4	Sampled in publicly available roadside vegetation just outside the proposal site. Insufficient vegetation in the proposal site to complete a plot, so connecting, immediately adjacent vegetation as sampled instead.
PCT 360 poor	Plot PA	Sampled within a previous iteration of the ETL, within a connected patch of vegetation that is representative of the proposal site.

Vegetation zone	Plots outside the proposal site	Justification
PCT 76 planted	Plot P3	Sampled in juvenile planted windbreak vegetation that is generally comparable in species assemblage to the small patch within the solar farm proposal site. The patch in the solar farm proposal site was too small to sample a vegetation integrity plot. Plot P3 data were also extrapolated to the 0.01 hectare area of the equivalent vegetation zone in the ETL proposal site.
PCT 76 derived native grassland	Plot P9	Sampled in publicly accessible roadside vegetation as access was unavailable within private property to sample other, larger patches. Floristic diversity and structure were broadly comparable to Plot 1 which was sampled within the proposal site.

3.7 Staff qualifications

The initial BDAR was prepared by Melissa Cotterill (accredited assessor number BAAS18127) based on the results of field surveys completed by GHD staff, with a technical review of the report and credit calculations undertaken by Ben Harrington (accredited assessor number BAAS17023) and Leigh Maloney (accredited assessor number BAAS18086). This revised BDAR has been completed by Kath Chesnut (accredited assessor number BAAS17031), with updates made in response to comments received from BCS, and a review has been completed by Ben Harrington. The BDAR has been prepared in accordance with the BAM. Staff qualifications are presented in Table 3.10.

Table 3.10: GHD ecology staff and qualifications

Name	Position / Project role	Qualifications	Relevant experience
Ben Harrington	Technical Director Biodiversity Technical Review	BSc, MSc, Accredited BAM Assessor (BAAS17023)	19+ years
Kath Chesnut	Senior Ecologist Lead assessor, credit calculations, reporting, field surveys	BEnvSc (Hons) Accredited BAM Assessor (BAAS17031)	12+ years
Leigh Maloney	Senior Ecologist Field surveys, Credit calculations review	BEnvSc (Hons) Accredited BAM Assessor (BAAS18086)	17+ years
Kirsten Crosby	Senior Ecologist Targeted fauna surveys	BSc (Zoology), PhD Accredited BAM Assessor (BAAS17011)	16+ years
Melissa Cotterill	Ecologist Field surveys, reporting	BSc (Biology) Accredited BAM Assessor (BAAS18127)	9+ years
Brianna Turner	Graduate Ecologist Site surveys, draft reporting	BSc (Ecology)	3+ years
Cindy Murphy	Ecologist Site surveys	BSc (Earth Science)	2+ years

4. Landscape context

The BAM requires the assessment of landscape features to help describe the biodiversity values of the proposal site and assess the impacts of the proposal. Landscape features relevant to the BAM calculations are shown on Figure 4-1, discussed below and summarised in Table 4.1.

4.1 Location

The proposed solar farm site is located about 11 kilometres north-east of Forbes, within the Forbes Shire Council local government area. The solar farm proposal site is within a rural property located on the southern side of Troubalgie Road, about five kilometres east of the Newell Highway at part Lot 77 of DP 750183.

The ETL proposal site comprises the corridor for an approximately 8.5-kilometre-long transmission line between the north-western boundary of the solar farm site and a switchyard to be located adjacent to the existing Forbes-Parkes 132kV transmission line about 500 metres west of the Newell Highway (refer to Figure 1.2).
The transmission line alignment traverses a number of private properties and road reserves along its length.

The proposed road upgrade footprint overlaps about 1.7km of the existing Troubalgie Road and Back Yamma Road. All upgrades would be within the existing road reserve.

4.2 Existing land uses

The solar farm proposal site is about 300 hectares in size, and has previously been used for agricultural purposes, with the primary use being cropping with some grazing. The site contains limited infrastructure, with only a disused shed next to an access track into the property from Troubalgie Road. An alternative property access point is located on the eastern boundary of the site and runs along the boundary.

The photo below shows cropping (canola) within the solar farm proposal site. The photo was taken during a period of extended heavy rain (September 2022), when there was ongoing flooding within the district.

Photo 1 Cropping within the solar farm proposal site

The ETL proposal site crosses numerous private properties used for both grazing and cropping. Two property access tracks are crossed in the central and western sections of the alignment and two local roads: Forest Road and Daroobalgie Road in the eastern and western sections of the alignment, respectively. The Newell Highway and Stockinbingal Parkes Railway are crossed in the western section of the alignment.

The transmission line alignment also crosses a portion of Crown Reserve (Lot 7003 DP 1060435.) bordering the western side of the railway, which is used as a Travelling Stock Route (TSR). The land spanned by the ETL is in varying condition, reflecting the different land uses along its length. Much of the footprint has been previously

disturbed by agricultural practices or historical land clearing, which is reflected in the low native understorey cover and species richness along much of its length.

Photo 2 Disturbed understorey and regrowth Callitris within the ETL footprint

The road upgrade footprint overlaps with the existing Troubalgie Road, which is a dirt road with table drains on either side. At the time of the field survey of the road upgrade footprint, the local area was experiencing a period of prolonged rain and localised flooding. There was evidence of ongoing land management practices along Back Yamma Road and Troubalgie Road, with signs that a wheeled vehicle had driven along each table drain with a bucket or dozer attachment to clear the drains of most vegetation, whether for flood mitigation, weed control or bushfire hazard reduction works. Vegetation that remained was dominated by exotic pasture and herbaceous cropping species, with occasional canopy species (which were assessed as part of a scattered tree module).

Photo 3 Existing Troubalgie Road, including table drains along either side of the road

4.3 Climate

In the town of Forbes, located approximately 11 kilometres south-west of the proposal site the climate is generally warm in summer and cold in winter months, with relatively low amounts of rainfall. About 491 mm of precipitation falls annually with lowest rainfall occurring in April, and highest in December. January typically experiences the

warmest temperatures, with an average maximum temperature of 34.5 degrees Celsius and July experiences the coolest average minimum temperatures at 2.5 degrees Celsius.

4.4 Hydrology

There are no permanent rivers or streams within the proposal site. Several small, ephemeral, unnamed drainage lines occur within the proposal site, as shown on Figure 1.2. A number of small farm dams are also present within both the solar farm and ETL proposal site. The water level in these dams has fluctuated throughout the various field surveys that have been completed for this BDAR, and the presence of fringing vegetation is influenced by the water level as well as general climatic conditions in the months preceding surveys.

There are also several areas where gilgais are present along the proposal site. As with dams and drainage lines along the proposal site, the presence and amount of water in the gilgais fluctuated during field surveys, with vegetation in the gilgais increasing in floristic diversity and abundance in response to rainfall, and dying off during periods of drought.

4.5 Landscape features

The study area occurs in the NSW South Western Slopes IBRA bioregion. Landscape features within the proposal site are summarised in Table 4.1 and shown in Figure 4.1 as required by Section 3.1 of the BAM.

Table 4.1: Landscape features

Landscape features	Study area
IBRA bioregions and subregions	NSW South West Slopes Bioregion, Lower Slopes
NSW (Mitchell) Landscape regions	Eugowra Plains (solar farm site and eastern section of transmission line) Calarie Plains (western section of transmission line)
Local Government Area (LGA)	Forbes
Rivers and streams	Undefined, ephemeral drainage lines are present in the eastern and western sections of the transmission line proposal site, and through the south-eastern corner of the solar farm proposal site. These are not listed as key fish habitat.
Important wetlands	No important wetlands occur within the proposal site, on adjacent lands or downstream.
Connectivity features	Vegetation at the proposal site provides limited connectivity with adjacent areas. There is a vegetated TSR at the western end of the transmission line alignment which forms part of a narrow, linear corridor of vegetation that is spanned by the transmission line proposal site.
Areas of geological significance and soil hazard features	There are no karst, caves, crevices, cliffs, rocks or other areas of geological significance located within the proposal site or buffer area surrounding the site.
Areas of outstanding biodiversity value	No declared areas of outstanding biodiversity value occur in or near the proposal site
Landscape features listed in the SEARs	No additional landscape features are listed in the SEARs

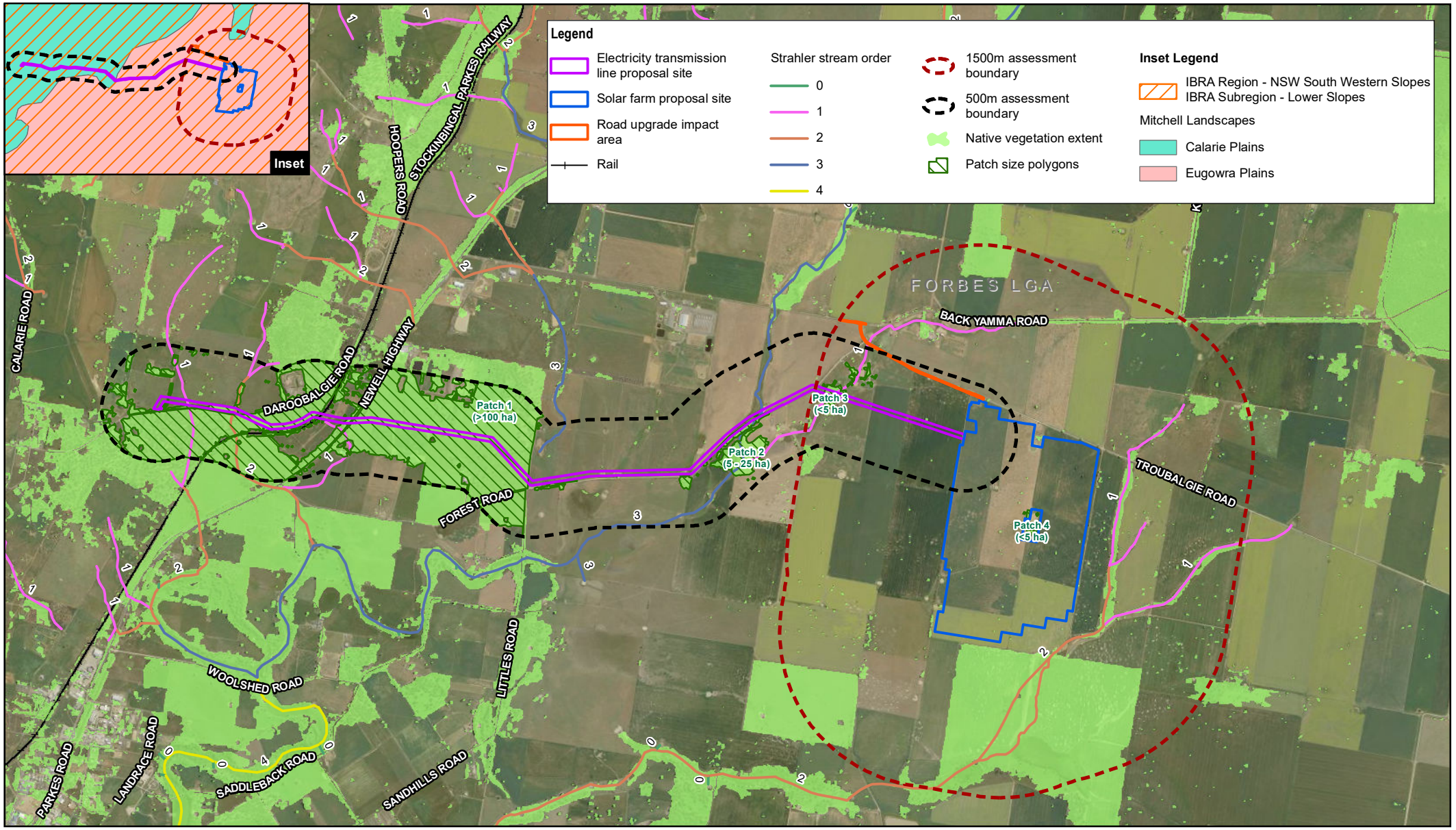
4.5.1 NSW (Mitchell) landscape

The proposal site is located within the two NSW (Mitchell) Landscapes: the Eugowra Plains and Calarie Plains. The descriptions for these landscapes are reproduced below from DECC (2008a):

Eugowra Plains: Alluvial plains and lower hill slopes of the Lachlan River terraces and tributary valleys on Quaternary alluvium. General elevation 250 to 300 metres, local relief 15 metres. Extensive red-brown earths and cracking clay soils. Extensively cleared and farmed. Originally this area carried white cypress pine (*Callitris glaucophylla*) and grey box (*Eucalyptus microcarpa*) with yellow box (*Eucalyptus melliodora*) communities and River Red Gum (*Eucalyptus camaldulensis*) adjacent to stream lines. Includes small areas of low bedrock hills.

Calarie Plains: Undulating low hills and rises on folded steep dipping Ordovician quartz sandstone, slate and chert, Silurian and Devonian quartzite, sandstone, conglomerate and small areas of limestone. General elevation 250 to 300m, local relief 15m. Open woodlands of red ironbark (*Eucalyptus sideroxylon*) and grey box (*Eucalyptus microcarpa*) with a grassy understorey.

The soils, vegetation and landform across the majority of the proposal site is mapped as the Eugowra Plains soil landscape. It is characterised by alluvial clay soils on a relatively flat landscape and supports vegetation containing Grey Box (*Eucalyptus microcarpa*) with White Cypress Pine (*Callitris glaucophylla*) as described in the description of this soil landscape. Consequently, 'Eugowra Plains' was entered as the Mitchell landscape for the solar farm, road upgrade scattered tree assessment, solar farm scattered tree assessment and transmission line BAM calculator cases.



Paper Size ISO A4

0 375 750 1,125 1,500

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Biodiversity Development Assesssment Report

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Location map

Figure 4.1

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4.6 Determining site context

To determine site context as required under the BAM (Section 3.2 and Subsection 4.3.2), an assessment of native vegetation cover and patch size has been undertaken and is outlined below.

4.6.1 Native vegetation cover

Native vegetation cover (woody and non-woody) was assessed on the proposal site and within a 1,500 metre buffer area surrounding the outside edge of the boundary of the solar farm proposal site, and within a 500 metre buffer area surrounding the outside edge of the boundary of the transmission line proposal site (approach for linear development). Aerial photography was examined at scales between 1:2000 and 1:4000. The percent native vegetation cover within the 1,500 metre and 500 metre buffer areas were assessed to be 17 percent and 33 percent respectively and includes (see Table 4.2):

– Remnant native vegetation types
– Planted native vegetation types
– Gilgai wetlands
– Derived native grasslands.

Areas that were excluded include:

– Cleared areas
– Non-native vegetation
– Dams, ponds and other waterbodies (not including gilgai wetlands)
– Buildings
– Non-native plantings.

The identification of native vegetation (including derived native grasslands) in the buffer areas was based on review of the NSW Native Vegetation Extent 5m Raster v1.2 (2018 woody extent layer), in combination with aerial photograph interpretation and ground-truthing during field surveys.

Table 4.2: Native vegetation cover

Native vegetation cover unit	1,500 m (solar farm) buffer area	500 m (electricity transmission line) buffer area
Total assessment area	1,961 (nearest whole ha)	967 (nearest whole ha)
Area of native vegetation cover (woody and non-woody)	332 (nearest whole ha)	315 (nearest whole ha)
% native vegetation cover	17%	33%
Cover class	>10–30%	>30–70%

4.6.2 Patch size

Patch size is defined under the BAM (DPIE 2020) as an area of native vegetation that:

– Occurs on the development site or biodiversity stewardship site (i.e. proposal site).
– Includes native vegetation that has a gap of less than 100 metres from the next area of native vegetation (or ≤ 30 metres for non-woody ecosystems).

Patch size may extend into adjoining land that is not part of a development site or a biodiversity stewardship site. Patch size area is assigned to each vegetation zone as a class, being < 5 hectares, 5-<25 hectares, 25-<100 hectares or ≥ 100 hectares.

Four different patches were identified as occurring within the proposal site and extending beyond the proposal site (see Table 4.3, Figure 4.1). These patch size polygons are associated with vegetation zones in the proposal site and include remnant woodland, derived scrub, Inland Floodplain Swamps and derived native grasslands.

One of the patch sizes was greater than 100 hectares and therefore the patch size for connected vegetation zones was entered as 101. Where the patch size was greater than 100 hectares, the assessor stopped calculating the total area of the patch at the edge of the assessment area. Discontinuous vegetation zones were all part of the same patch.

Table 4.3: Patch sizes at the proposal site

Patch	Size (nearest whole hectare)	Patch size class
1	291	>100 ha
2	16	5 - 25 ha
3	1	<5 ha
4	4	<5 ha

4.6.3 Land categorisation designations

The results of the land use categorisation desktop assessment combined with the results of the field survey confirmed the presence of large areas of land that meet the definition of category 1- exempt land.

As outlined in Section 3.1.3, areas of category 1 land were identified based on the results of desktop assessment and field survey verification. Figure 4.2 shows the areas identified as category 1 land as part of this assessment. To establish which areas of land were category 1 land, areas that were mapped as 'cropping' on the NSW Land Use 2017 map, **and** which overlapped areas mapped as 'not native' on the NSW Native Vegetation Extent 5m Raster v1.2 (2018 woody extent layer), **and** which were shown on aerial photographs to support evidence of cropping and/or were visually inspected during field surveys and confirmed to be used for cropping, were mapped as category 1 land. Areas of hardstand such as roads were excluded from the mapping.

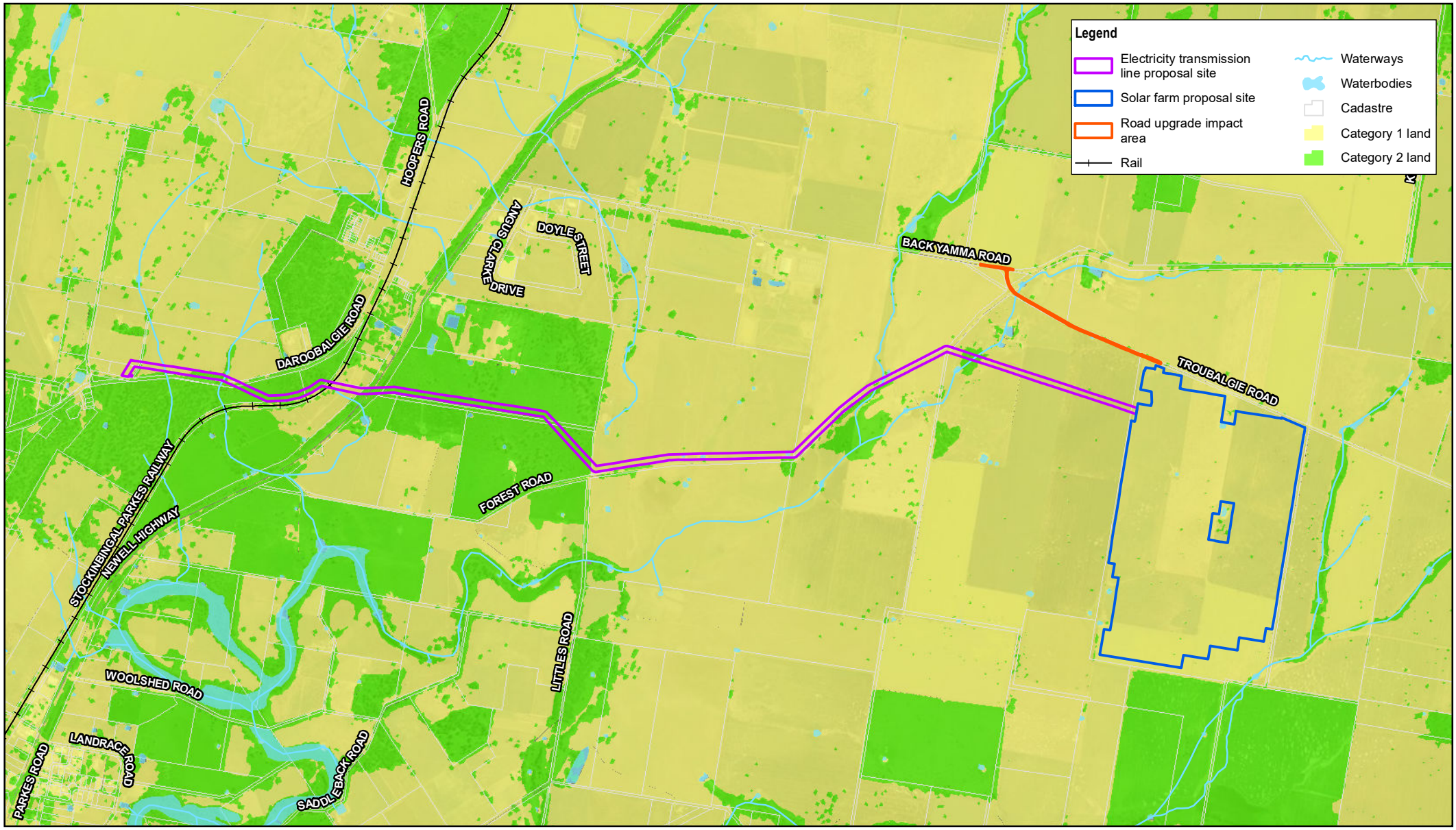
There are several small patches of planted vegetation within the solar farm proposal site, presumably planted as windbreaks. Some of these plantings have been classified as category 1 – exempt land as they were planted post-1990 and are within existing cropped paddocks (refer to Figure 5.1). A review of Google Earth historical imagery indicates that the plantings were absent in 2006. These plantings were not established or grown with the help of public funds or assistance, and as such, do not meet the definition of category 2 – regulated land. These plantings also comprise a random mixture of species, including species that are not locally indigenous to the area and cannot be easily assigned to a PCT. All individuals are juvenile, with small DBHs and no hollows.

One small patch of planted trees within the solar arm proposal site has been mapped as PCT ID 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregion (planting). This patch is present on the 2006 aerial image with no previous images available, and contains species characteristic of that PCT. This patch is therefore not classified as category 1 land and is subject to the BAM.

Stretches of the ETL proposal site were also mapped as category 1 – exempt land, when they met the criteria listed above, based on the methodology outlined in Section 3.1.3. The land use within the region varies depending on the weather conditions, with less intensive cropping undertaken during periods of extended wet weather, and intensive cropping instigated when conditions are dry enough to allow successful sowing and harvest. Figure 4.2 shows the areas of the proposal site that have been designated category 1 exempt land.

Within the solar farm proposal site and within the road upgrade footprint, the scattered paddock trees have been designated as category 2 land, as they are mapped as 'tree cover' on the NSW Native Vegetation Extent 5m Raster v1.2 (2018 woody extent layer) (Figure 4.2).

At the western end of the ETL proposal site, there is a narrow strip of planted non-vegetation comprising species that are not locally native along the access road/driveway to the nearby property. This patch is mapped as 'cropped' on the Landuse maps but is mapped as 'tree cover' on the NSW Native Vegetation Extent 5m Raster v1.2 (2018 woody extent layer). A conservative approach has been taken, as recommended by BCS and the BAM, and this patch has not been mapped as category 1 land given the presence of woody vegetation and lack of historical aerials that demonstrate the date this vegetation was planted.



Paper Size ISO A4

0 300 600 900 1,200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Pacific Hydro
Daroobalgie Solar Farm
Biodiversity Development Assesssment Report

Project No. **23-16511**
Revision No. **0**
Date **20 Oct 2022**

Land categorisation

Figure 4.2

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5. Vegetation and habitats

5.1 Native vegetation extent

The majority of the proposal site has been cleared and used for agriculture (predominantly cropping, with some sheep and cattle grazing). Most of the solar farm proposal site comprises cropping land which has been classed as category 1 land, with only scatted paddock trees and one very small patch of native vegetation remaining. Table 5.1 presents a description of non-native vegetation in the proposal site, including category 1 land.

Much of the transmission line proposal site has also been cleared of native vegetation, however native grassland species have persisted in the central portion of the alignment with derived native grassland dominating. There are small patches of Gilgai wetland dominated by *Eleocharis* spp., with native grass species such as *Cynodon dactylon* (Couch) and *Enteropogon acicularis* (Curly Windmill Grass) surrounding the gilgais, and Weeping Myall woodland. The western section of the alignment traverses the edge of a Crown Reserve TSR, with a patch of woodland dominated by Grey Box.

There is a total extent of 14.91 hectares of native vegetation mapped within the solar farm site boundary and ETL proposal site (including the switchyard site). It has been assumed that all vegetation within the proposal site will be cleared, with 0.22 hectares of planted native trees within the solar farm site, and 14.69 hectares of remnant native woodland patches, gilgai wetlands and derived native grassland within the transmission alignment (see Figure 5.1).

Table 5.1 Exotic vegetation (including category 1 land)

Attribute	Description
Vegetation Formation	N/A
Vegetation Class	N/A
PCT ID	N/A
PCT % Cleared	N/A
Plots sampled	N/A
Floristic description	Non-native vegetation in the study area is dominated by exotic grasslands comprising pastures or cropping. The dominant introduced species recorded within these areas and other exotic grasslands, including disturbed roadsides, include Wimmera Ryegrass (*Lolium rigidum*), Capeweed (*Arctotheca calendula*), Barley Grass (*Hordeum leporinum*), Paterson's Curse (*Echium plantagineum*), Small-flowered Mallow (*Malva parviflora*), St John's Wort (*Hypericum perforatum*) and Winter Grass (*Poa annua*).
Justification for PCT selection	N/A
Conservation significance	N/A

Attribute	Description
Photograph	 Photograph 1 Non-native vegetation (exotic grassland) along the transmission alignment.  Photograph 2 Non-native vegetation (cropped) within the solar farm site, mapped as category 1 land.  Photograph 3 Cropped vegetation within the solar farm site, mapped as category 1 land.

5.2 Planted native vegetation assessment

Planted native vegetation within the study area was compared with the decision-making key in Appendix D.1 of the BAM. A summary of the comparison is provided in Table 5.2 and justification is provided below.

Table 5.2: Planted native vegetation key

Number	Question	Answer
Question 1	Does the planted native vegetation occur within an area that contains a mosaic of planted and remnant native vegetation and which can be reasonably assigned to a PCT known to occur in the same IBRA subregion as the proposal?	No
Question 2	Is the planted native vegetation: planted for the purpose of environmental rehabilitation or restoration under an existing conservation obligation listed in BAM Section 11.9(2.), and the primary objective was to replace or regenerate a plant community type or a threatened plant species population or its habitat?	No
Question 3	Is the planted/translocated native vegetation individuals of a threatened species or other native species planted/translocated for the purpose of providing threatened species habitat under one of the following: species recovery project Saving our Species project other types of government funded restoration project condition of consent for a development approval that required those species to be planted or translocated for the purpose of providing threatened species habitat legal obligation as part of a condition or ruling of court. This includes regulatory directed or ordered remedial plantings (e.g. Remediation Order for clearing without consent issued under the BC Act or the Native Vegetation Act) ecological rehabilitation to re-establish a PCT or TEC that was, or is carried out under a mine operations plan, or approved vegetation management plan (e.g. as required as part of a Controlled Activity Approval for works on waterfront land under the NSW Water Management Act 2000)?	No
Question 4	Was the planted native vegetation (including individuals of a threatened flora species) undertaken voluntarily for revegetation, environmental rehabilitation or restoration without a legal obligation to secure or provide for management of the native vegetation?	No
Question 5	Is the native vegetation (including individuals of a threatened flora species) planted for functional, aesthetic, horticultural or plantation forestry purposes? This includes examples such as: windbreaks in agricultural landscapes, roadside plantings (including street trees, median strips, roadside batters), landscaping in parks, gardens and sport fields/complexes, macadamia plantations or teatree farms?	Yes

Planted native vegetation at the western end of the ETL proposal site appears to have been planted for functional and aesthetic purposes as part of typical agricultural land management practices (ie establishing a windbreak and visual amenity). Vegetation within this area has not been planted with species that resemble any locally occurring PCTs and cannot be reasonably assigned to a PCT known to occur in the same IBRA subregion as the project.

The BAM notes that vegetation that meets the above criteria does not need to be assessed in line with Chapter 4 or 5 of the BAM, but Appendix D.2 must be applied, and the vegetation must be assessed for threatened species habitat (refer to Section 6.3). As such, this area of planted vegetation has not been entered as a vegetation zone in the BAM calculator.

Any opportunistic or incidental sightings of threatened biota within planted native vegetation have been recorded during this assessment, and, where relevant, Section 8.4 of the BAM has been applied and mitigation measures have been recommended for impacts on these species as a result of the project. Species credits have not been calculated for any such impact, in line with the BAM.

A description of planted vegetation within the proposal site that could not be appropriately matched to any locally occurring PCTs is provided below, and is mapped on Figure 5.1.

Table 5.3: Planted vegetation

Attribute	Description
Vegetation Formation	N/A
Vegetation Class	N/A
PCT ID	N/A
PCT % Cleared	N/A
Plots sampled	N/A
Floristic description	The plantings in the western section of the proposal site are comprised of non-locally native eucalypts including Sugar Gum (*Eucalyptus cladocalyx*) and mallee species not native to NSW.
Justification for PCT selection	N/A. This vegetation could not be appropriately allocated to any locally occurring PCTs. The species assemblage did not match with any local PCT types, and the species that have been planted appear to have been selected based on likely survival, availability and aesthetics, rather than being characteristic of local PCTs.
Conservation significance	N/A
Photograph	 Photograph 4 Planted mallee in the western section of the ETL.

Attribute	Description
	 Photograph 5 Planted Sugar Gum in the western section of the ETL.

5.3 Flora species

Appendix B provides a list of the flora species recorded during the field survey.

No threatened flora species were identified within the proposal site during field surveys. Targeted threatened flora survey effort was largely limited to the transmission line easement because much of the solar farm proposal site is cropped and has subsequently been classified as category 1 land. Cropped areas do not provide suitable habitat for the threatened flora species. Threatened flora survey effort within the solar farm site was restricted to the small areas that support native vegetation.

5.3.1 Priority and high threat exotic weed species

There were no priority weeds listed in the Central West region (which includes the Forbes local council area) recorded within the proposal site during the field surveys.

The following exotic species recorded in the proposal site are classified as high threat exotics for the purposes of the BAM:

- *Xanthium spinosum* (Bathurst Burr)
- *Phalaris aquatica* (Phalaris)
- *Carthamus lanatus* (Saffron Thistle)
- *Paspalum dilatatum* (Paspalum)
- *Romulea rosea* (Onion Grass)
- *Hypericum perforatum* (St John's Wort).

5.4 Vegetation in the region

The Forbes region is located on the Lower Slopes, ranging from undulating to hilly ranges and isolated peaks set in wide valleys at the apices of the Riverina alluvial fans. The geology of the region features Ordovician to Devonian folded and faulted sedimentary sequences with inter-bedded volcanic rocks and large areas of intrusive granites and Tertiary and Quaternary alluvium. Soils are characterised by shallow stony soils on steep slopes,

texture contrast soils grading from red subsoils on upper slopes to yellow subsoils on lower slopes. There are extensive red-brown earths on undulating plains and grey clays on alluvium (OEH 2016a).

The region supports a wide variety of vegetation types from semi-arid woodland to grassy woodlands. Typical species in the lower parts of the region are dominated by *Eucalyptus microcarpa* (Grey Box) with *Eucalyptus melliodora* (Yellow Box), *Casuarina cristata* (Belah) and *Callitris glaucophylla* (White Cypress Pine) with *Eucalyptus dwyeri* (Dwyer's Red Gum) on granite, *Eucalyptus sideroxylon* (Mugga Ironbark) on sedimentary and *Eucalyptus dealbata* (Tumbledown Red Gum), White Cypress Pine and *Eucalyptus macrorhyncha* (Red Stringybark) in the ranges. *Eucalyptus populnea* (Poplar Box), *Brachychiton populneus* (Kurrajong), *Geijera parviflora* (Wilga) and *Eucalyptus polyanthemos* in the northern part of the subregion, with limited areas of mallee species in the central west. *Acacia pendula* (Weeping Myall), *Alectryon oleifolius* (Rosewood) and *Acacia homalophylla* (Yarran) occur on grey clays with Yellow Box, Poplar Box and Belah occurring on alluvial loams. *Eucalyptus camaldulensis* (River Red Gum) occurs on all streams, with *Eucalyptus largiflorens* (Black Box) occurring in the west with some *Duma florulenta* (Lignum) and *Acacia stenophylla* (River Cooba) (OEH 2016a).

The discovery of gold in the region saw the widespread felling of local box and stringybark timber, which was used for fuel for steam dredges (OEH 2016b). By the 1820s, pastoralists were making their mark on the landscape, with cattle stations prominent in the region (OEH 2016b). As such, much of the original vegetation in the region has been cleared to support agriculture, both cropping and grazing, with remaining intact or remnant woodland vegetation on the flats occurring as scattered patches within a predominantly agricultural landscape.

5.5 Vegetation in the proposal site

5.5.1 Plant community types

Several small patches of remnant woodland, small areas of native tree plantings, and several moderately sized patches of derived native grassland are present in the proposal site, along with large areas of cropped land that have been designated as category 1 land. Woodland that is connected to larger patches, such as the TSR in the western section of the study area, and Weeping Myall woodland in the central section, generally feature higher native groundcover cover and diversity, likely due to lower levels of disturbance.

Areas of native vegetation in the proposal site have been mapped and described in accordance with the BAM. Five PCTs have been identified in the proposal site. The BAM notes that any planted native vegetation that occurs within an area that contains a mosaic of planted and remnant native vegetation and which can be reasonably assigned to a PCT, must be allocated to the best-fit PCT. Planted vegetation within the proposal site has been allocated to a PCT where the mix of native species could be reasonably fitted to a candidate PCT.

The derived native grasslands that occur at the proposal site are generally continuous with the understories of the surrounding remnant woodland patches and are considered to be derived from the clearing of the original woodland PCT. For this reason, the various areas of derived native grassland have been assigned to the woodland PCTs that they are most likely to correspond with, based on their landscape position and existing regional vegetation mapping. In determining the original woodland PCT that would have occurred at a location, consideration was given to nearby woodland patches (within and outside of the proposal site), existing regional vegetation mapping and any scattered paddock trees present. Native plantings that are comprised of NSW endemic species were placed into the closest matching PCT based on species, landform and soil type.

Three of the PCTs identified within the proposal site comprise occurrences of threatened ecological communities under the EPBC Act and/or the BC Act (see section 6.2.3 and 7.1).

Description profiles of the PCTs present in the study area are provided in the following tables.

The structure, species composition and condition of the PCTs within the study area are described below. Plant species lists for each PCT are provided in Appendix B and plot data is provided in Appendix E along with benchmark values for each PCT.

Table 5.4: Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion

Attribute	Description
Vegetation Formation	Semi-arid Woodlands (grassy sub-formation)
Vegetation Class	Riverine Plain Woodlands
PCT ID	26
Plots sampled	Good - 2, P5, P10 (only Plot 2 was included in the BAM-C calculations) (vegetation zone 2)
Floristic description	Open woodland up to 8m high dominated by Weeping Myall (*Acacia pendula*). Other tree species include scattered Belah (*Casuarina cristata*), while Black Box (*E. largiflorens*) and River Red Gum may occur in depressions. Chenopod shrubs may be absent but if present include *Rhagodia spinescens, Maireana decalvans, Atriplex nummularia, Maireana aphylla* and *Chenopodium nitrariaceum*. Other shrub species that occur include *Hakea leucoptera, Santalum lanceolatum* and *Exocarpos aphyllus*. The groundcover is dominated by grass species and includes *Rytidosperma caespitosum, Rytidosperma setaceum, Austrostipa aristiglumis, Austrostipa scabra, Austrostipa nodosa* and *Sporobolus caroli*. Saltbush species include *Atriplex spinibractea, Atriplex leptocarpa* and *Atriplex semibaccata*. Forb species include *Alternanthera denticulata, Myriocephalus rhizocephalus, Centipeda cunninghamii, Rhodanthe corymbiflora* and *Vittadinia cuneata*.
Justification for PCT selection	Within the proposal site, this PCT was dominated by Weeping Myall on loam soils on alluvial plains north of Forbes consistent with the landform position, dominant canopy, soil types and location attributes described for this PCT in the BioNet Vegetation Classification database. Multiple small shrub and ground cover species listed in BioNet for this PCT occurred in the plot. No *Eucalyptus* or *Casuarina* species were present within this vegetation zone in the study area.
Conservation significance	The woodland occurrences of this community at the proposal site are consistent with the final determination for the EEC *Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions* (BC Act). The woodland occurrences are also consistent with the related EEC *Weeping Myall Woodlands* as listed under the EPBC Act.
Photograph	 Photograph 6 Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion.

Table 5.5: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Attribute	Description
Vegetation Formation	Grassy Woodlands
Vegetation Class	Floodplain Transition Woodlands
PCT ID	76
Plots sampled	Planted - P3 (plantings in central section of solar farm site are consistent) (vegetation zone 1) Good - P4, P2, DAR001S, PE (only P4 was used in the BAM-C calculations (vegetation zone 3) Derived native grassland - 1, P9, P7, P8 (only Plot 1 and P9 were included in the BAM-C calculations (vegetation zone 4)
Floristic description	This community is a tall woodland to 25 metres high dominated by Western Grey Box (*Eucalyptus microcarpa*), often as the only tree species. Other canopy species that may occur include Yellow Box (*E. melliodora*), White Cypress Pine (*Callitris glaucophylla*) and minor Buloke (*Allocasuarina leuhmannii*). The shrub layer if present is sparse and includes *Dodonaea viscosa subsp. cuneata, Acacia buxifolia, Acacia acinacea, Acacia hakeoides, Bursaria spinosa*. A mid-dense or dense, grassy ground cover is present composed of *Rytidosperma caespitosum, Rytidosperma setaceum, Austrostipa scabra*, *Paspalidium constrictum, Themeda australis, Austrostipa aristiglumis, Aristida behriana* and *Anthosachne scabra.* The small scrambler *Einadia nutans* is usually present. Native forbs include *Sida corrugata, Wahlenbergia gracilis, Vittadinia gracilis, Dianella porracea, Oxalis perennans* and *Chamaesyce drummondii*.
Justification for PCT selection	Within the proposal site, the PCT was dominated by a canopy of Western Grey Box on clay soils on undulating alluvial plains north of Forbes, which is the northern extent of the community consistent with the landform position, dominant canopy, soil types and location attributes described for this PCT in the BioNet Vegetation Classification database. Multiple ground cover species consistent described for this PCT in the BioNet occurred in the plots sampled. The derived native grassland (DNG) form of the community is consistent with these attributes, but lacks a Western Grey Box canopy. Areas mapped as the DNG form of the community occurred adjacent to the woodland form of the community. The planting within the solar farm site is a mixed planting including Western Grey Box and River Red Gum. Given the presence of planted Western Grey Box, and connectivity with remnant Western Grey Box woodland patches, in an equivalent landscape position, the planting has been placed in this PCT as the closest fit PCT.
Conservation significance	Occurrences of this community within the study area are consistent with the final determination for the EEC *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions*. These patches are also commensurate with the related EEC listed under the EPBC Act as *Grey Box (Eucalyptus microcarpa) Grassy Woodland and Derived Native Grasslands of South-Eastern Australia.* The derived grassland form of the community also classifies for listing under the BC and EPBC Acts due to being dominated by native species, patches being of an appropriate size and the ground layer containing at least 12 native species. The planted form of the community classifies for listing under the BC Act, however does not meet the key diagnostic characteristics in the listing advice for the EPBC Act form of the community due to the low canopy cover and small size class of the trees in the planted areas.

Attribute	Description
Photograph	 Photograph 7 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (planted)  Photograph 8 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (good)

Attribute	Description
	 Photograph 9 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (derived native grassland)

Table 5.6: Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion

Attribute	Description
Vegetation Formation	Grassy Woodlands
Vegetation Class	Floodplain Transition Woodlands
PCT ID	80
Plots sampled	Good - PD Derived native grassland – JP02, JP08, PF (only JP02 and JP08 were included in the BAM-C calculations) (vegetation zone 6) Derived scrub - 3 DAR002S (only Plot 3 was included in the BAM-C calculations (vegetation zone 7)
Floristic description	This community is a tall woodland up to 25 metres high but averaging about 20 metres and co-dominated by Western Grey Box and White Cypress Pine. Other trees may include Yellow Box, Buloke, *Pittosporum angustifolium* and Kurrajong (*Brachychiton populneus*). If present, a sparse layer of shrubs includes Wilga (*Geijera parviflora*), *Eremophila deserti*, Quandong (*Santalum acuminatum*) and wattles such as *Acacia deanei* subsp. *deanei, Acacia hakeoides, Acacia brachybotrya* and *Acacia buxifolia*. The low shrub *Maireana microphylla* is often the most common shrub present where tall shrubs are absent. A sparse to mid-dense ground cover includes sub shrubs such as *Einadia nutans* and *Eremophila debilis* with grass species such as *Austrostipa scabra*, *Rytidosperma setaceum, Rytidosperma fulvum, Anthosachne scabra, Enteropogon acicularis* and *Aristida ramosa*. Forb species include *Calotis cuneiofolia, Sida corrugata, Dichondra* sp. A, *Daucus glochidiatus, Oxalis perennans, Arthropodium minus, Bulbine* spp. and *Goodenia pinnatifida*. The rock fern *Cheilanthes sieberi* is common along with the graminoid *Lomandra filiformis*.
Justification for PCT selection	Within the proposal site, this PCT was dominated by a canopy of Western Grey Box and to a lesser extent White Cypress Pine on clay-loam soils on alluvial plains consistent with the attributes described for this PCT in the BioNet Vegetation Classification database (landform position, dominant canopy, soil types, location). Multiple shrub and ground cover species listed in BioNet for this PCT occurred in the plots sampled. The DNG form of the community is consistent with these attributes, other than the absence of canopy species and occurs adjacent to the woodland form of the community. The derived scrub form of the community is dominated by White Cypress Pine as a small tree layer, but lacks a canopy due to historical timber getting and clearing for agriculture.

Attribute	Description
Conservation significance	Occurrences of this community within the study area are consistent with the final determination for the EEC *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions*. These patches are also commensurate with the related EEC listed under the EPBC Act as *Grey Box (Eucalyptus microcarpa) Grassy Woodland and Derived Native Grasslands of South-Eastern Australia.* The derived grassland and derived scrub forms of the community also classifies for listing under the BC and EPBC Acts due to being dominated by native species, patches being of an appropriate size and the ground layer containing at least 12 native species. These forms of the community are connected to the woodland form and part of the same patch.
Photograph	 Photograph 10 Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion (good)  Photograph 11 Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion (derived native grassland)

Attribute	Description
	 Photograph 12 Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion (derived scrub)

Table 5.7: Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt)

Attribute	Description
Vegetation Formation	Grassy Woodlands
Vegetation Class	Floodplain Transition Woodlands
PCT ID	244
Plots sampled	Planted - 4 (vegetation zone 8)
Floristic description	This community is a mid-high to tall woodland or open woodland, averaging 13 metres high, dominated by *Eucalyptus populnea subsp. bimbil* (Poplar Box). The small trees Belah or Western Rosewood (*Alectryon oleifolius*) may be present but not co-dominant. Tall shrub species include Wilga, Warrior Bush (*Apophyllum anomalum*) and Budda (*Eremophila mitchellii*). Low shrubs include *Maireana microphylla, Maireana decalvans* and Thorny Saltbush (*Rhagodia spinescens*). The ground cover is mid-dense to sparse and contains sub shrubs such as *Sclerolaena birchii* and *Sclerolaena muricata* and a range of grass species including *Rytidosperma setaceum, Enteropogon acicularis, Austrostipa scabra, Anthosachne scabra, Eragrostis parvifolia, Chloris truncata, Rytidosperma fulvum* and *Sporobolus caroli*. Herb species include *Calotis cuneifolia, Sida corrugata, Vittadinia dissecta*, *Dichondra repens, Rostellularia adscendens* subsp. *adscendens, Oxalis perennans* and *Rumex brownii*. Sedges such as *Eleocharis plana* and *Carex inversa,* rushes (*Juncus* spp.) and the wetland fern Nardoo (*Marsilea drummondii*) grow in slight depressions.
Justification for PCT selection	In the proposal site this PCT occurs as a planting with the dominant canopy species being Poplar Box. Although the groundcover is dominated by introduced species, many of the native species that occur are consistent with those in the PCT description. This was the closest fit PCT based on the distribution information in the PCT database (lower slopes subregion and occurrence on flats on alluvial plains).
Conservation significance	The occurrence of this community within the study area does not meet the key diagnostic characteristics in the listing advice for *Poplar Box Grassy Woodland on Alluvial Plains* as listed under the EPBC Act due to the absence of mature trees or a range of tree ages in the patch.

Attribute	Description
Photograph	 Photograph 13 Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) (planted)

Table 5.8: Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion

Attribute	Description
Vegetation Formation	Freshwater Wetlands
Vegetation Class	Inland Floodplain Swamps
PCT ID	360
Plots sampled	Poor – PA, PB, P1 (only PA and PB were included in the BAM-C calculations (vegetation zone 9) Very poor - JP03, JP04, PC (vegetation zone 10)
Floristic description	Within the proposal site, this community occurs as degraded agrictulral land used for grazing livestock, and supports small open wetlands in gilgai depressions dominated by exotic species, with occasional scattered native grasses such as *Lolium rigidum, Medicago truncatula, Aira* spp. and *Trifolium* spp., with percentage covers of between 5 to 30%. Dominant native species include *Cynodon dactylon, Eleocharis* spp.*, Eriochloa australiensis, Chloris truncata, Atriplex semibaccata, Austrostipa scabra, Enteropogon acicularis, Enneapogon* spp. and *Juncus* spp., with percentage covers of between 3 and 20%. There were no canopy species present, and extensive evidence of trampling and pugging by livestock. The survey period was following a period of high rainfall, with gilgais containing water and wetland species being prevalent in and surrounding the depressions, including *Eleocharis* spp. *Juncus* spp. and *Carex* spp. Disturbance adjacent to the community due to agricultural practices has modified the surrounding grassland with introduced species more prevalent in more open areas.
Justification for PCT selection	The occurrence of this PCT within the study area is consistent with the attributes described for this PCT in the BioNet Vegetation Classification database (landform position, dominant canopy, soil types, location), notably including its occurrence on heavy clay gilgaied soils on alluvial terraces, which are a key diagnostic feature of the community and readily identified in the field.
Conservation significance	Based on vegetation structure and condition criteria the patches of this community in the proposal site do not comprise part of an occurrence of the related TEC Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plain (see section 7.1).

Attribute	Description
Photograph	 Photograph 14 Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion (good)

5.5.2 Vegetation zones

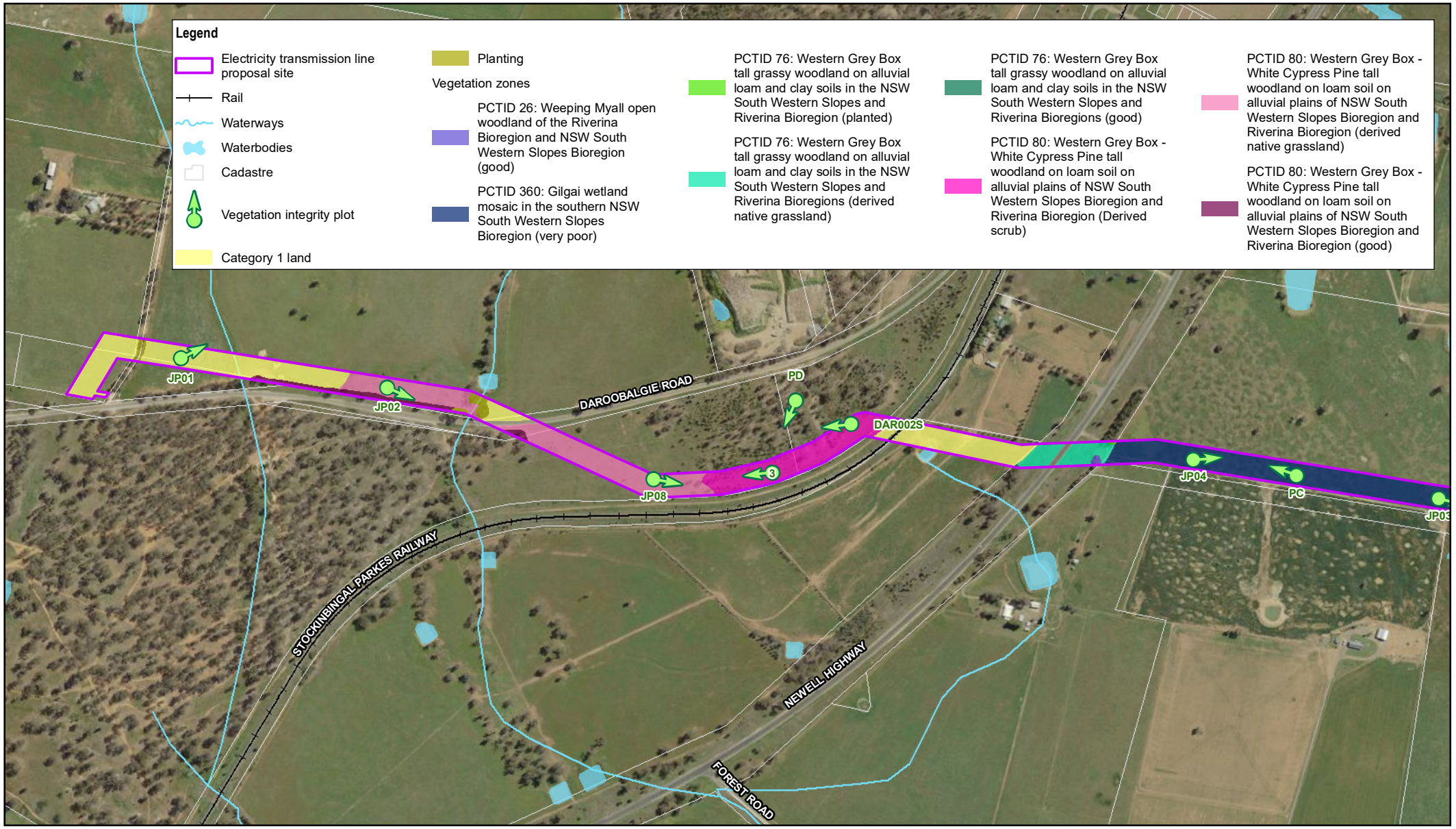
PCTs identified within the study area during field surveys were further split into broad condition classes resulting in the vegetation zones as shown in Figure 5.1 and summarised in Table 5.9. Many areas of native vegetation within the proposal site retained a layer of native canopy with a predominantly native understorey and were assigned to a 'good' condition. Obvious changes to condition were separated into different zones and included areas of grassland derived from clearing of the overstorey or planted trees.

The vegetation zones identified within the proposal site are detailed in Table 5.9 and shown on Figure 5.1.

Table 5.9: Vegetation within the proposal site

Vegetation zone	PCT ID	PCT	Condition	Area	Patch size class (ha)	PCT percentage cleared	Current VI score
Solar Farm							
1	76	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Planted	0.22	<5	92	36.5
ETL							
1	76	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Planted	0.01	≥100	92	36.5
2	26	Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Good	0.65	≥100	90	66
3	76	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Good	0.62	≥100	92	47.5

Vegetation zone	PCT ID	PCT	Condition	Area	Patch size class (ha)	PCT percentage cleared	Current VI score
4	76	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Derived native grassland	2.14	≥100	92	45.4
5	80	Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion	Good	0.44	≥100	83	64.9
6	80	Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion	Derived native grassland	2.62	≥100	83	37.1
7	80	Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion	Derived scrub	1.64	≥100	83	52
8	244	Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt)	Planted	0.07	5 - 25	73	41.2
9	360	Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion	Poor	2.54	≥100	90	32.4
10	360	Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion	Very poor	3.96	>100	90	32.1
	Total native vegetation Solar Farm	N/A	N/A	0.22	N/A	N/A	N/A
	Total native vegetation ETL	N/A	N/A	14.69	N/A	N/A	N/A
	Category 1 – exempt land Solar Farm	N/A	N/A	252.61	N/A	N/A	N/A
	Category 1 – exempt land ETL	N/A	N/A	22.09	N/A	N/A	N/A
	Category 1 – exempt land road upgrade	N/A	N/A	1.17	N/A	N/A	N/A
	Planting	Non-native	N/A	0.20	N/A	N/A	N/A



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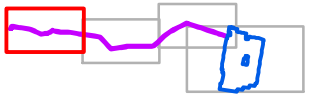

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Figure 5.1a

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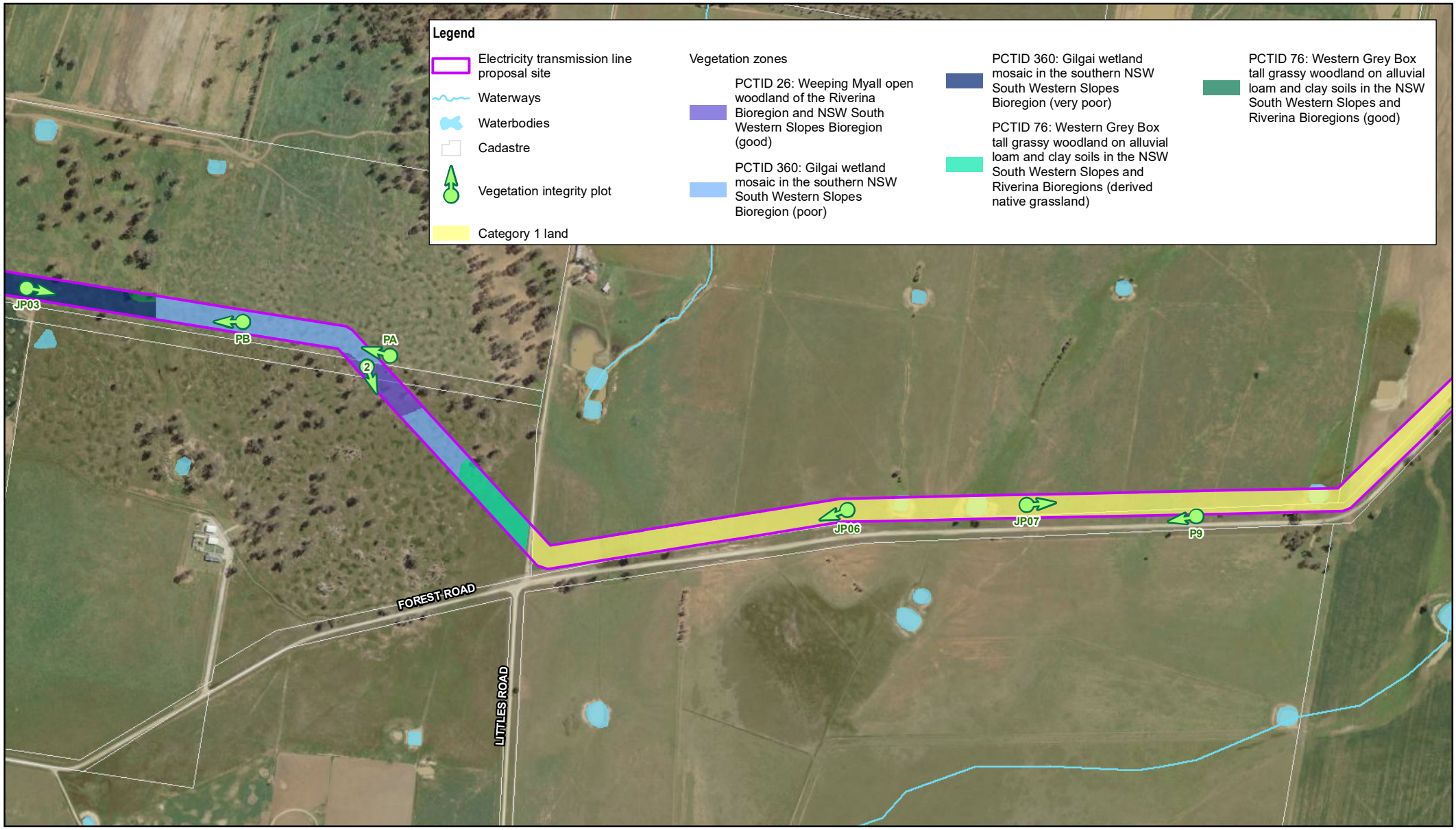

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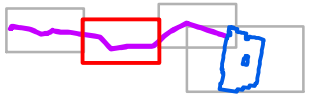

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Figure 5.1b

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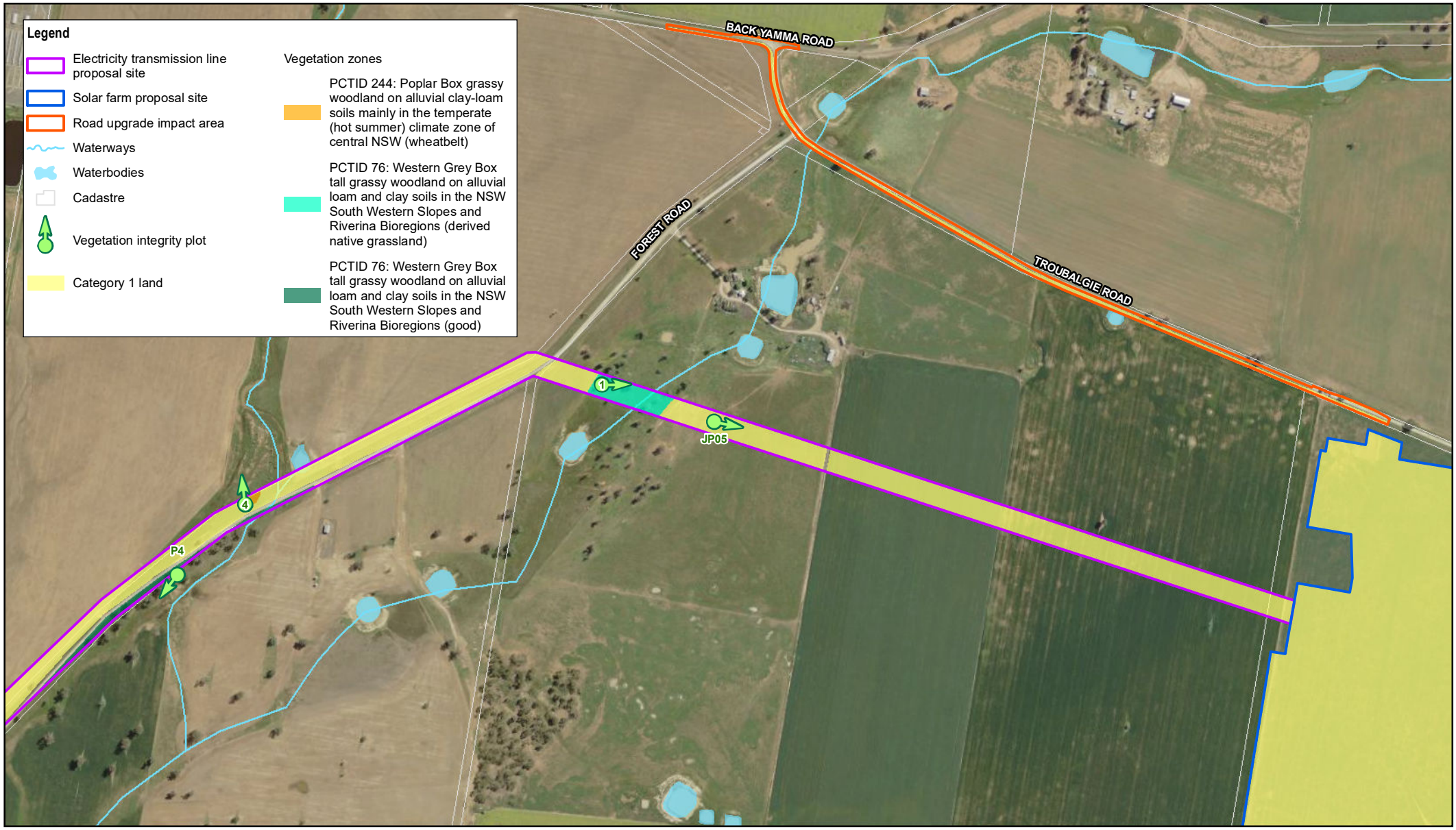

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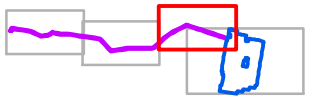

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Figure 5.1c

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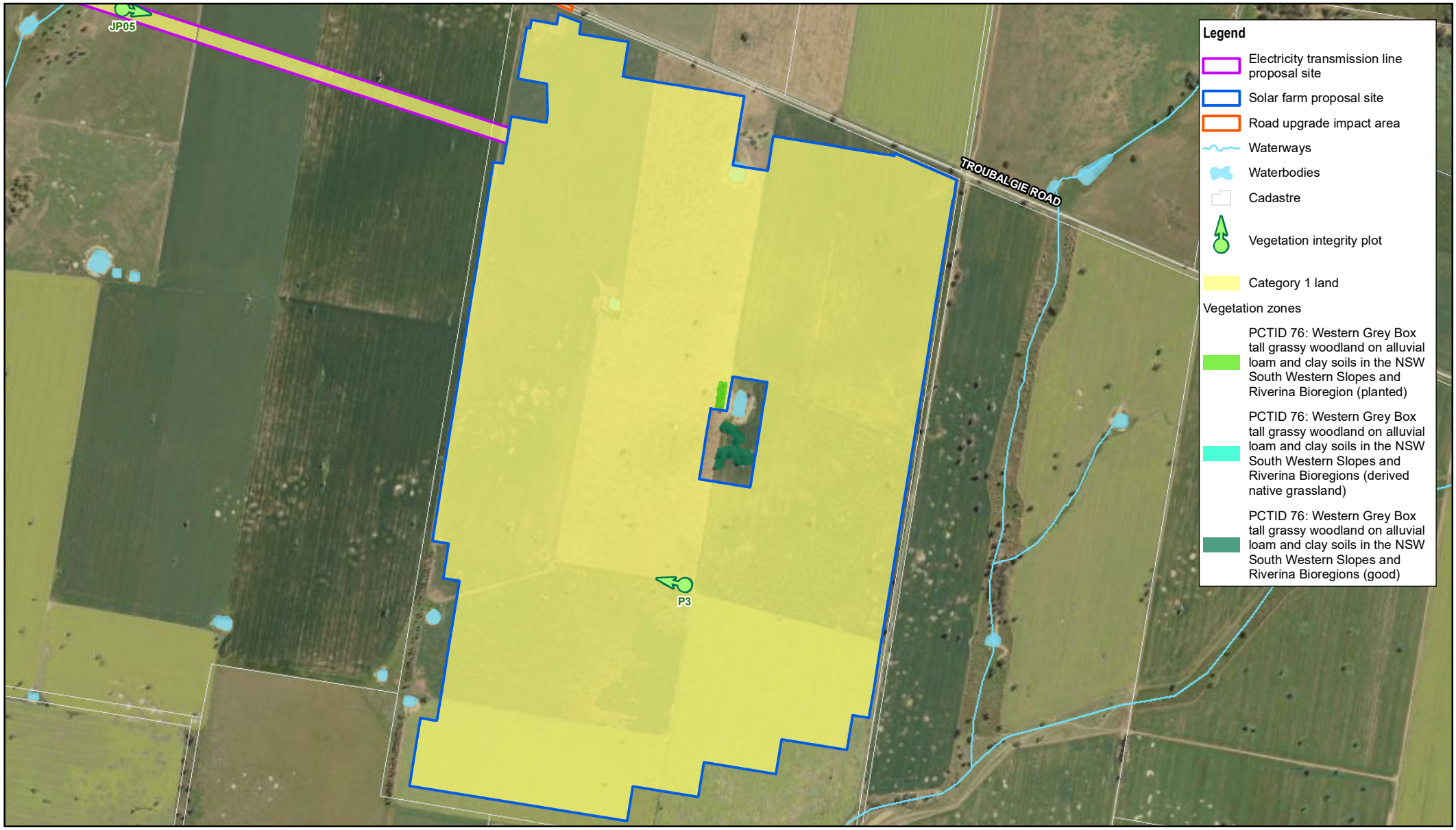

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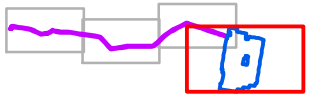

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Grid: GDA 1994 MGA Zone 55

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Figure 5.1d

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5.5.3 Groundwater dependent ecosystems

The *NSW State Groundwater Dependent Ecosystems Policy* defines groundwater dependent ecosystems (GDEs) as ecosystems which have their species composition, and their natural ecological processes determined by groundwater (DLWC 2002). Ecosystems vary dramatically in the degree of dependency of groundwater, from having no apparent dependence through to being entirely dependent on it (DLWC 2002).

Dependence (or interaction) of the vegetation communities identified within the proposal site on groundwater was determined by searching the Atlas of GDEs (BOM 2021a). This Atlas predicts the occurrence of groundwater dependent ecosystems and ecosystems that potentially use groundwater. It shows ecosystems that interact with the subsurface expression of groundwater (including vegetation ecosystems) or the surface expression of groundwater (such as rivers and wetlands). The Atlas also shows the likelihood that landscapes are accessing water in addition to rainfall, such as soil water, surface water or groundwater.

Native vegetation within the proposal site is mapped as having a low potential for being reliant on the subsurface presence of groundwater (BOM 2021a). There are some areas of low potential for terrestrial GDEs, predominantly in the western section of the study area and includes some corresponding areas of mapped Grey Box dominated woodland. In addition, there is an area in the central section of the transmission alignment mapped as having high potential for a terrestrial GDE, however the GDE database has the area mapped as River Red Gum – Lignum woodland. Field surveys did not identify this vegetation type in the corresponding area, which is comprised of Grey Box dominated woodland and therefore unlikely to represent a high potential GDE. The gilgai wetland areas are not mapped as GDEs, which is likely a reflection of their dependence on rainfall and the impeded drainage within the wetland areas. The gilgai depressions fill and empty in response to rainfall events and subsequent dry periods.

5.6 Scattered tree assessment

5.6.1 Solar farm

The species of scattered trees within the solar farm proposal site comprised:

– *Acacia pendula*
– *Alectryon oleifolius*
– *Eucalyptus melliodora*
– *Eucalyptus microcarpa.*

This floristic assemblage, when combined with existing regional vegetation mapping and consideration of the topography of the site indicated that PCT ID 76 (Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions) was the most likely PCT associated with the scattered trees. The large tree threshold size for this PCT is 50cm. There are patches of PCT 76 mapped on the NSW Statewide Vegetation Type Map in adjacent properties, in comparable landscape positions to the solar farm proposal site, with a patch mapped on land immediately to the east as well as about 1.3 km to the west. The only other PCTs mapped within similar distances are grassland communities (ie PCT 45) which do not align with the presence of canopy trees.

No class 1 trees were identified within the solar farm proposal site, but several class 2 and class 3 trees were identified (refer to Figure 5.2). Appendix B provides a summary of the scattered trees recorded. The quantum of offsets required for impacts to scattered trees is based on the tree's DBH, size class and presence/absence of hollows. Section 11.1.2 provides a summary of the offset requirements for impacts to scattered trees within the proposal site.

5.6.2 Road upgrade

The species of scattered trees within the road upgrade footprint comprised:

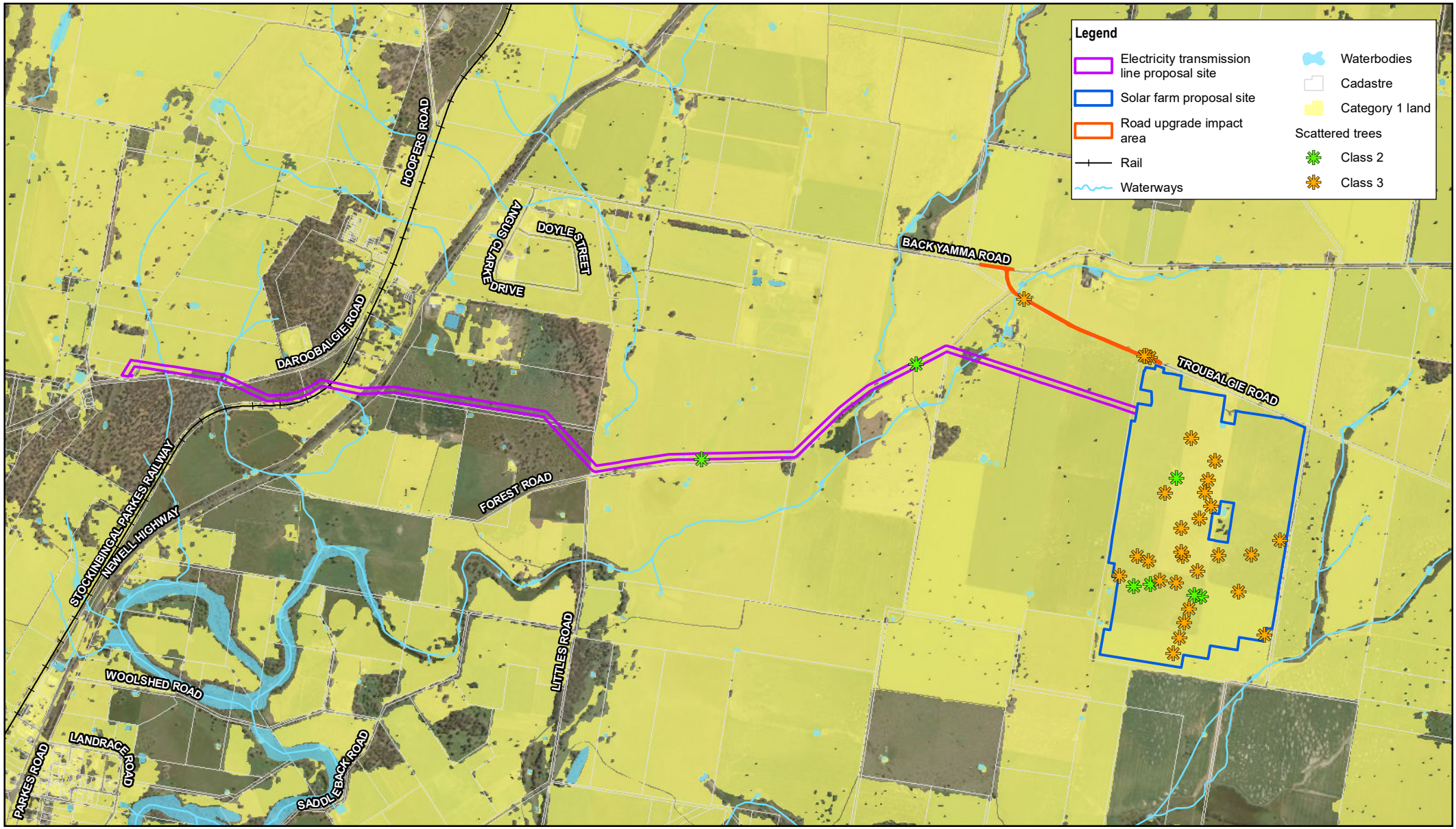
– *Eucalyptus microcarpa*
– *Eucalyptus camaldulensis*

Based on the species recorded, existing regional vegetation mapping and the topography and landscape position of the footprint, two different PCTs were considered likely to have once been present within the footprint of the proposed road upgrade; PCT 76 (Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions) and PCT 11 (River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion). PCT 76 was the most likely PCT associated with the occurrences of *Eucalyptus microcarpa* and *Alectryon oleifolius*, while PCT 11 was considered the best fit for the large *Eucalyptus camaldulensis* individual. The large tree threshold size for both of these PCTs is 50cm.

There are patches of PCT 76 mapped on the NSW State Vegetation Type Map in adjacent properties, in comparable landscape positions to the road upgrade footprint, with a patch mapped on land immediately to the east as well as about 1.3 km to the west. The only other PCTs mapped within similar distances are grassland communities (ie PCT 45) which do not align with the presence of canopy trees.

There are small, narrow linear patches of PCT 11 mapped within the local area on the NSW State Vegetation Type Map, and based on the landscape position, this was considered the most appropriate PCT for the occurrence of *Eucalyptus camaldulensis*.

Four class 3 trees were identified within the proposed road upgrade footprint (refer to Figure 5.2). Appendix B provides a summary of the scattered trees recorded within the proposal site and section 11.1.2 provides a summary of the offset requirements for impacts to scattered trees.



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Scattered tree assessment

Figure 5.2

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5.7 Fauna species and habitat resources

5.7.1 Fauna species

A list of fauna species recorded during the field survey is provided in Appendix B. The majority of species recorded were birds. Fauna species recorded were typical of the box-type woodlands and cleared agricultural landscapes of the Central West.

5.7.2 Fauna habitats

Better quality fauna habitat resources at the proposal site are associated with patches of good quality woodland dominated by Grey Box and containing hollow-bearing trees, and a smaller patch of woodland dominated by Weeping Myall. Locally native tree plantings dominated by Poplar Box and a mixed planting comprised of Grey Box/River Red Gum/River Oak also provide habitat resources for native fauna species. There are areas of derived native grassland and wetland areas that also provide potential fauna habitat.

There are no caves or culverts, cliff lines, substantial rock outcrops, important wetlands or waterbodies within the proposal site. Fauna habitats present at the site are described in Table 5.10 to Table 5.12.

Table 5.10: Fauna habitats: native grassland

Native grassland	
Description	Dominated by native grass species within the central and western section of the transmission alignment. Occasional isolated paddock trees, some containing hollows, are present and some areas of grassland occur adjacent to patches of woodland. Paddock tree species mostly comprise Western Grey Box with some Buloke occurring in the eastern section of the proposal site. Commonly occurring native groundcover species include Windmill Grass (*Chloris truncata*), *Digitaria* spp., Purple Wiregrass (*Aristida ramosa*) and Curly Windmill Grass (*Enteropogon acicularis*).
Fauna recorded	A number of bird species typically associated with open grazing country were recorded. Galahs (*Eolophus rosiecapillus*), Red-rumped Parrot (*Psephotus haematonotus*) and Eastern Rosella (*Platycercus eximius*) were recorded in remnant roadside vegetation and scattered paddock trees amongst grassland habitat, often near hollows. The introduced Common Starling (*Sturnus vulgaris*) is likely to compete with native bird species for hollows. Small flocks of the Noisy Miner (*Manorina melanocephala*) were observed. Ravens (*Corvus spp.*) Australian Magpies (*Cracticus tibicen*) and Pied Butcherbirds (*Cracticus nigrogularis*) were frequently seen perching on fences and powerlines. Flocks of Welcome Swallows (*Hirundo neoxena*) were seen foraging above and in the pasture and grassland, and Rufous Songlarks (*Cincloramphus mathewsi*) were observed and heard singing in open grassland areas. Black Kites (*Milvus migrans*) were observed hunting over open paddock grasslands in the study area. The introduced Brown Hare (*Lepus capensis*) was observed in open paddocks.
Threatened species	Superb Parrots (*Polytelis swainsonii*) were observed traversing the paddocks and open grassland area within the proposal site during multiple site survey periods. Additionally, they were recorded perching and foraging in Western Grey Box trees in woodland adjacent to grassland areas within the proposal site (see Figure 6.1).
	
	Photograph 15 Derived native grassland habitat

Table 5.11: Fauna habitats: woodland patches

Roadside vegetation	
Description	Features a canopy of Western Grey Box throughout the study area, with some patches also containing White Cypress Pine. A small patch of Weeping Myall woodland is present in the central section of the transmission alignment. Hollow-bearing trees are present within the woodland patches, including narrow remnants along road corridors. Leaf litter and fallen timber is present to varying degrees throughout patches, with higher abundances occurring in Western Grey Box dominated woodland where cypress pine is absent. Regeneration is occurring throughout most patches of woodland. There is some connectivity along roadside corridors extending into adjacent private property and in the western section of the study area vegetation is well connected to the large patch of woodland in the adjacent Crown Reserve. Groundcover is a mixture of native and introduced species and dominated by grass and forb species.
Fauna recorded	A number of woodland bird species were recorded in these areas, including the Eastern Rosella (*Platycercus eximius*), Australian Magpie (*Cracticus tibicen*) and Yellow-rumped Thornbill (*Acanthiza chrysorrhoa*). Cockatiels (*Nymphicus hollandicus*) were recorded within Western Grey Box woodland along Forest road on multiple occasions and observed entering hollows within the woodland. A single microbat species – the White-striped Freetail-bat (*Austronomus australis*) was recorded on the edge of woodland habitat at the far-western extent of the proposed transmission line (see Appendix B).
Threatened species	The Grey-crowned Babbler was recorded calling in a patch of Western Grey Box – White Cypress Pine woodland in the western portion of the site (see Figure 6.1).
	
	Photograph 16 Native woodland

Table 5.12: Fauna habitats: farm dams and wetlands

Farm dams	
Description	There are small patches of Gilgai wetland dominated by Eleocharis spp in the central portion of the study area (see Table 5.8). Gilgai wetlands comprise 'Type 2 – moderately sensitive key fish habitat (DPI 2013). None of the other waterbodies in the study area are considered key fish habitat; they include first streams on gaining streams (based on the Strahler method of stream ordering); farm dams on first and second order streams or unmapped gullies; or agricultural and urban drains (DPI 2013). Along Forest Road there are depressions and table drains within the road reserve that hold water for periods following rainfall, as was evident during the survey period. During field surveys following rainfall events, these areas were flooded and contained emergent and fringing vegetation typical of wetland areas, including *Eleocharis* spp., rushes and sedges (see Photograph 17).

Farm dams	
	Several farm dams are present in the proposal site. Farm dams contained no emergent aquatic vegetation and fringing vegetation was limited to common grass species and would have limited habitat value for fish and other aquatic fauna. These waterbodies are used as watering points by stock which would further limit water quality and value for native fauna (see Photograph 17). Small, undefined drainage lines are also present, some leading to and from these dams. Some of these drainage lines eventually flow into the Lachlan River to the south via a network of drainage lines. These drainage lines tended to be depressions in the grassland, with some merging with the table drains along Forest Road. No woody debris or snags are present. There is no key fish habitat mapped at the proposal site or any adjacent or downstream areas that could be affected by the proposal (DPI, 2007).
Fauna recorded	Common frogs such as the Eastern Sign-bearing Froglet (*Crinia parinsignifera*) and Bibron's Toadlet (*Pseudophryne bibronii*) were heard calling within the gilgai habitat in the central section of the transmission alignment. Bird species typical of wetland habitats such as ducks and herons were recorded at the dams in the study area and gilgai habitat, including Plumed Whistling Duck (*Dendrocygna eytoni*), Australian Wood Duck (*Chenonetta jubata*) and White-necked Heron (*Ardea pacifica*). The dams and gilgais would provide a source of water for other birds, microbats and macropods. Microbats are also likely to forage for insects above water habitat.
Threatened species	Targeted surveys for Sloan's Froglet were undertaken over two survey periods in August and the species was not recorded. No other threatened species are likely to occur in this habitat type. Threatened bird species likely to occur occasionally use water habitats as a drinking source.
	
	Photograph 17 Gilgai wetland
	

Farm dams	
	Photograph 18 Farm dam

5.7.3 Important habitat

For a small number of species, the habitat constraint information in the TBDC refers to an important habitat map (BAM Section 5.1.3). Important habitat maps identify areas that are considered essential to support critical life stages of the species, e.g. breeding areas or locations important for foraging/over-wintering for migratory species. Important habitat for the Swift Parrot (*Lathamus discolor)* is mapped around Back Yamma State Forest, about 5km to the north east of the proposal site. There would be no impact on any areas of mapped important habitat as a result of the proposal.

6. Conservation significance

6.1 Identification of threatened species under the BAM

6.1.1 Predicted threatened species (ecosystem credit entities)

Based on the bioregional context for the assessment and the PCTs, patch size, vegetation cover and habitat resources present at the proposal site, the BAM calculator generates a list of threatened fauna species that are associated with native vegetation at the proposal site (i.e. potential 'predicted threatened species', or potential 'ecosystem credit entities'). The potential for these predicted threatened species to occur within the site were further refined based on the desktop assessment, habitat resources observed during field surveys and the knowledge and experience of the assessor.

The suite of 'confirmed' predicted threatened species associated with ecosystem credits required for the proposal site, and with relevant habitat resources present on the site, are listed in Table 6.1. For each confirmed predicted threatened species, the vegetation zone association is provided. Targeted surveys are not required under the BAM for these species as they are assumed to be present. It is noted that two of these species were recorded in the study area during surveys. Species indicated by **bold text** were recorded within the study area.

It should be noted that several of these species would only occur in the woodland form of the PCTs present at the proposal site, as the derived native grassland forms of the PCTs lack necessary habitat components for the species to persist. These species are only associated with ecosystem credits generated for impacts to woodland vegetation zones. Notably many species of woodland birds would only occur in vegetation with canopy vegetation, in large patches over 5 ha in size and/or with habitat resources such as abundant fallen woody debris (see Appendix A for further detail and justification).

The sensitivity to gain class is based on the species life history characteristics and ecological information. It estimates the ability of a species to respond to improvements in habitat condition at an offset site. If 'N/A' is listed in a column, it indicates that the species is not associated with any of the vegetation zones in that assessment area.

Table 6.1: Confirmed predicted threatened species

Common name	Scientific name	Sensitivity to gain class	Vegetation zone association ETL assessment	Vegetation zone association Solar Farm assessment	Vegetation zone association Scattered tree assessments
Australasian Bittern	*Botaurus poiciloptilus*	Moderate	360 - Gilgai wetland - poor 360 - Gilgai wetland – very poor	N/A	N/A
Australian Painted Snipe	*Rostratula australis*	Moderate	360 - Gilgai wetland - poor 360 - Gilgai wetland – very poor	N/A	N/A
Barking Owl (foraging habitat)	*Ninox connivens*	High	76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – planted 76 - Western Grey Box tall grassy woodland – DNG 80 - Western Grey Box – White Cypress Pine tall woodland - good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub	76 - Western Grey Box tall grassy woodland – planted	11, 76

Common name	Scientific name	Sensitivity to gain class	Vegetation zone association ETL assessment	Vegetation zone association Solar Farm assessment	Vegetation zone association Scattered tree assessments
			244 - Poplar Box grassy woodland – planted		
Black-breasted Buzzard (foraging habitat)	*Hamirostra melanosternon*	Moderate	N/A	N/A	11
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	Moderate	76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – DNG 80 - Western Grey Box – White Cypress Pine tall woodland – good 80 - Western Grey Box – White Cypress Pine tall woodland – derived scrub 244 - Poplar Box grassy woodland – planted	N/A	11, 76
Black Falcon	*Falco subniger*	Moderate	26 - Weeping Myall open woodland – good 76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – planted 76 - Western Grey Box tall grassy woodland – DNG 80 - Western Grey Box – White Cypress Pine tall woodland – good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub	244 - Poplar Box grassy woodland – planted76 - Western Grey Box tall grassy woodland – planted	11, 76
Brolga	*Grus rubicunda*	Moderate	26 - Weeping Myall open woodland – good 360 - Gilgai wetland - poor 360 - Gilgai wetland – very poor	N/A	N/A
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	High	76 - Western Grey Box tall grassy woodland – planted 76 - Western Grey Box tall grassy woodland – DNG 76 - Western Grey Box tall grassy woodland – good	244 - Poplar Box grassy woodland – planted76 - Western Grey Box tall grassy woodland – planted	76
Corben's Long-eared Bat	*Nyctophilus corbeni*	High	80 - Western Grey Box – White Cypress Pine tall woodland – good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub 244 - Poplar Box grassy woodland – planted	N/A	N/A

Common name	Scientific name	Sensitivity to gain class	Vegetation zone association ETL assessment	Vegetation zone association Solar Farm assessment	Vegetation zone association Scattered tree assessments
Diamond Firetail	*Stagonopleura guttata*	Moderate	26 - Weeping Myall open woodland – good 76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – planted 76 - Western Grey Box tall grassy woodland – DNG 80 - Western Grey Box – White Cypress Pine tall woodland – good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub	244 - Poplar Box grassy woodland – planted76 - Western Grey Box tall grassy woodland – planted	N/A
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	Moderate	26 - Weeping Myall open woodland – good 76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – planted 76 - Western Grey Box tall grassy woodland – DNG 80 - Western Grey Box – White Cypress Pine tall woodland – good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub 244 - Poplar Box grassy woodland – planting 360 - Gilgai wetland - poor	360 - Gilgai wetland – very poor76 - Western Grey Box tall grassy woodland – planted	11, 76
Flame Robin	*Petroica phoenicea*	Moderate	76 – Western Grey Box tall grassy woodland – good 76 – Western Grey Box tall grassy woodland – planted 76 – Western Grey Box tall grassy woodland – DNG 80 – Western Grey Box – White Cypress Pine tall woodland – good	80 – Western Grey Box – White Cypress Pine tall woodland – derived scrub76 – Western Grey Box tall grassy woodland – planted	76
Freckled Duck	*Stictonetta naevosa*	Moderate	360 – Gilgai wetland – poor 360 – Gilgai wetland – very poor	N/A	N/A
Gilbert's Whistler	*Pachycephala inornata*	Moderate	80 – Western Grey Box – White Cypress Pine tall woodland – good 80 – Western Grey Box – White Cypress Pine tall woodland – derived scrub	N/A	N/A
Glossy Black-Cockatoo (foraging habitat)	*Calyptorhynchus lathami*	Hgh	76 – Western Grey Box tall grassy woodland – DNG	Excluded – see Table 6.2	Excluded – see Table 6.2

Common name	Scientific name	Sensitivity to gain class	Vegetation zone association ETL assessment	Vegetation zone association Solar Farm assessment	Vegetation zone association Scattered tree assessments
			80 – Western Grey Box – White Cypress Pine tall woodland – good		
Grey Falcon	*Falco hypoleucos*	Moderate	26 – Weeping Myall open woodland – good 76 – Western Grey Box tall grassy woodland – good 76 – Western Grey Box tall grassy woodland – planted 76 – Western Grey Box tall grassy woodland – DNG 80 – Western Grey Box – White Cypress Pine tall woodland – good 80 – Western Grey Box – White Cypress Pine tall woodland – derived scrub	244 – Poplar Box grassy woodland – planted76 – Western Grey Box tall grassy woodland – planted	11, 76
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	Moderate	26 – Weeping Myall open woodland – good 76 – Western Grey Box tall grassy woodland – good 76 – Western Grey Box tall grassy woodland – planted 76 – Western Grey Box tall grassy woodland – DNG 80 – Western Grey Box – White Cypress Pine tall woodland – good 80 – Western Grey Box – White Cypress Pine tall woodland – derived scrub	244 – Poplar Box grassy woodland – planted76 – Western Grey Box tall grassy woodland – planted	76
Grey-headed Flying-fox (foraging habitat)	*Pteropus poliocephalus*	High	76 – Western Grey Box tall grassy woodland – good 76 – Western Grey Box tall grassy woodland – planted 76 – Western Grey Box tall grassy woodland – DNG	44 – Poplar Box grassy woodland – planted76 – Western Grey Box tall grassy woodland – planted	N/A
Hooded Robin (south-eastern form)	*Melanodryas cucullata cucullata*	Moderate	26 – Weeping Myall open woodland – good 76 – Western Grey Box tall grassy woodland – good 76 – Western Grey Box tall grassy woodland – DNG 76 – Western Grey Box tall grassy woodland – planted 80 – Western Grey Box – White Cypress Pine tall woodland – good 80 – Western Grey Box – White Cypress Pine tall woodland – derived scrub	244 – Poplar Box grassy woodland – planted76 – Western Grey Box tall grassy woodland – planted	11, 76

Common name	Scientific name	Sensitivity to gain class	Vegetation zone association ETL assessment	Vegetation zone association Solar Farm assessment	Vegetation zone association Scattered tree assessments
Little Eagle (foraging habitat)	*Hieraaetus morphnoides*	Moderate	26 – Weeping Myall open woodland – good 76 – Western Grey Box tall grassy woodland – good 76 – Western Grey Box tall grassy woodland – DNG 76 – Western Grey Box tall grassy woodland – planted 80 – Western Grey Box – White Cypress Pine tall woodland – good 80 – Western Grey Box – White Cypress Pine tall woodland – derived scrub 244 – Poplar Box grassy woodland – planted 360 – Gilgai wetland – poor 360 – Gilgai wetland – very poor	76 - Western Grey Box tall grassy woodland – planted	11, 76
Little Pied Bat	*Chalinolobus picatus*	High	26 – Weeping Myall open woodland – good 76 – Western Grey Box tall grassy woodland – good 76 – Western Grey Box tall grassy woodland – DNG 76 – Western Grey Box tall grassy woodland – planted 244 – Poplar Box grassy woodland – planted	76 – Western Grey Box tall grassy woodland – planted	11, 76
Magpie Goose	*Anseranas semipalmata*	Moderate	360 - Gilgai wetland - poor 360 - Gilgai wetland – very poor	N/A	N/A
Major Mitchell's Cockatoo (foraging habitat)	*Lophochroa leadbeateri*	Moderate	26 - Weeping Myall open woodland - good 76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – planted 76 - Western Grey Box tall grassy woodland – DNG 80 - Western Grey Box – White Cypress Pine tall woodland - good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub	244 - Poplar Box grassy woodland – planted76 - Western Grey Box tall grassy woodland – planted	11, 76
Masked Owl (foraging habitat)	*Tytp novaehollandiae*	High	26 - Weeping Myall open woodland - good 76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – planted 76 - Western Grey Box tall grassy woodland – DNG	N/A	11, 76

Common name	Scientific name	Sensitivity to gain class	Vegetation zone association ETL assessment	Vegetation zone association Solar Farm assessment	Vegetation zone association Scattered tree assessments
			80 - Western Grey Box – White Cypress Pine tall woodland - good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub 244 - Poplar Box grassy woodland – planted		
Pied Honeyeater	*Certhionyx variegatus*	Moderate	26 - Weeping Myall open woodland - good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub 80 - Western Grey Box – White Cypress Pine tall woodland - good 244 - Poplar Box grassy woodland – planted	N/A	N/A
Purple-crowned Lorikeet	*Glossopsitta porphyrocephala*	High	N/A	N/A	11
Scarlet Robin	*Petroica boodang*	Moderate	26 - Weeping Myall open woodland - good 76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – planted 76 - Western Grey Box tall grassy woodland – DNG 80 - Western Grey Box – White Cypress Pine tall woodland - good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub	244 - Poplar Box grassy woodland – planted76 - Western Grey Box tall grassy woodland – planted	11, 76
Speckled Warbler	*Chthonicola sagittata*	High	76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – DNG 76 - Western Grey Box tall grassy woodland – planted 80 - Western Grey Box – White Cypress Pine tall woodland – good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub	244 - Poplar Box grassy woodland – planted76 - Western Grey Box tall grassy woodland – planted	76
Spotted Harrier	*Circus assimilis*	Moderate	26 - Weeping Myall open woodland - good 244 - Poplar Box grassy woodland – planted 360 - Gilgai wetland - poor 360 - Gilgai wetland – very poor	N/A	11

Common name	Scientific name	Sensitivity to gain class	Vegetation zone association ETL assessment	Vegetation zone association Solar Farm assessment	Vegetation zone association Scattered tree assessments
Square-tailed Kite (foraging habitat)	*Lophoictinia isura*	Moderate	26 - Weeping Myall open woodland - good 76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – DNG 76 - Western Grey Box tall grassy woodland – planted 244 - Poplar Box grassy woodland – planted	76 - Western Grey Box tall grassy woodland – planted	N/A
Superb Parrot (foraging habitat)	*Polytelis swainsonii*	Moderate	26 - Weeping Myall open woodland - good 76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – planting 76 - Western Grey Box tall grassy woodland – DNG 80 - Western Grey Box – White Cypress Pine tall woodland - good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub	244 - Poplar Box grassy woodland – planted76 - Western Grey Box tall grassy woodland – planted	11, 76
Swift Parrot (foraging habitat)	*Lathamus discolor*	Moderate	76 - Western Grey Box tall grassy woodland – planted 76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – DNG 80 - Western Grey Box – White Cypress Pine tall woodland – good	80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub76 - Western Grey Box tall grassy woodland – planted	11, 76
Turquoise Parrot	*Neophema pulchella*	High	76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – planted 76 - Western Grey Box tall grassy woodland – DNG 80 - Western Grey Box – White Cypress Pine tall woodland – good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub 244 - Poplar Box grassy woodland – planted	76 - Western Grey Box tall grassy woodland – planted	N/A
Varied Sittella	*Daphoenositta chrysoptera*	Moderate	26 - Weeping Myall open woodland - good 76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – DNG	76 – Western Grey Box tall grassy woodland – planted	11, 76

Common name	Scientific name	Sensitivity to gain class	Vegetation zone association ETL assessment	Vegetation zone association Solar Farm assessment	Vegetation zone association Scattered tree assessments
			76 - Western Grey Box tall grassy woodland – planted 80 - Western Grey Box – White Cypress Pine tall woodland - good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub 244 - Poplar Box grassy woodland – planted 360 - Gilgai wetland - poor 360 - Gilgai wetland – very poor		
White Bellied Sea-Eagle (foraging habitat)	*Haliaeetus leucogaster*	High	26 - Weeping Myall open woodland - good 76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – planted 76 - Western Grey Box tall grassy woodland – DNG 80 - Western Grey Box – White Cypress Pine tall woodland - good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub	244 - Poplar Box grassy woodland – planted76 - Western Grey Box tall grassy woodland – planted	11, 76
White-fronted Chat	*Epthianura albifrons*	Moderate	360 - Gilgai wetland - poor 360 - Gilgai wetland – very poor	N/A	N/A
White-throated Needletail (EPBC Act listed only)	*Hirundapus caudacutus*	High	26 - Weeping Myall open woodland - good 76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – DNG 76 - Western Grey Box tall grassy woodland – planted 80 - Western Grey Box – White Cypress Pine tall woodland – good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub 244 - Poplar Box grassy woodland – planted 360 - Gilgai wetland - poor	360 - Gilgai wetland – very poor76 - Western Grey Box tall grassy woodland – planted	11, 76
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	High	26 - Weeping Myall open woodland - good 76 - Western Grey Box tall grassy woodland – good 76 - Western Grey Box tall grassy woodland – DNG	76 - Western Grey Box tall grassy woodland – planted	11, 76

Common name	Scientific name	Sensitivity to gain class	Vegetation zone association ETL assessment	Vegetation zone association Solar Farm assessment	Vegetation zone association Scattered tree assessments
			76 - Western Grey Box tall grassy woodland – planted 80 - Western Grey Box – White Cypress Pine tall woodland – good 80 - Western Grey Box – White Cypress Pine tall woodland - derived scrub 244 - Poplar Box grassy woodland – planted 360 - Gilgai wetland - poor 360 – Gilgai wetland – very poor		

The potential predicted threatened species listed in Table 6.2 were assessed as unlikely to occur and were excluded from the list of confirmed predicted threatened species.

Table 6.2: Excluded predicted threatened species

Common name	Scientific name	Justification
Species excluded from solar farm proposal site assessment		
Glossy Black-Cockatoo (foraging habitat)	*Calyptorhynchus lathami*	Listed habitat constraint – No *Allocasuarina* and *Casuarina* species of trees in the solar farm site to provide foraging habitat for the species.
Painted Honeyeater	*Grantiella picta*	Listed habitat constraint – no mistletoes present at a density of five per hectare.
Species excluded from ETL proposal site assessment		
Painted Honeyeater	*Grantiella picta*	Listed habitat constraint – no mistletoes present at a density of five per hectare.
Striped-faced Dunnart	*Sminthopsis macroura*	Proposal site lacks the species' preferred un-grazed, diverse native grasslands and dry shrublands. Species only associated with PCT 244 within the proposal site, which is only present as a planted, poor condition form of the community with a predominantly exotic understorey.
Species excluded from scattered tree assessment (solar farm and road upgrade)		
Glossy Black-Cockatoo (foraging habitat)	*Calyptorhynchus lathami*	Listed habitat constraint – No *Allocasuarina* and *Casuarina* species of trees in the scattered tree assessment areas to provide foraging habitat for the species.
Painted Honeyeater	*Grantiella picta*	Listed habitat constraint – no mistletoes present at a density of five per hectare.

6.1.2 Candidate threatened species (Species credit entities)

Threatened species that cannot reliably be predicted to occur on a development site based on PCT, distribution and habitat criteria are identified by the Threatened Biodiversity Data Collection as 'species credit' entities. In some circumstances, the particular habitat components of species assessed for ecosystem credit species, such as the breeding habitat of a cave roosting bat or forest owls, are also assessed for species credits. The credit calculator references geographic, vegetation and habitat data for the proposal site to generate a list of the species credit entities that are predicted to occur (i.e. the '*potential* candidate threatened species').

Searches of threatened species databases were also completed to identify any additional potential candidate threatened species (to those generated by the credit calculator) that are known or predicted to occur in the locality (refer to likelihood of occurrence table in Appendix A). The likelihood of occurrence of these additional potential candidate threatened species were reviewed, giving consideration to the habitats available in the study area.

Potential candidate threatened species that could occur in the study area based on the habitat resources observed during field surveys were confirmed as candidate threatened species. 'Confirmed' candidate threatened species require targeted survey in accordance with Section 5.3 of the BAM (DPIE 2020) . The list of confirmed candidate threatened species is presented in Table 6.3; these species were subjected to targeted survey. Surveys were conducted in the appropriate season for the majority of confirmed candidate threatened species and so the targeted survey results for these species can be considered a reliable indicator of their presence or absence at the proposal site (see Table 6.3).

Table 6.3: Confirmed candidate species credit species for which surveys were conducted

Common name	Scientific name	BioNet records in locality	Survey months	Presence	Justification and location
Fauna					
Barking Owl (breeding habitat)	*Ninox connivens*	None	May-Dec	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in August, September, and December. No candidate nest trees that represent breeding habitat were identified (solar farm and transmission line).
Bush Stone-curlew	*Burhinus grallarius*	None	All year	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in September, August and December (solar farm and transmission line).
Eastern Pygmy-possum	*Cercartetus nanus*	None	Oct-Dec	Assumed present	Surveys were not adequate to discount the presence of this species, and so presence has been assumed in areas that provide broadly suitable habitat (transmission line).
Glossy Black-Cockatoo (breeding habitat)	*Calyptorhynchus lathami*	None	April-Aug	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in August (solar farm & transmission line).
Little Eagle (breeding habitat)	*Hieraaetus morphnoides*	None	Aug - Oct	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in August and September. No candidate nest trees with evidence of previous nesting activity by larger raptors were observed in the proposal site or surrounding area (solar farm & transmission line).
Major Mitchell's Cockatoo (breeding habitat)	*Lophochroa leadbeateri*	None	Sep-Dec	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in September and December (solar farm & transmission line).
Masked Owl (breeding habitat)	*Tyto novaehollandiae*	None	May-Aug	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in August. No candidate nest trees that represent breeding habitat were identified (solar farm and transmission line).
Sloan's Froglet	*Crinia sloanei*	None	Jul-Aug	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in August (solar farm & transmission line)

Common name	Scientific name	BioNet records in locality	Survey months	Presence	Justification and location
Southern Bell Frog	*Litoria raniformis*	None	Oct-Jan	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in December (solar farm & transmission line)
Square-tailed Kite (breeding habitat)	*Lophoictinia isura*	None	Sep-Jan	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in September and December. No candidate nest trees with evidence of previous nesting activity by larger raptors were observed in the proposal site or surrounding area (solar farm and transmission line).
Squirrel Glider	*Petaurus norfolcensis*	None	All year	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in August, September and December (transmission line)
Superb Parrot (breeding habitat)	*Polytelis swainsonii*	5 records	Sep-Nov	No - surveyed	No evidence of the species breeding was recorded at the site despite targeted surveys in September (solar farm & transmission line)
White-bellied Sea-Eagle (breeding habitat)	*Haliaeetus leucogaster*	None	Jul-Dec	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in August, September and December. No candidate nest trees with evidence of previous nesting activity by larger raptors were observed in the proposal site or surrounding area (solar farm & transmission line).
Flora					
Speargrass	*Austrostipa metatoris*	None	Oct-Nov	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in September and December. The survey period was outside the specified survey months, however due to the substantial rainfall prior to surveys and the flowering of other *Austrostipa* spp. at the time, the survey period was determined to be suitable for detection of the species if present (transmission line)
Austral Pillwort	*Pilularia novae-hollandiae*	None	Oct-Dec	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in December (transmission line)
Oaklands Diuris	*Diuris sp. (Oaklands, D.L. Jones 5380)*	None	Nov	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in December. The survey period was outside the specified survey month, however due to the flowering of other *Diuris* spp. in the area at the time, the survey period was determined to be suitable for detection of the species if present (transmission line)
Pine Donkey Orchid	*Diuris tricolor*	None	Sep-Oct	No - surveyed	No evidence of the species was recorded at the site in surveys in September (solar farm & transmission line)
Spike-Rush	*Eleocharis obicis*	None	Oct-Nov	No - surveyed	Targeted surveys for this species 1 day before and 7 days after the prescribed survey period did not locate this species in the proposal site. It should also be noted that the surveys complied with the nominated survey period in the TBDC at the time they were completed, but the

Common name	Scientific name	BioNet records in locality	Survey months	Presence	Justification and location
					survey period has since changed with a recent update to the TBDC. The survey period was outside the specified survey months, however was completed within such close proximity to the recommended months that should the species have been present, there would still be evidence of it as either juvenile material or old material, neither of which was located. Further the habitat for this species is degraded in the proposal site, as the species is known to be threatened by modification of land for agriculture, grazing, trampling and pugging by stock and weed invasion (DEWHA, 2008c); all of which have degraded land that comprises otherwise broadly suitable habitat within the proposal site. The understorey in all areas of potential habitat (based on vegetation associations listed in the TBDC) is grazed and/or subject to weed infestations and has been exposed to long-term degradation from agricultural practices along with alterations to the natural hydrology of the local area, all of which are known threats to the species (DEWHA 2008c) (transmission line).
Spiny Peppercress	*Lepidium aschersonii*	None	Nov-April	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in December (solar farm & transmission line)
Slender Darling Pea	*Swainsona murrayana*	None	September	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in September (solar farm & transmission line)
Small Purple-pea	*Swainsona recta*	None	Sept-Oct	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in September (solar farm & transmission line)
Silky Swainson-pea	*Swainsona sericea*	None	Sept-Oct	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in September (solar farm & transmission line)
Winged Peppercress	*Lepidium monoplocoides*	None	Nov-Feb	No - surveyed	No evidence of the species was recorded at the site despite targeted surveys in December (transmission line)

A number of species could be reliably discounted as occurring within the study area based on lack of suitable habitat types present, habitat degradation, lack of suitable microhabitats, and/or the known distribution of the species. A number of dual credit fauna species have foraging habitat present but either no potential breeding habitat was identified during the field surveys, or the species does not breed in the area. These species are **not** 'confirmed candidate threatened species' for the purposes of this assessment and do not require further assessment. Detailed justification for the conclusion is provided in Table 6.4 and/or the 'habitat/constraints' fields in the credit calculator.

Table 6.4: Excluded candidate species

Common name	Scientific name	Justification and location
Fauna		
Glossy Black-Cockatoo – endangered population (Riverina population)	*Calyptorhynchus lathami*	Proposal site is located outside the geographic limitations of the endangered population (i.e. Carrathool, Griffith, Leeton and Narrandera LGAs) (transmission line)
Grey-headed Flying-fox (breeding habitat)	*Pteropus poliocephalus*	No roost camps present in the area
Koala (breeding habitat)	*Phascolarctos cinereus*	No suitable breeding habitat. No core habitat present according to mapping of Areas of Regional Koala Significance (ARKS) (solar farm & transmission line)
Squirrel Glider	*Petaurus norfolcensis*	No suitable habitat. Vegetation in the proposal site is not connected to other areas of potential habitat (solar farm)
Petaurus norfolcensis - endangered population Squirrel Glider in the Wagga Wagga Local Government Area	*Petaurus norfolcensis*	Proposal site is located outside the geographic limitations of the endangered population (ie Wagga Wagga Local Government Area) (solar farm & transmission line)
Swift Parrot (important area)	*Lathamus discolor*	The proposal site is outside the mapped breeding habitat and important habitat for the species. Mapped important habitat occurs to the east within Back Yamma State Forest, but this area will not be impacted by the proposal (solar farm, solar farm scattered trees, road upgrade scattered trees & transmission line).
White-browed Treecreeper – endangered population (Carrathool LGA)	*Climacteris affinis*	Proposal site is located outside the geographic limitations of the endangered population (i.e. Carrathool LGA south of the Lachlan River and Griffith LGA) (transmission line)
Flora		
A spear-grass	*Austrostipa metatoris*	While field surveys were completed outside the specified survey months, they were completed in the months either side of the recommended survey period, with the September 2018 survey missing the recommended survey period by only one day, and the December survey missing the recommended survey period by only seven days. While no reference populations were available for verification, the presence of other *Austrostipa* species that were flowering during the field survey periods was considered a suitable indication that, while the survey was between 1 and 7 days outside the recommended survey period, conditions were suitable to detect the targeted threatened species. Irrelevant of the above, as outlined in Appendix A, the likelihood of the species occurring within the proposal site is very low, given the only occurrence of the associated PCT is a planted form of the community with a modified understorey. Habitat degraded button was checked in the BAM-C (transmission line).
A spear-grass	*Austrostipa wakoolica*	Proposal site is located outside the geographic limitations of the species (i.e. south of Narrandera) (solar farm & transmission line)
Claypan Daisy	*Brachyscome muelleroides*	Proposal site is located outside the geographic limitations of the species (i.e. south of Griffith) (solar farm & transmission line)
Mossgiel Daisy	*Brachyscome papillosa*	Proposal site is located outside the geographic limitations of the species (i.e. south and west of the Coolamon to Ardlethan Road, west of Lockhart and north or Rand) (solar farm & transmission line)

Common name	Scientific name	Justification and location
Sand-hill Spider Orchid	*Caladenia arenaria*	Proposal site is located outside the geographic limitations of the species (i.e. west of Lockhart and north of Rand) (solar farm & transmission line)
Oaklands Diuris	*Diuris sp. (Oaklands, D.L. Jones 5380)*	While field surveys were completed outside the specified survey month, they were completed in the month immediately after the recommended survey period, with the December 2020 survey period missing the recommended survey period by only seven days. However, recently published literature (Copeland and Backhouse, 2022) as well as historical published material (Bishop, 2000; Jones, 2003) on this species indicates that it flowers from November into December, meaning surveys at the start of December are appropriate for detection. Additionally, should the species have flowered in November, there would still be evidence of its presence, with seed capsules still present in early December when field surveys were completed. Nevertheless, as outlined in Appendix A, this species is considered unlikely to occur within the proposal site, based on the soil landscape and underlying geology, and the likely soil associations of this species (transmission line).
Spike Rush	*Eleocharis obicis*	The only patch of native vegetation within the solar farm footprint is a small stand of juvenile planted vegetation that does not provide suitable habitat for this species. (solar farm)
Lanky Buttons	*Leptorhynchos orientalis*	Proposal site is located outside the geographic limitations of the species (i.e. west of Narrandera/Lockhart Road and north of Urana/Lockhart Road) (transmission line)
Species excluded from scattered tree assessment (solar farm and road upgrade)		
Swift Parrot (breeding habitat)	Swift Parrot (breeding habitat)	Swift Parrot (breeding habitat)

6.1.3 Confirmed species credit entities

No species credit entities were confirmed to occur in the proposal site based on detection during field surveys. One species has been assumed to occur, as the survey effort was insufficient to exclude the presence of the species, as identified in Table 6.5. A species polygon is mapped on Figure 11.2.

Table 6.5: Species credit entities for which species polygons have been prepared

Common name	Scientific name	Species type	Biodiversity risk weighting	Location
Eastern Pygmy Possum	*Cercartetus nanus*	Area	2	Areas of woodland and derived scrub that are less than 200 m from any other area of woodland or scrub that is 5 ha or larger

6.2 Threatened species survey results

6.2.1 Threatened flora

No threatened flora species were recorded in the proposal site during targeted threatened flora field surveys of the study area.

All potential threatened plant habitat associated with native vegetation in the proposal site was traversed via walked parallel transects, with a focus on areas that supported a native understorey, with limited grazing and no cropping activities. There were no notable barriers to human movement or visibility encountered during the field survey. Field staff were able to traverse all areas of potential threatened flora habitat on foot, in a manner that reflected threatened species survey guidelines (DPIE 2020b, 2016; Cropper, 1993). The candidate threatened

flora species can be excluded from occurring at the proposal site, given they were not located despite targeted, seasonally appropriate (refer to Section 3.4) survey by experienced botanists familiar with each of the species.

6.2.2 Threatened fauna

Two threatened fauna species listed under the BC Act were recorded during surveys, one of which is a predicted/ecosystem credit species and the other a dual (ecosystem/species) credit species (see Appendix A):

– Grey-crowned Babbler (*Pomatostomus temporalis temporalis*) – ecosystem credit species
– Superb Parrot (*Polytelis swainsonii*) – dual credit species. This species is an ecosystem credit species for foraging habitat and a species credit species for breeding habitat.

The Superb Parrot was recorded flying over the proposal site, as well as outside the proposal site on an alternate potential transmission alignment option, and foraging adjacent to the proposed ETL alignment. The species were observed foraging in remnant Western Grey Box trees. There was no evidence of breeding behaviour such as males returning to hollows to feed females or presence of fledglings despite the presence of candidate nest trees with potentially suitable hollows. No individuals were observed foraging within the proposal site. Targeted field surveys were undertaken at a suitable time of year to detect the Superb Parrot during the breeding period, and it was not found. Therefore, it can reliably be discounted as breeding within the proposal site based on the survey effort employed.

The proposal site contains broadly suitable habitat for the additional candidate threatened species listed in

Table 6.3. Targeted field surveys were undertaken at a suitable time of year to detect each of these species, if present, at the proposal site. None of these species were observed and there have been no local records of the species (DPIE 2021a).

The candidate threatened fauna species can be excluded from occurring at the proposal site, given they were not located despite targeted, seasonally appropriate survey by experienced ecologists familiar with each of the species and the habitat resources associated with breeding and nesting activity.

None of the waterbodies at the proposal site contain potential habitat for any threatened species listed under the FM Act (see Table 5.12).

6.2.3 Threatened ecological communities

Three of the PCTs identified within the transmission line alignment, and the PCT within the solar farm site, comprise occurrences of threatened ecological communities under the BC Act, as summarised in Table 6.6.

Table 6.6: Vegetation zones commensurate with threatened ecological communities in the proposal site

Vegetation type	BC Act status	EPBC Act status
Solar Farm		
PCTID 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions - planted	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions endangered ecological community ((Inland Grey Box Woodland EEC)	Does not meet the key diagnostic characteristics in the listing advice for the Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia EEC (Grey Box Grassy Woodlands EEC)
ETL		
PCTID 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion - good	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions EEC	Weeping Myall Woodlands EEC
PCTID 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions - good	Inland Grey Box Woodland EEC	Grey Box Grassy Woodlands EEC

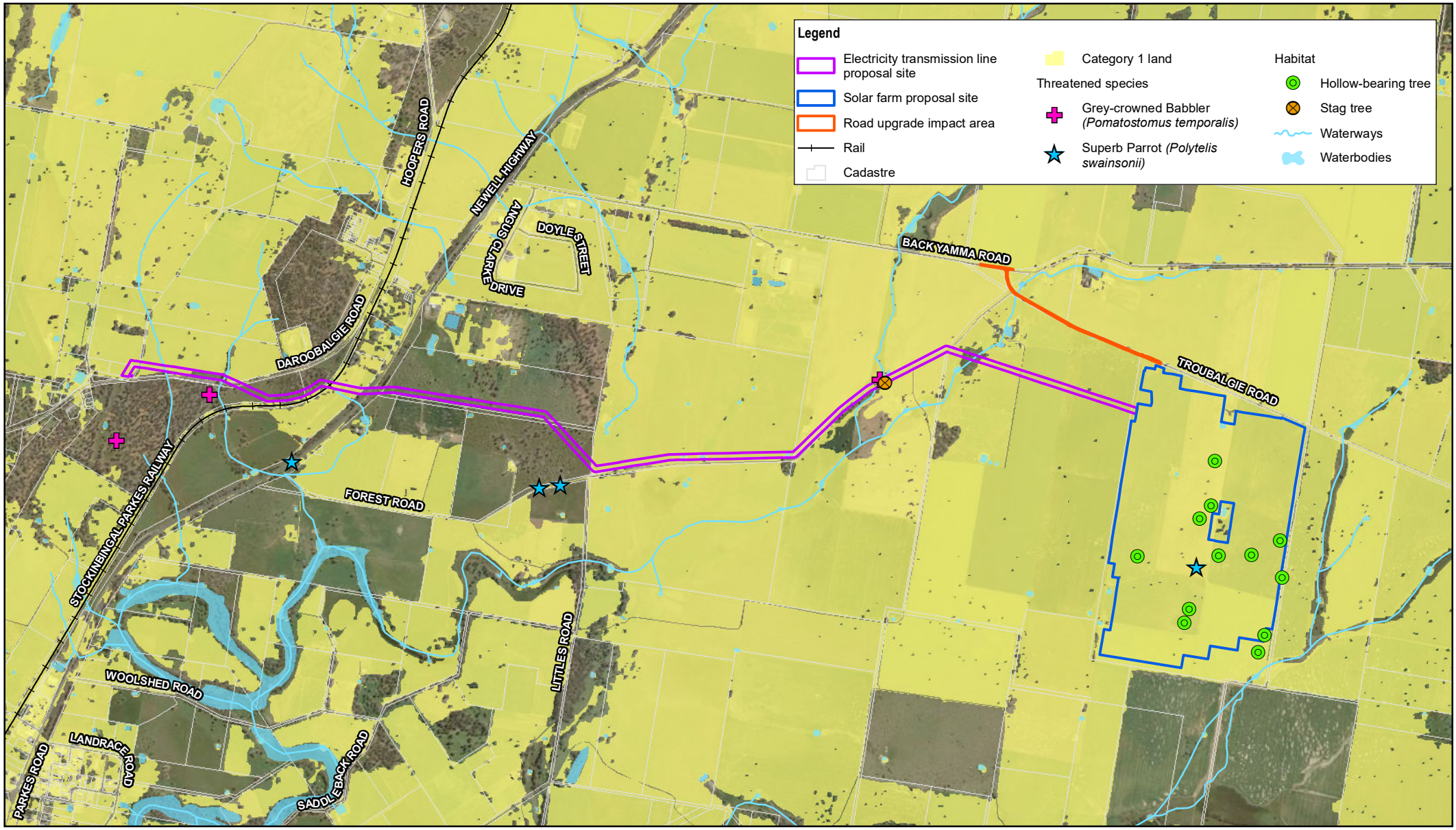
Vegetation type	BC Act status	EPBC Act status
PCTID 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions - derived native grassland	Inland Grey Box Woodland EEC	Grey Box Grassy Woodlands EEC
PCTID 80 – Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion - good	Inland Grey Box Woodland EEC	Grey Box Grassy Woodlands EEC
PCTID 80 – Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion - derived native grassland	Inland Grey Box Woodland EEC	Grey Box Grassy Woodlands EEC
PCTID 80 – Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion - derived scrub	Inland Grey Box Woodland EEC	Grey Box Grassy Woodlands EEC
PCTID 244 – Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) - planted	Not listed	Does not meet the key diagnostic characteristics in the listing advice for the Poplar Box Grassy Woodland on Alluvial Plains EEC
PCTID 360 – Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion - poor	Not listed	Does not meet the description in the listing advice for the Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains CEEC
PCTID 360 – Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion – very poor	Not listed	Does not meet the description in the listing advice for the Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains CEEC

Weeping Myall Woodland (PCTID 26) comprises a local occurrence of the endangered ecological community (EEC) Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions. It is also commensurate with the related EEC listed under the EPBC Act as Weeping Myall Woodlands and occurs in the central section of the transmission line alignment (see Figure 6.2).

Areas dominated by a canopy of Grey Box or areas of native grassland that are derived from a community once dominated by Grey Box (PCTID 76 and PCTID 80) comprise local occurrences of the EEC Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions. These patches are also commensurate with the related EEC listed under the EPBC Act as Grey Box (*Eucalyptus microcarpa*) Grassy Woodland and Derived Native Grasslands of South-Eastern Australia. The community occurs as scattered patches along the length of the transmission alignment, with woodland in the western section of the alignment connected to larger patches within Crown Reserve (see Figure 5-1). The planting in the solar farm site classifies for listing under the BC Act however does not meet the key diagnostic characteristics in the listing advice for the EPBC Act form of the community due to the low percentage of canopy cover and small size class of the trees in the planted areas.

The occurrence of PCT 244 in the proposal site does not meet the key diagnostic characteristics in the listing advice for *Poplar Box Grassy Woodland on Alluvial Plains* as listed under the EPBC Act due to the absence of mature trees or a range of tree ages in the patch.

Patches of PCT 360 were considered against the listing advice for the critically endangered ecological community (CEEC) Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains as listed under the EPBC Act. The vegetation within the proposal site does not meet the description provided in the listing advice for the community, as the listing advice excludes wetlands dominated by species such as *Eleocharis* spp. and other taller native graminoids (TSSC 2012), which are the dominant native species within the proposal site. The patches of PCT 360 in the proposal site are degraded with high exotic plant cover and low native herb and graminoid species richness and cover. Degraded remnants are excluded from the listing (TSSC 2012). As the characteristic species of the EPBC Act-listed CEEC are not present, and the community is dominated by species specifically excluded from the listing if they are dominant (TSSC 2012), vegetation within the proposal site does not comprise an occurrence of the EPBC Act-listed CEEC.



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Threatened species and habitat features

Figure 6.1

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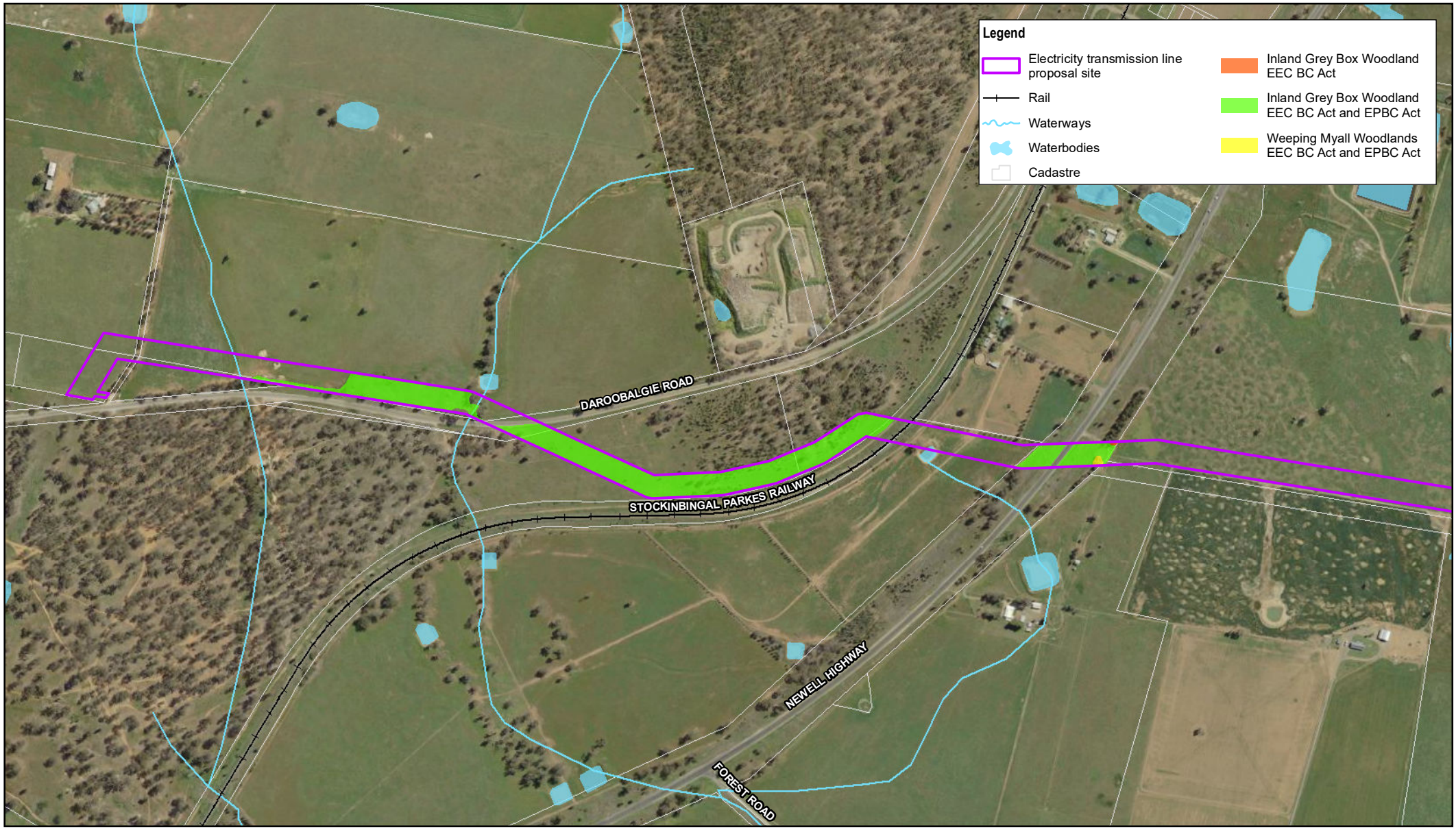

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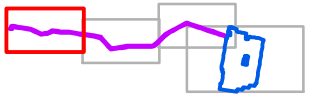

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Figure 6.2a

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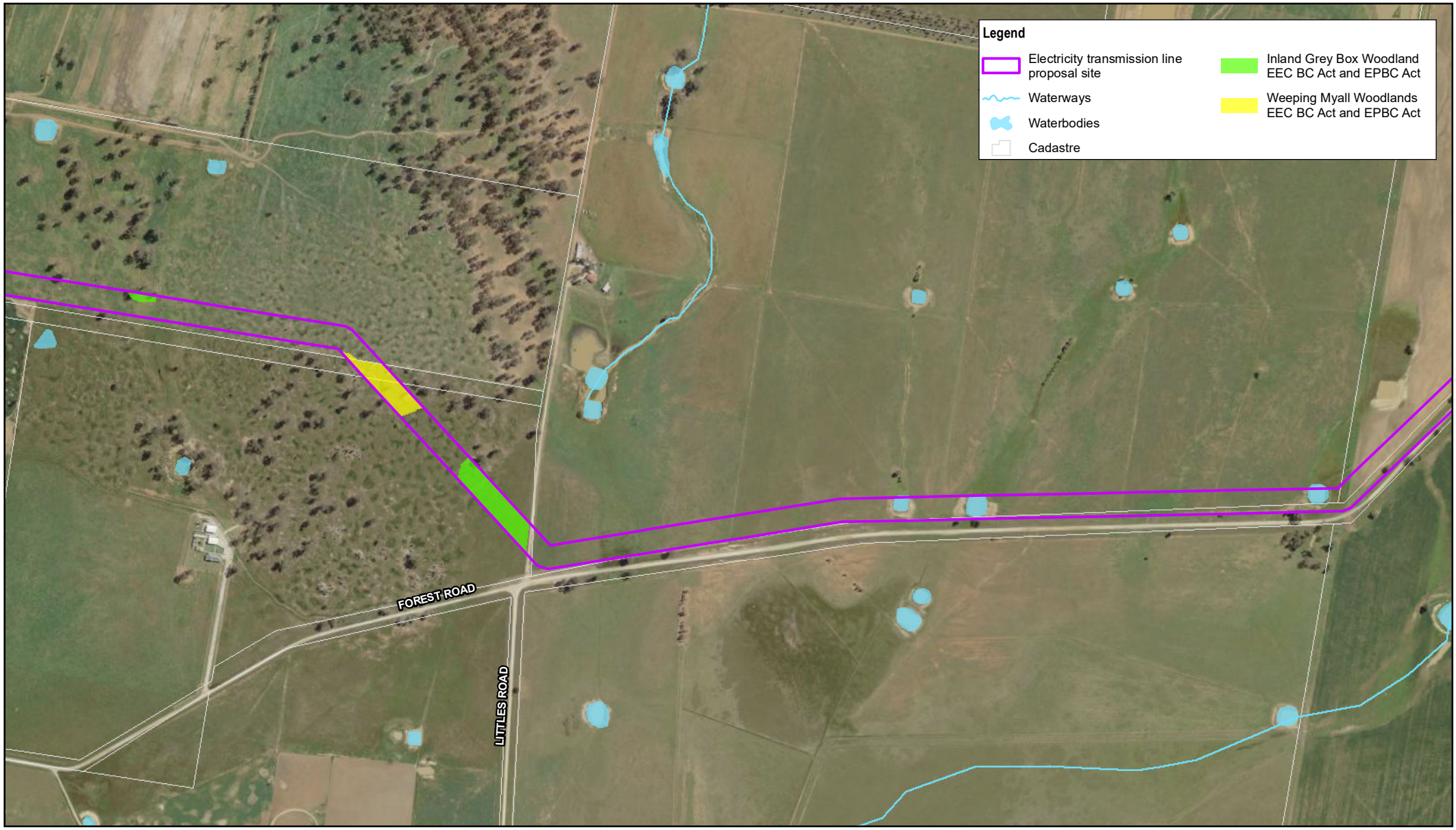

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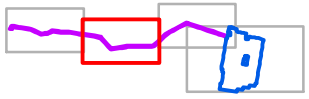

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Figure 6.2b

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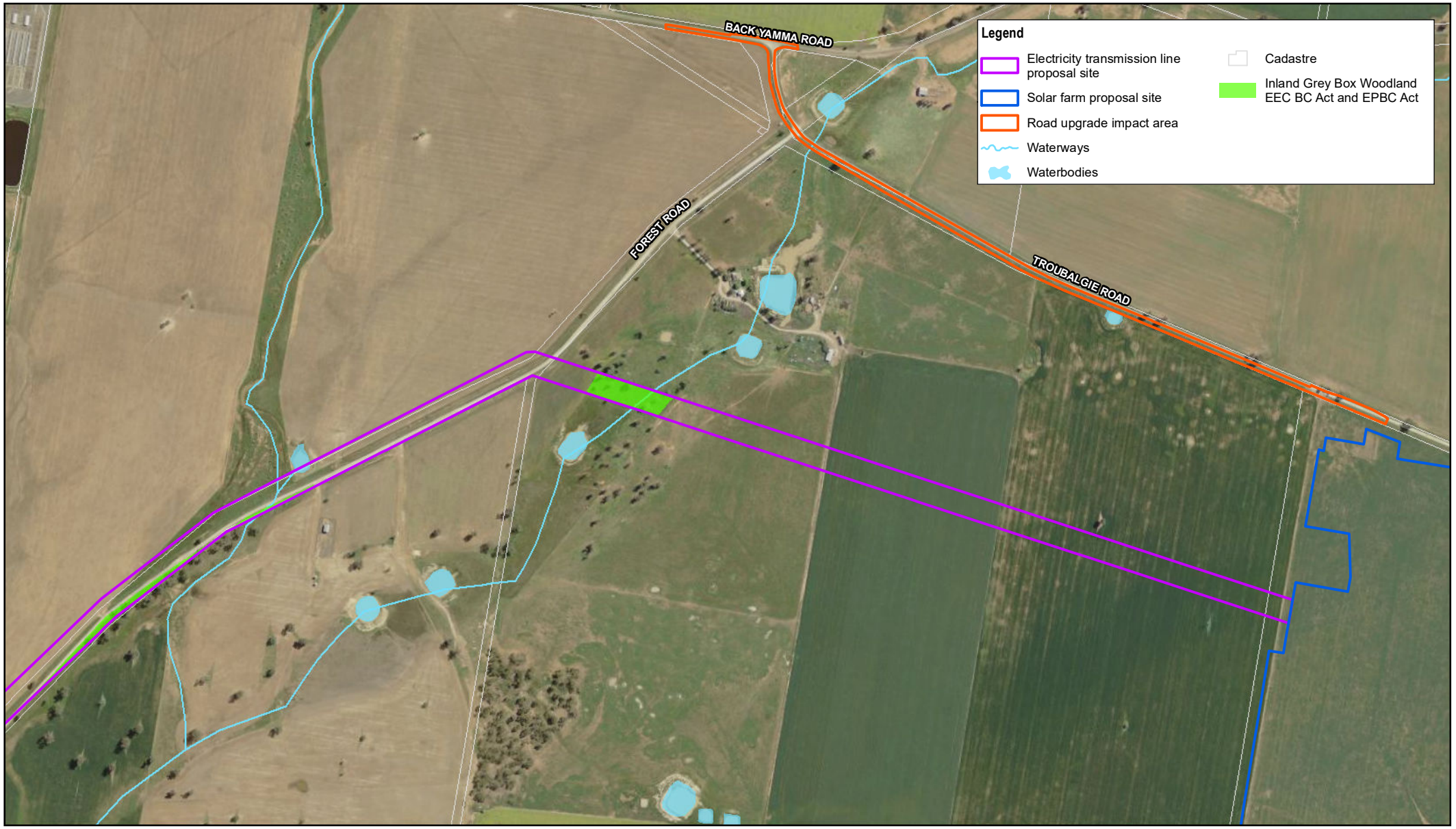

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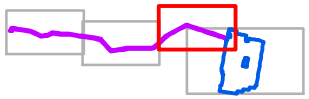

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Figure 6.2c

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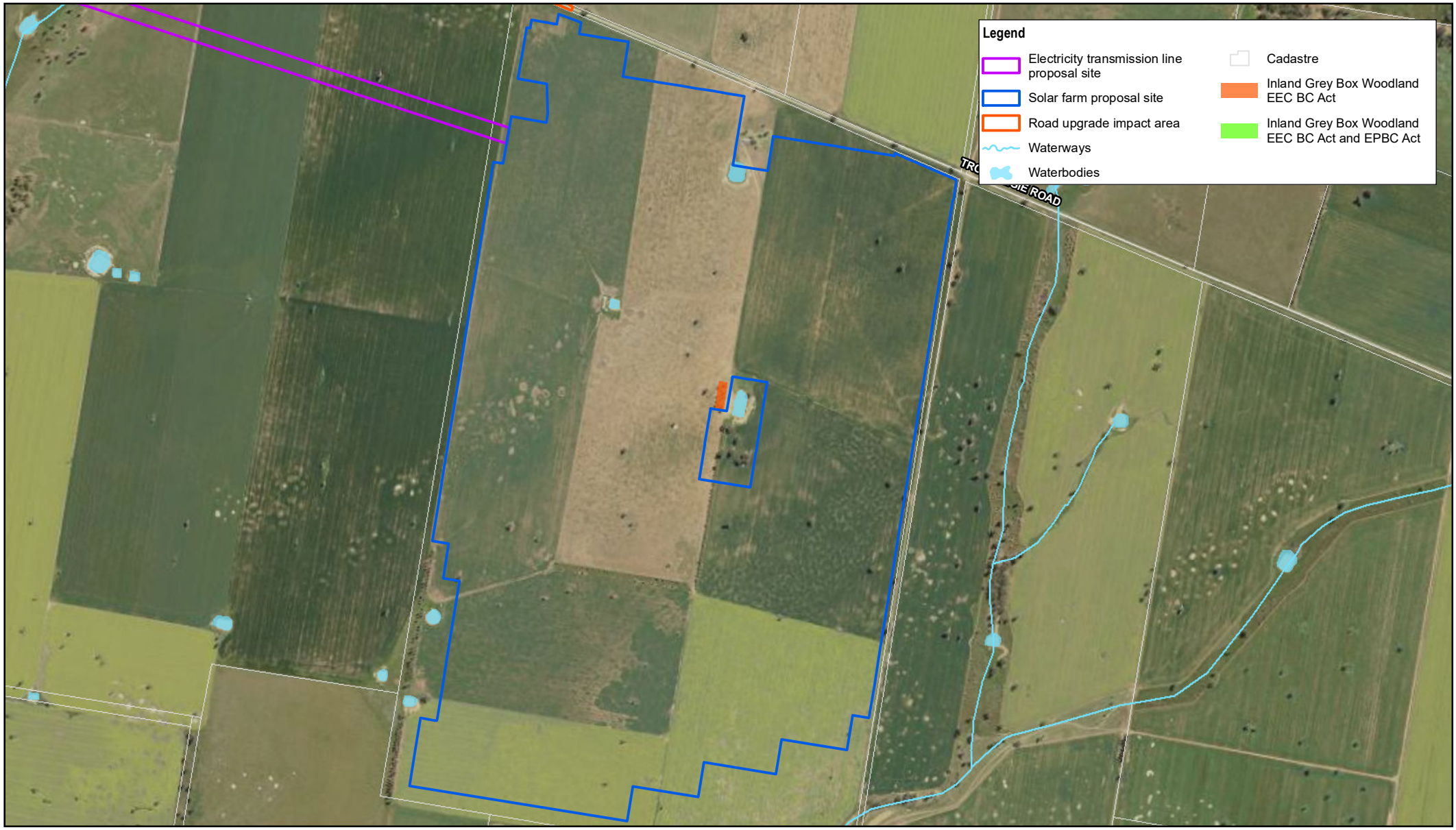

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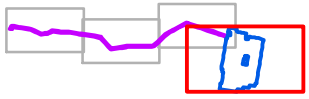

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Figure 6.2d

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6.3 Assessment of planted native vegetation for threatened species habitat

This Section provides an assessment of planted native vegetation within the proposal site (ie, the small patch of vegetation that has been planted as a windbreak along a driveway at the western end of the ETL) for use by threatened species.

6.3.1 Threatened flora species

Planted vegetation within the proposal site that cannot be assigned to any locally occurring PCT does not provide suitable habitat for any threatened flora species. Vegetation in these areas has been planted from unknown provenance seed, alongside cropped paddocks where the natural seed bank and soil profile has been lost, with the remaining soil subject to decades of disturbance. There is no source of seed or propagation material from which any threatened flora species may germinate.

6.3.2 Threatened and migratory fauna species

Planted native vegetation is low in species richness, and comprises non-locally native tree species. This area would provide marginal habitat resources for a range of native fauna, including mature canopy and mallee trees that provide myrtaceous foraging material, as well as broadly suitable roosting or nesting substrates and trees with decorticating bark. Threatened species that may forage in planted native vegetation include small woodland birds, microbats and parrots. Further discussion is provided in Section 8.2.

7. Matters of National Environmental Significance

7.1 Threatened ecological communities

Three of the PCTs identified within the proposal site comprise occurrences of threatened ecological communities listed under the EPBC Act:

– PCTID 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
– PCTID 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregion
– PCTID 80 – Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion

Weeping Myall Woodland (PCTID 26) is commensurate with the EPBC Act-listed EEC Weeping Myall Woodlands and occurs in the central section of the transmission line alignment (see).

Areas dominated by a canopy of Grey Box or areas of native grassland that are derived from a community once dominated by Grey Box (PCTID 76 and PCTID 80) are commensurate with the EPBC Act-listed EEC Grey Box (*Eucalyptus microcarpa*) Grassy Woodland and Derived Native Grasslands of South-Eastern Australia. The community occurs as scattered patches along the length of the transmission alignment, with woodland in the western section of the alignment connected to larger patches within Crown Reserve (see Figure 5-1). The planting in the solar farm site classifies for listing under the BC Act however does not meet the key diagnostic characteristics in the listing advice for the EPBC Act form of the community due to the low percentage of canopy cover and small size class of the trees in the planted areas.

The occurrence of PCT 244 in the proposal site does not meet the key diagnostic characteristics in the listing advice for *Poplar Box Grassy Woodland on Alluvial Plains* as listed under the EPBC Act due to the absence of mature trees or a range of tree ages in the patch.

7.2 Threatened species

One threatened species listed under the EPBC Act was identified during field surveys; the Superb Parrot (*Polytelis swainsonii*). Several other threatened species listed under the EPBC Act have the potential to occur in the proposal site, as summarised in Table 7.1. Various other species have been assessed to have a low potential to occur given lack of suitable habitat and few local records (Appendix A).

Table 7.1: Threatened EPBC Act-listed species known or likely to occur in the study area

Common name	Scientific name	EPBC Act status	Likelihood of occurrence
Flora			
Floating Swamp Wallaby-grass	*Amphibromus fluitans*	V	Low
Spiny Peppercress	*Lepidium aschersonii*	V	Low
Winged Peppercress	*Lepidium monoplocoides*	E	Low
Slender Darling-pea	*Swainsona murrayana*	V	Low
Small Purple-pea	*Swainsona recta*	E	Low
Fauna			
Sloane's Froglet	*Crinia sloanei*	E	Low
Australasian Bittern	*Botaurus poiciloptilus*	E	Low
Curlew Sandpiper	*Calidris ferruginea*	CE	Low

Common name	Scientific name	EPBC Act status	Likelihood of occurrence
Grey Falcon	*Falco hypoleucos*	V	Moderate
White-throated Needletail	*Hirundapus caudacutus*	V	Low
Swift Parrot	*Lathamus discolor*	CE	Low
Superb Parrot	*Polytelis swainsonii*	V	Present
Australian Painted Snipe	*Rostratula australis*	E	Low
South-eastern Long-eared Bat	*Nyctophilus corbeni*	V	Moderate
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	Low
Spotted-tailed Quoll	*Dasyurus maculatus maculatus*	E	Low

Key: CE – critically endangered, E – endangered, V – vulnerable

7.3 Migratory biota

No migratory species were recorded during field surveys. There is potential for a number of migratory bird species of wetlands and woodland to forage on occasion within the proposal site, during their migration to breeding habitats elsewhere.

Important habitat for migratory birds is defined in the significance criteria for listed migratory species (DoE 2013) as follows:

– Habitat utilised by a migratory species occasionally or periodically within the region that supports an ecologically significant proportion of the population of the species.
– Habitat that is of critical importance to the species at particular life-cycle stages.
– Habitat utilised by a migratory species which is at the limit of the species range.
– Habitat within an area where the species is declining.

The proposal site does not contain any specific habitat features or resources that suggest that it would support these species frequently or in large numbers. Habitat in the proposal site is unlikely to be important habitat for migratory species as it would not support an ecologically significant proportion of the population, is not critical to the lifecycle of these species and is not at the limit of these species' range. While some migratory species may occur on occasion, they would not rely on the habitats present for their survival in the locality.

8. Identification of prescribed additional biodiversity values

8.1 Introduction

The Biodiversity Conservation Regulation 2017 (BC Regulation) (clause 6.1) identifies additional biodiversity impacts to which the BOS applies. These 'prescribed impacts' are the impacts on biodiversity values which are not related to, or are in addition to, native vegetation clearing and habitat loss. These types of impacts are used by the decision-maker to inform the determination and conditions of consent for developments. These include impacts:

– on the habitat of threatened entities including:
  - karst, caves, crevices, cliffs, rocks and other geological features of significance,
  - human-made structures, or
  - non-native vegetation
– on areas connecting threatened species habitat, such as movement corridors
– that affect water quality, water bodies and hydrological processes that sustain threatened entities
– on threatened and protected animals from turbine strikes from a wind farm (not relevant to this project)
– on threatened species or fauna that are part of a TEC from vehicle strikes.

The BDAR must identify the relevant prescribed impacts and the suite of threatened species that use or rely on the habitat values or would be affected by the impact, as specified in BAM Section 6. The likelihood, extent and magnitude of prescribed impacts must then be assessed using the approach specified in the BAM Section 8.3. Those of relevance to this project are described in the sections below.

8.2 Habitat of threatened species

No areas of karst, caves, crevices or cliffs are present in the proposal site. There are no human-made structures within the proposal site. Habitats associated with non-native vegetation are described in Table 8.1.

Table 8.1: Habitats associated with non-native vegetation

Criteria	Discussion
a. Provide a description of the type of non-native vegetation habitat	Non-native vegetation in the proposal site comprises planted vegetation, exotic grassland and cropland (as described in Table 5.1 and Table 5.3 and mapped on Figure 5.1).
b. Prepare a list of threatened species that use these features as habitat	**Woodland birds, parrots and raptors:** – Dusky Woodswallow – Spotted Harrier – Varied Sittella – Grey Falcon – Black Falcon – Little Eagle – Major Mitchell's Cockatoo – Square-tailed Kite – Hooded Robin – Turquoise Parrot – Scarlet Robin – Flame Robin – Superb Parrot – Grey-crowned Babbler – Diamond Firetail

Criteria	Discussion
	Microbats: – Little Pied Bat – South-eastern Long-eared Bat – Yellow-bellied Sheathtail-bat
c. Describe how each threatened species could, or does, use the non-native vegetation as habitat (based on published literature and other reliable sources)	**Woodland birds, parrots and raptors:** Each of the species listed in the table above may forage, hunt and/or perch within the small stands of planted vegetation within the proposal site on occasion, in response to favourable conditions or as part of their wider home range. The habitats present within planted vegetation are insufficient to support any species entire lifecycle or habitat needs, but may contribute to the species' overall home range and suite of available habitats. **Microbats:** Each of the species listed in the table above may forage, hunt and/or use trees within the small stands of planted vegetation for temporary or diurnal roosts on occasion, in response to favourable conditions or as part of their wider home range. The habitats present within planted vegetation are insufficient to support any species entire lifecycle or habitat needs, but may contribute to the species' overall home range and suite of available habitats.

8.3 Habitat connectivity

Connectivity is provided in the locality by:

– Vegetated Crown Reserve TSRs
– Scattered paddock trees that provide stepping stones throughout the landscape
– Small, narrow, linear strips of vegetation planted for windbreaks
– Small, isolated patches of remnant vegetation within otherwise cleared agricultural landscapes.

In general, vegetation in the locality is highly fragmented because of historical agricultural activities. There are few large tracts of native vegetation outside of the limited Crown Reserve network, and all areas are subject to ongoing disturbance from surrounding land uses and impacts associated with edge effects, periodic grazing and the influence of windblown seed from surrounding cropping practices. The Crown Reserve TSR represents the only real movement corridor in the local area.

An assessment of connectivity values for key species is provided in Table 8.2.

Table 8.2: Connectivity values

Criteria	Discussion
Where corridors or other areas of connectivity link habitat for threatened entities, the assessor must: (a) prepare a list of threatened entities that are likely to use or are a part of the connectivity or corridor	**Woodland birds, parrots and raptors:** – Dusky Woodswallow – Spotted Harrier – Varied Sittella – Grey Falcon – Black Falcon – Little Eagle – Major Mitchell's Cockatoo – Square-tailed Kite – Hooded Robin – Turquoise Parrot – Scarlet Robin – Flame Robin – Superb Parrot – Grey-crowned Babbler – Diamond Firetail

Criteria	Discussion
	Microbats: – Little Pied Bat – South-eastern Long-eared Bat – Yellow-bellied Sheathtail-bat
(b) describe the importance of the connectivity to threatened entities, particularly for maintaining movement that is crucial to the species' life cycle (based on published literature and other reliable sources).	**Microbats, woodland birds, parrots and raptors:** The proposal site is located in a predominantly cleared landscape, with extensive tracts of cropping land and agricultural grazing land. The species that have the potential to persist are highly-mobile species that are capable of surviving in a fragmented landscape with limited connectivity. The above listed species are all highly mobile, and capable of moving throughout the landscape, despite the existing degree of habitat fragmentation. These species generally utilise upwards of several hectares of habitat as part of their home ranges. The proposal will not result in the creation of any new barriers to movement for any of these species. There are already several transmission lines in the study area, along with roads, rail lines, and agricultural infrastructure. The ETL proposal site has been located so as to avoid impacts through the middle of any patches of intact woodland that may contribute to movement corridors throughout the landscape. Instead, impacts will be limited to the edges of patches, adjacent to areas of existing disturbance.

8.4 Water quality, water bodies and hydrological processes

An assessment of water bodies relevant to threatened species is provided in Table 8.3.

Table 8.3: Habitats and species that depend on waterbodies

Criteria	Discussion
a. prepare a list of threatened entities that may use or depend on water bodies or hydrological processes for all or part of their life cycle or b. prepare a list of threatened entities that will be, or are likely to be impacted by changes to existing water bodies or hydrological processes or the construction of a new water body	While several threatened wetland bird species may occur in the proposal site on occasion, this would be on a short term in response to favourable conditions on site. none of the predicted species are likely to breed at the site or to occur within the site on a permanent basis, and instead, may forage on occasion in gilgai wetlands. **Wetland species (birds and amphibians)** – Australasian Bittern – Australian Painted Snipe – Brolga – Magpie Goose – White Bellied Sea-Eagle (foraging habitat) – White-fronted Chat – Sloane's Froglet
c. describe the habitat provided for each threatened entity by the water body or hydrological process, including consideration of water quality, volume, flow paths and seasonal patterns (based on published literature and other reliable sources)	Gilgai wetlands (PCT 360) provide broadly suitable occasional foraging habitat for the threatened bird species listed above and Sloane's Froglet. There is insufficient habitat present for any of these species to occur within the study area on a permanent basis, nor are any of the species likely to breed within the proposal site given the limited extent of wetland areas, the ongoing disturbance within and around them from agricultural activities, and lack of adequate vegetative cover and shelter habitat. Gilgai wetlands are ephemeral, and fill following rainfall events, then gradually empty as water drains away or evaporates. When they contain water, they may provide occasional habitat for frogs and invertebrates, and wetland bird species may visit the area on occasion either as part of their migration, or while they are traversing the landscape. Gilgai areas within the proposal site are subject to frequent and ongoing disturbance, associated with agricultural activities such as cropping, grazing and harvesting. Any species using them as habitat would need

Criteria	Discussion
	to be capable of persisting alongside such disturbance, and surviving in an environment prone to regular vehicle and machinery movements. Given the zoning of the land, agricultural impacts (including grazing, dam creation, cropping etc) have degraded habitat resources in wetland areas for many decades and will likely continue to occur in the land surrounding the ETL in the future.

8.5 Vehicle strike

Key species at risk of vehicle strike is provided in Table 8.4.

Table 8.4: Vehicle strike risk

Criteria	Discussion
a. identify potential impact locations on the Site Map, and	Construction of the proposal would result in a small, temporary increase to the risk of vehicle strike through the movement of construction vehicles, potentially along Troubalgie Road, Forest Road and Daroobalgie Road, as shown on Figure 1.1. Operation of the project is unlikely to result in any increased risk of vehicle strike, given movements would be restricted to occasional maintenance along the ETL and within the solar farm itself, and much of the footprint already experiences occasional vehicle movements as a result of existing agricultural activities.
b. prepare a list of threatened fauna or animals that are part of a TEC at risk of vehicle strike.	**Woodland birds, parrots and raptors:** – Dusky Woodswallow – Spotted Harrier – Varied Sittella – Grey Falcon – Black Falcon – Little Eagle – Major Mitchell's Cockatoo – Square-tailed Kite – Hooded Robin – Turquoise Parrot – Scarlet Robin – Flame Robin – Superb Parrot – Grey-crowned Babbler – Diamond Firetail **Wetland species (birds and amphibians)** – Australasian Bittern – Australian Painted Snipe – Brolga – Magpie Goose – White Bellied Sea-Eagle (foraging habitat) – White-fronted Chat – Sloane’s Froglet Common, non-threatened native fauna species that are part of the various TECs such as macropods, larger reptiles and birds may also be at risk of vehicle strike as they move throughout the landscape.

9. Impact assessment

9.1 Measures to avoid and minimise impacts

9.1.1 Avoidance measures

During the development of the proposal, a number of alternative transmission line alignment options and solar farm site layouts were investigated. These options were developed in response to ongoing environmental investigations, which included habitat constraints mapping, consultation with landowners, and consideration of constructability. The proposal was purposefully modified to avoid impacts to biodiversity values and especially threatened biota as follows:

– Avoidance of areas of TECs as far as practicable, including the remnant Grey Box Woodland within the solar farm site by excluding solar panels and other infrastructure from the area that supports this vegetation type
– Avoidance of gilgai wetland habitat within the south-eastern corner of the solar farm site excluding solar panels and other infrastructure from land that supports this vegetation
– Avoiding fragmentation of the large woodland patches within the Crown Reserve TSR in the western section of the transmission alignment, with multiple potential alignments considered and the final alignment selected in part due to the lower magnitude of impacts on biodiversity values
– Avoidance of woodland vegetation and large remnant trees as a priority when selecting the transmission line alignment.

The following additional changes to the proposal site layout were made to reduce social or other environmental impacts of the proposal and further reduced impacts to biodiversity values:

– Inclusion of buffers around the edge of the solar farm site for potential planting of vegetation to provide visual screening.

9.1.2 Mitigation measures

A Construction Environmental Management Plan (CEMP) (or equivalent) would be required for the construction phase of the proposal, and would be prepared prior to issue of the Construction Certificate. The CEMP would include, as a minimum, industry-standard measures for the management of soil, surface water, weeds and pollutants, and planting of vegetated screens (see Section 10).

Planting of vegetated screens is proposed along a portion of the boundary of the solar farm proposal site, where shading of the solar panels is unlikely to occur. These would include locally sourced species typical of the PCTs present around the proposal site.

At the end of its operational life, the solar farm would be decommissioned. Pacific Hydro would remove all above ground structures while underground infrastructure would be left in-situ. A decommissioning and rehabilitation plan would be prepared detailing the actions required for Pacific Hydro to return the operational portions of the site to a condition suitable for agricultural use (see Section 10.3). Native vegetation that is avoided through the design of the proposal and visual screening plantings would be retained and excluded from any agricultural activities that would reduce its value as habitat.

9.2 Direct impacts

Impacts have been assessed in a conservative manner, with the entire solar farm proposal site and ETL proposal site assumed to be permanently cleared of all vegetation for the purposes of this assessment. In reality, this is likely to be an overestimate of the extent and permanence of impacts.

Along the ETL proposal site, impacts will generally be limited to construction of poles and establishment of a 45 m wide easement. No formal access track would be established. This is likely to involve standard vegetation management measures employed in transmission line management, whereby vegetation of a certain height is removed to create the necessary clearance for the transmission lines. In this instance, it will involve all vegetation

that grows to 6.5 m or higher being removed. No permanent access tracks along the easement would be established; a 4WD vehicle would access the alignment over existing terrain within the easement for operations and maintenance activities. It is likely that understorey and midstorey vegetation will remain along much of the ETL proposal site, however given a lack of certainty over the ability of retained vegetation to withstand disturbance without experiencing a decline in native floristic diversity, abundance or cover, it has been assumed that all vegetation would be removed. The construction process would involve establishment of temporary laydown areas and construction compounds within the easement, however these would be contained entirely within the ETL proposal site and impacts associated with these ancillary features are captured within the impact assessment of direct impacts for the proposal.

At the solar farm proposal site permanent, direct impacts would be restricted to the footprints for tracking structures attached to solar arrays, the operations and maintenance facility, internal access roads and perimeter security fencing. Throughout the rest of the solar farm site impacts would be minor and indirect, such as shading beneath panels or temporary, such as soil disturbance for temporary construction compounds and cabling.

9.2.1 Removal or modification of vegetation

Land clearance is listed as a Key Threatening Process (KTP) under the BC Act and EPBC Act. Land clearance consists of the destruction of the above ground biomass of native vegetation and its substantial replacement by non-local species or by human artefacts.

Construction of the project would require the removal of 14.91 hectares of native vegetation, which would constitute an increase in the operation of this KTP in the locality. A total of 0.22 ha of native vegetation would be removed from the solar farm proposal site, and 14.69 ha of native vegetation would be removed from the ETL proposal site, as summarised in Table 9.1.

Once the solar farm is established, it is possible that some native understorey species could establish and some degree of natural recruitment would take place underneath the solar panels. Remnant woodland in the solar farm site would be retained, with appropriate buffers established around these trees.

Construction of the ETL would require a mixture of permanent and temporary impacts to vegetation, with permanent removal of vegetation at each pole and stringer location, and temporary impacts during the construction phase with laydown areas and establishment of access tracks for construction vehicles. Once the ETL is operational, impacts would include regular (approximately twice-yearly) maintenance of the ETL to maintain the necessary 6.5 m clearance of the transmission line span, within the ETL footprint considered in this assessment.

The ETL proposal site supports a combination of native woodland, derived native grassland, gilgai wetlands, planted vegetation and cropping land (mapped as category 1 exempt land). It is likely that some native species (and perhaps, plant communities) would persist within the ETL, given that total vegetation clearing along the entire easement is not necessary or proposed, particularly in the areas mapped as derived native grasslands and gilgai wetlands, where no removal of midstorey or canopy species is necessary or proposed. However, uncertainty over the degree of impact during the construction phase and ability of vegetation to recover post construction has meant that a conservative approach has been adopted, and it has been assumed that all vegetation within the ETL proposal site would be cleared for this assessment.

Table 9.1: Direct impacts on vegetation

Plant community type	Threatened ecological community	Area impacted (ha)
Solar farm proposal site		
Zone 1 – PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions - planted	EEC – Grey Box Woodland (BC Act)	0.22
ETL proposal site		
Zone 1 – PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions - planted	EEC – Grey Box Woodland (BC Act)	0.01

Plant community type	Threatened ecological community	Area impacted (ha)
Zone 2 – PCT 26 Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion - good	EEC – Weeping Myall Woodland (BC Act & EPBC Act)	0.65
Zone 3 – PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions - good	EEC – Grey Box Woodland (BC Act & EPBC Act)	0.62
Zone 4 - PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – derived native grassland	EEC – Grey Box Woodland (BC Act)	2.14
Zone 5 – PCT 80 Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion - good	EEC – Grey Box Woodland (BC Act & EPBC Act)	0.44
Zone 6 - PCT 80 Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion – derived native grassland	EEC – Grey Box Woodland (BC Act)	2.62
Zone 7 – PCT 80 Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion – derived scrub	EEC – Grey Box Woodland (BC Act & EPBC Act)	1.64
Zone 8 – PCT 244 Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) - planted	Does not meet condition criteria for EPBC Act EEC	0.07
Zone 9 – PCT 360 Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion - poor	Not listed	2.54
Zone 10 - PCT 360 Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion – very poor	Not listed	3.96
Total native vegetation (ETL)		**14.69**
Total native vegetation (solar farm & ETL)		**14.91**
Category 1 – exempt land (solar farm, road upgrade footprint & ETL)		**275.87**
Planted vegetation (ETL)		**0.20**
Total proposal site		**290.98**

9.2.2 Removal of habitat and habitat resources

The vegetation that would be removed or modified provides habitat resources for native fauna species, including threatened fauna species. Habitat features to be impacted include fallen timber, hollow-bearing trees, accumulations of leaf litter, gilgais and patches of intact woodland and derived native grassland. Habitat resources that would be removed include foraging and shelter resources that would mainly be used by native fauna capable of persisting in highly fragmented agricultural landscapes.

Mature trees that would be removed have value for fauna populations as sources of foraging resources such as leaves, nectar, sap or seed and substrate for invertebrate prey. Hollow-bearing trees would also be removed, and are a limited resource, relied on by many native fauna for shelter and breeding. Galahs and Eastern Rosellas were observed during surveys at hollows in the wider study area. The removal of hollow-bearing trees would reduce the extent of potential breeding habitat for native species in the area, and could potentially remove breeding habitat for threatened species such as the Turquoise Parrot (*Neophema pulchella*), which has the potential to breed in the locality.

As outlined in Section 9.2.1, not all vegetation within the ETL proposal site would be removed (but it has been assumed it may be, or may be disturbed to such an extent that it does not recover post-construction, for this assessment). Understorey and some mid storey vegetation along the ETL would likely be retained, potentially with some degree of change to floristic assemblage and diversity as a result of disturbance. As such, the total area of native vegetation removal is likely to be an overestimate.

In the context of the areas of remaining native woodland vegetation surrounding the proposal site, particularly in the Crown Reserve TSR in the western section of the transmission line, the proposal would remove a small proportion of available habitat resources for local populations of native fauna. It is unlikely that this would substantially impact on the available habitat resources of local fauna in the study area.

9.2.3 Fauna injury and mortality

As described above, the proposal site provides a variety of habitat resources for native fauna species, including foraging, roosting and shelter resources for threatened species as well as common native fauna. Groundcover vegetation, gilgais, leaf litter and woody debris would provide shelter and foraging substrate for reptiles, frogs and invertebrates. Construction may result in the injury or mortality of some individuals of these less mobile fauna species and other small terrestrial fauna that may be sheltering in vegetation within the proposal site during clearing activities. There is a potential risk of injury or mortality to any species which may be using hollows, such as microbats, arboreal mammals or hollow-nesting birds. The potential for impacts on fauna utilising hollows would be reduced through pre-clearance surveys of hollow-bearing trees and protocols for reduced-impact felling of habitat trees (see Table 10.1). More mobile native fauna such as native birds, bats, terrestrial and arboreal mammals that may be sheltering in vegetation in the proposal site are likely to evade injury during construction activities as they are more able to disperse once disturbed.

Recommendations have been made in Section 10.2 to minimise the risk of vegetation clearing activities resulting in the injury or mortality of resident fauna.

9.2.4 Fragmentation or isolation of habitat

Much of the proposal site is located on already cleared land. The majority of the solar farm proposal site is comprised of cropped land that already comprises a gap in habitat for less mobile native fauna. A small patch of native planting would be removed from the solar farm proposal site. The proposal would also require the removal of numerous scattered paddock trees from within the solar farm proposal site. These trees are often important habitat features within agricultural landscapes and provide ‘stepping stones’ that facilitate movement across the landscape by shelter-dependent and mobile fauna species. The small patch of mature Inland Grey Box Woodland would be retained within the solar farm proposal site, which would continue to provide a stepping stone for mobile fauna species, should they require one.

The proposal would remove woodland vegetation in the transmission line alignment, which is connected to surrounding vegetation in the western and central sections of the proposal site. However, tree removal is generally restricted to the edge of woodland patches and would result in a minor increase to the degree of habitat fragmentation in the local area.

Construction of the ETL would require clearing of an easement up to 45 m wide. Despite this, the creation of an easement is unlikely to result in a barrier to movement for any mobile fauna species, which would still be able to traverse the landscape. The easement may result in some disruption to habitat for less-mobile species, but would not prevent movement post-construction.

The proposal would not isolate any patches of habitat and no connecting links would be severed, thanks to the design of the ETL which was re-routed several times to avoid any such impacts. Instead of bisecting intact patches of habitat, the ETL proposal site now falls on the edge of patches, rather than in the middle.

Connectivity of groundcover vegetation would still be retained under solar panels and between transmission line poles. The study area contains extensively fragmented patches of remnant habitat within an agricultural landscape and would be unlikely to support populations of shelter-dependent or less mobile fauna species. In this context, vegetation removal for the proposal is unlikely to comprise a significant barrier to the movement of any locally occurring fauna species.

9.2.5 Groundwater dependent ecosystems

The potential impacts on GDEs are likely to be minimal. Construction of the proposal would not result in the erection of large areas of impermeable surfaces, nor would it influence groundwater or surface water flows.

9.3 Scattered tree assessment

9.3.1 Solar farm

The results of the scattered tree assessment are presented in section 5.6 and Appendix B.

A total of 32 scattered trees would be removed, including 7 class 2 and 25 class 3 trees. It is likely that these trees were once components of PCT ID 76 (Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions). Appendix B provides a summary of the scattered trees recorded within the proposal site. No threatened species were observed using these trees during field surveys, and no signs of use by threatened species was noted by site staff, despite targeted searches looking for any evidence of use of habitation.

No confirmed candidate species were considered likely to occur, and no entities at risk of an SAII were identified by the BAM calculator, desktop review or results of the field survey.

9.3.2 Road upgrade

The results of the scattered tree assessment are presented in section 5.6 and Appendix B.

A total of four scattered trees would be removed, all of which are class 3 trees. It is likely that most of these trees were once components of PCT ID 76 (Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions), while one tree was part of PCT 11 (River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion). Appendix B provides a summary of the scattered trees recorded within the proposal site. No threatened species were observed using these trees during field surveys, and no signs of use by threatened species was noted by site staff, despite targeted searches looking for any evidence of use of habitation.

No confirmed candidate species were considered likely to occur, and no entities at risk of an SAII were identified by the BAM calculator, desktop review or results of the field survey.

9.4 Indirect impacts

Indirect impacts that may occur as a result of the proposal are described in Table 9.2. Mitigation measures proposed to minimise the risk of these impacts are detailed in Section 10.2. Given the minor area and intensity of potential indirect impacts, proposed mitigation measures and substantially modified character of the receiving environment, indirect impacts are not likely to result in any tangible negative impacts on native vegetation or other threatened species habitat. No biodiversity offsets have been calculated for indirect impacts.

Table 9.2: Indirect impacts

Impact	Description
Disturbance of native vegetation	In addition to the direct removal of native vegetation, the area within the transmission line easement is also likely to be indirectly disturbed during the construction period for the transmission line due to vehicle movement, material set-down in the vicinity of pole locations and general construction activity. Following completion of the proposal the groundcover would be allowed to regenerate to a condition similar to its existing state.
Reflected light and heat generated by solar panels	Reflected heat and light from the solar panel would increase the temperature of the microclimate around the infrastructure. This may alter the species composition and richness. It may also affect growth of plants. These impacts may then affect habitat for small fauna such as lizards that may occur in these areas.
Weed invasion and edge effects	'Edge effects' refer to increased noise and light or erosion and sedimentation at the interface of intact vegetation and cleared areas. Edge effects may result in impacts such as changes to vegetation type and structure, increased growth of exotic plants, increased predation of native fauna or avoidance of habitat by native fauna. Altered environmental conditions along new edges can allow invasion by pest animals specialising in edge habitats and/or change the behaviour of resident animals. Edge

Impact	Description
	effects would result from construction activities and then continue to affect vegetation and habitats adjoining the proposal site. The majority of the proposal site and adjoining land has been extensively cleared for agricultural purposes. Small patches of woodland vegetation occur at scattered locations with larger patches occurring in the Crown Reserve in the western section of the transmission alignment and connected to vegetation in the proposal site. Various weeds and exotic pasture species are present throughout the site. Construction of the proposal would result in new edges along already fragmented woodland patches, and has the potential to introduce or spread weeds. Given the existing degree of vegetation clearing and ongoing disturbance from infrastructure and agricultural practices in the study area this would comprise a very minor increase in the degree of edge effects.
Pests and pathogens	Construction activities, in general, have the potential to introduce or spread pathogens such as Phytophthora (*Phytophthora cinnamomi*), Myrtle Rust (*Uredo rangelii*) and Chytrid fungus (*Batrachochytrium dendrobatidis*) into native vegetation. The potential for impacts associated with these pathogens is low, given the disturbed nature of much of the study area, lack of permanent flowing water on site, and the environmental safeguards that would be implemented during the construction process.
Noise, light and vibration	Construction of the proposal would require the use of additional vehicles and plant in the site. Fauna that occupy habitats within the proposal site and adjacent areas are likely to be accustomed to some existing noise and vibration originating from vehicles, including trains, and agricultural machinery. There is limited light spill currently at the solar farm site. With light spill along the transmission alignment generally associated with traffic and lighting along the Newell Highway. Noise and vibration disturbance during construction could disturb resident fauna. While there would be localised increases in noise, vibration and light that would temporarily create substantial disturbance, increases above existing background levels during construction are unlikely to result in a significant impact on fauna that occur in the study area.
Sedimentation and erosion	Construction of the proposal has the potential to result in sedimentation and erosion within the proposal site and adjoining native vegetation and aquatic habitats, through soil disturbance and construction activities. Sediment laden runoff to waterways can alter water quality and adversely affect aquatic life. Given the modified nature of drainage lines in adjacent areas and their ephemera nature, the potential for impacts is negligible.
Aquatic disturbance and pollution	Construction of the proposal has the potential to result in the mobilisation of contaminated sediments into waterways, or chemical spills from vehicles or plant. The introduction of pollutants from the proposal into the surrounding environment, if uncontrolled, could potentially impact on water quality further downstream. Given the modified nature of drainage lines in adjacent areas and their ephemeral nature, the potential for impacts is negligible. Management measures to prevent potential impacts on waterways would be included in the CEMP.

9.5 Assessment of serious and irreversible impacts

Under the BC Act, a determination of whether an impact is serious and irreversible must be made in accordance with the principles set out in Section 6.7 of the BC Regulation.

The principles are aimed at capturing impacts which are likely to contribute significantly to the risk of extinction of a threatened species or ecological community in New South Wales. These impacts will:

– Cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline, or
– Further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size, or
– Impact on the habitat of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution, or
– Impact on a species or ecological community that is unlikely to respond to measures to improve habitat and vegetation integrity and is therefore irreplaceable.

The decision-maker must determine whether or not an impact on biodiversity values is likely to be a serious and irreversible impact (SAII). The framework allows for decision-makers to take into account the scale of an impact and the potential for avoidance and mitigation. These factors are weighed against the status and vulnerabilities of the potential SAII entity to ultimately determine if a proposal would result in a SAII (DPIE 2019). If there is a SAII for a State Significant Development, the development may be approved but the approval authority must take those impacts into consideration and determine whether there are any additional and appropriate measures that would minimise those impacts if approval is granted.

Of the threatened biota of relevance to this assessment, no threatened species or ecological communities considered likely to occur are candidate SAII entities. The proposal would not result in any impacts to SAII entities or their habitat. Therefore, no further consideration of potential SAIIs is required.

9.6 Impacts on aquatic habitats

Several farm dams on the solar farm site are likely to be removed by the proposal, while several others will be spanned by the ETL. There is also the potential for some gilgai wetlands to be disturbed during the construction of the transmission line. It is anticipated that pole placement for the transmission line in the area of the gilgai wetlands would be micro-sited and avoid direct impacts on the gilgai wetlands themselves. There would be no direct impacts on the undefined drainage lines within the proposal site. There is potential for impacts to the depressions and table drains that retain water after periods of substantial rain, particularly along the road reserve of Forest Road. Given their ephemeral nature, these drainage lines provide negligible habitat for threatened species.

None of the aquatic habitats in the proposal site or study area are classified as Key Fish Habitat and would not provide potential habitat for threatened fish (see Appendix A). Aquatic habitats may provide limited breeding and shelter resources for common frog and reptile species.

No habitat for threatened biota listed under the FM Act would be directly impacted. Indirect impacts could include sedimentation and erosion during construction. Given the generally dry nature of these drainage lines and limited habitat resources for aquatic biota, the risk of indirect impacts is low. There would be no blockage of fish passage or removal of snags as a result of the proposal.

9.7 Prescribed impacts

Prescribed impacts are the impacts on biodiversity values which are not related to, or are in addition to, native vegetation clearing and habitat loss (Section 6.7 of the BAM). These types of impacts are used by the decision-maker to inform the determination and conditions of consent for developments. In general, these types of impacts affect habitat or features of the environment that are irreplaceable or otherwise important to the maintenance of biodiversity values.

The BC Regulation (clause 6.1) identifies actions that are prescribed as impacts to be assessed under the biodiversity offsets scheme. The likelihood, extent and magnitude of prescribed impacts must be assessed using the approach specified in the BAM, Section 8.3. Those of relevance to this project are discussed in the Sections below.

Given the scale and context of the proposal there are unlikely to be any substantial impacts on threatened species and their habitats beyond those associated with the removal of vegetation and habitat in the proposal site.

9.7.1 Karst, caves, crevices, cliffs, rocks and other geological features of significance

No areas of geological significance are present. No caves suitable for roosting or breeding of bats are present.

9.7.2 Human made structures and non-native vegetation

No buildings, culverts, bridges or similar human-made structures of particular relevance to fauna would be removed for the proposal. Assessments of prescribed impacts are provided below for non-native vegetation present in the proposal site (Table 9.3).

Table 9.3 Prescribed impacts on non-native vegetation

Criteria	Assessment
describe the nature, extent and duration of short-term and long-term impacts (during operation, during construction, that are uncertain)	The proposal would remove 0.20 hectares of planted, non-locally native vegetation. It is assumed that this would comprise a permanent loss of this vegetation. The proposal would remove or modify a further 275.87 hectares of non-native vegetation within the area of category 1 – exempt land associated with cropped land and exotic grassland.
predict the consequences of impacts on threatened entities identified in Sub-Section 6.1.2 justify predictions of impacts with relevant literature and other published sources of information or advice from experts	Non-native vegetation does not comprise habitat for any threatened flora species (see section 6.1.2) and provides minimal habitat resources for threatened fauna species. Planted vegetation includes foraging habitat for birds and microbats. There is no intact understorey or midstorey; the strips of planted vegetation are along a driveway and a small, narrow windbreak, with cropping land on either side. Habitat to be impacted is on the edge of an existing access road/driveway and within an otherwise cropped and grazed paddock and is subject to existing levels of noise and disturbance from vehicles and farm machinery. Large areas of similar habitat is present throughout the local area. The non-native vegetation to be removed is not likely to be important to any common or threatened species. The loss of a relatively small total area of planted vegetation from a small, isolated patch is unlikely to impact the habitat resources available for these species.

The proposal would remove or modify up to 276.07 hectares of non-native vegetation associated with cropped land, cleared land, exotic grassland, plantings and dams in category 1 – exempt land. Category 1 – exempt land does not need to be assessed under the BAM.

of the proposal. These areas would be modified through shading by solar panels and periodic operational activities. This would comprise a substantially lower impact on biodiversity values than complete or permanent vegetation removal.

9.7.3 Habitat connectivity

Habitat fragmentation through the clearing of vegetation can increase the isolation of remnant vegetation and create barriers to the movements of small and sedentary fauna such as ground dwelling mammals, reptiles and amphibians. Furthermore, habitat fragmentation can create barriers to the movement of pollinator vectors, such as insects, or seed vectors, such as birds, and consequently affect the life cycle of both common and threatened flora.

The proposal site provides limited connectivity for fauna given the predominantly cleared nature of the site. Vegetation in the transmission line proposal site is connected to surrounding vegetation in the western and central sections of the proposal site, however tree removal is generally restricted to the edge of woodland patches, which would result in a slightly wider gap between remnants post-construction. The proposal would not isolate any patches of habitat. Connectivity would still be retained with vegetation removal unlikely to impact movement of any fauna species. The maximum width of removal for the proposal would be associated with the 45-metre easement requirement for the transmission line.

Table 9.4: Impacts on connectivity

Criteria	Assessment
describe the nature, extent and duration of short and long-term impacts (during operation, during construction, that are uncertain)	The proposal would require removal of scattered trees from cropped land and roadside reserves and the loss of a small area of planted, immature woodland vegetation for the solar farm proposal site, and establishment of a linear ETL across a predominantly cleared and highly fragmented agricultural landscape. Impacts to connectivity associated with construction would be temporary and relatively short-term; once the ETL was constructed, impacts along its length would be limited to occasional vehicle movements for maintenance, with no barrier to movement established as a result of the proposal. Impacts associated with the solar farm and road upgrade would be permanent, in that the scattered trees would be permanently removed. This would result in a permanent loss of shelter, refuge and foraging habitat from the landscape, however there are comparable trees on all surrounding properties, and neither the solar farm or road upgrade would represent a significant, additional barrier to movement for any mobile fauna species that may traverse the landscape.

Criteria	Assessment
predict the consequences of the impacts for the persistence of the threatened entities identified in Sub-Section 6.1.3, taking into consideration mobility, abundance, range and other relevant life history factors. justify predictions of impacts with relevant literature and other published sources of information and describe any limitations to data, assumptions and predictions about impacts on biodiversity).	The majority of the proposal is located in a cleared agricultural landscape, with limited connectivity. Impacts on connectivity in these areas are likely to be minimal. Clearing of scattered trees from within the solar farm footprint or road upgrade footprint would result in the loss of a series of stepping stones from within that parcel of land, however there are equivalent trees in surrounding properties, and any species likely to use them would find comparable habitat and routes throughout the locality. Scattered hollow-bearing trees and small patches of woodland present along the transmission alignment provide 'stepping stones' of habitat between larger areas of vegetation for mobile species such as bats and birds. Removal of these patches and trees would reduce the availability of these steeping stones to a minor degree. Species that require larger tracts of connected vegetation would have already ceased to occur in these small, fragmented patches. Poles and wires associated with the transmission alignment would be unlikely to impact movement of any fauna species. Connectivity for ground-dwelling fauna such as reptiles, amphibians and kangaroos would be retained in the proposal site, as these species can move under and between the solar panels and across the transmission line easement. Given the nature of the proposal, and the landscape context in which it will be located, impacts on connectivity are likely to be minimal.

Direct impacts to habitat connectivity associated with removal of native vegetation are discussed further in section 9.2.

9.7.4 Water bodies, water quality and hydrological processes

Table 9.5: Impacts on water quality, water bodies and hydrology

Criteria	Assessment
describe the nature, extent and duration of short-term and long-term impacts	**Construction** Several farm dams may be removed or impacted by the proposal, along with up to 6.51 ha of gilgai wetlands, during the construction of the transmission line. It is anticipated that pole placement for the transmission line in the area of the gilgai wetlands would be micro-sited and avoid direct impacts on the wetlands themselves. Removal of these dams and gilgai wetlands would reduce the number of watering points in the wider study area to a minor degree, however there is a substantial area of waterbodies in the study area that would remain undisturbed. Construction of the proposal has the potential to result in sedimentation and erosion within the construction sites and adjoining native vegetation and gilgai habitats. These impacts would be adequately managed through the implementation of standard mitigation measures including erosion and sediment controls. The region is already subject to the ongoing impacts of large-scale land clearing, and the erosion and waterway degradation associated with that. The proposal may result in a temporary increase to the overall risk of erosion or sedimentation but is unlikely to substantially contribute to any major events in the locality. Existing land uses within properties that contain gilgais include cropping and grazing, and the proposal is unlikely to result in a substantial increase to the risk of negative impacts on water bodies, quality or hydrological processes. The proposal would not impact the hydrological processes in the region any more than the existing agricultural activities that take place, with regular cropping and soil disturbance a typical event in the region. There would be minor if any impacts on aquatic habitat downstream of the proposal site with impacts likely to be localised in the areas of pole placement for the transmission line and only minor ephemeral drainage lines located in the vicinity of the solar farm proposal site. There is no evidence that aquatic habitat in the vicinity of the proposal site would be occupied by any threatened biota (see Section 8.4). **Operation** During operation, it is unlikely that the proposal would result in any impacts on water quality, water bodies or hydrology. There would be limited works required once construction is complete. Routine maintenance of the facility is unlikely to result in impacts to hydrology. There would be no direct impacts on the undefined drainage lines within the proposal site, with pole locations for the transmission line located away from drainage lines. There is potential for impacts to the depressions and table drains that retain water after periods of

Criteria	Assessment
	substantial rain, particularly along the road reserve of Forest Road. Given their ephemeral nature, these drainage lines provide poor quality habitat for threatened species.
predict the consequences to the threatened entities identified in Sub-Section 6.1.4 justify predictions of impacts with appropriate modelling (if available), relevant literature and other published sources of information, or consultation with species experts	Changes to hydrology or increased sedimentation or erosion are unlikely, and as such are unlikely to impact any threatened species of relevance. Threatened species that may use these habitats (such as the Grey-crowned Babbler and microchiropteran bats) would likely use a number of similar watering points throughout their home range. Threatened species dependent on wetlands, such as Brolgas, are likely to utilise similar habitat throughout the study area and locality, while still able to inhabit wetland areas within the transmission line easement where retained.

9.7.5 Vehicle strike

Fauna are already at risk from vehicle movements on roads and on private property in the proposal site. Increased movement of vehicles in the area during construction, operation of the solar farm and maintenance of the ETL increases the risk of vehicle strike for fauna species. An assessment of the risk of vehicle strike is provided in Table 9.6.

Table 9.6: Impacts of vehicle strike

Criteria	Assessment
(a) predict the likelihood of vehicle strike to each relevant species, taking into consideration mobility, abundance, range and other relevant life cycle factors	The Newell Highway and Stockinbingal-Parkes Railway run north-south and cross the western section of the transmission line proposal site. The remainder of the proposal site currently has low levels of vehicle activity typically associated with low density agricultural land uses. Few of the threatened fauna species known or likely to occur at the proposal site are at particular risk of road-kill, however construction traffic has the potential to injure or kill terrestrial species such as parrots (e.g. Major Mitchell's Cockatoo, Turquoise Parrot, Superb Parrot, along with the Grey-crowned Babbler; all species with the propensity to forage around and along roadsides), that are foraging on the side of the road, or which fly into vehicles. This risk of vehicle strike already exists, with existing increased risk around busy periods such as harvest etc. As with the existing risk, the likelihood of a substantial impact on any threatened fauna species as a result of the proposal is likely to be low. Occasional movements of cars, utility vehicles, trucks and farming equipment would occur throughout the proposal site. The movements of vehicles and machinery would increase during construction, but would be limited to a small number of operational staff and maintenance activities during operation. The risk of vehicle strike along the transmission line alignment is unlikely to increase to more than a minor degree with the Newell Highway and railway posing the largest existing risk.
(b) estimate vehicle strike rates with supporting data or literature, where available	Given the location of the project in a largely cleared landscape, without large areas of habitat that would support substantial populations of native fauna, vehicle strike rates are likely to be low, particularly compared to the mortality rates typical of harvest periods when species are foraging on grain that has spilt from trucks along the roads, as well as within roadside vegetation.
(c) predict the consequences of the impacts for the persistence of the relevant species	Impacts of vehicle strike during construction are unlikely to substantially impact threatened species in the local areas and region as a whole, given the location of much of the proposal site along or near to existing roads and rail lines. Most threatened species in the study area occur in low densities and have a low risk of vehicle strike.

9.8 Considerations of MNES

The proposal would result in direct impacts to the following MNES:

– Grey Box (*Eucalyptus microcarpa*) Grassy Woodland and Derived Native Grasslands of South-Eastern Australia (PCT 76, PCT 80) which is listed as an EEC
– Weeping Myall Woodlands (PCT 26) which is listed as an EEC
– Superb Parrot (*Polytelis swainsonii*) which is listed as a vulnerable species

Areas of woodland, derived native grassland and derived scrub are all consistent with the criteria for listing as EEC forms of the relevant communities under the EPBC Act, with the exception of the planted form of PCT 76. The Superb Parrot was recorded during field surveys vegetation to be removed by the proposal provides potential habitat for the species.

The proposal would remove about 7.46 hectares of Grey Box Woodland and 0.65 hectares of Weeping Myall Woodland as listed under the EPBC Act. This represents a small fraction of the mapped habitat within the study area, with about 160 hectares and 24.4 hectares of these communities remaining in the study area, respectively (DPE 2015). There are additional areas of these communities outside of the proposal site and within the locality, and so this quantum of impact would represent a small proportion of the communities being removed by the proposal. Much of the Grey Box Woodland to be impacted occurs as either derived native grassland or derived scrub, with only 1.06 ha of intact woodland or derived scrub vegetation to be removed, from the edges of larger patches along a narrow, linear alignment. Much of the derived grassland form of the community is subject to occasional grazing and the condition of this vegetation varies depending on rainfall/drought and grazing pressure.

The Superb Parrot is likely to use Grey Box Woodland and Weeping Myall Woodland, as well as other woodland vegetation types in the local area. The proposed removal of vegetation that would provide habitat for this species represents the loss of a minor proportion of available habitat for this species within the locality. No patches of habitat would be completely removed and no connecting links would be severed.

The occurrence of PCT 244 within the proposal site does not meet the key diagnostic characteristics in the listing advice for *Poplar Box Grassy Woodland on Alluvial Plains* as listed under the EPBC Act and therefore was not assessed further.

Similarly, the area of PCT 36- within the proposal site fails to meet the condition requirements provided in the listing advice for *Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains* as listed under the EPBC Act.

Assessments of significance have been prepared for impacts to MNES in accordance with the '*Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999'* (DotE 2013). These assessments are provided in Appendix E.

The outcome of the assessments of significance indicate that the proposal is unlikely to result in a significant impact on any MNES, and no further assessment or approval of the proposal under the EPBC Act is likely to be required.

10. Mitigation and management of impacts

10.1 Overview

The mitigation of adverse effects arising from the proposal has been presented according to the hierarchy of avoidance, mitigation and offsetting of impacts. The proposal has been located and designed to avoid impacts on biodiversity values as far as possible as discussed in Section 9.1. The majority of the impacts arising from the proposal are associated with the solar farm, which has been purposefully sited in an area of agricultural land that does not contain remnant native vegetation or threatened species habitat. The proposal would result in minimal direct impacts on native biota and their habitats within the proposal site associated with a small portion of the solar farm where planted native vegetation could not be practically avoided and sections of the transmission line alignment.

There is limited potential for impacts on native vegetation or threatened species habitat in the study area during the longer-term operational phase of the proposal. Specific mitigation measures are recommended in section 10.2 to minimise impacts on the natural environment and biodiversity values.

10.2 Mitigation of impacts

In order to address the potential impacts of the proposal on biodiversity, the mitigation measures outlined in Table 10.1 should be incorporated into the CEMP.

Table 10.1: Mitigation measures

Timing	Mitigation measures	Responsible party
Pre-construction/ clearing	A fauna management plan should be prepared prior to construction. This would detail fauna management protocols including management of tree hollows and fauna handling.	Site ecologist
	Ensure all workers are provided with an environmental induction prior to starting work on site. This would include information on the ecological values of the site and protection measures to be implemented to protect biodiversity.	Construction contractor/ Site ecologist
	Use of and regular inspection and maintenance of erosion and sediment control measures.	Construction contractor
	Fence off or mark trees and areas of native vegetation to be retained, to avoid additional impacts on vegetation. Fencing should protect the entire Tree Protection Zone (i.e. 10 times the diameter of the trunk at breast height). Education of all site staff that vehicles, equipment and machinery should not be placed, even temporarily, in adjacent vegetated areas, and that existing tracks should be used wherever available to minimise impacts.	Construction contractor/ Site ecologist
	Appropriate buffers would be established around trees that are to be retained. Work would avoid damage to the structural root zones (SRZ) of the trees	Construction contractor/ Site ecologist
Construction/ clearing	Restrict stockpiles of construction materials, fill or vegetation to existing cleared areas within the proposed ETL easement and not within areas of adjoining native vegetation	Construction contractor
	Water should be applied to stockpile areas during windy conditions	Construction contractor
	Construction traffic would remain on existing roads and tracks and avoid areas of native vegetation where practicable.	Construction contractor
	Any hollow-bearing trees to be felled should be marked prior to clearing of vegetation. The removal of hollow bearing trees	Site ecologist

Timing	Mitigation measures	Responsible party
	is to be undertaken in accordance with a tree hollow management protocol set out in the CEMP, and would involve the presence of a qualified ecologist or wildlife specialist experienced in the rescue of fauna.	
	Habitat features such as hollow trunks and limbs within the proposal site should be salvaged and replaced within adjacent areas of woodland as far as is practicable.	Site ecologist
	Pole placement within gilgai wetland habitat will be micro-sited to avoid direct impacts to wetlands.	Site ecologist
	Reinstatement of stabilised surfaces as quickly as practicable after construction	Construction contractor/ Site ecologist
Post construction/ clearing	Planting of locally endemic tree species in areas proposed for vegetated screens. Species should be drawn from the list of species typical of the PCTs present on site wherever practical.	Site ecologist
Operation	Commencement of vegetation management measures to control the establishment of any environmental or priority weeds within the proposal site, that may threaten the condition of the adjacent native vegetation outside the proposal site. This should include regular (annual) inspections of the ETL and solar farm to assess whether any weed species of concern have become established, and if they have, a contractor or otherwise suitably qualified person should undertake the necessary weed control measures necessary to manage any new infestations.	Operator

10.3 Decommissioning of the solar farm

At the end of life, the solar farm would be decommissioned. Pacific Hydro would remove all above ground structures while underground infrastructure would be left in-situ. A decommissioning and rehabilitation plan would be prepared detailing the actions required for Pacific Hydro to return the site to a condition suitable for agricultural use.

11. Offsetting

11.1 BC Act offset requirements

11.1.1 Impacts not requiring offset

The majority of the proposal site contains non-native vegetation or other site features that do not comprise habitat for threatened biota and do not require assessment or calculation of biodiversity offsets under the BAM.
The project would result in direct impacts to:

– 275.87 ha of category 1 land
– 0.20 ha of planted vegetation that does not align with any locally occurring PCT.

11.1.2 Impacts requiring offset

Impacts within the proposal site that require biodiversity offsets are shown on Figure 11.1.

11.1.2.1 Ecosystem credits

The data from the fieldwork and mapping was entered into version 1.4.0.00 of the BAM calculator (version 55) to determine the number and type of biodiversity credits that would be required to offset impacts of the proposal ('Parent' case 00024310).

Four separate assessment cases were created:

– A development case for the solar farm site using a using a 1,500 metre buffer for the landscape assessment and reflecting full removal of vegetation in the impact area (case 00024310/BAAS18127/21/00024311)
– A development case for the transmission line using a 500 metre buffer for a linear development and reflecting partial removal of vegetation in the corridor (case 0024310/BAAS18127/21/00024316)
– A scattered tree assessment case for impacts to scattered paddock trees within the solar farm proposal site in line with Appendix B of the BAM (case 00024310/BAAS17031/22/00034035)
– A scattered tree assessment case for impacts to scattered paddock trees within the proposed road upgrade footprint in line with Appendix B of the BAM (case 00024310/BAAS17031/22/00035828)

The biodiversity credit reports are included in Appendix F and summarised below.

There are 14.91 hectares of native vegetation at the proposal site that would be removed or modified for construction of the solar farm and the associated ETL. The majority of the solar farm footprint is category 1 – exempt land, and does not need to be considered in this assessment. The remainder of the proposal site comprises a mixture of native woodland, gilgai wetlands and derived native grassland, and comprises impacts requiring offsets.

A conservative approach to impact assessment and offset requirements has been adopted, and it has been assumed that the entire proposal footprint would be cleared and the 'future vegetation integrity score' for all vegetation zones was entered as 0.

Ecosystem credits that would be required to offset the impacts of the proposal are shown in Table 11.1.

Table 11.1: Ecosystem credits required to offset impacts of the proposal

Vegetation zone / PCT	Area (ha)	Current vegetation integrity score	Future vegetation integrity score	Change in VI score	Potential SAII	Ecosystem credits required
Solar farm proposal site						
Zone 1 – PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions - planted	0.22	36.5	0	-36.5	FALSE	4
Solar farm scattered tree assessment						
PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	N/A	N/A	N/A	N/A	FALSE	26
Road upgrade scattered tree assessment						
PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	N/A	N/A	N/A	N/A	FALSE	3
PCT 11 River Red Gum – Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	N/A	N/A	N/A	N/A	FALSE	1
ETL proposal site						
Zone 1 – PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – planted	0.01	36.5	0	-36.5	FALSE	1
Zone 2 – PCT 26 Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion – good	0.65	66	0	-66	FALSE	21
Zone 3 – PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – good	0.62	47.5	0	-47.5	FALSE	15
Zone 4 – PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – derived native grassland	2.14	45.4	0	-45.4	FALSE	49
Zone 5 – PCT 80 Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion – good	0.44	64.9	0	-64.9	FALSE	14
Zone 6 – PCT 80 Western Grey Box – White Cypress Pine tall woodland	2.62	37.1	0	-37.1	FALSE	49

Vegetation zone / PCT	Area (ha)	Current vegetation integrity score	Future vegetation integrity score	Change in VI score	Potential SAII	Ecosystem credits required
on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion – derived native grassland						
Zone 7 – PCT 80 Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion – derived scrub	1.64	52	0	-52	FALSE	43
Zone 8 – PCT 244 Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) – Planted	0.07	41.2	0	-41.2	FALSE	1
Zone 9 – PCT 360 Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion – poor	2.54	32.4	0	-32.4	FALSE	51
Zone 10 – PCT 360 Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion – very poor	3.96	32.1	0	-32.1	FALSE	79

11.1.2.2 Species credits

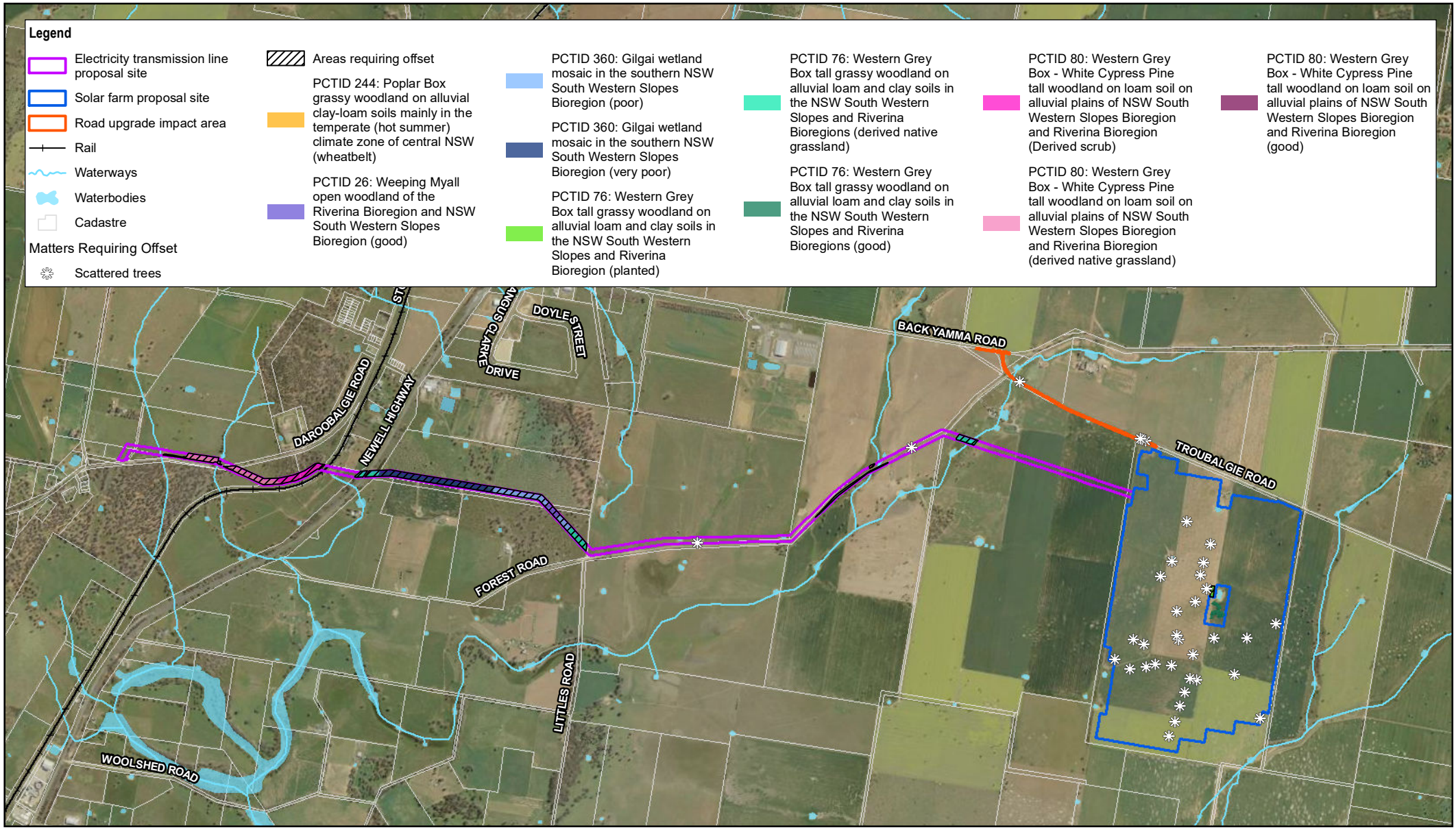
The proposal site is assumed to support one species credit entity; the Eastern Pygmy-possum. Species credit obligations are detailed in Table 11.2 with justifications provided below.

Table 11.2: Species credits required to offset direct impacts of the project

Species	BC Act	EPBC Act	Habitat impact (ha)	Potential SAII	Species credits required
Cercartetus nanus Eastern Pygmy-possum	V	-	2.04	False	57

Eastern Pygmy-possum species polygon

A species polygon that shows the area of potential habitat for the Eastern Pygmy-possum that may be impacted by the proposal was defined by identifying all areas of native woodland and derived scrub vegetation within 200 m of any patch of woodland vegetation that was 5 ha of more in size. The area of broadly suitable habitat within the proposal site has been mapped in a 2.08 hectare species polygon comprising 1.64 ha of woodland and 0.44 ha of derived scrub as shown on Figure 11.2 (n.b. the BAM calculator has rounded the total area of the species polygon to 2.04 ha as summarised in Table 11.2).



Paper Size ISO A4

0 300 600 900 1,200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Biodiversity Development Assesssment Report

Areas requiring offset

Project No. **23-16511**
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Date **20 Oct 2022**

Figure 11.1

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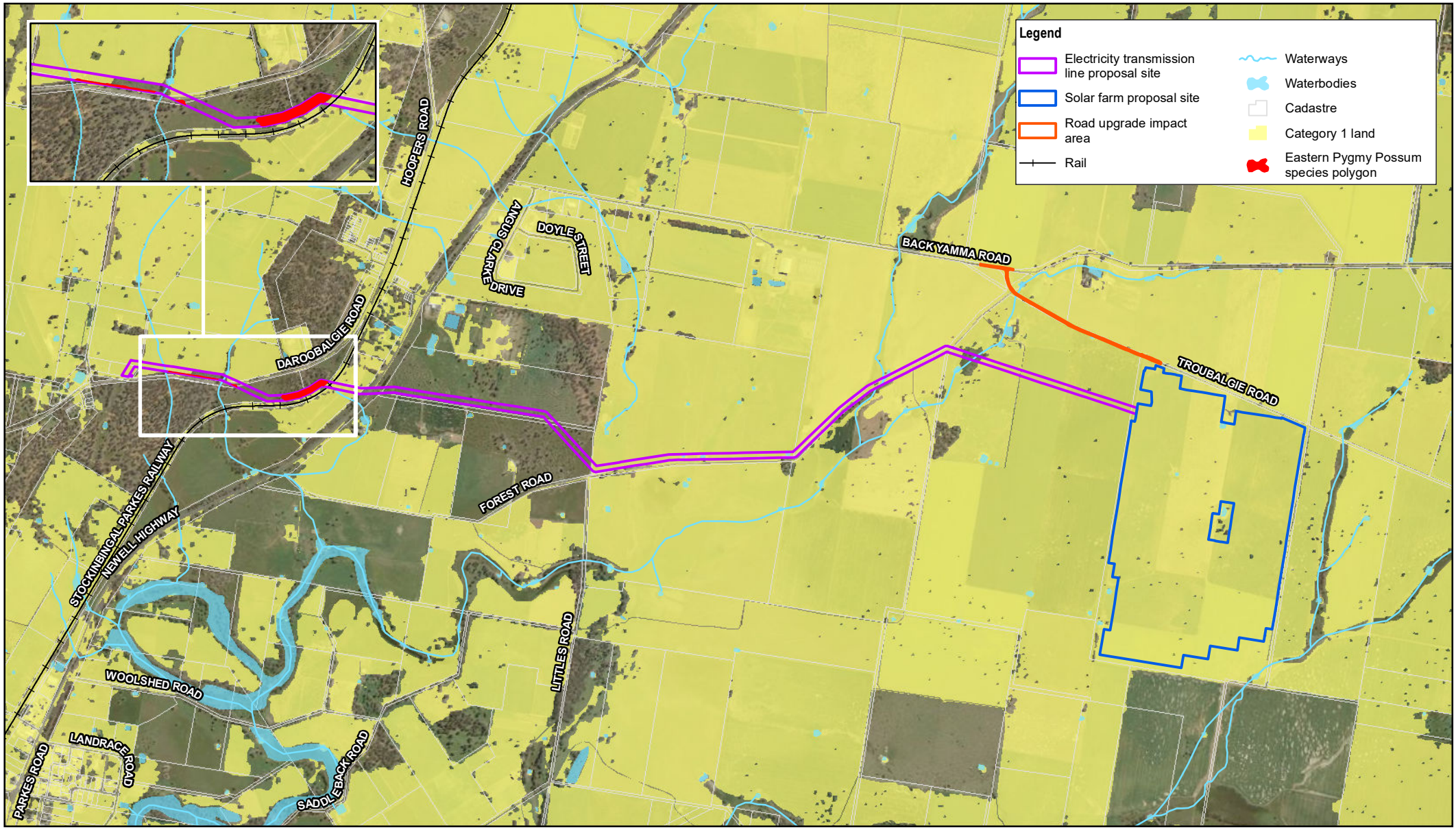

Paper Size ISO A4

0 300 600 900 1,200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Pacific Hydro
Daroobalgie Solar Farm
Biodiversity Development Assesssment Report

Eastern Pygmy Possum species polygon

Project No. **23-16511**
Revision No. **0**
Date **20 Oct 2022**

Figure 11.2

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11.1.3 Option to meet offset obligations / approach to delivering offsets

In accordance with the offset rules established by the *Biodiversity Conservation Regulation 2017* there are various means by which offset obligations described in Section 11.1 can be met. These include:

– Retiring like for like credits from an established stewardship site
– Retiring biodiversity credits in accordance with the 'variation rules' in clause 6.4 of the BC Regulation
– Monetary payment to the Biodiversity Conservation Fund (BCF), or
– Funding an approved biodiversity action. Funding a biodiversity action may be available as a last resort, subject to consultation with approval authorities, if all other options are determined to be unsuitable.

11.1.3.1 Existing biodiversity credits

Should Pacific Hydro opt to offset the residual impacts of the proposal by securing and retiring appropriate credits from stewardship site/s, these must fit within the trading rules of the BOS in accordance with the 'like for like' report generated by the credit calculator. The like for like trading rules for the ecosystem credits required for the proposal are summarised in Table 11.3. If such credits are unavailable, credits would be sourced in accordance with the 'variation report' generated by the BAM calculator.

Table 11.3: 'Like for like' ecosystem credits required to offset impacts of the proposal

Credit class	Any PCT in the below class	And in any of the below trading groups	Containing hollow-bearing trees	In the below IBRA subregions
Credit classes for PCT 26	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (including PCTs 26, 27, 37, 43, 49, 55, 145, 159, 1766)	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	Yes	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee Or Any IBRA subregion that is within 100 kilometres of the outer edge of the impacted site.
Credit classes for PCT 76 (planted)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (including PCTs 76, 80, 81, 82, 101, 110, 237, 248)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	No	
Credit classes for PCT 76 (derived native grassland	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (including PCTs 76, 80, 81, 82, 101, 110, 237, 248)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	No	
Credit classes for PCT 76 (good)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (including PCTs	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain,	Yes	

Credit class	Any PCT in the below class	And in any of the below trading groups	Containing hollow-bearing trees	In the below IBRA subregions
	76, 80, 81, 82, 101, 110, 237, 248)	Nandewar and Brigalow Belt South Bioregions		
Credit classes for PCT 80 (good)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (including PCTs 76, 80, 81, 82, 101, 110, 237, 248)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	No	
Credit classes for PCT 80 (derived scrub)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (including PCTs 76, 80, 81, 82, 101, 110, 237, 248)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	No	
Credit classes for PCT 80 (derived native grassland)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (including PCTs 76, 80, 81, 82, 101, 110, 237, 248)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	No	
Credit classes for PCT 244 (planted)	Floodplain Transition Woodlands (includes PCTs 56, 74, 76, 80, 81, 82, 237, 244, 248)	Floodplain Transition Woodlands - ≥ 70% - <90% cleared group (including Tier 2 or higher threat status).	No	
Credit classes for PCT 360 (poor)	Inland Floodplain Swamps (includes PCTs 205, 360)	Inland Floodplain Swamps - ≥ 90% cleared group (including Tier 1 or higher threat status).	No	
Credit classes for PCT 360 (very poor)	Inland Floodplain Swamps This includes PCT's: 205, 360	Inland Floodplain Swamps - ≥ 90% cleared group (including Tier 1 or higher threat status).	No	

11.1.3.2 Payment into the Biodiversity Conservation Fund

A payment to the Biodiversity Conservation Fund (BCF) could be considered if a suitable number and type of biodiversity credits could not be secured from third parties. This is currently the preferred option for Pacific Hydro. The Biodiversity Offsets Payment Calculator (BOPC) was recently replaced with the BCF Charge System. The new BCF Charge System will be used to determine the amount a proponent may pay into the BCF to meet a biodiversity offset obligation. A quote can be requested from the BCT upon approval of a BDAR And receipt of conditions of consent.

11.2 Offsets for impacts on MNES

Offsets are required for any significant residual impacts on MNES, according to the requirements of the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy October 2012* (EPBC Act Offsets Policy) (DSEWPaC, 2012).

The proposal would remove habitat for the following MNES listed under the EPBC Act:

– 0.65 hectares of Weeping Myall Woodlands
– 7.46 hectares of Grey Box (*Eucalyptus microcarpa*) Grassy Woodland and Derived Native Grasslands of South-Eastern Australia, of which 1.06 ha is woodland, 1.64 ha is derived scrub, and 4.76 ha is derived native grasslands
– 15.11 hectares of Superb Parrot habitat (comprising all vegetation within the proposal site, and excluding category 1 land).

The assessments of significance prepared for the two TECs and the Superb Parrot indicated that the proposal is unlikely to have a significant impact on these MNES due to the limited removal of habitat in the context of the additional habitat in the surrounding study area and locality. No patches of habitat would be completely removed and no connecting links would be severed. Therefore, the proposal is unlikely to be deemed a controlled action and no offsets for impacts to MNES are required.

12. Conclusion

Pacific Hydro proposes to construct and operate a 100 megawatt solar farm and associated electricity transmission line (ETL) and switchyard at Daroobalgie, about 11 kilometres north-east of Forbes.

The majority of the proposal site has been cleared and used for agriculture (cropping and sheep and cattle grazing).

The solar farm proposal site has been predominantly cleared of all native vegetation and comprises cropland with no native species present. There is a small patch of remnant Grey Box Woodland within the proposal site that has been avoided in an attempt to minimise impacts on biodiversity values, however a small stand of planted vegetation that is broadly commensurate with Grey Box Woodland would be removed for construction of the solar farm. The majority of the solar farm site comprises category 1 land (252.61 hectares out of a total 274.70 hectares) and are excluded from assessment under the BAM.

Much of the ETL proposal site and switchyard have also been cleared of native vegetation, with large areas of copped land present along the alignment. As for the solar farm proposal site, these areas have been mapped as category 1 land when appropriate, and excluded from this assessment. There are also large tracts of derived native grassland and areas of gilgai wetlands along the ETL proposal site, as well as small, scattered patches of Weeping Myall woodland in the central portion of the alignment. The western section of the alignment traverses the edge of a Crown Reserve travelling stock route, which contains Inland Grey Box woodland.

PCT 26 comprises a local occurrence of the endangered ecological community (EEC) *Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions*. It is also commensurate with the related EEC listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as *Weeping Myall Woodlands*. Most areas of PCT 76 and PCT 80 comprise local occurrences of the EEC *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions*. These patches are also commensurate with the EEC listed under the EPBC Act as *Grey Box* (*Eucalyptus microcarpa*) *Grassy Woodland and Derived Native Grasslands of South-Eastern Australia*. The proposal would remove 0.65 hectares and 7.46 hectares of these EECs, respectively. Much of the Inland Grey Box Woodland that would be removed is a derived native grassland form of the community, with only 1.06 ha of intact woodland to be impacted.

Two threatened fauna species listed under the *Biodiversity Conservation Act 2016* (BC Act were recorded during surveys; the Grey-crowned Babbler, which is an ecosystem credit species, and the Superb Parrot, which is a dual credit species, being a species credit species for its breeding habitat. The Superb Parrot is also listed under the EPBC Act. No evidence of breeding was identified during field surveys for this species during the appropriate survey period and therefore no species credits were calculated. No threatened flora species were recorded.

Presence has been assumed for the Eastern Pygmy-possum as surveys were not completed at an appropriate time of year to discount the presence of the species. A species polygon has been created for this species, and species credits calculated for impacts to assumed habitat for this species. 57 Eastern Pygmy-possum species credits would be required to offset impacts to this species.

The location and layout of the proposal was purposefully modified to avoid impacts to as many biodiversity values as possible, with a particular focus on avoiding impacts to woodland vegetation that corresponds with threatened ecological communities. Areas of high value vegetation commensurate with Grey Box Woodland EEC were avoided within the solar farm site and areas of remnant woodland vegetation were avoided as far as practicable during transmission alignment selection to minimise impacts on fauna habitats and to retain better condition native vegetation. The gilgai wetland in the south-eastern corner of the solar farm site would also be retained. A range of mitigation measures are proposed, including planting of vegetated screens, fauna habitat management and rescue protocols, and protection of vegetation to be retained.

The following ecosystem credits that would be required to offset the residual impacts of the proposal:

– 5 credits for Zone 1 – PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – planting
– 21 credits for Zone 2 – PCT 26 Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion – good

– 15 credits for Zone 3 – PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – good
– 49 credits for Zone 4 – PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions – derived native grassland
– 14 credits for Zone 5 – PCT 80 Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion – good
– 49 credits for Zone 6 – PCT 80 Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion – derived native grassland
– 43 credits for Zone 7 – PCT 80 Western Grey Box – White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion – derived scrub
– 1 credit for Zone 8 – PCT 244 Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt) – planted
– 51 credits for Zone 9 – PCT 360 Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion – poor
– 79 credits for Zone 10 – PCT 360 Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion – very poor
– 29 credits for PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions for impacts to scattered trees
– 1 credit for PCT 11 River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) for impacts to scattered trees.

No assessment has been undertaken nor have any credits been calculated for impacts to land that has been mapped as category 1 land.

There would be impacts on two EECs (*Grey Box (Eucalyptus microcarpa) Grassy Woodland and Derived Native Grasslands of South-Eastern Australia* and *Weeping Myall Woodlands*) and one threatened species (Superb Parrot) listed under the EPBC Act. Given the relatively small area of direct impacts on these communities and habitat for the Superb Parrot in the context of the additional potential habitat in the surrounding study area and locality, the proposal is unlikely to constitute a significant impact. No further assessment or approval or provision of biodiversity offsets is required under the EPBC Act.

Aquatic habitat is limited to undefined, ephemeral drainage lines, farm dams and gilgai wetland areas. These do not constitute key fish habitat and would not provide potential habitat for threatened fish listed under the FM Act. It is anticipated that pole placement for the ETL in the area of the gilgai wetlands would be micro-sited where possible and attempts to avoid direct impacts on the wetlands themselves would be made where practical. There would be no direct impacts on the undefined drainage lines within the proposal site.

A construction and environmental management plan (CEMP, or equivalent) would be required for the construction phase of the proposal, and would be prepared prior to issue of the Construction Certificate. The CEMP would include, as a minimum, industry-standard measures for the management of soil, surface water, weeds and pollutants, and planting of vegetated screens around the boundary of the solar farm.

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Appendices

Appendix A

Threatened species for assessment

Likelihood of occurrence evaluation

An evaluation of the likelihood and extent of impact to threatened and migratory fauna recorded from within the Forbes LGA (BC Act threatened species and EPBC Act threatened and migratory species). Records are from a search of the NSW BioNet Atlas, and the EPBC Protected Matters Search Tool available from the Department of the Agriculture, Water and the Environment (DAWE) website. Ecology information has been obtained from the Threatened Species Profiles on the NSW Environment, Energy and Science website (**http://www**.environment.nsw.gov.au/threatenedspecies/) and from the Species Profiles and Threats Database on the Commonwealth DAWE website (http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl).

Status

– National – Environment Protection and Biodiversity Conservation Act 1999.
– NSW – Biodiversity Conservation Act 2016 and Fisheries Management Act 1994.
– E – endangered
– CE -critically endangered
– V – vulnerable
– EP – endangered population
– Mi – migratory

Likelihood of occurrence in study area

– Recorded – The species was observed in the study area during the current survey.
– High – It is highly likely that a species inhabits the study area and is dependent on identified suitable habitat (i.e. for breeding or important life cycle periods such as winter flowering resources), has been recorded recently and is known or likely to maintain resident populations in the study area. Also includes species known or likely to visit the study area during regular seasonal movements or migration.
– Moderate – Potential habitat is present in the study area. Species unlikely to maintain sedentary populations, however, may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (i.e. for breeding or important life cycle periods such as winter flowering resources) on habitat within the study area, or habitat is in a modified or degraded state.
– Low – It is unlikely that the species inhabits the study area and has not been recorded recently in the LGA. It may be an occasional visitor, but habitat similar to the study area is widely distributed in the local area, meaning that the species is not dependent (i.e. for breeding or important life cycle periods such as winter flowering resources) on available habitat. Specific habitat is not present in the study area or the species is a non-cryptic perennial flora species that were specifically targeted by surveys and not recorded. A category of 'Low' is also assigned for biota known or likely to be present in the study area but unlikely to be impacted by the project.
– Nil – Suitable habitat is absent from the study area.
– **Likelihood of impact**
– Nil impact – the species is unlikely to occur as suitable habitat is absent from the area, so the project would result in no impacts to the species.
– Unlikely impact – The project would have a low possibility of impact on this species/community or its habitats.
– Likely impact – The project could impact on this species/community and its habitat.

Likelihood of occurrence of threatened flora species and populations in the proposal site

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
Amphibromus fluitans Floating Swamp Wallaby-grass	V	V	Species	BAM-C	Species has been recorded recently in lagoons beside the Murray River near Cooks Lagoon (Shire of Greater Hume), Mungabarina Reserve, East Albury, at Ettamogah, Thurgoona (Charles Sturt University Campus), near Narranderra, and also further west along the Murray River (near Mathoura) and in Victoria. There is a recent record of this species near Laggan in Upper Lachlan Shire. Grows mostly in permanent swamps. The species needs wetlands which are at least moderately fertile and which have some bare ground, conditions which are produced by seasonally-fluctuating water levels. Habitats in south-western NSW include swamp margins in mud, dam and tank beds in hard clay and in semi-dry mud of lagoons with *Potamogeton* and *Chamaeraphis* species.	Low Unlikely	Targeted surveys for this species within areas of suitable habitat during the prescribed survey period did not locate this species. Habitat for this species is also limited in the proposal site due to regular degradation of damp areas by stock as well as agricultural practices such as cropping of areas of potential habitat.
Androcalva procumbens	V	V	Species	PMST	Mainly confined to the Dubbo-Mendooran-Gilgandra region, but also in the Pilliga and Nymagee areas and recent collections from the Upper Hunter. Grows on sandy soils, often on roadsides. Has been recorded in Tumbledown Red Gum and Mugga Ironbark communities, Broombush scrub, under mallee eucalypts with a Common Fringe-myrtle understorey, and in a recently burnt Ironbark and Callitris area. Also in *Eucalyptus fibrosa* subsp. *Nubila*, Tumbledown Red Gum, White Box and White Cypress Pine woodlands north of Dubbo.	Low Unlikely	The study area occurs outside of this species typical range. No vegetation communities associated with this species were recorded in the study area. Not predicted by the BAM-C.
Austrostipa metatoris A spear-grass	V	V	Species	PMST BAM-C	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. Grows in sandy areas of the Murray Valley; habitats include sandhills, sandridges, undulating plains and flat	Low Unlikely	The only PCT within the proposal site associated with this species is PCT 244. The only occurrence of PCT 244 within the proposal site is a small patch of vegetation with a planted canopy (all juvenile individuals at the time of the field survey) and an understorey dominated by exotic species. PCT 244 was selected as the most appropriate PCT

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					open mallee country, with red to red-brown clay-loam to sandy-loam soils. Associated species include *Eucalyptus populnea, E. intertexta, Callitris glaucophylla, Casuarina cristata, Santalum acuminatum* and *Dodonaea viscosa*.		based on the presence of *Eucalyptus populnea* within the canopy, but the groundcover is dominated by introduced species, and no suitable habitat for this species is present. 'Habitat degraded' was selected in the BAM-C for this species given the microhabitats present on site are not suitable for this species to occur.
Austrostipa wakoolica A spear-grass	E	E	Species	2 records (BCD 2021) PMST BAM-C	Confined to the floodplains of the Murray River tributaries of central-western and south-western NSW, with localities including Manna State Forest, Matong, Lake Tooim, Merran Creek, Tulla, Cunninyeuk and Mairjimmy State Forest (now part of South West Woodland Nature Reserve). Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise.	Nil Unlikely	This species has a geographic limitation of occurring south of Narranderra. The proposal site is about 240km to the south of this, and so, the geographic limitation button was unclicked for this species.
Brachyscome muelleroides Claypan Daisy	V	V	Species	BAM-C	Occurs in the Wagga Wagga, Narranderra, Tocumwal and Walbundrie areas. Grows in damp areas on the margins of claypans in moist grassland with *Pycnosorus globosus, Agrostis avenacea* and *Austrodanthonia duttoniana*. Also recorded from the margins of lagoons in mud or water, and in association with *Calotis anthemoides*. Victorian collections have generally come from open positions on the Murray River floodplain, swampy River Red Gum (*Eucalyptus camaldulensis*) Forest and damp depressions.	Nil Nil	The study area occurs outside of this species range, so the geographic limitations button was unclicked in the BAM-C (species restricted to south of Griffith)
Brachyscome papillosa Mossgiel Daisy	V	V	Species	BAM-C	The Mossgiel Daisy is endemic to NSW and chiefly occurs within the Riverina Bioregion, from Mossgiel in the north, Murrumbidgee Valley (Yanga) National Park in the south west to Urana in the south east. Sites are scattered across this Bioregion including the Jerilderie	Nil Nil	The study area occurs outside of this species range, so the geographic limitations button was unclicked in the BAM-C (species restricted to south and west of

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					area, the Hay Plain (Maude and Oxley) and around Darlington Point. In addition, there are a number of records from the Willandra Lakes World Heritage Area (including Mungo National Park) with a north-western outlier at Byrnedale Station, north of Menindee. The only known site on South Western Slopes is Ganmain Reserve. Recorded primarily in clay soils on Bladder Saltbush (*Atriplex vesicaria*) and Leafless Bluebush (*Maireana aphylla*) plains, but also in grassland and in Inland Grey Box (*Eucalyptus microcarpa*) – Cypress Pine (*Callitris spp.*) woodland.		the Coolamon to Ardlethan Road, west of Lockhart and north or Rand)
Caladenia arenaria Sand-hill Spider Orchid	E	E	Species	BAM-C	Caladenia arenaria is 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 Narranderra. Occurs in woodland with sandy soil, especially that dominated by White Cypress Pine (*Callitris glaucophylla*)	Nil Nil	The study area occurs outside of this species range. The BAM-C indicates that this species has the geographic limitation of being restricted to the areas west of Lockhart and north of Rand. The geographic limitation button was unchecked for this species in the BAM-C .
Diuris sp. (Oaklands, D.L. Jones 5380) Oakland Diuris *Diuris callitrophila*	E	-	Species	BAM-C	Currently known only from the Oaklands-Urana region of southern NSW. Grows in White Cypress Pine (*Callitris glaucophylla*) Woodland, either among dense grasses in flat areas with associated eucalypts, or amongst sparse grasses and forbs on low sandhills. Grows mostly on sandy loam soils, with the original population of the species found on red sandy loams (Bishop, 2000; Jones, 2003).	Low Unlikely	There are no areas of woodland dominated by White Cypress Pine or low sandhills in the proposal site, which are the preferred habitat for this species, The species is known from sandy loams around Urana and Oaklands, about 280 km from the proposal site. It is likely that *Diuris callitrophila* is associated with the red parma soils which overlaid much of the Murray Basin, and which are prevalent around the Urana and Oaklands area. These soils generally end well before Forbes, as Forbes is higher in the catchment and surface soils would have been

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
							eroded away as a result of typical upstream erosion. The Forbes area has richer clays and patchy lime soils, which are not found near Oaklands and Urana. The likelihood of sandy loams (or, soils that are similar to those found near Oaklands and Urana) in the vicinity of the proposal site are low. Soils around the proposal site are silty loams, rather than sandy loams, given the lack of course sandstone parent material. The presence of gilgais around the proposal site also indicate more clay and possibly limey settings, which are not present around Oaklands and Urana where the species is known from (W. Chesnut, former Principal Geologist, Engineering and Environmental Geology, NSW Dept. Mines, *pers. Comm*.) Given the microhabitats present within the proposal site are unlikely to be suitable for this species to occur, the habitat degraded button was ticked in the BAM-C.
Diuris tricolor Pine Donkey Orchid	V	-	Species	BAM-CPMST	Sporadically distributed on the western slopes of NSW, extending from south of Narrandera all the way to the north of NSW. Localities in the south include Red Hill north of Narrandera, Coolamon, and several sites west of Wagga Wagga. Condobolin-Nymagee road, Wattamondara towards Cowra, Eugowra, Girilambone, Dubbo and Cooyal, in the Central West. Pilliga SCA, Pilliga National Park and Bibblewindi State Forest in the north and Muswellbrook in the east. Disturbance regimes are not known, although the species is usually recorded from disturbed habitats. Associated species include *Callitris glaucophylla*,	Low Unlikely	Targeted surveys for this species during the prescribed survey period did not locate this species in the proposal site. Habitat for this species is limited in the proposal site due to degradation by weeds and exotic species associated with surrounding agricultural land, as well as cropping and grazing. It is noted that this species can withstand disturbance, so the habitat

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					Eucalyptus populnea, *Eucalyptus intertexta*, Ironbark and Acacia shrubland. The understorey is often grassy with herbaceous plants such as *Bulbine* species.		degraded button was not selected in the BAM-C.
Eleocharis obicis Spike-Rush	V	V	Species	BAM-C	Found near Condobolin and Hay, as well as being known from an old collection from the Barrier Range near Broken Hill. The later collection was made on the Lachlan River floodplain at Micabil, near Condobolin. Grows in ephemerally wet situations such as roadside mitre drains and depressions, usually in low-lying grasslands. Sites include depressions with heavy clay soils on the Lachlan River floodplain, with *Eragrostis australasica, Atriplex vesicaria* and *A. nummularia* shrublands, low-lying claypans near an irrigation channel, and a shallow open ditch on a low ridge with Eucalyptus populnea in red sandy soil over clay.	Low Unlikely	Targeted surveys for this species immediately before and after the prescribed survey period did not locate this species in the proposal site. Habitat for this species is degraded in the proposal site, as the species is known to be threatened by modification of land for agriculture, grazing, trampling and weed invasion (DEWHA, 2008c); all of which are experienced by land within the proposal site. Habitat degraded button selected in the BAM-C, given the understorey in all areas of potential habitat (based on vegetation associations) is grazed and/or subject to weed infestations and has been exposed to long-term degradation from agricultural practices.
Lepidium aschersonii Spiny Peppercress	V	V	Species	BAM-C	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.	Low Unlikely	This species is noted as capable of persisting in landscapes with understories dominated by exotic species, and as such, was retained in the BAM-C as a potential candidate species. Targeted surveys for this species during the prescribed survey period did not locate this species in the proposal site.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					Found on ridges of gilgai clays dominated by Brigalow (*Acacia harpophylla*), Belah (*Casuarina cristata*), Buloke (*Allocasuarina luehmanii*) and Grey Box (*Eucalyptus microcarpa*). In the south has been recorded growing in Bull Mallee (*Eucalyptus behriana*). Often the understorey is dominated by introduced plants. The species grows as a a component of the ground flora, in grey loamy clays. Vegetation structure varies from open to dense, with sparse grassy understorey and occasional heavy litter.		
Lepidium monoplocoides Winged Peppercress	E	E	Species	BAM-C	Widespread in the semi-arid western plains regions of NSW. Collected from widely scattered localities, with large numbers of historical records but few recent collections. Also previously recorded from Bourke, Cobar, Urana, Lake Cargelligo, Balranald, Wanganella and Deniliquin. Recorded more recently from the Hay Plain, south-eastern Riverina, and from near Pooncarie. Occurs on seasonally moist to waterlogged sites, on heavy fertile soils, with a mean annual rainfall of around 300-500 mm. Predominant vegetation is usually an open woodland dominated by *Allocasuarina luehmannii* (Bulloak) and/or eucalypts, particularly *Eucalyptus largiflorens* (Black Box) or *Eucalyptus populnea* (Poplar Box). The field layer of the surrounding woodland is dominated by tussock grasses. Recorded in a wetland-grassland community comprising *Eragrostis australasicus, Agrostis avenacea, Austrodanthonia duttoniana, Homopholis proluta, Myriophyllum crispatum, Utricularia dichotoma* and *Pycnosorus globosus*, on waterlogged grey-brown clay. Also recorded from a *Maireana pyramidata* shrubland.	Low Unlikely	Targeted surveys for this species during the prescribed survey period did not locate this species in the proposal site. Habitat for this species is limited in the proposal site due to degradation by weeds and exotic species associated with surrounding agricultural land.
Leptorhynchos orientalis Lanky Buttons	E	-	Species	BAM-C	Recorded from several Hay Plain and southern Riverina localities, including Willanthry east of Hillston, Zara-Wanganella via Hay, McKinley Road SW of Hillston, and “Morundah” navy land west of Buckingbong SF. A large population has most recently been recorded from Cowl Cowl Station SSW of Hillston along a TSR. Grows in woodland or grassland,	Nil Nil	Proposal site is located outside the geographic limitations of the species (i.e. west of Narrandera/Lockhart Road and north of Urana/Lockhart Road). Geographic limitations button was unclicked in the BAM-C.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					sometimes on the margins of swamps. Communities include a Bimble Box plain in red-brown soil, dense Acacia pendula woodland with herbaceous understorey on red clay to clay-loam, open grassland areas on red soils, and red clay plains at the edge of a Canegrass swamp.		
Pilularia novae-hollandiae Austral Pillwort	E	-	Species	BAM-C	The Austral Pillwort is a small semi-aquatic fern that resembles fine grass. In NSW, the Austral Pillwort has been recorded from suburban Sydney, Khancoban, the Riverina between Albury and Urana (including Henty, Walbundrie, Balldale and Howlong). This species grows in shallow swamps and waterways, often among grasses and sedges. It is most often recorded in drying mud as this is when it is most conspicuous. Most records for the Albury-Urana area were from table drains on the side of roads.	Low Unlikely	The study area occurs outside of this species typical range. Targeted surveys during the prescribed survey period did not locate this species. Wetland habitat (gilgai) in the study area is grazed and trampled regularly by stock, and it is unlikely that this species would persist in the site.
Prasophyllum petilum Tarengo Leek Orchid The NSW Herbarium considers *Prasophyllum petilum* and *Prasophyllum* sp. Wybong (C. Phelps ORG5269) to be synonyms (i.e. the same species). This taxonomic recognition will be released in the next Orchidaceae taxonomic update via the Australian Plant Census.	E	CE	Species	PMST	Natural populations are known from a total of five sites in NSW. These are near Boorowa, Queanbeyan area, Ilford, Delegate and a newly recognised population c.10 km west of Muswellbrook. Also at Hall in ACT. Grows on relatively fertile soils in grassy woodland or natural grassland. Occurs in relatively moist, poorly drained areas. Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. Also grows in grassy woodland in association with River Tussock *Poa labillardieri*, Black Gum *Eucalyptus aggregata* and tea-trees *Leptospermum* spp. Near Queanbeyan and within the grassy ground layer dominated by Kangaroo Grass under Box-Gum Woodland at Ilford (and Hall, ACT). Apparently highly susceptible to grazing, being retained only at little-grazed travelling stock reserves (Boorowa & Delegate) and in cemeteries (near Queanbeyan, Ilford and Hall).	Low Unlikely	The study area occurs outside of known range for the species. No suitable moist, poorly drained, un-grazed native grassland or grassy woodland habitat that could support the species occurs in the study area. No associated species present.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
Swainsona murrayana Slender Darling-pea	V	V	Species	PMST BAM-C	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. Occurs in grassland, herbland and open Black-box woodland. Associated with low chenopod shrubs *Maireana* species, wallaby-grass *Austrodanthonia* species and spear grass *Austrostipa* species. Flowers from spring to early summer. Grows on heavy grey or brown clay, loam, or red cracking clays. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with *Maireana* species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated.	Low Unlikely	Targeted surveys for this species during the prescribed survey period did not locate this species in the proposal site. Habitat for this species is limited in the proposal site due to degradation by weeds and exotic species associated with surrounding agricultural land.
Swainsona recta Small Purple-pea	E	E	Species	BAM-C PMST	Small Purple-pea was recorded historically from places such as Carcoar, Culcairn and Wagga Wagga where it is probably now extinct. Populations still exist in the Queanbeyan and Wellington-Mudgee areas. Over 80% of the southern population grows on a railway easement. It is also known from the ACT and a single population of four plants near Chiltern in Victoria. Before European settlement Small Purple-pea occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum *Eucalyptus blakelyi*, Yellow Box *E. melliodora*, Candlebark Gum *E. rubida* and Long-leaf Box *E. goniocalyx*. Grows in association with understorey dominants that include Kangaroo Grass *Themeda australis*, poa tussocks *Poa spp*. And spear-grasses *Austrostipa spp*.	Low Unlikely	Targeted surveys for this species during the prescribed survey period did not locate this species in the proposal site. No associated vegetation communities or species were recorded in the study area. Habitat in the study area is unlikely to support the species
Swainsona sericea Silky Swainson-pea	V	-	Species	BAM-C	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.	Low Unlikely	Targeted surveys for this species during the prescribed survey period did not locate this species in the proposal site. The study area occurs outside of this species known range.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					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.		
Tylophora linearis -	V	E	Species	PMST	Majority of records occur in the central western region. Records from Goonoo, Pillaga West, Pillaga East, Bibblewindi, Cumbil and Eura State Forests, Coolbaggie NR, Goobang NP and Beni SCA. Also has been recorded Hiawatha State Forest near West Wyalong in the south and there are old records as far north as Crow Mountain near Barraba and near Glenmorgan in the western Darling Downs. Grows in dry scrub and open forest. Recorded from low-altitude sedimentary flats in dry woodlands of *Eucalyptus fibrosa*, *Eucalyptus sideroxylon*, *Eucalyptus albens*, *Callitris endlicheri*, *Callitris glaucophylla* and *Allocasuarina luehmannii*.	Low Unlikely	The study area occurs outside of this species known range. Communities typically associated within the species do not occur in the study area

Likelihood of occurrence of threatened and migratory species and populations in the proposal site

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
Amphibians							
Crinia sloanei Sloane's Froglet	V	E	Species	BAM-C	Sloane's Froglet has been recorded from widely scattered sites in the floodplains of the Murray-Darling Basin, with the majority of records in the Darling Riverine Plains, NSW South Western Slopes and Riverina bioregions in New South Wales. It has not been recorded recently in the northern part of its range and has only been recorded infrequently in the southern part of its range in NSW. At a number of sites where records are verified by museum specimens, the species has not been subsequently detected during more recent frog surveys in the vicinity (e.g. Holbrook, Nyngan, Wagga Wagga and Tocumwal). The low number of sites, low number of recorded individuals per site, and the low proportion of records of this species in regional surveys all indicate that a moderately low number of mature individuals exist. The apparent loss from previous recorded sites and decline in recording rates indicates that this is not just a rare or uncommonly encountered species, but that there has been a reduction in population size and range. It is typically associated with periodically inundated areas in grassland, woodland and disturbed habitats.	Low Unlikely	Broadly suitable habitat is present for this species, however it was not detected despite targeted surveys during the required survey period.
Litoria raniformis Southern Bell Frog	E	V	Species	BAM-C	The species is known to exist only in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. A few yet unconfirmed records have also been made in the Murray Irrigation Area. The species is usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated	Low Unlikely	The proposal site lacks the preferred habitat of this species (Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys) and there are no rice crops in the local area.

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					rice crops, particularly where there is no available natural habitat. During the breeding season animals are found floating amongst aquatic vegetation (especially cumbungi or Common Reeds) within or at the edge of slow-moving streams, marshes, lagoons, lakes, farm dams and rice crops. Tadpoles require standing water for at least 4 months for development and metamorphosis to occur but can take up to 12 months to develop. Outside the breeding season animals disperse away from the water and take shelter beneath ground debris such as fallen timber and bark, rocks, grass clumps and in deep soil cracks.		There are no slow moving streams within the proposal site or surrounding study area. Broadly suitable habitat is present for this species, however it was not detected despite targeted surveys during the required survey period.
Birds							
Actitis hypoleucos Common Sandpiper	-	C,J,K	-	PMST	Does not breed in Australia. When in Australia it is found on all coastlines and in inland areas, but is concentrated in the north and west with important areas in WA, the NT and Qld. Utilises a wide range of coastal and inland wetlands with varying salinity levels.	Low Unlikely	No suitable permanent aquatic habitat, to support this species year-round occurs in the study area. Ephemeral gilgai wetlands may provide moderate foraging habitat for the species during times of high rainfall, however due to the arid climate of the Forbes region, this is unlikely to be a frequent occurrence.
Anseranas semipalmata Magpie Goose	V	-	Ecosystem	BioNet – 2 records (BCD 2021) BAM-C	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. Equally at home in aquatic or terrestrial habitats; often seen walking and	Low Unlikely	No suitable permanent aquatic habitat, to support this species year-round occurs in the study area. Ephemeral gilgai wetlands may provide occasional foraging habitat for the species in response to favourable conditions such as during times of high rainfall, however due to the arid climate of the Forbes

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					grazing on land; feeds on grasses, bulbs and rhizomes. Activities are centred on wetlands, mainly those on floodplains of rivers and large shallow wetlands formed by run-off; breeding can occur in both summer and winter dominated rainfall areas and is strongly influenced by water level; most breeding now occurs in monsoonal areas; nests are formed in trees over deep water; breeding is unlikely in south-eastern NSW.		region, this is unlikely to be a frequent occurrence.
Anthochaera phrygia Regent Honeyeater	CE	CE	Dual	PMST	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. 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 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.	Low Unlikely	Woodland habitat in the study area does not constitute preferred or important foraging habitat for the species, and it is considered unlikely to occur. The study area is outside of the species known breeding region, no breeding habitat is present in the study area.
Apus pacificus Fork-tailed Swift	-	Mi	-	PMST	Recorded in all regions of NSW. Non-breeding, and almost exclusively aerial while in Australia. Occurs over urban and rural areas as well as areas of native vegetation.	Moderate Unlikely	The species may occur, and forage aerially over the proposal site, however given the species is generally aerial and does not breed in Australia, the proposal is unlikely to impact this species.
Artamus cyanopterus cyanopterus Dusky Woodswallow	V	-	Ecosystem	BioNet–- 2 records (BCD 2021) BAM-C	The Dusky Woodswallow is widespread from the coast to inland, including the western slopes of the Great Dividing Range and farther west. It is often recorded in woodlands and dry open sclerophyll forests, and has also been recorded in shrublands, heathlands	Moderate Unlikely	Broadly suitable habitat for this species exists within the proposal site.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					regenerating forests and very occasionally in moist forests or rainforests. The understorey is typically open with sparse eucalypt saplings, acacias and other shrubs, often with coarse woody debris. It is also recorded in farmland, usually at the edges of forest or woodland or in roadside remnants or wind breaks with dead timber. The nest is an open shallow untidy cup frequently built in an open hollow, crevice or stump. Although Dusky Woodswallows have large home ranges, individuals may spend most of their time in about a 2 ha range and defend an area about 50 m around the nest. Dusky Woodswallows prefer larger remnants over smaller remnants. Competitive exclusion by Noisy Miners (*Manorina melanocephala*) is a significant threat to this species.		
Botaurus poiciloptilus Australasian Bittern	E	E	Ecosystem	PMST BAM-C	Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. The Species favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.), it hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. The species may construct feeding platforms over deeper water from reeds trampled by the bird; platforms are often littered with prey remains.	Low Unlikely	No suitable permanent aquatic habitat, to support this species year-round occurs in the study area. Ephemeral gilgai wetlands may provide occasional foraging habitat for the species in response to favourable conditions such as during times of high rainfall, however due to the arid climate of the Forbes region, this is unlikely to be a frequent occurrence.
Burhinus grallarius Bush Stone-curlew	E	-	Species	BAM-C	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and 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.	Low Unlikely	Not located during targeted surveys at an appropriate time of year. No suitable woodland or open-forest habitat with a sparse grassy ground-layer and abundant fallen timber is present in the study area to support this species.

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					Nest on the ground in a scrape or small bare patch.		
Calidris acuminata Sharp-tailed Sandpiper	-	C,J,K	-	PMST	Spends the non-breeding season in Australia with small numbers occurring regularly in New Zealand. Most of the population migrates to Australia, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. Many inland records are of birds on passage. In Australasia, prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. Breeds in northern Siberia.	Low Unlikely	No suitable permanent aquatic habitat, to support this species year-round occurs in the study area. Ephemeral gilgai wetlands may provide occasional foraging habitat for the species during times of high rainfall, however due to the arid climate of the Forbes region, this is unlikely to be a frequent occurrence.
Calidris ferruginea Curlew Sandpiper	E	CE, M	Dual	PMST	The Curlew Sandpiper is distributed around most of the Australian coastline (including Tasmania). It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration. The Curlew Sandpiper breeds in Siberia and migrates to Australia (as well as Africa and Asia) for the non-breeding period, arriving in Australia between August and November, and departing between March and mid-April. It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland.	Low Unlikely	No suitable permanent aquatic habitat, to support this species year-round occurs in the study area. Ephemeral gilgai wetlands may provide occasional foraging habitat for the species in response to favourable conditions such as during times of high rainfall, should the species be on its migration while such an event occurs, however any such rainfall events and regular waterlogging is unlikely given the arid climate of the region,
Calidris melanotos Pectoral Sandpiper	-	Mi	-	PMST	In NSW, the Pectoral Sandpiper is widespread, but scattered. Records exist east of the Great Divide, from Casino and Ballina, south to Ulladulla. West of the Great Divide, the species is widespread in the Riverina and Lower Western regions. The species prefers shallow fresh to saline wetlands. The species is usually found in coastal or near coastal habitat but	Low Unlikely	No suitable permanent aquatic habitat, to support this species year-round occurs in the study area. Ephemeral gilgai wetlands may provide moderate foraging habitat for the species during times of

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					occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. The species has also been recorded in swamp overgrown with lignum. They forage in shallow water or soft mud at the edge of wetlands.		high rainfall, however due to the arid climate of the Forbes region, this is unlikely to be a frequent occurrence.
Calyptorhynchus lathami Glossy Black-Cockatoo	V	-	Dual	BAM-C	The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. An isolated population exists on Kangaroo Island, South Australia. Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) are important foods. Inland populations feed on a wide range of sheoaks, including Drooping Sheoak, *Allocasuaraina diminuta*, and *A. gymnathera*. Belah is also utilised and may be a critical food source for some populations.	Low Unlikely	Broadly suitable foraging habitat for this species (*Alloscasuarina leuhmannii*) was available in native plantings within the proposal site, and within remnant Grey Box woodland along the proposed transmission alignment. Food resources were limited in the study area, and did not occur extensively. No evidence of breeding habitat was identified during targeted searches.
Calyptorhynchus lathami Glossy Black-Cockatoo Riverina population	EP	-	Credit	BAM-C	This population now occurs west of longitude 146º 40' E, within Cobar, Carrathool, Narrandera and Leeton local government areas.	Nil Nil	Proposal site is not located within the geographic area identified by the BAM-C. Geographic limitation button was unchecked in the BAM-C
Certhionyx variegatus Pied Honeyeater	V	-	Ecosystem	BAM-C	Widespread throughout acacia, mallee and spinifex scrubs of arid and semi-arid Australia. Occasionally occurs further east, on the slopes and plains and the Hunter Valley, typically during periods of drought. Inhabits wattle shrub, primarily Mulga (*Acacia aneura*), mallee, spinifex and eucalypt woodlands, usually when shrubs are flowering; feeds on nectar, predominantly from various species of emu-	Low Unlikely	Minimal suitable habitat (acacia (mulga), mallee and spinifex scrub) to support this species occurs in the study area.

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					bushes (*Eremophila* spp.); also from mistletoes and various other shrubs (e.g. *Grevillea* spp.); also eats saltbush fruit, berries, seed, flowers and insects.		
Chthonicola sagittata Speckled Warbler	V	-	Ecosystem	BioNet–- 2 records (BCD 2021) BAM-C	The Speckled Warbler has a patchy distribution throughout south-eastern Queensland, the eastern half of NSW and into Victoria, as far west as the Grampians. The species is most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast. The Speckled Warbler lives in a wide range of Eucalyptus 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.	Low Unlikely	Habitat within the study area is unlikely to support the species, as it typically occurs in large tracts (greater than 100 hectares) of relatively undisturbed woodland habitat. Woodland habitat within the study area occurs in smaller, disturbed patches (no bigger than 80 hectares). It has been modified by adjacent agricultural land, residential housings and various infrastructure corridors through the Crown Reserve.
Circus assimilis Spotted Harrier	V	-	Ecosystem	BAM-C	Occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges. Individuals disperse widely in NSW and comprise a single population. 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. Preys on terrestrial mammals (eg bandicoots, bettongs, and rodents), birds and reptile, occasionally insects and rarely carrion. Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months.	Moderate Unlikely	The species may utilise open woodland and grassy habitat in the study area to forage for prey. Impacts of the transmission line route would not impact on foraging habitat for this species, as its prey could still readily access the areas surrounding the transmission line poles. No stick nests or potential nest trees were observed during site surveys, despite targeted searches.
Climacteris affinis–-	EP	-	Species	BAM-C	In NSW, occupies a broad area of western NSW, west from a line from Balranald to Lake	Nil	Proposal site is not located within the geographic area

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endangered population White-browed Treecreeper population in Carrathool local government area south of the Lachlan River and Griffith local government area					Cargelligo then Lightning Ridge. The species appears absent in the far north west of the state with no records occurring west of a line from Broughams Gate, 100km northwest of Broken Hill to Hungerford. A small population, now recognised as isolated, occurs in Carrathool local government area south of the Lachlan River and Griffith local government areas.	Nil	identified by the BAM-C. Geographic limitation button was unchecked in the BAM-C
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies)	V	-	Ecosystem	BioNet–- 2 records (BCD 2021) BAM-C	Endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. Mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses. Sedentary, considered to be resident in many locations throughout its range; present in all seasons or year-round at many sites; territorial year-round. Up to 80% of the diet is comprised of ants; other invertebrates (including spiders, insects larvae, moths, beetles, flies, hemipteran bugs, cockroaches, termites and lacewings) make up the remaining percentage; nectar from Mugga Ironbark (*Eucalyptus sideroxylon*) and paperbarks, and sap from an unidentified eucalypt are also eaten. Hollows in standing dead or live trees and tree stumps are essential for nesting. Breeds in pairs or co-operatively in territories which range in size from 1.1 to 10.7 ha (mean = 4.4 ha).	Low Unlikely	Woodland within the study area lacks stringy barks and rough-barked eucalypts habitat this species prefers. This species is unlikely to permanently occur in the study area as it lacks its preferred feed resources.

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Daphoenositta chrysoptera Varied Sittella	V	-	Ecosystem	BioNet–- 1 record (BCD 2021) BAM-C	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. The Varied Sittella's population size in NSW is uncertain but is believed to have undergone a moderate reduction over the past several decades. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy.	Moderate Unlikely	This species may occur within the western extent of the proposal site where connected woodland habitat occurs, where it may utilise foraging resources.
Epthianura albifrons White-fronted Chat	V	-	Ecosystem	BAM-C	Found from southern Queensland to southern Tasmania, and across to Western Australia as far north as Carnarvon. Found mostly in temperate to arid climates and very rarely sub-tropical areas, it occupies foothills and lowlands up to 1000 m above sea level. In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. Gregarious species, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground.	Low Unlikely	This species may occur within the western extent of the proposal site where connected woodland habitat occurs, where it may utilise foraging resources.
Falco hypoleucos Grey Falcon	E	V	Ecosystem	PMST BAM-C	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left.	Moderate Unlikely	The species may utilise open grassy habitat in the study area to forage for prey. No stick nests or potential nest trees were observed during site

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					Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.		surveys despite targeted searches.
Falco subniger Black Falcon	V	-	Ecosystem	BAM-C	The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. Some reports of 'Black Falcons' on the tablelands and coast of New South Wales are likely to be referable to the Brown Falcon. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly travelling hundreds of kilometres (Marchant & Higgins 1993).	Moderate Unlikely	The species may utilise open grassy habitat in the study area to forage for prey. No stick nests or potential nest trees were observed during site surveys despite targeted searches.
Gallinago hardwickii Latham's Snipe	-	J,K, Migratory Wetland	-	PMST	Latham's Snipe is a non-breeding migrant to the south east of Australia including Tasmania, passing through the north and New Guinea on passage. Latham's Snipe breed in Japan and on the east Asian mainland. Latham's Snipe are seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. They are found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. They also use crops and pasture.	Low Unlikely	No suitable permanent aquatic habitat, to support this species year-round occurs in the study area. Ephemeral gilgai wetlands may provide moderate foraging habitat for the species during times of high rainfall, however due to the arid climate of the Forbes region, this is unlikely to be a frequent occurrence.
Glossopsitta porphyrocephala Purple-crowned Lorikeet	V	-	Ecosystem	BAM-C	Species is uncommon in NSW, with records scattered across the box-ironbark woodlands of the Riverina and south west slopes, the River Red Gum forests and mallee of the Murray Valley as far west as the South Australian border, and, more rarely, the forests of the South Coast. The species is nomadic and	Low Unlikely	Species is associated with PCT 11, the River Red Gum community, which only occurs within the proposal footprint as a single scattered tree.

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					most, if not all, records from NSW are associated with flowering events. Found in open forests and woodlands, particularly where there are large flowering eucalypts. Also recorded from mallee habitats.		
Grantiella picta Painted Honeyeater	V	V	Ecosystem	PMST BAM-C	Nomadic, occurring in low densities across most of NSW. Highest concentrations and almost all breeding occur on inland slopes of the Great Dividing Range. Inhabits Boree, Brigalow and Grey Box Woodlands and Box-Ironbark forests. Specialist forager on the fruits of mistletoes, preferably of the *Amyema* genus. Nests in outer tree canopy. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias.	Low Unlikely	This nomadic species requires mistletoes to be present at a density of greater than 5 mistletoes per hectare. This density of mistletoes were not observed within the proposal site, and so, the habitat constraint button has been unchecked in the BAM-C, as without this habitat requirement present, the species is unlikely to occur.
Grus rubicunda Brolga	V	-	Ecosystem	BAM-C	The Brolga was formerly found across Australia, except for the south-east corner, Tasmania and the south-western third of the country. It is still abundant in the northern tropics, but very sparse across the southern part of its range. Though Brolgas often feed in dry grassland or ploughed paddocks or even desert claypans, they are dependent on wetlands too, especially shallow swamps. They feed primarily on sedge roots and tuber but will also take large insects, crustaceans, molluscs and frogs. The nest comprises a platform of grasses and sticks, augmented with mud, on an island or in the water. Two eggs are laid from winter to autumn.	Low Unlikely	No suitable permanent aquatic habitat, to support this species year-round occurs in the study area. Ephemeral gilgai wetlands may provide moderate foraging habitat for the species during times of high rainfall, however due to the arid climate of the Forbes region, this is unlikely to be a frequent occurrence.
Haliaeetus leucogaster White-bellied Sea-Eagle	V	M	Dual	PMST BAM-C	Distributed along the Australian coastline and well inland along rivers and wetlands, it's widespread in eastern NSW. Foraging habitat consists of coastal seas, rivers, fresh and saline lakes, lagoons, reservoirs and terrestrial	Low Unlikely	The proposal site generally lacks the large open waterways necessary to support this species' foraging requirement.

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					habitats such as grasslands. Diet consists of waterbirds, turtles and fish. Resident pairs are territorial and occupy nesting territories of hundreds of hectares. Breeding habitat consists of large trees within mature open forest, gallery forest or woodland and reported that they avoid nesting near urban areas. 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.		No stick nests or nest trees were identified despite targeted searches.
Hieraaetus morphnoides Little Eagle	V	-	Dual	*Hirundapus caudacutus* 1 record (BCD 2021) BAM-C	The Little Eagle 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. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used.	Moderate Unlikely	The species may utilise open grassy habitat in the study area to forage for prey. No stick nests or nest trees were observed during targeted searches.
Hirundapus caudacutus White-throated Needletail	-	V	Ecosystem	PMST BAM-C	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. A large proportion of the White-throated Needletails of the nominate subspecies would occur in Australia as non-breeding visitors. Most White-throated Needletails spend the non-breeding season in Australasia, mainly in Australia, and occasionally in New Guinea and New Zealand, though it has been suggested that some may overwinter in parts of South-East Asia. As the Needletails that occur in Australia migrate from breeding areas in the Northern Hemisphere, they would be affected by global threats.	Low Unlikely	The species may occur, and forage aerially over the proposal site.
Lathamus discolor Swift Parrot	E	CE	Dual	PMST BAM-C	Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the	Low Unlikely	This intermittently occurring species may forage on flowering

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					eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*.		eucalypts in woodland in the study area. Important habitat for the species is mapped to the west of the proposal site within Back Yamma State Forest, but would not be impacted by the proposal.
Leipoa ocellata Mallee Fowl	E	V		PMST	Occurs in semi-arid to arid mallee country in the south-west of NSW. Its NSW stronghold is centred on Mallee Cliffs NP, extending east to Balranald and with scattered records north to Mungo NP. There are also populations near Dubbo (Goonoo forest). Occasional records exist from the Pilliga, around Cobar and Goulburn River NP. Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300 - 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species. Prefers areas of light sandy to sandy loam soils and habitats with a dense but discontinuous canopy and dense and diverse shrub and herb layers.	Low Unlikely	No preferred mallee habitat present in the study area. While this species may use eucalypt woodlands, they prefer those with a thich understoey of those dominated by Mulga or native Callitris species, which are not present in the study area. Unlikely to occur.
Lophochroa leadbeateri Major Mitchell's Cockatoo	V	-	Dual	BAM-C	In NSW Major Mitchell's Cockatoo is found across the arid and semi-arid inland and is regularly as far east as about Bourke and Griffith, and sporadically further east than that.	Moderate Unlikely	This species may forage in the study area given the presence of suitable foraging resources for the

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					The species inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. It 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.		species. No evidence of nesting/breeding was observed in the study area, despite targeted surveys.
Lophoictinia isura Square-tailed Kite	V	-	Dual	BAM-C	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. The species is 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, it has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland.	Moderate Unlikely	The species may utilise open grassy habitat in the study area to forage for prey. No stick nests or potential nest trees were observed during site surveys, despite targeted searches.
Melanodryas cucullata cucullata Hooded Robin	V	-	Ecosystem	BioNet - 1 record (BCD 2021) BAM-C	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. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring	Moderate Unlikely	This species may occur within the proposal site and forage on habitat resources present.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.		
Melithreptus gularis gularis Black-chinned Honeyeater	V	-	Ecosystem	BAM-C	Extends south from central Queensland, through NSW, Victoria into south eastern South Australia, though it is very rare in the last state. In NSW it is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is rarely recorded east of the Great Dividing Range, although regularly observed from the Richmond and Clarence River areas. It has also been recorded at a few scattered sites in the Hunter, Central Coast and Illawarra regions, though it is very rare in the latter. Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*E. albens*), Inland Grey Box (E. microcarpa), Yellow Box (*E. melliodora*), Blakely's Red Gum (*E. blakelyi*) and Forest Red Gum (*E. tereticornis*).	Low Unlikely	No suitable tracts of extensive, connected woodland habitat likely to support this species occurs in the study area.
Motacilla flava Yellow Wagtail	-	C,J,K	-	PMST	The Yellow Wagtail breeds in temperate Europe and Asia. They occur within Australia in open country habitat with disturbed ground and some water. Recorded in short grass and bare ground, swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land and town lawns.	Low Unlikely	This species may occur intermittently in the study area. No local records and no breeding occurs in Australia.
Myiagra cyanoleuca Satin Flycatcher	-	Mi	-	PMST	In NSW widespread on and east of the Great Divide, sparsely scattered on the western slopes, very occasional records on the western plains. Inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, often near wetlands and watercourses. On migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests. Generally not in rainforests. Prefer to nest in a fork of outer	Low Unlikely	This species may occur intermittently in the study area, however is only an occasional visitor west of the Great Divide.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					branches of trees, such as paperbarks, eucalypts, and banksia. Where they breed at elevations of more than 600 m above sea level in south-eastern Australia, they breed from November to early January (Frith 1969). mainly insectivorous, preying on arthropods, mostly insects, although very occasionally they will also eat seeds. They are arboreal foragers, feeding high in the canopy and subcanopy of trees.		
Neophema pulchella Turquoise Parrot	V	-	Ecosystem	BioNet - 2 records (BCD 2021) BAM-C	The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.	Moderate Unlikely	This species may occur within the proposal site and forage on habitat resources present.
Ninox connivens Barking Owl	V	-	Dual	BAM-C	The Barking Owl is found throughout continental Australia except for the central arid regions. The owls sometimes extend their home range into urban areas, hunting birds in garden trees and insects attracted to streetlights. Extensive wildfires in 2019-20 reduced habitat quality further, burnt many old, hollow-bearing trees needed as refuge by prey species and reduced the viability of some regional owl populations. The species inhabit woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey found on these fertile riparian soils. The species typically roost in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as Acacia and Casuarina species.	Low Unlikely	The species may occur and hunt within the proposal site. No evidence of breeding habitat (eg nest trees) was identified within the proposal site, despite targeted surveys.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
Numenius madagascariens Eastern Curlew	-	C,J,K	-	PMST	The Eastern Curlew is widespread in coastal regions in the north-east and south of Australia, including Tasmania, and scattered in other coastal areas. It is rarely seen inland. It breeds in Russia and north-eastern China. On passage, they are commonly seen in Japan, Korea and Borneo. Small numbers visit New Zealand. The Eastern Curlew is found on intertidal mudflats and sandflats, often with beds of seagrass, on sheltered coasts, especially estuaries, mangrove swamps, bays, harbours and lagoons.	Low Unlikely	No suitable permanent aquatic habitat, to support this species year-round occurs in the study area. Ephemeral gilgai wetlands may provide moderate foraging habitat for the species in response to favourable conditions such as during times of high rainfall, however due to the arid climate of the Forbes region, this is unlikely to be a frequent occurrence.
Oxyura australis Blue-billed Duck	V	-	Ecosystem	BioNet - 3 records (BCD 2021)	The Blue-billed Duck is endemic to south-eastern and south-western Australia. It is widespread in NSW, but most common in the southern Murray-Darling Basin area. The species disperses during the breeding season to deep swamps up to 300 km away, and is generally only during summer or in drier years that they are seen in coastal areas. The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. It will fly if disturbed, but prefers to dive if approached.	Low Unlikely	No suitable large permanent wetlands with deep water and dense aquatic vegetation present in the study area.
Pachycephala inornata Gilbert's Whistler	V	-	Ecosystem	BAM-C	The Gilbert's Whistler is 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 eastern population extends from the central NSW mallee (Yathong, Nombinnie and Round Hill NRs), south and east through the Cocoparra Range to Pomingalama Reserve (near Wagga Wagga) then north through the South West Slopes east as far as Cowra and Burrendong Dam, to the Goonoo reserves (with scattered records as far north as Pilliga). Occasional records are also	Low Unlikely	Habitat within the proposal site is not preferred by the species, as they typically occur in woodland with a dense shrub layer. This species may occur intermittently and utilise foraging resources.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					made of this species in the Capertee Valley. The species is also recorded in River Red Gum forests along the Murray River valley between Mathoura and Wentworth, with the eastern populations (between Mathoura and Barham) apparently isolated from other NSW populations. West of Swan Hill, this population may interact with populations found to the north of the Murray River west of Balranald and as far north as the Scotia country (Tarawi NR and Scotia Sanctuary). The Gilbert's Whistler occurs in a range of habitats within NSW, though the shared feature appears to be a dense shrub layer. It is widely recorded in mallee shrublands, but also occurs in box-ironbark woodlands, Cypress Pine and Belah woodlands and River Red Gum forests, though at this stage it is only known to use this habitat along the Murray, Edwards and Wakool Rivers. Within the mallee the species is often found in association with an understorey of spinifex and low shrubs including wattles, hakeas, sennas and hop-bushes. In woodland habitats, the understorey comprises dense patches of shrubs, particularly thickets of regrowth *Callitris* pine. Parasitic 'cherries' (*Exocarpus* species) appear to be an important habitat component in Belah and Red Gum communities, though in the latter case other dense shrubs, such as Lignum and wattles, are also utilised.		
Pandion haliaetus Osprey	V	Mi	Dual	PMST	The distribution of the species around the northern coast (south-western Western Australia to south-eastern NSW) appears continuous except for a possible gap at Eighty Mile Beach. Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish	Low Unlikely	No suitable habitat (large open waterways, variety of wetland habitats) required to support this species foraging requirements occur in the study area.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					or saline water for foraging. They frequent a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes. Eastern Ospreys occur sympatrically and sometimes interact with White-bellied Sea-Eagles		
Petroica boodang Scarlet Robin	V	-	Ecosystem	BAM-C	The Scarlet Robin is found from south east Queensland to south east South Australia and also in Tasmania and south west Western Australia. In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins 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.	Moderate Unlikely	This species may occur intermittently in the study area, and utilise foraging habitat. No breeding habitat occurs in the region.
Petroica phoenicea Flame Robin	V	-	Ecosystem	BAM-C	The Flame Robin is endemic to south eastern Australia, and ranges from near the Queensland border to south east South Australia and also in Tasmania. In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains. It is likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The ground layer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense.	Moderate Unlikely	This species may occur intermittently in the study area. No breeding habitat occurs in the region.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
Polytelis swainsonii Superb Parrot	V	V	Dual	PMST BioNet - 5 records (BCD 2021) BAM-C	The Superb Parrot is found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the upper Namoi and Gwydir Rivers. The other main breeding sites are in the Riverina along the corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest.	Recorded (foraging) Likely	This species was recorded foraging within the proposal site in Grey Box woodland. Isolated hollow-bearing trees occur within the proposed solar farm site, however as this species typically nests within riparian corridors, the study area is unlikely to contain breeding habitat. No evidence of breeding was found within the proposal site, despite targeted surveys.
Pomatostomus temporalis temporalis Grey-crowned Babbler (eastern subspecies)	V	-	Ecosystem	BioNet - 8 records (BCD 2021) BAM-C	The eastern subspecies (temporalis occurs from Cape York south through Queensland, NSW and Victoria and formerly to the south east of South Australia. This subspecies also occurs in the Trans-Fly Region in southern New Guinea. In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions.	Recorded Low	This species was recorded foraging in the proposal site. No breeding nests or trees were recorded during site surveys within the solar farm site or transmission line route.
Rhipidura rufifrons Rufous Fantail	-	Mi	-	PMST	Found along NSW coast and ranges. Inhabits rainforest, dense wet forests, swamp woodlands and mangroves. During migration, it	Low Unlikely	No suitable rainforest or dense wet forest habitat

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					may be found in more open habitats or urban areas (BA, 2017). Forages mainly in the low to middle strata of forests, sometimes in or below the canopy or on the ground; insectivorous. Breeds from about September to February. A small cup-shaped nest made from grass, roots, fine strips of bark, plant-fibre, decayed wood, moss and spider web is placed in a tree, shrub or vine, between 0.34–6.0 m above the ground, the average height being 1.6 m (Higgins *et al*. 2006). Nests are placed in a wide variety of plant species, including Blackberries (*Rubus fruticosa*), Musk Daisybush (*Olearia argophylla*), eucalypts and other genera.		occurs for this species in the study area.
Rostratula australis Australian Painted Snipe	E	E	Ecosystem	PMST BAM-C	In NSW many records of the Australian Painted Snipe are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. The species prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.	Low Unlikely	No suitable permanent aquatic habitat, to support this species year-round occurs in the study area. Ephemeral gilgai wetlands may provide moderate foraging habitat for the species in response to favourable conditions such as during times of high rainfall, however due to the arid climate of the Forbes region, this is unlikely to be a frequent occurrence.
Stagonopleura guttata Diamond Firetail	V	-	Ecosystem	BioNet - 1 record (BCD 2021) BAM-C	The Diamond Firetail is endemic to south-eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia. It is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Cental and South Western Slopes and the North West Plains and Riverina. Not commonly found in coastal districts, though there are records from near Sydney, the Hunter Valley and the Bega Valley. This species has a scattered distribution over the rest of NSW, though is very rare west of the Darling River.	Moderate Unlikely	This species may occur intermittently in the study area, and utilise foraging habitat.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus pauciflora Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.		
Stictonetta naevosa Freckled Duck	V	-	Ecosystem	BioNet - 4 records (BCD 2021) BAM-C	The Freckled Duck is found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. It breeds in large temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system, particularly along the Paroo and Lachlan Rivers, and other rivers within the Riverina. The duck is forced to disperse during extensive inland droughts when wetlands in the Murray River basin provide important habitat. The species may also occur as far as coastal NSW and Victoria during such times. Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds.	Low Unlikely	No suitable permanent aquatic or wetland habitat required to support this species occurs in the study area
Tringa stagnatilis Marsh Sandpiper	-	C,J,K	-	PMST	The Marsh Sandpiper is found on coastal and inland wetlands throughout Australia. It is recorded in all regions of NSW but especially the central and south coasts and (inland) on the western slopes of Great Divide and western plains. The Hunter River Estuary and the Macquarie Marshes are internationally important sites for this species. 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. They are recorded less	Low Unlikely	No suitable permanent aquatic habitat, to support this species year-round occurs in the study area. Ephemeral gilgai wetlands may provide moderate foraging habitat for the species in response to favourable conditions such as during times of high rainfall, however due to the arid climate of the Forbes region, this is unlikely to be a frequent occurrence.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes.		
Tyto novaehollandiae Masked Owl	V	-	Dual	BAM-C	The Masked Owl occurs from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner. There is no seasonal variation in its distribution. This species lives in dry eucalypt forests and woodlands from sea level to 1100 m an often hunts along the edges of forests, including roadsides. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	Low Unlikely	Proposal site is outside the known range for the species as mapped in the BioNet Atlas. There are no local records of this species, and no nest trees were found within the proposal site despite targeted searches. The species was not located during surveys at an appropriate time of year. This species may forage in the study area on occasion, as part of their large home range (500-1000ha) but would be unlikely to breed within the proposal site, given their preference for breeding within moist eucalypt forested gullies, which are not present within the proposal site.
Bats							
Chalinolobus dwyeri Large-eared Pied Bat	V	V	Species	PMST	The Large-eared Pied Bat is 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. There are scattered records from the New England Tablelands and North West Slopes. The species roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Petrochelidon ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity	Low Unlikely	No cave or cliff structures occur in the study area. This species is unlikely to occur.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. It is found in well-timbered areas containing gullies.		
Chalinolobus picatus Little Pied Bat	V	-	Ecosystem	BAM-C	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 and mallee and Bimbil box woodlands. Roosts in caves, rock outcrops, mine shafts, tunnels, tree hollows and buildings.	Moderate Unlikely	This species may roost in hollow-bearing trees in the study area, and forage over the proposal site. Not recorded during anabat surveys.
Nyctophilus corbeni South-eastern Long-eared Bat	V	V	Ecosystem	BAM-C	Distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species. Inhabits a variety of vegetation types, including mallee, bulloke *Allocasuarina leuhmanni* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland.	Moderate Unlikely	This species may roost in hollow-bearing trees in the study area, and forage over the proposal site. Not recorded during anabat surveys.
Pteropus poliocephalus Grey-headed Flying-fox	V	V	Dual	PMST BAM-C	Grey-headed Flying-foxes are generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. In times of natural resource shortages, they may be found in unusual locations. The species occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Low Unlikely	This species typically occurs within 200 kilometres of the east coast of Australia, and is unlikely to occur in the study area. No roost camps occur in the study area, so the habitat constraint 'breeding camps' was unchecked in the BAM-C. Broadly suitable foraging habitat present in patches of woodland.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	V	-	Ecosystem	BAM-C	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 forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	Moderate Unlikely	This species may roost in hollow-bearing trees in the study area, and forage over the proposal site. Not recorded during anabat surveys.
Fish							
Maccullochella macquariensis Trout Cod	-	E	-	PMST	The Trout Cod is endemic to the southern Murray-Darling river system, including the Murrumbidgee and Murray Rivers, and the Macquarie River in central NSW. The species was once widespread and abundant in these areas but has undergone dramatic declines in its distribution and abundance over the past century. The last known reproducing population of Trout Cod is confined to the Murray River below Yarrawonga downstream to Tocumwal.	Nil Nil	No permanent aquatic likely to support this species occurs in the study area
Maccullochella peelii Murray Cod	-	V	-	PMST	Occurs throughout the Murray-Darling Basin. Can live in a wide range of habitats, from clear, rocky streams in the upper western slopes regions of New South Wales to the slow flowing, turbid rivers and billabongs of the western plains. Generally, they are found in waters up to 5m deep and in sheltered areas with cover from rocks, timber or overhanging banks. The presence of wood debris has been shown to be the primary factor determining Murray cod presence.	Nil Nil	No permanent aquatic likely to support this species occurs in the study area
Macquaria australasica Macquarie Perch	-	E	-	PMST	Occurs in the upper reaches of the Lachlan, Murrumbidgee and Murray Rivers, and in parts of the Hawkesbury and Shoalhaven catchment areas. Inhabits river and lake habitats, especially the upper reaches of rivers and their tributaries. Requires clear water with deep, rocky holes and abundant cover (including	Nil Nil	No permanent aquatic likely to support this species occurs in the study area

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
					aquatic vegetation, woody debris, large boulders and overhanging banks). Spawning occurs in spring and summer in shallow upland streams or flowing sections of river systems.		
Mammals							
Cercartetus nanus Eastern Pygmy Possum	V	-	Species	BAM-C	The Eastern Pygmy-possum is found in south-eastern Australia, from southern Queensland to eastern South Australia and in Tasmania. In NSW it extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes. Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. They may occupy small patches of vegetation in fragmented landscapes and although the species prefers habitat with a rich shrub understory, they are known to occur in grassy woodlands and the presence of Eucalypts alone is sufficient to support populations in low densities.	Low Unlikely	No known local records. Species is difficult to survey for, and a conservative approach has been taken and the species has been assumed to be present within areas of woodland within 200 m of any patch of woodland vegetation greater than 5 ha in size.
Dasyurus maculatus maculatus (SE mainland population) Spotted-tailed Quoll	V	E	Ecosystem	PMST BioNet - 1 record (BCD 2021)	The range of the Spotted-tailed Quoll has contracted considerably since European settlement. It is now found in eastern NSW, eastern Victoria, south-east and north-eastern Queensland, and Tasmania. Only in Tasmania is it still considered relatively common. The species has been recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. Females occupy home ranges of 200-500 hectares, while males occupy very large home ranges from 500 to over 4000 hectares. Are known to traverse their home ranges along densely vegetated creeklines.	Low Unlikely	No large tracts of connected habitat required by this species to persist in an area are present within the study area. Woodland habitat is sparse and fragmented by agricultural properties and infrastructure. Habitat in the study area is unlikely to support the species.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
Petaurus norfolcensis Squirrel Glider	V	-	Species	BAM-C	Widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. The species 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.	Low Unlikely	Species generally requires patches of vegetation greater than 5 ha in size. The Crown Reserve to the west of the proposal site could support potential habitat for the species, however there are no known local occurrences of the species, and it was not found during targeted spotlighting and call-playback surveys, nor was any evidence of the species such as scratches on tree trunks seen.
Petaurus norfolcensis - endangered population Squirrel Glider in the Wagga Wagga Local Government Area	EP	-	Species	BAM-C	The extent of the endangered population is legally defined by the boundaries of the Wagga Wagga LGA.	Nil Nil	The proposal is not within the Wagga Wagga LGA, and so the species was not included as a confirmed candidate species.
Phascolarctos cinereus Koala	V	V	Species	BAM-C	The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In New South Wales, koala populations are found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range. The species inhabit eucalypt woodlands and forests, and feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.	Low Unlikely	No suitable breeding habitat. No core habitat present according to mapping of Areas of Regional Koala Significance (ARKS). Woodland in the study area is highly fragmented by agricultural development, and not easily traversable by the species. No local records of an easily identifiable and recognisable species. The habitat degraded button was ticked in the BAM-C, given the

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
							fragmented nature of the proposal site and surrounding areas.
Pseudomys novaehollandiae New Holland mouse	-	V	Ecosystem	PMST	The New Holland Mouse has a fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Genetic evidence indicates that the New Holland Mouse once formed a single continuous population on mainland Australia and the distribution of recent subfossils further suggest that the species has undergone a large range contraction since European settlement. Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. It is a social animal, living predominantly in burrows shared with other individuals.	Low Unlikely	No suitable habitat to support the species (open forest with a heathland understory and vegetated sand dunes) occurs in the study area.
Sminthopsis macroura Stripe-faced Dunnart	V	-	Ecosystem	BAM-C	Found throughout much of inland central and northern Australia. They are rare on the NSW Central West Slopes and North West Slopes with the most easterly records of recent times located around Dubbo, Coonabarabran, Warialda and Ashford. Occur in native dry grasslands and low dry shrublands, often along drainage lines where food and shelter resources tend to be better. They shelter in cracks in the soil, in grass tussocks or under rocks and logs. Co-occupies areas with the more common Fat-tailed Dunnart, but prefers relatively ungrazed habitats with greater diversity and healthier understorey vegetation.	Low Unlikely	Species considered unlikely to occur. With reference to the vegetation types present in the proposal site, this species is only associated with PCT 244, which, within the proposal site, occurs as a small patch of planted vegetation with an understorey dominated by exotic species, surrounded by cropland. Given this, combined with their preference for un-grazed habitats, the species is unlikely to occur and has been removed as a candidate predicted species in the BAM-C.

Scientific name Common name	BC Status	EPBC Status	Credit type	Source	Habitat requirements	Likelihood of occurrence Likelihood of impact	Justification
Reptiles							
Aprasia parapulchella Pink-tailed Worm Lizard	V	V	Species	PMST	Populations occur in the Queanbeyan/Canberra district, Cooma, Yass, Bathurst, Albury and West Wyalong areas. Inhabits grassland and open woodland with substantial embedded rock cover in sunny situations. Recorded in both native and non-native grasslands. Usually recorded under small rocks (150 - 600 mm basal area) shallowly embedded in the soil (2 - 5 cm), and use ant burrows under these rocks.	Low Unlikely	The study area occurs outside the known geographical extent for the species. No suitable rocky habitat within native grasslands occurs within the study area.

Appendix B

Survey results

Flora species list for PCT 26_Good within Transmission Line

Family	Scientific name	Common name	Exotic	Growth form	Plot 2 Cover	Plot 2 Abundance	Plot P10 Cover	Plot P10 Abundance	Plot P5 Cover	Plot P5 Abundance
Amaranthaceae	*Alternanthera denticulata*	Lesser Joyweed	0	FG	0.1	20				
Asteraceae	*Calotis cuneifolia*	Purple Burr-Daisy	0	FG	2	150				
Asteraceae	*Carthamus lanatus*	Saffron Thistle	*	HT	0.1	1				
Asteraceae	*Centaurea melitensis*	Maltese Cockspur	*	EX	0.5	10				
Asteraceae	*Euchiton involucratus*	Star Cudweed	0	FG	0.1	1				
Asteraceae	*Lactuca serriola*	Prickly Lettuce	*	EX	0.1	1				
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	*	EX					0.1	1
Asteraceae	*Vittadinia cuneata*	A Fuzzweed	0	FG	0.5	20			0.1	20
Boraginaceae	*Echium plantagineum*	Patterson's Curse	*	EX	0.1	3				
Brassicaceae	*Lepidium africanum*	Common Peppercress	*	EX	0.1	2				
Chenopodiaceae	*Atriplex semibaccata*	Creeping Saltbush	0	SG	0.2	5			0.3	100
Chenopodiaceae	*Einadia nutans*	Climbing Saltbush	0	FG	0.1	5	0.2	50	0.5	100
Chenopodiaceae	*Enchylaena tomentosa*	Ruby Saltbush	0	SG			0.1	1	2	100
Chenopodiaceae	*Maireana decalvans*	Black Cotton Bush	0	SG	1	515				
Chenopodiaceae	*Maireana enchylaenoides*	Wingless Fissure-weed	0	FG	0.1	5	0.1	2		
Chenopodiaceae	*Maireana pentagona*	Hairy Bluebush, Slender Fissure-weed	0	FG			0.1	10	2	500
Chenopodiaceae	*Salsola australis*	0	0	SG	0.2	5			0.1	10
Chenopodiaceae	*Sclerolaena diacantha*	Grey Copperburr	0	SG	0.2	10				
Chenopodiaceae	*Sclerolaena divaricata*	Tangled Copperburr	0	SG			0.1	10	0.1	1
Chenopodiaceae	*Sclerolaena muricata*	Black Rolypoly	0	SG	0.1	1	0.1	1		
Convolvulaceae	*Convolvulus erubescens*	Pink Bindweed	0	OG	0.1	2	0.1	1	0.1	2
Cyperaceae	*Carex inversa*	Knob Sedge	0	GG	0.1	5	0.1	10		
Cyperaceae	*Eleocharis plana*	Flat Spike-sedge	0	GG	0.2	100				
Euphorbiaceae	*Chamaesyce drummondii*	Caustic Weed	0	FG	0.1	10				
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	*	EX					0.1	3
Fabaceae (Faboideae)	*Trifolium glomeratum*	Clustered Clover	*	EX	0.1	5				

Family	Scientific name	Common name	Exotic	Growth form	Plot 2 Cover	Plot 2 Abundance	Plot P10 Cover	Plot P10 Abundance	Plot P5 Cover	Plot P5 Abundance
Fabaceae (Mimosoideae)	*Acacia pendula*	Weeping Myall, Boree	0	TG	25	20	3	5	20	10
Goodeniaceae	*Goodenia fascicularis*	Mallee Goodenia	0	FG			0.1	1		
Lythraceae	*Lythrum hyssopifolia*	Hyssop Loosestrife	0	FG	0.1	10				
Malvaceae	*Abutilon* spp.	Lantern-bush	*	EX					0.1	5
Malvaceae	*Sida corrugata*	Corrugated Sida	0	FG					0.1	5
Malvaceae	*Sida fibulifera*	Pin Sida	0	FG			0.1	20		
Marsileaceae	*Marsilea drummondii*	Common Nardoo	0	EG			0.1	100		
Marsileaceae	*Marsilea hirsuta*	Short-fruited Nardoo	0	EG	1	100				
Myrtaceae	*Eucalyptus microcarpa*	Western Grey Box	0	TG			5	1		
Nyctaginaceae	*Boerhavia dominii*	Tarvine	0	FG			0.1	1		
Oxalidaceae	*Oxalis corniculata*	Creeping Oxalis	*	EX			0.1	2	0.1	10
Oxalidaceae	*Oxalis perennans*	0	0	FG	0.1	5				
Poaceae	*Amphibromus nervosus*	Swamp Wallaby Grass	0	GG	0.1	10				
Poaceae	*Austrostipa aristiglumis*	Plains Grass	0	GG	1	150	0.2	50		
Poaceae	*Austrostipa bigeniculata*	Yanganbil	0	GG					0.3	100
Poaceae	*Austrostipa scabra*	Speargrass	0	GG	5	200			0.2	50
Poaceae	*Austrostipa spp.*	A Speargrass	0	GG	5	200				
Poaceae	*Bothriochloa macra*	Red Grass	0	GG			1	50	0.2	100
Poaceae	*Chloris truncata*	Windmill Grass	0	GG	5	200	30	1000	5	1000
Poaceae	*Digitaria* spp.	A Finger Grass	*	GG					0.1	3
Poaceae	*Eragrostis parviflora*	Weeping Lovegrass	0	GG	0.5	50				
Poaceae	*Lachnagrostis filiformis*	0	0	GG	0.2	20				
Poaceae	*Lolium rigidum*	Wimmera Ryegrass	*	EX	0.5	250				
Poaceae	*Paspalidium constrictum*	Knottybutt Grass	0	GG					0.1	10
Poaceae	*Paspalum* spp.	0	*	GG			0.1	2		
Poaceae	*Phalaris aquatica*	Phalaris	*	HT	0.1	5				
Poaceae	*Rytidosperma caespitosum*	Ringed Wallaby Grass	0	GG			3	200	0.1	10
Poaceae	*Rytidosperma* spp.	0	0	GG	1	150				

Family	Scientific name	Common name	Exotic	Growth form	Plot 2 Cover	Plot 2 Abundance	Plot P10 Cover	Plot P10 Abundance	Plot P5 Cover	Plot P5 Abundance
Poaceae	*Sporobolus caroli*	Fairy Grass	0	GG			0.1	5	0.1	20
Polygonaceae	*Persicaria hydropiper*	Water Pepper	0	FG	0.1	2				
Polygonaceae	*Polygonum aviculare*	Wireweed	*	EX	0.1	10				
Portulacaceae	*Portulaca oleracea*	Pigweed	0	FG	0.2	50				
Rubiaceae	*Asperula conferta*	Common Woodruff	0	FG			0.1	100		
Solanaceae	*Lycium ferocissimum*	African Boxthorn	*	HT					0.1	1
Solanaceae	*Solanum esuriale*	Quena	0	EX			0.1	2		
Solanaceae	*Solanum esuriale*	Quena	0	FG	0.1	3			0.2	50
Verbenaceae	*Verbena bonariensis*	Purpletop	*	EX			0.1	1		

Notes: Growth form; EX= exotic, HTE= High threat exotic, TG= Tree , SG= Shrub, GG= Grass or grass-like, FG= Forb, EG= fern OG= other

Flora species list for PCT 76_Good within Transmission Line

Family	Scientific name	Common name	Exotic	Growth form	Plot DAR0001S Cover	Plot DAR0001S Abundance	Plot P4 Cover	Plot P4 Abundance	Plot P6 Cover	Plot P6 Abundance	Plot PE Cover	Plot PE Abundance
Aizoaceae	*Psilocaulon tenue*	Wiry Noon-flower	*	HT	0.3	5						
Amaranthaceae	*Alternanthera denticulata*	Lesser Joyweed	0	FG			1	500	0.3	100		
Asteraceae	*Arctotheca calendula*	Capeweed	*	EX	2	100	3	500			0.1	5
Asteraceae	*Calotis cuneifolia*	Purple Burr-Daisy	0	FG							0.1	50
Asteraceae	*Calotis hispidula*	Bogan Flea	0	FG	0.3	100						
Asteraceae	*Centipeda cunninghamii*	Common Sneezeweed	0	FG			0.1	3				
Asteraceae	*Cichorium intybus*	Chicory	*	EX					0.3	5		
Asteraceae	*Cirsium vulgare*	Spear Thistle	*	EX			0.1	2	0.1	2	0.1	1
Asteraceae	*Hypochaeris radicata*	Catsear	*	EX							0.1	1
Asteraceae	*Lactuca serriola*	Prickly Lettuce	*	EX			0.1	10				
Asteraceae	*Minuria leptophylla*	0	0	FG							0.1	3
Asteraceae	*Picris* spp.	0	0	FG	0.1	1						
Asteraceae	*Rhodanthe pygmaea*	Pigmy Sunray	0	FG	0.1	5						
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	*	EX	0.1	1	0.1	3			0.1	2
Asteraceae	*Vittadinia cuneata*	A Fuzzweed	0	FG	0.1	2						
Asteraceae	*Xanthium spinosum*	Bathurst Burr	*	HT			0.1	1				
Boraginaceae	*Echium plantagineum*	Patterson's Curse	*	EX			0.2	50				
Brassicaceae	*Brassica rapa* subsp. *campestris*	Turnip	*	EX							0.2	30
Brassicaceae	*Lepidium africanum*	Common Peppercress	*	EX	0.1	5						
Brassicaceae	*Raphanus raphanistrum*	Wild Radish	*	EX					2	1000		
Campanulaceae	*Wahlenbergia* spp.	Bluebell	0	FG					0.1	2		
Chenopodiaceae	*Atriplex semibaccata*	Creeping Saltbush	0	SG	0.1	3						
Chenopodiaceae	*Einadia nutans*	Climbing Saltbush	0	FG	0.1	3					0.5	30
Chenopodiaceae	*Enchylaena tomentosa*	Ruby Saltbush	0	SG					0.1	1	0.1	30
Chenopodiaceae	*Maireana enchylaenoides*	Wingless Fissure-weed	0	FG	0.1	5					0.1	1
Chenopodiaceae	*Salsola australis*	0	0	SG							0.1	1
Chenopodiaceae	*Salsola kali* var. *kali*	Buckbush	0	SG	0.1	5						

Family	Scientific name	Common name	Exotic	Growth form	Plot DAR0001S Cover	Plot DAR0001S Abundance	Plot P4 Cover	Plot P4 Abundance	Plot P6 Cover	Plot P6 Abundance	Plot PE Cover	Plot PE Abundance
Chenopodiaceae	*Sclerolaena birchii*	Galvinized Burr	0	SG	0.1	2						
Chenopodiaceae	*Sclerolaena divaricata*	Tangled Copperburr	0	SG	0.8	100						
Chenopodiaceae	*Sclerolaena muricata*	Black Rolypoly	0	SG	0.3	100						
Colchicaceae	*Wurmbea dioica* subsp. *Dioica*	Early Nancy	0	FG							0.1	1
Convolvulaceae	*Convolvulus erubescens*	Pink Bindweed	0	OG							0.1	3
Convolvulaceae	*Dichondra repens*	Kidney Weed	0	FG					0.5	1000		
Crassulaceae	*Crassula decumbens var. decumbens*	Spreading Stonecrop	0	FG	0.2	100						
Crassulaceae	*Crassula sieberiana*	Australian Stonecrop	0	FG	5	5000					0.1	10
Cucurbitaceae	*Citrullus lanatus* var. *lanatus*	Wild Melon, Camel Melon,Bitter	*	EX			0.2	100				
Cyperaceae	*Carex inversa*	Knob Sedge	0	GG			0.2	20	1	100		
Cyperaceae	*Cyperus bifax*	Downs Nutgrass	0	GG			0.3	500				
Cyperaceae	*Eleocharis acuta*	0	0	GG			4	1000	0.2	1000		
Fabaceae (Faboideae)	*Medicago arabica*	Spotted Burr Medic	*	EX							0.1	3
Fabaceae (Faboideae)	*Medicago laciniata*	Cut-leaved Medic	*	EX	3	2000						
Fabaceae (Faboideae)	*Medicago minima*	Woolly Burr Medic	*	EX							0.1	10
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	*	EX	1	500	0.2	500				
Fumariaceae	*Fumaria muralis* subsp. *muralis*	Wall Fumitory	*	EX					0.1	3		
Geraniaceae	*Geranium solanderi*	Native Geranium	0	FG					0.1	10		
Goodeniaceae	*Goodenia fascicularis*	Mallee Goodenia	0	FG	0.1	10						
Goodeniaceae	*Goodenia pinnatifida*	Scrambles Eggs	0	FG							0.1	15
Goodeniaceae	*Goodenia pusilliflora*	0	0	FG	0.1	20						
Hypoxidaceae	*Hypoxis glabella* var. *glabella*	Tiny Star	0	FG	0.1	20					0.1	1
Iridaceae	*Romulea minutiflora*	Small-flowered Onion Grass	*	EX	0.2	200						
Iridaceae	*Romulea rosea* var. *australis*	Onion Grass	*	HT	0.1	100						

Family	Scientific name	Common name	Exotic	Growth form	Plot DAR0001S Cover	Plot DAR0001S Abundance	Plot P4 Cover	Plot P4 Abundance	Plot P6 Cover	Plot P6 Abundance	Plot PE Cover	Plot PE Abundance
Juncaceae	*Juncus usitatus*	0	0	GG			0.2	50	1	50		
Lobeliaceae	*Lobelia concolor*	Poison Pratia	0	FG			5	1000				
Lomandraceae	*Lomandra* spp.	Mat-rush	0	GG							0.1	1
Malvaceae	*Malva parviflora*	Small-flowered Mallow	*	EX	0.1	3						
Malvaceae	*Sida corrugata*	Corrugated Sida	0	FG	0.1	3					0.1	20
Malvaceae	*Sida fibulifera*	Pin Sida	0	FG					0.1	3		
Marsileaceae	*Marsilea drummondii*	Common Nardoo	0	EG			1	1000				
Meliaceae	*Melia azedarach*	White Cedar	0	TG					3	20		
Myoporaceae	*Eremophila sturtii*	Turpentine Bush	0	SG					1	2		
Myoporaceae	*Myoporum* spp.	Boobialla	0	SG							0.2	1
Myrtaceae	*Eucalyptus microcarpa*	Western Grey Box	0	TG	6	15	10	100	15	7	15	2
Oxalidaceae	*Oxalis corniculata*	Creeping Oxalis	*	EX			0.1	5	0.2	100		
Oxalidaceae	*Oxalis perennans*	0	0	FG	0.1	2						
Oxalidaceae	*Oxalis pes-caprae*	Soursob	*	EX							0.5	100
Oxalidaceae	*Oxalis* spp.	0	0	FG							0.1	5
Poaceae	*Aristida behriana*	Bunch Wiregrass	0	GG							0.1	2
Poaceae	*Austrostipa scabra*	Speargrass	0	GG	1	300					10	200
Poaceae	*Avena fatua*	Wild Oats	*	EX			0.1	100	2	100	0.1	1
Poaceae	*Bothriochloa macra*	Red Grass	0	GG					0.2	100		
Poaceae	*Chloris divaricata* var. *divaricata*	Slender Chloris	0	GG					0.1	3		
Poaceae	*Chloris ventricosa*	Tall Chloris	0	GG							0.1	20
Poaceae	*Cynodon dactylon*	Common Couch	0	GG			0.2	500				
Poaceae	*Dichelachne* spp.	A Plumegrass	0	GG			3	500				
Poaceae	*Enteropogon acicularis*	Curly Windmill Grass	0	GG	0.2	20					20	200
Poaceae	*Eragrostis cilianensis*	Stinkgrass	*	EX			0.1	20				
Poaceae	*Eriochloa australiensis*	Australian Cupgrass	0	GG			20	1000				
Poaceae	*Hordeum leporinum*	Barley Grass	*	EX	0.1	30						
Poaceae	*Lolium rigidum*	Wimmera Ryegrass	*	EX	3	1000	12	1000	1	1000	20	1000

Family	Scientific name	Common name	Exotic	Growth form	Plot DAR0001S Cover	Plot DAR0001S Abundance	Plot P4 Cover	Plot P4 Abundance	Plot P6 Cover	Plot P6 Abundance	Plot PE Cover	Plot PE Abundance
Poaceae	*Panicum effusum*	Hairy Panic	0	GG			3	1000	0.5	500		
Poaceae	*Paspalidium constrictum*	Knottybutt Grass	0	GG							0.1	10
Poaceae	*Paspalum dilatatum*	Paspalum	*	HT			2	100	60	1000		
Poaceae	*Paspalum distichum*	Water Couch	0	GG			20	1000	5	1000		
Poaceae	*Rytidosperma caespitosum*	Ringed Wallaby Grass	0	GG					0.5	20		
Poaceae	*Rytidosperma* spp.	0	0	GG	0.2	200	0.1	2			0.1	12
Poaceae	*Sorghum* spp.	0	*	GG			5	1000				
Poaceae	*Sporobolus creber*	Slender Rat's Tail Grass	0	GG			15	1000	0.5	50		
Polygonaceae	*Rumex crispus*	Curled Dock	*	EX			0.2	10	0.1	10		
Portulacaceae	*Portulaca oleracea*	Pigweed	0	FG			0.1	2				
Solanaceae	*Solanum esuriale*	Quena	0	FG					1	200	0.1	1
Solanaceae	*Solanum nigrum*	Black-berry Nightshade	*	EX			0.1	2				

Notes: Growth form; EX= exotic, HTE= High threat exotic, TG= Tree , SG= Shrub, GG= Grass or grass-like, FG= Forb, EG= fern OG= oth

Flora species list for PCT 76_DNG within Transmission Line

Family	Scientific name	Common Name	Exotic	Growth form	Plot 1 Cover	Plot 1 Abundance	Plot JP05 Cover	Plot JP05 Abundance	Plot JP06 Cover	Plot JP06 Abundance	Plot JP07 Cover	Plot JP07 Abundance	Plot P7 Cover	Plot P7 Abundance	Plot P8 Cover	Plot P8 Abundance	Plot P9 Cover	Plot P9 Abundance
Amaranthaceae	*Alternanthera denticulata*	Lesser Joyweed	0	FG	10	500												
Amaranthaceae	*Alternanthera spp.*	Joyweed	0	FG			0.2	20										
Amaranthaceae	*Ptilotus exaltatus var. exaltatus*	Tall Mulla Mulla	0	FG									5	300	0.1	3	0.3	100
Apiaceae	*Daucus* spp.	0	*	EX					0.1	100								
Asteraceae	*Arctotheca calendula*	Capeweed	*	EX					0.1	100	1	100						
Asteraceae	*Calotis* spp.	A Burr-daisy	0	FG							0.2	2						
Asteraceae	*Centipeda cunninghamii*	Common Sneezeweed	0	FG	0.1	50												
Asteraceae	*Cirsium vulgare*	Spear Thistle	*	EX							0.2	20						
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	*	EX					0.1	5	0.1	20						
Asteraceae	*Lactuca serriola*	Prickly Lettuce	*	EX											0.1	10		
Asteraceae	*Senecio cunninghamii* var. *cunninghamii*	0	0	FG									0.1	5			0.1	2
Asteraceae	*Senecio* spp.	Groundsel, Fireweed	*	EX			0.1	10										
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	*	EX											0.1	20	0.1	10
Asteraceae	*Vittadinia cuneata*	A Fuzzweed	0	FG			0.2	10					0.1	5	0.1	10	0.1	1
Asteraceae	*Xanthium spinosum*	Bathurst Burr	*	HT									0.1	1				
Boraginaceae	*Echium plantagineum*	Patterson's Curse	*	EX	0.5	25	0.2	20			0.5	100			0.2	50	0.1	1
Boraginaceae	*Heliotropium europaeum*	Potato Weed	*	EX											0.1	5		

Family	Scientific name	Common Name	Exotic	Growth form	Plot 1 Cover	Plot 1 Abundance	Plot JP05 Cover	Plot JP05 Abundance	Plot JP06 Cover	Plot JP06 Abundance	Plot JP07 Cover	Plot JP07 Abundance	Plot P7 Cover	Plot P7 Abundance	Plot P8 Cover	Plot P8 Abundance	Plot P9 Cover	Plot P9 Abundance
Brassicaceae	*Lepidium africanum*	Common Peppercress	*	EX			0.1	10			0.2	20						
Campanulaceae	*Wahlenbergia* spp.	Bluebell	0	FG			0.1	2			0.1	5						
Campanulaceae	*Wahlenbergia stricta*	Tall Bluebell	0	FG													0.1	20
Casuarinaceae	*Allocasuarina luehmannii*	Bulloak	0	TG	5	2												
Chenopodiaceae	*Atriplex semibaccata*	Creeping Saltbush	0	SG			5	100	5	100	0.5	50			0.3	50		
Chenopodiaceae	*Maireana brevifolia*	0	0	SG			0.1	2										
Chenopodiaceae	*Maireana enchylaenoides*	Wingless Fissure-weed	0	FG									0.1	5	0.1	1	0.1	2
Chenopodiaceae	*Salsola australis*	0	0	SG	0.1	10	0.1	20	0.2	50	0.1	10	0.1	10				
Chenopodiaceae	*Sclerolaena divaricata*	Tangled Copperburr	0	SG									0.1	10				
Chenopodiaceae	*Sclerolaena muricata*	Black Rolypoly	0	SG			0.2	5	0.4	10	0.2	5	0.1	1				
Clusiaceae	*Hypericum perforatum*	St. Johns Wort	*	HT					0.2	20								
Convolvulaceae	*Convolvulus erubescens*	Pink Bindweed	0	OG									0.1	1	0.2	100	0.1	20
Convolvulaceae	*Convolvulus* spp.	A Bindweed	*	EX			0.1	5										
Cucurbitaceae	*Citrullus lanatus var. lanatus*	Wild Melon, Camel Melon,Bitter	*	EX													0.1	1
Cyperaceae	*Carex inversa*	Knob Sedge	0	GG	0.1	50									0.3	100		
Cyperaceae	*Cyperus eragrostis*	Umbrella Sedge	*	HT	0.5	100												
Cyperaceae	*Eleocharis plana*	Flat Spike-sedge	0	GG	25	2000												
Cyperaceae	*Eleocharis* spp.	Spike-rush, Spike-sedge	0	GG			0.2	10										

Family	Scientific name	Common Name	Exotic	Growth form	Plot 1 Cover	Plot 1 Abundance	Plot JP05 Cover	Plot JP05 Abundance	Plot JP06 Cover	Plot JP06 Abundance	Plot JP07 Cover	Plot JP07 Abundance	Plot P7 Cover	Plot P7 Abundance	Plot P8 Cover	Plot P8 Abundance	Plot P9 Cover	Plot P9 Abundance
Euphorbiaceae	*Chamaesyce drummondii*	Caustic Weed	0	FG									0.2	50	0.1	10	0.1	5
Fabaceae (Faboideae)	*Medicago arabica*	Spotted Burr Medic	*	EX			15	1500	10	1000	20	1500						
Fabaceae (Faboideae)	*Medicago laciniata*	Cut-leaved Medic	*	EX									0.1	10				
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	*	EX											0.1	3	0.1	10
Fabaceae (Faboideae)	*Trifolium* spp.	A Clover	*	EX			15	1000	15	1500	20	1500						
Fumariaceae	*Fumaria* spp.	Fumitory	*	EX			0.8	100										
Iridaceae	*Romulea* spp.	0	*	EX			0.2	50	0.2	600								
Juncaceae	*Juncus continuus*	0	0	GG	1	50												
Juncaceae	*Juncus* spp.	A Rush	0	GG			2	30										
Lamiaceae	*Mentha diemenica*	Slender Mint	0	FG													0.1	50
Lamiaceae	*Teucrium racemosum*	Grey Germander	0	FG													0.1	10
Lobeliaceae	*Lobelia concolor*	Poison Pratia	0	FG											1	100		
Lobeliaceae	*Pratia concolor*	Poison Pratia	(blank)	FG	1	200												
Lythraceae	*Lythrum hyssopifolia*	Hyssop Loosestrife	0	FG	0.1	50												
Lythraceae	*Lythrum* spp.	0	0	FG											0.1	10		
Malvaceae	*Abutilon* spp.	Lantern-bush	*	EX							0.1	4						
Malvaceae	*Sida corrugata*	Corrugated Sida	0	FG									0.3	80	0.1	3	0.1	30
Malvaceae	*Sida fibulifera*	Pin Sida	0	FG									0.1	1				
Malvaceae	*Sida* spp.	0	*	EX							0.1	4						
Marsileaceae	*Marsilea hirsuta*	Short-fruited Nardoo	0	EG	40	2000												
Oxalidaceae	*Oxalis corniculata*	Creeping Oxalis	*	EX	0.1	20							0.1	1	0.1	10	0.1	10

Family	Scientific name	Common Name	Exotic	Growth form	Plot 1 Cover	Plot 1 Abundance	Plot JP05 Cover	Plot JP05 Abundance	Plot JP06 Cover	Plot JP06 Abundance	Plot JP07 Cover	Plot JP07 Abundance	Plot P7 Cover	Plot P7 Abundance	Plot P8 Cover	Plot P8 Abundance	Plot P9 Cover	Plot P9 Abundance
Oxalidaceae	*Oxalis perennans*	0	0	FG							0.5	20						
Plantaginaceae	*Veronica plebeia*	Trailing Speedwell	0	FG									0.1	5	0.2	100	0.1	20
Poaceae	*Aira* spp.	A Hairgrass	*	EX			2	200	5	200	0.5	150						
Poaceae	*Amphibromus nervosus*	Swamp Wallaby Grass	0	GG	1	100												
Poaceae	*Austrostipa aristiglumis*	Plains Grass	0	GG	10	500							0.1	2	3	200	10	500
Poaceae	*Austrostipa scabra*	Speargrass	0	GG													0.1	10
Poaceae	*Avena fatua*	Wild Oats	*	EX									0.2	100	1	500	0.3	100
Poaceae	*Bothriochloa macra*	Red Grass	0	GG									0.1	1	2	300	0.2	100
Poaceae	*Chloris truncata*	Windmill Grass	0	GG			120	500	10	200	0.5	100	5	500			5	500
Poaceae	*Cynodon dactylon*	Common Couch	0	GG											0.5	200		
Poaceae	*Digitaria brownii*	Cotton Panic Grass	0	GG									20	1000				
Poaceae	*Digitaria* spp.	A Finger Grass	*	GG			0.4	20									15	1000
Poaceae	*Diplachne spp.*	0	*	GG											0.8	200		
Poaceae	*Eragrostis cilianensis*	Stinkgrass	*	EX									0.1	10			0.1	2
Poaceae	*Eragrostis parviflora*	Weeping Lovegrass	0	GG	5	500												
Poaceae	*Lolium rigidum*	Wimmera Ryegrass	*	EX					5	1000	15	1000			0.5	200		
Poaceae	*Lolium* spp.	A Ryegrass	*	EX			15	1000										
Poaceae	*Panicum capillare*	Witchgrass	*	EX					0.5	30								
Poaceae	*Panicum effusum*	Hairy Panic	0	GG	5	100									0.2	100	0.8	100
Poaceae	*Paspalidium constrictum*	Knottybutt Grass	0	GG									0.1	2	1	100	10	500

Family	Scientific name	Common Name	Exotic	Growth form	Plot 1 Cover	Plot 1 Abundance	Plot JP05 Cover	Plot JP05 Abundance	Plot JP06 Cover	Plot JP06 Abundance	Plot JP07 Cover	Plot JP07 Abundance	Plot P7 Cover	Plot P7 Abundance	Plot P8 Cover	Plot P8 Abundance	Plot P9 Cover	Plot P9 Abundance
Poaceae	*Paspalidium gracile*	Slender Panic	0	GG	5	200												
Poaceae	*paspalidium* spp.	0	0	GG													0.2	50
Poaceae	*Paspalum dilatatum*	Paspalum	*	HT	0.1	1												
Poaceae	*Poa annua*	Winter Grass	*	EX	1	200			0.1	10								
Poaceae	*Rytidosperma caespitosum*	Ringed Wallaby Grass	0	GG									0.1	10			0.1	2
Poaceae	*Rytidosperma duttonianum*	Brown-back Wallaby Grass	0	GG											0.5	100		
Poaceae	*Sporobolus caroli*	Fairy Grass	0	GG									2	300	0.8	300	0.3	100
Poaceae	*Tragus australianus*	Small Burrgrass	0	GG									0.6	200				
Polygonaceae	*Persicaria* spp.	Knotweed	*	FG			0.1	2										
Polygonaceae	*Polygonum aviculare*	Wireweed	*	EX	0.1	50												
Polygonaceae	*Polygonum* spp.	0	*	FG							0.1	10						
Polygonaceae	*Rumex brownii*	Swamp Dock	0	FG											0.1	1		
Polygonaceae	*Rumex crispus*	Curled Dock	*	EX	0.1	10									0.1	2		
Pteridaceae	*Cheilanthes sieberi*	Rock Fern	0	EG									0.1	5				
Solanaceae	*Solanum esuriale*	Quena	0	FG							0.5	40	0.1	10	0.3	200	0.1	40
Verbenaceae	*Verbena bonariensis*	Purpletop	*	EX													0.1	1

Notes: Growth form; EX= exotic, HTE= High threat exotic, TG= Tree , SG= Shrub, GG= Grass or grass-like, FG= Forb, EG= fern OG= other

Flora species list for PCT 80_Good within Transmission Line

Family	Scientific name	Common name	Exotic	Growth form	Plot DAR002S Cover	Plot DAR002S Abundance	Plot PD Cover	Plot PD Abundance
Apiaceae	*Daucus glochidiatus*	Native Carrot	0	FG	0.1			
Asteraceae	*Arctotheca calendula*	Capeweed	*	EX	10		1	100
Asteraceae	*Calotis cuneifolia*	Purple Burr-Daisy	0	FG	0.2		0.1	3
Asteraceae	*Calotis hispidula*	Bogan Flea	0	FG	0.1			
Asteraceae	*Hypochaeris radicata*	Catsear	*	EX	0.5		0.1	10
Asteraceae	*Lactuca serriola*	Prickly Lettuce	*	EX	0.1			
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	*	EX	0.3		0.1	5
Asteraceae	*Stuartina muelleri*	Spoon Cudweed	0	FG	0.1			
Asteraceae	*Vittadinia cuneata*	A Fuzzweed	0	FG	0.1			
Boraginaceae	*Echium plantagineum*	Patterson's Curse	*	EX	2		1	100
Brassicaceae	*Sisymbrium irio*	London Rocket	*	EX	0.8			
Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell	0	FG	0.1			
Caryophyllaceae	*Cerastium glomeratum*	Mouse-ear Chickweed	*	EX	0.5			
Casuarinaceae	*Casuarina cristata*	Belah	0	TG			0.1	1
Chenopodiaceae	*Atriplex semibaccata*	Creeping Saltbush	0	SG			0.1	1
Chenopodiaceae	*Einadia nutans*	Climbing Saltbush	0	FG	0.1			
Chenopodiaceae	*Enchylaena tomentosa*	Ruby Saltbush	0	SG			0.1	3
Chenopodiaceae	*Maireana enchylaenoides*	Wingless Fissure-weed	0	FG	0.1		0.1	2
Chenopodiaceae	*Maireana microphylla*	Small-leaf Bluebush	0	SG	0.1		0.1	1
Chenopodiaceae	*Salsola australis*	0	0	SG			0.1	2
Chenopodiaceae	*Sclerolaena divaricata*	Tangled Copperburr	0	SG	0.1			
Clusiaceae	*Hypericum gramineum*	Small St John's Wort	0	FG			0.1	1
Clusiaceae	*Hypericum perforatum*	St. Johns Wort	*	HT	0.1		0.1	2
Convolvulaceae	*Dichondra repens*	Kidney Weed	0	FG	0.1			
Crassulaceae	*Crassula sieberiana*	Australian Stonecrop	0	FG	0.3		0.1	20
Cupressaceae	*Callitris glaucophylla*	White Cypress Pine	0	TG	30		5	2
Fabaceae (Caesalpinioideae)	*Senna artemisioides* subsp. X *artemisioides*	0	0	SG			0.5	3
Fabaceae (Faboideae)	*Medicago arabica*	Spotted Burr Medic	*	EX			0.1	1
Fabaceae (Faboideae)	*Trifolium arvense*	Haresfoot Clover	*	EX	5		1	1000

Family	Scientific name	Common name	Exotic	Growth form	Plot DAR002S Cover	Plot DAR002S Abundance	Plot PD Cover	Plot PD Abundance
Fabaceae (Faboideae)	*Trifolium glomeratum*	Clustered Clover	*	EX	3			
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	*	EX			1	1000
Fabaceae (Faboideae)	*Trifolium subterraneum*	Subterranean Clover	*	EX	7			
Geraniaceae	*Erodium botrys*	Long Storksbill	*	EX	0.1			
Geraniaceae	*Erodium crinitum*	Blue Crowfoot	0	FG			0.1	1
Goodeniaceae	*Goodenia fascicularis*	Mallee Goodenia	0	FG	0.1			
Goodeniaceae	*Goodenia pinnatifida*	Scrambles Eggs	0	FG			0.1	20
Hypoxidaceae	*Hypoxis* spp.	0	0	FG			0.1	5
Iridaceae	*Romulea minutiflora*	Small-flowered Onion Grass	*	EX	1			
Iridaceae	*Romulea rosea var. australis*	Onion Grass	*	HT			0.5	1000
Lamiaceae	*Salvia verbenaca*	Vervain	*	EX	0.1			
Linaceae	*Linum marginale*	Native Flax	0	FG	0.1			
Lomandraceae	*Lomandra filiformis*	Wattle Matt-rush	0	GG	0.1			
Malvaceae	*Sida corrugata*	Corrugated Sida	0	FG	0.1		0.1	2
Myoporaceae	*Myoporum montanum*	Western Boobialla	0	SG	0.1			
Myoporaceae	*Myoporum* spp.	Boobialla	0	SG			0.5	3
Myrsinaceae	*Lysimachia arvensis*	Scarlet Pimpernel	*	EX	0.3		1	200
Myrtaceae	*Eucalyptus microcarpa*	Western Grey Box	0	TG			30	74
Oxalidaceae	*Oxalis corniculata*	Creeping Oxalis	*	EX	0.1		0.1	1
Papaveraceae	*Papaver* spp.	0	*	EX	0.1			
Phormiaceae	*Dianella longifolia*	Blueberry Lily	0	FG	0.1			
Poaceae	*Aristida ramosa*	Purple Wiregrass	0	GG			0.1	5
Poaceae	*Austrostipa* spp.	A Speargrass	0	GG			0.1	4
Poaceae	*Avena fatua*	Wild Oats	*	EX	3			
Poaceae	*Bothriochloa macra*	Red Grass	0	GG	0.1		10	100
Poaceae	*Chloris ventricosa*	Tall Chloris	0	GG	0.3		20	500
Poaceae	*Enteropogon acicularis*	Curly Windmill Grass	0	GG	0.5		10	100
Poaceae	*Eragrostis cilianensis*	Stinkgrass	*	EX			0.1	1
Poaceae	*Lolium rigidum*	Wimmera Ryegrass	*	EX	20		20	500
Poaceae	*Rytidosperma* spp.	0	0	GG			0.1	4

Family	Scientific name	Common name	Exotic	Growth form	Plot DAR002S Cover	Plot DAR002S Abundance	Plot PD Cover	Plot PD Abundance
Poaceae	*Sporobolus caroli*	Fairy Grass	0	GG			0.2	30
Poaceae	*Vulpia bromoides*	Squirrel Tail Fesque	*	EX	0.1			
Pteridaceae	*Cheilanthes sieberi*	Rock Fern	0	EG			0.1	4
Sapindaceae	*Dodonaea viscosa* subsp. *cuneata*	Wedge-leaf Hop-bush	0	SG	1		2	6
Solanaceae	*Datura ferox*	Fierce Thornapple	*	EX			0.1	3
Solanaceae	*Lycium ferocissimum*	African Boxthorn	*	HT	0.2	2		

Notes: Growth form; EX= exotic, HTE= High threat exotic, TG= Tree , SG= Shrub, GG= Grass or grass-like, FG= Forb, EG= fern OG= other

Flora species list for PCT 80_DNG within Transmission Line

Family	Scientific name	Common name	Exotic	Growth form	Plot JP01 Cover	Plot JP01 Abundance	Plot JP02 Cover	Plot JP02 Abundance	Plot JP08 Cover	Plot JP08 Abundance	Plot PF Cover	Plot PF Abundance
Asteraceae	*Arctotheca calendula*	Capeweed	*	EX	5	300	1	200			0.1	20
Asteraceae	*Calotis cuneifolia*	Purple Burr-Daisy	0	FG							0.1	3
Asteraceae	*Calotis lappulacea*	Yellow Burr-daisy	0	FG	0.1	3						
Asteraceae	*Calotis* spp.	A Burr-daisy	0	FG					2	2		
Asteraceae	*Carthamus lanatus*	Saffron Thistle	*	HT			0.1	2				
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	*	EX	1	300						
Asteraceae	*Cotula australis*	Common Cotula	0	FG	0.1	100						
Asteraceae	*Hypochaeris radicata*	Catsear	*	EX					0.2	100	0.1	2
Asteraceae	*Leiocarpa semicalva* subsp. *Semicalva*	0	0	FG			0.4	10				
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	*	EX			0.2	50			0.1	1
Asteraceae	*Taraxacum officinale*	Dandelion	*	EX							0.1	1
Asteraceae	*Vittadinia cuneata*	A Fuzzweed	0	FG					0.2	3	0.1	4
Asteraceae	*Vittadinia cuneata* var. *cuneata*	A Fuzzweed	0	FG			0.1	3				
Asteraceae	*Xanthium spinosum*	Bathurst Burr	*	HT			0.1	1				
Boraginaceae	*Echium plantagineum*	Patterson's Curse	*	EX	0.2	100	0.2	50			1	50
Brassicaceae	*Brassica* spp.	Brassica	*	EX					0.1	3		
Brassicaceae	*Lepidium africanum*	Common Peppercress	*	EX	0.3	600			0.1	10		
Brassicaceae	*Sisymbrium irio*	London Rocket	*	EX							0.1	1
Campanulaceae	*Wahlenbergia* spp.	Bluebell	0	FG	0.1	1			0.1	5		
Caryophyllaceae	*Cerastium glomeratum*	Mouse-ear Chickweed	*	EX	0.1	100						
Chenopodiaceae	*Atriplex semibaccata*	Creeping Saltbush	0	SG			0.5	30	0.4	20		
Chenopodiaceae	*Atriplex* spp.	A Saltbush	0	SG					0.1	1		
Chenopodiaceae	*Einadia nutans*	Climbing Saltbush	0	FG					0.1	5		
Chenopodiaceae	*Enchylaena tomentosa*	Ruby Saltbush	0	SG							0.1	2

Family	Scientific name	Common name	Exotic	Growth form	Plot JP01 Cover	Plot JP01 Abundance	Plot JP02 Cover	Plot JP02 Abundance	Plot JP08 Cover	Plot JP08 Abundance	Plot PF Cover	Plot PF Abundance
Chenopodiaceae	*Maireana microphylla*	Small-leaf Bluebush	0	SG			0.1	1				
Chenopodiaceae	*Salsola australis*	0	0	SG					0.1	20	0.1	15
Chenopodiaceae	*Sclerolaena birchii*	Galvinized Burr	0	SG			0.1	1				
Chenopodiaceae	*Sclerolaena muricata*	Black Rolypoly	0	SG			0.4	2			0.1	1
Chenopodiaceae	*Sclerolaena* spp.	Copperburr, Poverty-bush	0	SG					0.2	4		
Clusiaceae	*Hypericum perforatum*	St. Johns Wort	*	HT					25	1500		
Convolvulaceae	*Convolvulus erubescens*	Pink Bindweed	0	OG					0.1			
Crassulaceae	*Crassula* spp.	Stonecrop	*	EX							0.1	3
Cupressaceae	*Callitris glaucophylla*	White Cypress Pine	0	TG					2	6		
Euphorbiaceae	*Chamaesyce drummondii*	Caustic Weed	0	FG			0.1	2				
Fabaceae (Faboideae)	*Medicago arabica*	Spotted Burr Medic	*	EX			1	200	6	800		
Fabaceae (Faboideae)	*Medicago laciniata*	Cut-leaved Medic	*	EX							0.1	1
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	*	EX			0.5	200				
Fabaceae (Faboideae)	*Medicago sativa*	Lucerne	*	EX	3	250						
Fabaceae (Faboideae)	*Medicago truncatula*	Barrel Medic	*	EX			15	1000				
Fabaceae (Faboideae)	*Trifolium angustifolium*	Narrow-leaved Clover	*	EX							0.1	5
Fabaceae (Faboideae)	*Trifolium arvense*	Haresfoot Clover	*	EX					0.6	200	0.2	200
Fabaceae (Faboideae)	*Trifolium campestre*	Hop Clover	*	EX							0.1	10
Fabaceae (Faboideae)	*Trifolium* spp.	A Clover	*	EX					3	1		
Fabaceae (Faboideae)	*Trifolium subterraneum*	Subterranean Clover	*	EX	40	2000	20	1000				
Fabaceae (Mimosoideae)	*Acacia* spp.	Wattle	0	SG					0.4	2		
Geraniaceae	*Erodium crinitum*	Blue Crowfoot	0	FG							1	40
Geraniaceae	*Geranium* spp.	0	0	FG					0.1	10		
Goodeniaceae	*Goodenia pinnatifida*	Scrambles Eggs	0	FG							0.1	5

Family	Scientific name	Common name	Exotic	Growth form	Plot JP01 Cover	Plot JP01 Abundance	Plot JP02 Cover	Plot JP02 Abundance	Plot JP08 Cover	Plot JP08 Abundance	Plot PF Cover	Plot PF Abundance
Iridaceae	*Romulea rosea* var. *australis*	Onion Grass	*	HT							0.5	1000
Juncaceae	*Juncus* spp.	A Rush	0	GG	5	200	5	500				
Juncaceae	*Juncus usitatus*	0	0	GG	25	500						
Lamiaceae	*Salvia verbenaca*	Vervain	*	EX					1	500	0.1	30
Lobeliaceae	*Lobelia concolor*	Poison Pratia	0	FG			0.2	100				
Malvaceae	*Sida corrugata*	Corrugated Sida	0	FG	0.1	5			0.1	20		
Malvaceae	*Sida* spp.	0	*	EX			0.1	5				
Marsileaceae	*Marsilea drummondii*	Common Nardoo	0	EG			0.1	20				
Oxalidaceae	*Oxalis perennans*	0	0	FG					1	200	0.1	10
Poaceae	*Aristida behriana*	Bunch Wiregrass	0	GG							0.1	5
Poaceae	*Aristida ramosa*	Purple Wiregrass	0	GG							5	50
Poaceae	*Austrostipa scabra*	Speargrass	0	GG	0.1	10	10	200	20	500		
Poaceae	*Austrostipa* spp.	A Speargrass	0	GG							1	40
Poaceae	*Avena fatua*	Wild Oats	*	EX							0.1	20
Poaceae	*Avena sativa*	Oats	*	EX	0.1	50						
Poaceae	*Bothriochloa macra*	Red Grass	0	GG							5	50
Poaceae	*Chloris truncata*	Windmill Grass	0	GG			3	200	0.5	200	50	1000
Poaceae	*Cynodon dactylon*	Common Couch	0	GG							0.1	20
Poaceae	*Dichanthium sericeum*	Queensland Bluegrass	0	GG			5	100				
Poaceae	*Dichanthium* spp.	0	0	GG					0.2	40		
Poaceae	*Enteropogon acicularis*	Curly Windmill Grass	0	GG							25	500
Poaceae	*Eragrostis cilianensis*	Stinkgrass	*	EX							0.1	10
Poaceae	*Eragrostis parviflora*	Weeping Lovegrass	0	GG							10	500
Poaceae	*Lolium perenne*	Perennial Ryegrass	*	EX			1	200				
Poaceae	*Lolium rigidum*	Wimmera Ryegrass	*	EX	5	1000	20	1000			0.1	30
Poaceae	*Lolium* spp.	A Ryegrass	*	EX					1	500		

Family	Scientific name	Common name	Exotic	Growth form	Plot JP01 Cover	Plot JP01 Abundance	Plot JP02 Cover	Plot JP02 Abundance	Plot JP08 Cover	Plot JP08 Abundance	Plot PF Cover	Plot PF Abundance
Poaceae	*Nassella tenuissima*	0	*	HT					0.1	2		
Poaceae	*Panicum capillare*	Witchgrass	*	EX	0.1	20						
Poaceae	*Panicum effusum*	Hairy Panic	0	GG			0.2	10				
Poaceae	*Paspalidium constrictum*	Knottybutt Grass	0	GG	0.1	10	0.2	20				
Poaceae	*Paspalidium distans*	0	0	GG							0.1	20
Poaceae	*Poa annua*	Winter Grass	*	EX	0.1	10						
Poaceae	*Rytidosperma caespitosum*	Ringed Wallaby Grass	0	GG							1	40
Poaceae	*Rytidosperma richardsonii*	Straw Wallaby-grass	0	GG							0.1	30
Poaceae	*Sporobolus caroli*	Fairy Grass	0	GG							0.1	10
Poaceae	*Sporobolus* spp.	Rat's Tail Couch	*	GG					0.1	10		
Polygonaceae	*Acetosella vulgaris*	Sheep Sorrel	*	HT			0.1	2				
Polygonaceae	*Polygonum aviculare*	Wireweed	*	EX	0.1	10						
Polygonaceae	*Rumex* spp.	Dock	*	FG					0.1	5		
Polygonaceae	*Rumex tenax*	Shiny Dock	0	FG	0.1	5						
Pteridaceae	*Cheilanthes sieberi*	Rock Fern	0	EG					0.1	10	0.1	3
Solanaceae	*Lycium ferocissimum*	African Boxthorn	*	HT			0.2	1				
Solanaceae	*Solanum esuriale*	Quena	0	FG			0.1	1				

Notes: Growth form; EX= exotic, HTE= High threat exotic, TG= Tree , SG= Shrub, GG= Grass or grass-like, FG= Forb, EG= fern OG= other

Flora species list for PCT 80_Derived scrub within Transmission Line

Family	Scientific name	Common name	Exotic	Growth form	Plot 3 Cover	Plot 3 Abundance
Asteraceae	*Calotis cuneifolia*	Purple Burr-Daisy	0	FG	1	100
Asteraceae	*Calotis hispidula*	Bogan Flea	0	FG	0.1	5
Asteraceae	*Centaurea melitensis*	Maltese Cockspur	*	EX	0.2	10
Asteraceae	*Euchiton involucratus*	Star Cudweed	0	FG	0.1	1
Asteraceae	*Lactuca serriola*	Prickly Lettuce	*	EX	0.1	1
Asteraceae	*Lactuca* spp.	0	*	EX	0.1	3
Asteraceae	*Vittadinia cuneata*	A Fuzzweed	0	FG	0.5	50
Boraginaceae	*Echium plantagineum*	Patterson's Curse	*	EX	0.1	1
Campanulaceae	*Wahlenbergia stricta*	Tall Bluebell	0	FG	0.1	10
Clusiaceae	*Hypericum perforatum*	St. Johns Wort	*	HT	20	1000
Convolvulaceae	*Convolvulus erubescens*	Pink Bindweed	0	OG	1	50
Cupressaceae	*Callitris glaucophylla*	White Cypress Pine	0	TG	15	16
Fabaceae (Caesalpinioideae)	*Senna artemisioides* subsp. X *coriacea*	0	0	SG	0.1	1
Fabaceae (Caesalpinioideae)	*Senna occidentalis*	Coffee Senna	*	EX	0.2	3
Fabaceae (Faboideae)	*Trifolium angustifolium*	Narrow-leaved Clover	*	EX	5	250
Fabaceae (Faboideae)	*Trifolium arvense*	Haresfoot Clover	*	EX	0.1	5
Fabaceae (Faboideae)	*Trifolium glomeratum*	Clustered Clover	*	EX	5	250
Gentianaceae	*Centaurium erythraea*	Common Centaury	*	EX	0.1	20
Goodeniaceae	*Goodenia fascicularis*	Mallee Goodenia	0	FG	0.1	5
Iridaceae	*Romulea rosea* var. *australis*	Onion Grass	*	HT	0.1	30
Lamiaceae	*Salvia verbenaca*	Vervain	*	EX	0.5	30
Malvaceae	*Sida corrugata*	Corrugated Sida	0	FG	0.1	15
Oxalidaceae	*Oxalis perennans*	0	0	FG	0.2	25
Phormiaceae	*Dianella revoluta*	Blueberry Lily	0	FG	0.2	3
Poaceae	*Austrostipa aristiglumis*	Plains Grass	0	GG	5	250
Poaceae	*Austrostipa bigeniculata*	Yanganbil	0	GG	25	1000
Poaceae	*Austrostipa scabra*	Speargrass	0	GG	1	50
Poaceae	*Avena fatua*	Wild Oats	*	EX	0.2	20
Poaceae	*Bothriochloa macra*	Red Grass	0	GG	5	250
Poaceae	*Chloris truncata*	Windmill Grass	0	GG	5	250
Poaceae	*Chloris ventricosa*	Tall Chloris	0	GG	1	50
Poaceae	*Cynodon dactylon*	Common Couch	0	GG	0.2	60

Family	Scientific name	Common name	Exotic	Growth form	Plot 3 Cover	Plot 3 Abundance
Poaceae	*Digitaria divaricatissima*	Umbrella Grass	0	GG	25	500
Poaceae	*Elymus scaber*	Common Wheatgrass	(blank)	GG	5	250
Poaceae	*Paspalum dilatatum*	Paspalum	*	HT	0.1	1
Poaceae	*Paspalum distichum*	Water Couch	0	GG	0.1	25
Poaceae	*Rytidosperma* spp.	0	0	GG	0.2	25
Polygonaceae	*Rumex brownii*	Swamp Dock	0	FG	0.1	5
Pteridaceae	*Cheilanthes sieberi*	Rock Fern	0	EG	0.1	15
Sapindaceae	*Dodonaea viscosa*	Sticky Hop-bush	0	SG	0.1	1
Scrophulariaceae	*Kickxia elatine* subsp. *crinita*	Twining Toadflax	*	EX	0.5	60
Scrophulariaceae	*Linaria arvensis*	0	*	EX	0.1	1

Notes: Growth form; EX= exotic, HTE= High threat exotic, TG= Tree , SG= Shrub, GG= Grass or grass-like, FG= Forb, EG= fern OG= other

Flora species list for PCT 244_Planting within Transmission Line

Family	Scientific name	Common name	Exotic	Growth form	Plot 4 Cover	Plot 4 Abundance
Amaranthaceae	*Alternanthera denticulata*	Lesser Joyweed	0	FG	0.1	5
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	*	EX	0.1	3
Asteraceae	*Euchiton involucratus*	Star Cudweed	0	FG	0.1	1
Asteraceae	*Lactuca* spp.	0	*	EX	0.1	5
Asteraceae	*Vittadinia cuneata*	A Fuzzweed	0	FG	0.2	10
Boraginaceae	*Echium plantagineum*	Patterson's Curse	*	EX	0.5	50
Brassicaceae	*Lepidium africanum*	Common Peppercress	*	EX	0.2	3
Campanulaceae	*Wahlenbergia gracilis*	Sprawling Bluebell	0	FG	0.1	2
Chenopodiaceae	*Atriplex semibaccata*	Creeping Saltbush	0	SG	0.1	1
Chenopodiaceae	*Salsola australis*	0	0	SG	0.1	3
Crassulaceae	*Crassula decumbens* var. *decumbens*	Spreading Stonecrop	0	FG	0.1	5
Crassulaceae	*Crassula sieberiana*	Australian Stonecrop	0	FG	0.1	2
Cyperaceae	*Carex inversa*	Knob Sedge	0	GG	0.1	20
Euphorbiaceae	*Chamaesyce drummondii*	Caustic Weed	0	FG	0.1	20
Fabaceae (Faboideae)	*Medicago laciniata*	Cut-leaved Medic	*	EX	0.1	10
Fabaceae (Faboideae)	*Trifolium glomeratum*	Clustered Clover	*	EX	1	200
Fabaceae (Faboideae)	*Trifolium vesiculosum*	0	*	EX	0.1	1
Gentianaceae	*Centaurium erythraea*	Common Centaury	*	EX	0.2	60
Juncaceae	*Juncus continuus*	0	0	GG	0.2	25
Lythraceae	*Lythrum hyssopifolia*	Hyssop Loosestrife	0	FG	0.2	20
Malvaceae	*Malva* spp.	Mallow	*	EX	0.1	1
Malvaceae	*Sida corrugata*	Corrugated Sida	0	FG	0.5	150
Myrtaceae	*Eucalyptus melliodora*	Yellow Box	0	TG	0.5	1
Myrtaceae	*Eucalyptus populnea* subsp. *bimbil*	Bimble Box	0	TG	20	6
Nyctaginaceae	*Boerhavia dominii*	Tarvine	0	FG	0.2	25
Oxalidaceae	*Oxalis corniculata*	Creeping Oxalis	*	EX	0.1	10
Poaceae	*Aristida behriana*	Bunch Wiregrass	0	GG	0.1	5
Poaceae	*Austrostipa aristiglumis*	Plains Grass	0	GG	0.5	50
Poaceae	*Austrostipa scabra*	Speargrass	0	GG	1	200
Poaceae	*Avena fatua*	Wild Oats	*	EX	0.5	200
Poaceae	*Avena sativa*	Oats	*	EX	0.1	1
Poaceae	*Bothriochloa macra*	Red Grass	0	GG	0.5	100

Family	Scientific name	Common name	Exotic	Growth form	Plot 4 Cover	Plot 4 Abundance
Poaceae	*Chloris truncata*	Windmill Grass	0	GG	10	500
Poaceae	*Cynodon dactylon*	Common Couch	0	GG	10	500
Poaceae	*Elymus scaber*	Common Wheatgrass	0	GG	1	200
Poaceae	*Eragrostis parviflora*	Weeping Lovegrass	0	GG	5	400
Poaceae	*Lolium rigidum*	Wimmera Ryegrass	*	EX	10	1000
Poaceae	*Paspalum dilatatum*	Paspalum	*	HT	0.5	25
Poaceae	*Poa annua*	Winter Grass	*	EX	20	1000
Poaceae	*Rytidosperma fulvum*	Wallaby Grass	0	GG	5	500
Poaceae	*Vulpia* spp.	Rat's-tail Fescue	*	EX	0.1	5
Zygophyllaceae	*Tribulus terrestris*	Cat-head	*	EX	0.1	25

Notes: Growth form; EX= exotic, HTE= High threat exotic, TG= Tree , SG= Shrub, GG= Grass or grass-like, FG= Forb, EG= fern OG= other

Flora species list for PCT 360_Poor within Transmission Line

Family	Scientific Name	Common Name	Exotic	Growth form	Plot PA Cover	Plot PA Abundance	Plot PB Cover	Plot PB Abundance
Asteraceae	Arctotheca calendula	Capeweed	*	EX	10	200	10	200
Asteraceae	Calotis cuneifolia	Purple Burr-Daisy	0	FG			0.1	5
Asteraceae	Centaurea melitensis	Maltese Cockspur	*	EX	0.1	30		
Asteraceae	Leiocarpa spp.	0	0	FG	0.1	1		
Asteraceae	Rhodanthe pygmaea	Pigmy Sunray	0	FG	0.1	50		
Asteraceae	Sonchus oleraceus	Common Sowthistle	*	EX	0.1	2	0.1	1
Asteraceae	Vittadinia cuneata	A Fuzzweed	0	FG	2	150	0.1	40
Asteraceae	Xanthium spinosum	Bathurst Burr	*	HT	0.5	30		
Boraginaceae	Echium plantagineum	Patterson's Curse	*	EX	0.1	1	0.1	5
Brassicaceae	Sisymbrium irio	London Rocket	*	EX	0.1	2	0.1	3
Chenopodiaceae	Enchylaena tomentosa	Ruby Saltbush	0	SG	0.1	4		
Chenopodiaceae	Salsola australis	0	0	SG	0.1	1		
Chenopodiaceae	Sclerolaena divaricata	Tangled Copperburr	0	SG	0.1	5		
Chenopodiaceae	Sclerolaena muricata	Black Rolypoly	0	SG	0.1	20	0.1	5
Cyperaceae	Eleocharis spp.	Spike-rush, Spike-sedge	0	GG	20	2000	1	100
Euphorbiaceae	Chamaesyce drummondii	Caustic Weed	0	FG			0.1	1
Fabaceae (Faboideae)	Astragalus hamosus	Yellow Milk-vetch	*	EX	0.1	10	0.1	10
Fabaceae (Faboideae)	Medicago minima	Woolly Burr Medic	*	EX	1	1000	1	1000
Fabaceae (Faboideae)	Medicago truncatula	Barrel Medic	*	EX	0.1	1		
Geraniaceae	Erodium cicutarium	Common Crowfoot	*	EX	0.1	50		
Goodeniaceae	Goodenia pinnatifida	Scrambles Eggs	0	FG			0.1	3
Iridaceae	Romulea rosea var. australis	Onion Grass	*	HT			0.5	200
Juncaceae	Juncus spp.	A Rush	0	GG	0.2	15		
Juncaginaceae	Triglochin procera	Water Ribbons	0	FG	0.1	10		
Lobeliaceae	Lobelia concolor	Poison Pratia	0	FG	1	50		
Malvaceae	Malva parviflora	Small-flowered Mallow	*	EX	1	30	2	100
Marsileaceae	Marsilea drummondii	Common Nardoo	0	EG	0.1	40		
Plantaginaceae	Plantago cunninghamii	Sago-weed	0	FG	0.1	3		
Poaceae	Avena fatua	Wild Oats	*	EX	0.1	1	2	50
Poaceae	Bothriochloa macra	Red Grass	0	GG			0.5	50
Poaceae	Chloris spp.	0	*	GG			0.1	30

Family	Scientific Name	Common Name	Exotic	Growth form	Plot PA Cover	Plot PA Abundance	Plot PB Cover	Plot PB Abundance
Poaceae	Chloris truncata	Windmill Grass	0	GG	0.1	10		
Poaceae	Cynodon dactylon	Common Couch	0	GG	5	100	0.1	30
Poaceae	Enteropogon acicularis	Curly Windmill Grass	0	GG	10	200	5	100
Poaceae	Eragrostis cilianensis	Stinkgrass	*	EX			0.1	20
Poaceae	Eragrostis parviflora	Weeping Lovegrass	0	GG			0.1	2
Poaceae	Hordeum leporinum	Barley Grass	*	EX			10	200
Poaceae	Lolium rigidum	Wimmera Ryegrass	*	EX	40	1000	60	100
Poaceae	Rytidosperma spp.	0	0	GG			0.1	20
Poaceae	Sporobolus caroli	Fairy Grass	0	GG	1	30	0.1	30
Potamogetonaceae	Potamogeton drummondii	Pondweed	0	FG	0.1	5		
Solanaceae	Datura ferox	Fierce Thornapple	*	EX			0.1	3
Solanaceae	Solanum esuriale	Quena	0	FG	0.1	3		

Notes: Growth form; EX= exotic, HTE= High threat exotic, TG= Tree , SG= Shrub, GG= Grass or grass-like, FG= Forb, EG= fern OG= other

Flora species list for PCT 360_Very Poor within Transmission Line

Family	Scientific name	Common name	Exotic	Growth form	Plot JP03 Cover	Plot JP03 Abundance	Plot JP04 Cover	Plot JP04 Abundance	Plot PC Cover	Plot PC Abundance
Amaranthaceae	*Alternanthera denticulata*	Lesser Joyweed	0	FG	0.1	5				
Amaranthaceae	*Alternanthera spp.*	Joyweed	0	FG			0.1	8		
Asteraceae	*Arctotheca calendula*	Capeweed	*	EX	2	1200	1	100	10	200
Asteraceae	*Cirsium vulgare*	Spear Thistle	*	EX	0.1	5				
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	*	EX	0.4	50	0.1	20		
Asteraceae	*Cotula australis*	Common Cotula	0	FG	0.2	50				
Asteraceae	*Leiocarpa* spp.	0	0	FG					0.1	4
Asteraceae	*Senecio* spp.	Groundsel, Fireweed	*	EX			0.1	4		
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	*	EX	0.4	100	0.4	20		
Asteraceae	*Vittadinia cuneata*	A Fuzzweed	0	FG			1	30	0.1	50
Asteraceae	*Vittadinia cuneata* var. *cuneata*	A Fuzzweed	0	FG	1	20				
Asteraceae	*Xanthium spinosum*	Bathurst Burr	*	HT	0.1	4	0.1	5		
Boraginaceae	*Echium plantagineum*	Patterson's Curse	*	EX	0.5	60	1	10	0.1	3
Brassicaceae	*Capsella bursa-pastoris*	Shepherd's Purse	*	EX					0.1	2
Brassicaceae	*Lepidium africanum*	Common Peppercress	*	EX	0.1	5	0.1	10	0.1	1
Brassicaceae	*Sisymbrium irio*	London Rocket	*	EX					0.1	5
Chenopodiaceae	*Atriplex semibaccata*	Creeping Saltbush	0	SG	5	200	2	40		
Chenopodiaceae	*Maireana microphylla*	Small-leaf Bluebush	0	SG			0.1	2		
Chenopodiaceae	*Maireana* spp.	Cotton Bush, Bluebush, Fissure-weed	0	SG			0.1	3		
Chenopodiaceae	*Salsola australis*	0	0	SG	0.1	20	0.2	100	0.1	1
Chenopodiaceae	*Sclerolaena birchii*	Galvinized Burr	0	SG					0.1	1

Family	Scientific name	Common name	Exotic	Growth form	Plot JP03 Cover	Plot JP03 Abundance	Plot JP04 Cover	Plot JP04 Abundance	Plot PC Cover	Plot PC Abundance
Chenopodiaceae	*Sclerolaena muricata*	Black Rolypoly	0	SG	0.8	25	0.5	20		
Chenopodiaceae	*Sclerolaena* spp.	Copperburr, Poverty-bush	0	SG	0.2	10			0.1	1
Cyperaceae	*Carex* spp.	0	0	GG	2	50	2	100		
Cyperaceae	*Eleocharis* spp.	Spike-rush, Spike-sedge	0	GG			0.5	40		
Fabaceae (Faboideae)	*Astragalus hamosus*	Yellow Milk-vetch	*	EX					10	200
Fabaceae (Faboideae)	*Medicago arabica*	Spotted Burr Medic	*	EX					0.1	1
Fabaceae (Faboideae)	*Medicago minima*	Woolly Burr Medic	*	EX					10	500
Fabaceae (Faboideae)	*Medicago sativa*	Lucerne	*	EX	0.3	150				
Fabaceae (Faboideae)	*Medicago truncatula*	Barrel Medic	*	EX	20	2000				
Fabaceae (Faboideae)	*Trifolium* spp.	A Clover	*	EX	1	800	20	1000		
Geraniaceae	*Erodium cicutarium*	Common Crowfoot	*	EX					0.1	50
Geraniaceae	*Erodium crinitum*	Blue Crowfoot	0	FG	0.1	10			15	100
Iridaceae	*Romulea rosea* var. *australis*	Onion Grass	*	HT					0.1	100
Juncaceae	*Juncus* spp.	A Rush	0	GG			3	40		
Juncaceae	*Juncus usitatus*	0	0	GG	0.5	15				
Lobeliaceae	*Lobelia concolor*	Poison Pratia	0	FG			0.6	100		
Malvaceae	*Malva parviflora*	Small-flowered Mallow	*	EX	0.5	40	0.2	20	40	200
Malvaceae	*Sida corrugata*	Corrugated Sida	0	FG	0.1	2				
Oxalidaceae	*Oxalis corniculata*	Creeping Oxalis	*	EX	2	300				
Oxalidaceae	*Oxalis perennans*	0	0	FG			0.1	10		
Plantaginaceae	*Plantago* spp.	Plantain	0	FG	0.1	20				
Poaceae	*Aira* spp.	A Hairgrass	*	EX			5	200		
Poaceae	*Austrostipa scabra*	Speargrass	0	GG	3	30	1	20		
Poaceae	*Chloris truncata*	Windmill Grass	0	GG	5	300	15	500		

Family	Scientific name	Common name	Exotic	Growth form	Plot JP03 Cover	Plot JP03 Abundance	Plot JP04 Cover	Plot JP04 Abundance	Plot PC Cover	Plot PC Abundance
Poaceae	*Cynodon dactylon*	Common Couch	0	GG	0.5	20			0.1	20
Poaceae	*Cynodon* spp.	0	*	GG			0.5	50		
Poaceae	*Dichanthium* spp.	0	0	GG			2	50		
Poaceae	*Enneapogon* spp.	Nineawn Grass, Bottlewashers	0	GG			5	30		
Poaceae	*Enteropogon acicularis*	Curly Windmill Grass	0	GG	5	50			0.1	30
Poaceae	*Eragrostis cilianensis*	Stinkgrass	*	EX					0.1	2
Poaceae	*Hordeum leporinum*	Barley Grass	*	EX					2	50
Poaceae	*Lolium rigidum*	Wimmera Ryegrass	*	EX	30	2000			10	300
Poaceae	*Lolium* spp.	A Ryegrass	*	EX			20	1500		
Poaceae	*Panicum capillare*	Witchgrass	*	EX	2	100				
Poaceae	*Panicum effusum*	Hairy Panic	0	GG	0.1	10				
Poaceae	*Paspalidium constrictum*	Knottybutt Grass	0	GG	0.1	5				
Poaceae	*paspalidium* spp.	0	0	GG			0.5	50		
Poaceae	*Sporobolus caroli*	Fairy Grass	0	GG					0.1	40
Poaceae	*Triticum aestivum*	Wheat * EX				0.1	1’			
Poaceae	*Vulpia* spp.	Rat's-tail Fescue	*	EX			0.1	5		
Polygonaceae	*Polygonum aviculare*	Wireweed	*	EX	0.1	5				
Polygonaceae	*Polygonum* spp.	0	*	FG			0.1	10		
Solanaceae	*Datura ferox*	Fierce Thornapple	*	EX					0.1	1
Solanaceae	*Solanum esuriale*	Quena	0	FG	0.1	2	0.1	10		

Notes: Growth form; EX= exotic, HTE= High threat exotic, TG= Tree , SG= Shrub, GG= Grass or grass-like, FG= Forb, EG= fern OG= other

Flora species list for PCT 76_Planted within Solar Farm

Family	Scientific name	Common name	Exotic	Growth form	Plot P3 Cover	Plot P3 Abundance
Amaranthaceae	*Alternanthera denticulata*	Lesser Joyweed	0	FG	0.1	2
Asteraceae	*Lactuca serriola*	Prickly Lettuce	*	EX	0.1	2
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	*	EX	0.1	5
Asteraceae	*Xanthium spinosum*	Bathurst Burr	*	HT	0.1	1
Boraginaceae	*Echium plantagineum*	Patterson's Curse	*	EX	0.1	2
Boraginaceae	*Heliotropium europaeum*	Potato Weed	*	EX	0.1	2
Cucurbitaceae	*Citrullus lanatus* var. *lanatus*	Wild Melon, Camel Melon,Bitter	*	EX	0.1	2
Cyperaceae	*Carex inversa*	Knob Sedge	0	GG	0.1	5
Cyperaceae	*Eleocharis acuta*	0	0	GG	0.2	100
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	*	EX	0.1	10
Fabaceae (Faboideae)	*Medicago sativa*	Lucerne	*	EX	0.1	1
Lobeliaceae	*Lobelia concolor*	Poison Pratia	0	FG	0.3	200
Malvaceae	*Sida corrugata*	Corrugated Sida	0	FG	0.1	1
Myrtaceae	*Eucalyptus camaldulensis*	Eucalyptus camaldulensis	0	TG	1	2
Nyctaginaceae	*Boerhavia dominii*	Tarvine	0	FG	0.1	1
Oxalidaceae	*Oxalis corniculata*	Creeping Oxalis	*	EX	0.1	2
Poaceae	*Avena fatua*	Wild Oats	*	EX	2	500
Poaceae	*Chloris truncata*	Windmill Grass	0	GG	1	100
Poaceae	*Cynodon dactylon*	Common Couch	0	GG	0.5	100
Poaceae	*Eriochloa australiensis*	Australian Cupgrass	0	GG	15	1000
Poaceae	*Hordeum leporinum*	Barley Grass	*	EX	0.1	5
Poaceae	*Lolium rigidum*	Wimmera Ryegrass	*	EX	0.5	200
Poaceae	*Panicum effusum*	Hairy Panic	0	GG	0.1	10
Poaceae	*Paspalum distichum*	Water Couch	0	GG	15	1000
Poaceae	*Phalaris paradoxa*	Paradoxa Grass	*	EX	0.3	100
Poaceae	*Sorghum* spp.	0	*	GG	0.1	1
Poaceae	*Sporobolus caroli*	Fairy Grass	0	GG	0.1	2
Polygonaceae	*Rumex crispus*	Curled Dock	*	EX	0.1	2
Polygonaceae	*Rumex tenax*	Shiny Dock	0	FG	0.1	5

Notes: Growth form; EX= exotic, HTE= High threat exotic, TG= Tree , SG= Shrub, GG= Grass or grass-like, FG= Forb, EG= fern OG= other

Flora species list for PCT 76_Good within Solar Farm

Family	Scientific name	Common name	Exotic	Growth form	Plot P2 Cover	Plot P2 Abundance
Amaranthaceae	*Amaranthus retroflexus*	Redroot Amaranth	*	EX	0.5	100
Asteraceae	*Arctotheca calendula*	Capeweed	*	EX	0.1	10
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	*	EX	0.1	1
Asteraceae	*Xanthium spinosum*	Bathurst Burr	*	HT	0.1	3
Boraginaceae	*Echium plantagineum*	Patterson's Curse	*	EX	0.1	1
Boraginaceae	*Heliotropium europaeum*	Potato Weed	*	EX	0.1	1
Brassicaceae	*Brassica rapa* subsp. *campestris*	Turnip	*	EX	5	1000
Brassicaceae	*Sisymbrium irio*	London Rocket	*	EX	2	500
Chenopodiaceae	*Scleroblitum atriplicinum*	Purple Goosefoot	0	FG	0.1	2
Cucurbitaceae	*Citrullus lanatus* var. *lanatus*	Wild Melon, Camel Melon,Bitter	*	EX	0.1	10
Fabaceae (Faboideae)	*Medicago sativa*	Lucerne	*	EX	0.1	3
Malvaceae	*Malva parviflora*	Small-flowered Mallow	*	EX	0.5	500
Myrtaceae	*Eucalyptus microcarpa*	Western Grey Box	0	TG	10	2
Plantaginaceae	*Veronica plebeia*	Trailing Speedwell	0	FG	5	1000
Poaceae	*Cynodon dactylon*	Common Couch	0	GG	0.1	2
Poaceae	*Hordeum leporinum*	Barley Grass	*	EX	0.1	10
Poaceae	*Lolium rigidum*	Wimmera Ryegrass	*	EX	0.5	500
Poaceae	*Panicum effusum*	Hairy Panic	0	GG	0.1	2
Polygonaceae	*Polygonum aviculare*	Wireweed	*	EX	0.1	5
Portulacaceae	*Portulaca oleracea*	Pigweed	0	FG	0.1	2

Notes: Growth form; EX= exotic, HTE= High threat exotic, TG= Tree , SG= Shrub, GG= Grass or grass-like, FG= Forb, EG= fern OG= other

Flora species list for PCT 360_Poor within Solar Farm

Family	Scientific name	Common name	Exotic	Growth form	Plot P1 Cover	Plot P1 Abundance
Asteraceae	*Arctotheca calendula*	Capeweed	*	EX	0.1	1
Asteraceae	*Centipeda cunninghamii*	Common Sneezeweed	0	FG	0.1	20
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	*	EX	0.1	5
Asteraceae	*Hypochaeris glabra*	Smooth Catsear	*	EX	0.1	2
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	*	EX	0.1	20
Asteraceae	*Xanthium spinosum*	Bathurst Burr	*	HT	0.1	2
Boraginaceae	*Echium plantagineum*	Patterson's Curse	*	EX	0.1	2
Chenopodiaceae	*Scleroblitum atriplicinum*	Purple Goosefoot	0	FG	0.2	200
Cucurbitaceae	*Citrullus lanatus* var. *lanatus*	Wild Melon, Camel Melon,Bitter	*	EX	0.1	2
Cyperaceae	*Carex inversa*	Knob Sedge	0	GG	0.3	100
Cyperaceae	*Cyperus bifax*	Downs Nutgrass	0	GG	0.5	200
Euphorbiaceae	*Chamaesyce drummondii*	Caustic Weed	0	FG	0.1	1
Fabaceae (Faboideae)	*Medicago minima*	Woolly Burr Medic	*	EX	0.1	100
Juncaceae	*Juncus usitatus*	0	0	GG	0.2	20
Lobeliaceae	*Lobelia concolor*	Poison Pratia	0	FG	1	500
Lythraceae	*Lythrum hyssopifolia*	Hyssop Loosestrife	0	FG	0.1	1
Malvaceae	*Malva parviflora*	Small-flowered Mallow	*	EX	0.1	2
Marsileaceae	*Marsilea drummondii*	Common Nardoo	0	EG	0.5	200
Oxalidaceae	*Oxalis corniculata*	Creeping Oxalis	*	EX	0.1	2
Plantaginaceae	*Veronica plebeia*	Trailing Speedwell	0	FG	0.1	50
Poaceae	*Austrostipa bigeniculata*	Yanganbil	0	GG	0.3	400
Poaceae	*Avena fatua*	Wild Oats	*	EX	0.1	20
Poaceae	*Chloris truncata*	Windmill Grass	0	GG	0.1	30
Poaceae	*Cynodon dactylon*	Common Couch	0	GG	50	1000
Poaceae	*Digitaria* spp.	A Finger Grass	*	GG	0.2	100
Poaceae	*Eragrostis cilianensis*	Stinkgrass	*	EX	0.1	20
Poaceae	*Eragrostis parviflora*	Weeping Lovegrass	0	GG	0.2	100
Poaceae	*Eriochloa australiensis*	Australian Cupgrass	0	GG	20	1000
Poaceae	*Hordeum leporinum*	Barley Grass	*	EX	0.1	20
Poaceae	*Lolium rigidum*	Wimmera Ryegrass	*	EX	0.2	100
Poaceae	*Paspalum distichum*	Water Couch	0	GG	1	500
Poaceae	*Rytidosperma bipartitum*	Wallaby Grass	0	GG	0.1	10

Family	Scientific name	Common name	Exotic	Growth form	Plot P1 Cover	Plot P1 Abundance
Poaceae	*Sporobolus caroli*	Fairy Grass	0	GG	0.1	20
Poaceae	*Sporobolus creber*	Slender Rat's Tail Grass	0	GG	0.1	10
Polygonaceae	*Polygonum aviculare*	Wireweed	*	EX	0.1	3
Polygonaceae	*Rumex brownii*	Swamp Dock	0	FG	0.1	1
Polygonaceae	*Rumex crispus*	Curled Dock	*	EX	0.5	50
Polygonaceae	*Rumex tenax*	Shiny Dock	0	FG	0.2	100
Solanaceae	*Solanum esuriale*	Quena	0	FG	0.3	300

Notes: Growth form; EX= exotic, HTE= High threat exotic, TG= Tree , SG= Shrub, GG= Grass or grass-like, FG= Forb, EG= fern OG= other

Fauna species recorded during surveys

Scientific name	Common name	NSW status	EPBC Act status
Amphibians			
Crinia parinsignifera	Eastern Sign-bearing froglet	-	-
Limnodynastes tasmaniensis	Spotted Grass Frog	-	-
Pseudophryne bibronii	Bibron's Toadlet	-	-
Birds			
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	-	-
Acanthiza reguloides	Buff-rumped Thornbill	-	-
Anas gracilis	Grey Teal	-	-
Anas superciliosa	Pacific Black Duck	-	-
Anhinga novaehollandiae	Australasian Darter	-	-
Anthus novaeseelandiae	Australian Pipit	-	-
Ardea pacifica	White-necked Heron	-	-
Cacatua galerita	Sulphur-crested Cockatoo	-	-
Cacatua sanguinea	Little Corella	-	-
Chenonetta jubata	Australian Wood Duck	-	-
Cincloramphus mathewsi	Rufous Songlark	-	-
Colluricincla harmonica	Grey Shrike-thrush	-	-
Coracina novaehollandiae	Black-faced Cuckoo-shrike	-	-
Corcorax melanorhamphos	White-winged Chough	-	-
Corvus coronoides	Australian Raven	-	-
Corvus mellori	Little Raven	-	-
Cracticus nigrogularis	Pied Butcherbird	-	-
Cracticus tibicen	Australian Magpie	-	-
Dacelo novaeguineae	Laughing Kookaburra	-	-
Dendrocygna eytoni	Plumed Whistling-Duck	-	-
Egretta novaehollandiae	White-faced Heron	-	-
Entomyzon cyanotis	Blue-faced Honeyeater	-	-
Eolophus roseicapillus	Galah	-	-
Falco berigora	Brown Falcon	-	-
Falco cenchroides	Nankeen Kestrel	-	-
Gerygone fusca	Western Gerygone	-	-
Grallina cyanoleuca	Magpie-lark	-	-
Haliastur sphenurus	Whistling Kite	-	-
Himantopus himantopus	Black-winged Stilt	-	-
Hirundo neoxena	Welcome Swallow	-	-
Manorina melanocephala	Noisy Miner	-	-
Microcarbo melanoleucos	Little Pied Cormorant	-	-
Microeca fascinans	Jacky Winter	-	-
Milvus migrans	Black Kite	-	-
Ninox novaeseelandiae	Southern Boobook	-	-
Northiella haematogaster	Blue Bonnet	-	-
Nymphicus hollandicus	Cockatiel	-	-
Ocyphaps lophotes	Crested Pigeon	-	-
Pachycephala rufiventris	Rufous Whistler	-	-
Pardalotus striatus	Striated Pardalote	-	-
Pelecanus conspicillatus	Australian Pelican	-	-

Scientific name	Common name	NSW status	EPBC Act status
Petrochelidon ariel	Fairy Martin	-	-
Phalacrocorax varius	Pied Cormorant	-	-
Platycercus eximius	Eastern Rosella	-	-
Poliocephalus poliocephalus	Hoary-headed Grebe	-	-
Polytelis swainsonii	**Superb Parrot**	**V**	**V**
Pomatostomus temporalis temporalis	**Grey-crowned Babbler (eastern subspecies)**	**V**	**-**
Psephotus haematonotus	Red-rumped Parrot	-	-
Rhipidura albiscapa	Grey Fantail	-	-
Rhipidura leucophrys	Willie Wagtail	-	-
Struthidea cinerea	Apostlebird	-	-
**Sturnus vulgaris*	Common Starling	-	-
Threskiornis molucca	Australian White Ibis	-	-
Threskiornis spinicollis	Straw-necked Ibis	-	-
Vanellus miles	Masked Lapwing	-	-
Vanellus tricolor	Banded Lapwing	-	-
Mammals			
Austronomus australis	White-striped Freetail-bat	-	-
**Lepus capensis*	Brown Hare	*	*

Notes-: * - exotic,, **bold-** threatened species, V – vulnerable

Solar farm scattered tree assessment

Species	DBH (cm)	Hollows	Class
Acacia pendula	25	No	2
Alectryon oleifolius	45	No	2
Alectryon oleifolius	45	No	2
Alectryon oleifolius	46	No	2
Eucalyptus melliodora	40	No	2
Eucalyptus microcarpa	45	No	2
Eucalyptus microcarpa	40	No	2
Total class 2			**7**
Alectryon oleifolius	60	No	3
Alectryon oleifolius	70	Yes	3
Alectryon oleifolius	80	No	3
Alectryon oleifolius	68	Yes	3
Alectryon oleifolius	80	Yes	3
Alectryon oleifolius	70	No	3
Alectryon oleifolius	54	No	3
Alectryon oleifolius	75	No	3
Alectryon oleifolius	76	No	3
Alectryon oleifolius	75	No	3
Alectryon oleifolius	70	No	3
Alectryon oleifolius	81	No	3
Alectryon oleifolius	70	No	3
Alectryon oleifolius	58	No	3
Eucalyptus microcarpa	115	Yes	3
Eucalyptus microcarpa	100	Yes	3
Eucalyptus microcarpa	94	No	3
Eucalyptus microcarpa	70	Yes	3
Eucalyptus microcarpa	92	No	3
Eucalyptus microcarpa	99	Yes	3
Eucalyptus microcarpa	90	No	3
Eucalyptus microcarpa	110	Yes	3
Eucalyptus microcarpa	110	Yes	3
Eucalyptus microcarpa	65	No	3
Eucalyptus microcarpa	100	Yes	3
Total class 3			**25**
Total scattered trees requiring offset within solar farm			**32**

Road upgrade scattered tree assessment

Species	DBH (cm)	Hollows	Class
Eucalyptus microcarpa	80	Yes	3
Eucalyptus microcarpa	70	Yes	3
Eucalyptus microcarpa	120	Yes	3
Eucalyptus camaldulensis	280 (multi-stemmed from about 2m high)	No	3
Total class 3			**4**
Total scattered trees requiring offset within road upgrade footprint			**4**

Appendix C

Field data sheets

BAM Site – Field Survey Form

Site Sheet no: 1 of

Date	8.12.20	Survey Name	Zone ID	Recorders			
		Daroobalgie		SR			
Zone	Datum	Plot ID	4	Plot dimensions		Photo #	
Easting	Northing	IBRA region		Midline bearing from 0 m	354		
601780	6311021						
Vegetation Class						Confidence: H M L	
Plant Community Type	244	?Box-Ironbark		EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	0
50 – 79 cm	0	0
30 – 49 cm	X	X
20 – 29 cm	X	X
10 – 19 cm	✓	X
5 – 9 cm	✓	X
< 5 cm	X	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0m	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	5	5	25	15	25															
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

-This document has not been endorsed or approved by Office of Environment and Heritage or Muddy Boots Environmental Training-

400 m² plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders
Date	8/12/20	Dacobalgie	4	SR

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
T	Eucalyptus populnea	N	20	6		
T	Eucalyptus melliodora	N	0.5	1		
G	Rytidosperma fulvum	N	5	500		
–	Lolium rigidum	E	10	1000		
–	Echium plantagineum	E	0.5	50		
G	Chloris truncata	N	10	500		
G	Cynodon dactylon	N	10	500		
–	Poa annua	E	20	1000		
–	Paspalum dilatatum	E	0.5	25		
G	Bothriochloa macra	N	0.5	100		
–	Centaurium erythraea	E	0.2	60		
G	Juncus continuus	N	0.2	25		
–	Avena fatua	E	0.5	200		
–	Medicago laciniata	E	0.1	10		
–	Trifolium glomeratum	E	1	200		
F	Crassula decumbens	N	0.1	5		
G	Eragrostis parviflora	N	5	400		
F	Lythrum hyssopifolia	N	0.2	20		
–	Lepidium africanum	E	0.2	3		
–	Malva sp	E	0.1	1		
F	Atriplex semibaccata	N	0.1	1		
–	Trifolium vesiculosum	E	0.1	1		
F	Boerhavia dominii	N	0.2	25		
F	Sida corrugata	N	0.5	150		
F	Vittadinia cuneata	N	0.2	10		
G	Austrostipa scabra	N	1	200		
G	Anthosachne scabra	N	1	200		
F	Euphorbia drummondii	N	0.1	20		
–	Oxalis articulata	E	0.1	10		
G	Aristida behriana	N	0.1	5		
–	Avena sativa	E	0.1	1		
S	Salsola australis	N	0.1	3		
–	Erigeron bonariensis	E	0.1	3		
G	Austrostipa aristiglumis	N	0.5	50		
F	Wahlenbergia gracilis	N	0.1	2		
G	Carex inversa	N	0.1	20		
F	Goodenia macbarronii	N	0.1	1		
F	Crassula sieberiana	N	0.1	2		
–	Vulpea sp.	E	0.1	5		
F	Alternanthera denticulata	N	0.1	5		

GF Code: see Growth Form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic GF – circle code if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); *Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

–	Tribulus terrestris	E	0.1	25		
–	Lactuca sp.	E	0.1	5		

BAM Site – Field Survey Form

Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	7/12/20	Daroobalgie		SR			
Zone	Datum	Plot ID	3	Plot dimensions		Photo #	
Easting	Northing	IBRA region		Midline bearing from 0 m	263		
Vegetation Class						Confidence: H M L	
Plant Community Type		80 – denuded scrub		EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	X	0
50 – 79 cm	X	0
30 – 49 cm	X	X
20 – 29 cm	X	X
10 – 19 cm	✓	X
5 – 9 cm	✓	X
< 5 cm	✓	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	5 | 10 | 10 | 20 | 5			
Average of the 5 subplots				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 7/12/20	Darobalgie	3	SR

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
S	Callitris glaucophylla	N	15	16		
G	Austrostipa bigeniculata	N	25	1000		
—	Echium plantagineum	E	0.1	1		
—	Hypericum perforatum	HTE	20	1000		
—	Trifolium angustifolium.	E	5	250		
—	Trifolium glomeratum	E	5	250		
—	Avena fatua	E	0.2	20		
G	Bothriochloa macra	N	5	250		
F	Convolvulus erubescens	N	1	50		
G	Chloris truncata	N	5	250		
—	Paspalum dilatatum	E	0.1	1		
F	Rumex brownii	N	0.1	5		
F	Calotis cuneifolia	N	1	100		
G	Anthosachne scabra	N	5	250		
—	Lactuca sp.	E	0.1	3		
—	Senna occidentalis	E	0.2	3		
F	Sida corrugata	N	0.1	15		
G	Chloris ventricosa	N	1	50		
F	Dianella revoluta.	N	0.2	3		
G	Austrostipa scabra	N	1	50		
G	Austrostipa aristiglumis	N	5	250		
—	Romulea rosea var australis	E	0.1	30		
e	Chrysanthe sulcata	N	0.1	15		
—	Salvia verbenaca	E	0.5	30		
G	Rhytidosperma sp.	N	0.2	25		
—	Centaurea melitensis	E	0.2	10		
—	Kickxia elatine subsp. crinita	E	0.5	60		
—	Centaurium erythraea	E	0.1	20		
S	Dodonaea viscosa	N	0.1	1		
S	Cassia nemophila	N	0.1	1		
f	Wahlenbergia stricta	N	0.1	10		
G	Cynodon dactylon	N	0.2	60		
—	Trifolium arvense	E	0.1	5		
f	Oxalis perennans	N	0.2	25		
f	Vittadinia cuneata	N	0.5	50		
—	Lactuca serriola	E	0.1	1		
F	Convolvulus fasciculatus	N	0.1	5		
G	Digitaria divaricatissima	N	25	500		
F	Euchiton involucratus	N	0.1	1		
—	Linaria arvensis	E				

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

F Calotis hispidula N 0.1 5

G Paspalum distichum N 0.1 25

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Zone ID	Recorders
Daroolbagie		SR,

Date	Zone	Datum	Plot ID	Plot dimensions	Photo #
7 12 20			2		

Easting	Northing	IBRA region	Midline bearing from 0 m
599293	6310736		160

Vegetation Class		Confidence: H M L
EPBC and BC Weeping Myall.		
Plant Community Type PCT26	Acacia + Silgum	EEC: Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	1	1
50 – 79 cm	0	0
30 – 49 cm	X	✓
20 – 29 cm	X	✓
10 – 19 cm	✓	✓
5 – 9 cm	✓	✓
< 5 cm	✓	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	4m	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	5	10	1	1	5															
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date: 7 12 20	Darool bagie	2	SR

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
T	Acacia paradoxa	N	25	20		
S	Maireana decalvans	N	1	15		
f	Portulaca oleracea	N	0.2	50		
G	Chloris truncata	N	5	200		
G	Austrostipa scabra	N	5	200		
f	Marsilea hirsuta	N	1	100		
f	Calotis cuneifolia	N	2	150		
S	Scherolaena dicantha	N	0.1	10		
f	Polygonum aviculare	N	0.1	10		
S	Maireana enchylaenoides	N	0.1	5		
S	Solanum esuriale	N	0.1	3		
G	Eragrostis parviflora	N	0.5	50		
G	Amphibromus nervosus	N	0.1	10		
F	Euchiton involucratus	N	0.1	1		
G	Austrostipa sp.	N	5	200		
F	Alternanthera denticulata	N	0.1	20		
G	Eleocharis plana	N	0.2	100		
G	Lachnagrostis filiformis	N	0.2	20		
F	Lythrum hyssopifolium	N	0.1	10		
-	Echium plantagineum	E	0.1	3		
-	Phalaris aquatica	E	0.1	5		
F	Euphorbia drummondii	N	0.1	10		
G	Rhytidosperma sp.	N	1	150		
G	Austrostipa mollis	N	1	150		
F	Erodium cicutarium	E	0.1	5		
-	Lactuca serriola	E	0.1	1		
f	Vittadinia cuneata	N	0.5	20		
F	Oxalis perennans	N	0.1	5		
-	Lolium rigidum	-	0.5	250		
F	Convolvulus subsericeus	N	0.1	2		
-	Trifolium glomeratum	E	0.1	5		
S	Salsola australis	N	0.2	5		
G	Carex inversa	N	0.1	5		
-	Carthamus lanatus	HTE	0.1	1		
-	Centaurea melitensis	E	0.5	10		
S	Atriplex semibaccata	N	0.2	5		
-	Lepidium africanum	E	0.1	2		
F	Poranthera microphylla	N	0.1	2		
S	Scherolaena muricata	N	0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:** 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

1.6% exotic

>20% is native (more than 50%)

BAM Site – Field Survey Form

Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders			
Date	07 12 20	Darcoladale		SR			
Zone	Datum	Plot ID	1	Plot dimensions		Photo #	
Easting	Northing	IBRA region		Midline bearing from 0 m	89		
Vegetation Class						Confidence: H M L	
Plant Community Type	76	Bellone + ag		EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	1	0
50 – 79 cm	3	0
30 – 49 cm	✓	0
20 – 29 cm	✓	0
10 – 19 cm	✓	0
5 – 9 cm	X	0
< 5 cm	✓	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	1	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	1 1 0 1 0			
Average of the 5 subplots				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date: 07 12 20	Daroobalgie	1	SR

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
T	Allocasuarina luehmanii	N	5	2		
F	Hardenbergia hirsuta	N	40	2000+		
G	Paspalidium gracile	N	5	200		
G	Elocharis plana	N	25	2000+		
–	Cyperus aragrostis	E	0.5	100		
G	Carex inversa	N	0.1	50		
G	Juncus continuous	N	1	50		
G	Amphibromus nervosus	N	1	100		
F	Alternanthera denticulata	N	10	500+		
–	Echium plantagineum	E	0.5	25		
G	Eragrostis parviflora	N	5	500+		
G	Austrostipa ornithocercum	N	10	500+		
S	Salsola australis	N	0.1	10		
G	Panicum effusum	N	5	100		
F	Lythrum myssopifolia	N	0.1	50		
F	Centipeda cunninghamii	N	0.1	50		
F	Polygonum aviculare	N	0.1	50		
–	Rumex conspersus	E	0.1	10		
–	Oxalis corniculata	E	0.1	20		
F	Pratia concolor	N	1	200		
–	Paspalum dilatatum	E	0.1	1		
–	Poa annua	E	1	200		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no: 101

Survey Name	Zone ID	Recorders
Daroobalgie SF		MC, BT

Date	26 08 20	Plot ID	PA	Plot dimensions	20 x 50.	Photo #	
Zone 55	Datum GDA 94						
Easting 599379	Northing 6310737	IBRA region	Riverina	Midline bearing from 0 m	286		

		Confidence: H M L
Vegetation Class		
Plant Community Type 360	Cuigai	EEC: / Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)		

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	0	0	0	0	0			
Average of the 5 subplots	0							

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 26 08 20	Darnobalgie	PA	MC, BT.

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
–	Arctotheca calendula	E	10	200		
–	Malva parviflora	E	1	30		
–	Lolium rigidum	E	40	1000		
F	Vittadinia cuneata	N	2	150		
–	Medicago minima.	E	1	1000		✓
–	Erodium cicutarium	E	0.1	50		
–	Centaurea melitensis	E	0.1	30		✓
F	Plantago cunninghamii	N	0.1	3		✓
G	Enteropogon acicularis.	N	10	200		
	~~Sclerolaena~~ Enchylaena tomentosa	N	0.1	4		✓
G	~~[illegible]~~ Sporobolus caroli	N	1	30		✓
G	Chloris truncata	N	0.1	10		
	Sclerolaena muricata.	N	0.1	20		✓
F	~~[illegible]~~ ? Leiocarpa sp.		0.1	1		✓
–	Sonchus oleraceus	E	0.1	2		
F	~~[illegible]~~ Rhodanthe pygmaea	N	0.1	50		✓
	Salsola australis	N	0.1	1		
–	Xanthium spinosum	HTE	0.5	30		
G	Cynodon dactylon	N	5	100		
F	Marsilea drummondii	N	0.1	40		
	Sclerolaena divaricata	N	0.1	5		✓
F	Solanum esuriale	N	0.1	3		
F	Swainsona ? Astragalus hamosus		0.1	10		✓
–	Echium plantagineum	E	0.1	1		
	~~Eleocharis sp.~~ [illegible]	N	20	2000		✓
	~~ribbon weed~~ Triglochin procera		0.1	10		✓
F	Pratia concolor	N	1	50		
	Pond weed / Potamogeton ~~natans~~ drummondii		0.1	5		✓
	Juncus - tall.		0.2	15		
–	Avena fatua	E	0.1	1		✓
–	Sisymbrium irio	E	0.1	2		
–	Medicago truncatula.	E	0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code if 'top 3'.**

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); *Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no: 101

		Survey Name	Zone ID	Recorders			
Date	26/08/20	Darooba/e		MC, BT			
Zone	Datum	Plot ID	PB	Plot dimensions	20×50	Photo #	
55	GDA 94						
Easting	Northing	IBRA region	Riverina	Midline bearing from 0 m	270		
599052	6310795						
Vegetation Class						Confidence: H M L	
Plant Community Type	360	Cilgai		EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)		

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30 . . , 100, 200, 300 . .). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)				
Average of the 5 subplots				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

-This document has not been endorsed or approved by Office of Environment and Heritage or Muddy Boots Environmental Training-

400 m² plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders
Date	26 08 20	Darroobalgie	PB	MC BT.

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
–	Lolium rigidum	E	60	1000		
–	Arctotheca calendula	E	10	200		
–	Medicago ~~medicago~~. minima	E	1	1000.		~~PA~~
–	[illegible] Astragalus hamosus	E	0.1	10.		~~PA~~
F	Goodenia pinnatifida	N	0.1	3		✓
–	Eragrostis cilienensis.	E	0.1	20		
G	Eragrostis parviflora	N	0.1	2		✓
F	[illegible]	N	[illegible]			
G	Sporobolus caroli	N	0.1	30		
G	Chloris sp	N	0.1	30		
F	Calotis cuneifolia	N	0.1	5		✓
–	Malva parviflora	E	2	100		
–	Hordeum leporinum	E	10	200		
–	Echium plantagineum	E	0.1	5		
G	Enteropogon acicularis	N	5	100		
G	Rytidosperma sp.	N	0.1	20		
G	~~Cynodon dactylon~~.	N	0.1	30		
	Sclerolaena muricata	N	0.1	5		✓
–	Datura ferox	E	0-1	3		
–	Sonchus oleraceus	E	0.1	1		
F	Vittadinia cuneata	N.	0.1	40		
–	Sisymbrium irio.	E	0.1	3		~~PA~~
–	Avena fatua	E	2	50		
–	Romulea rosea.	HTE	0.5	200.		
F	Euphorbia drummondii	N.	0.1	1		
G	Bothriochloa macra	N.	0.5	50.		
	Eleocharis sp.	N	1	100		PA

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders			
Date	26/08/20	Dandaloo Pic					
Zone	Datum	Plot ID	PC	Plot dimensions	20 × 50	Photo #	
55	GDA94						
Easting	Northing	IBRA region	Riverina	Midline bearing from 0 m	289		
598418	6110908						
Vegetation Class						Confidence: H M L	
Plant Community Type	360	Cuigai		EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)		

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)				
Average of the 5 subplots				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders
Date	26 08 20	Dubbo bulge	PC	MC BT.

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
–	Malva parviflora.	E	40	200		
–	Lolium rigidum	E	10	300		
F	Vittadinia cuneata.	N	0.1	50		
–	~~Astragalus~~ Astragalus hamosus	E	10	200		PB
–	Erodium cicutarium	E	0.1	50		PA/B
F	Erodium cinctum	N	15	100		
–	Arctotheca calendula	E	10	200		
–	Medicago minima.	E	10	500		PA
–	Sisymbrium irio.	E	0.1	5		PA
–	Medicago arabica	E	0.1	1		
–	Hordeum leporinum	E	2	50		
G	Enteropogon acicularis	N.	0.1	30		
F	~~Chrysocephalum~~ Leiocarpa sp.	N	0.1	4		PA
–	Eragrostis cilianensis.	E	0.1	2		
G	~~Rostraria~~ Sporobolus caroli	N.	0.1	40		PC
G	Cynodon dactylon	N.	0.1	20		
T	Romulea rosea	HTE	0.1	100		
–	Echium plantagineum	E	0.1	3		
L	~~Xanthium~~ Datura ferox.	E	0.1	1		
–	Capsella bursa-pastoris	E	0.1	2		
	Sclerolaena sp.	N	0.1	1		
	Sclerolaena birchii	N	0.1	1		PC
–	Triticum aestivum	E	0.1	1		
	Salsola australis.	N	0.1	1		
–	Lepidium africanum	E	0.1	1		PC

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form	Site Sheet no:

		Survey Name	Zone ID	Recorders	
Date	26 8 20	Dandaloie	.	MC BT	
Zone 55	Datum GDA94	Plot ID	PO	Plot dimensions 20x50	Photo #
Easting 597391	Northing 6311004	IBRA region	Riverina .	Midline bearing from 0 m	205
Vegetation Class					Confidence: H M L
Plant Community Type 80	Western Grey Box			EEC: Y	Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	X
50 – 79 cm	0	X
30 – 49 cm	1	X
20 – 29 cm	✓	X
10 – 19 cm	✓	X
5 – 9 cm	✓	X
< 5 cm	✓	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	2	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30…, 100, 200, 300…). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	1	2	10	60	2															
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date: 26 08 20	Darodalgie.	PD	MC BT.

GF Code	*Top 3 native species in each growth form group: Full species name mandatory. All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
T	Eucalyptus microcarpa	N	30	74		
T	Callitris glaucophylla	N	5	2		
S	Dodonaea viscosa subsp. cuneata	N	2	6		X
F	Crassula sieberana.	N	0.1	20.		X
G	Chloris ventricosa	N	20	500.		
-	Lolium rigidum	E	20	500		
-	Trifolium repens.	E	1	1000.		
-	Echium plantagineum	E	1	100		
-	Romulea rosea	HTE	0.5	1000		
G	Aristida ramosa	N	0.1	5		✓
G	Bothriochloa macra.	N	10	100.		
G	Enteropogon acicularis.	N.	10	100		
-	Sonchus oleraceus	E	0.1	5		
-	Lysimachia arvensis	E	1	200		
-	Trifolium arvense	E	1	1000.		
F	Maireana enchylaenoides	N.	0.1	2		
-	Hypochaeris radicata	E	0.1	10.		
				1		X
F	Sida corrugata	N.	0.1	2		
F	Hypoxis.	N	0.1	5		
F	Calotis cuneifolia	N.	0.1	3		
F	Goodenia pinnatifida	N	0.1	20		Vpar
-	Arctotheca calendula	E	1	100		
1	Salsola australis.	N.	0.1	2		
F	Enchylaena tomentosa	N	0.1	3		
1	Atriplex semibaccata.	N.	0.1	1		
-	Medicago arabica	E	0.1	1		
G	Austrostipa sp.	N	0.1	4		
S	Senna artemisioides	N	0.5	3		X
F	Hypericum gramineum	N	0.1	1		X
F	Chenlanthes sieberi.	N.	0.1	4		
-	Hypericum perforatum	HTE	0.1	2		
S	Myoporum sp.	N.	0.5	1		X
T	Callitris columellaris - Rebek	N.	0.1	1		
-	~~Bio thistle~~ Cahira Ferox	E	0.1	3		X
-	Eragrostis cilianensis.	E	0.1	1		
G	Sporobolus caroli	N	0.2	30.		X
G	Rytidosperma bipartitum	N	0.1	4		X
F	Erodium cinitum	N.	0.1	1		
	Maireana microphylla	N	0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

—	Oxalis corniculata	E	0.1	1		X

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Zone ID	Recorders
Darroolalgie		MC BT

Date	26/09/20	Plot ID	PE	Plot dimensions	20 x 50	Photo #	
Zone 55	Datum GDA 94						
Easting 595791	Northing 6310423	IBRA region	Riverina	Midline bearing from 0 m	135		

Vegetation Class			Confidence: H M L
Plant Community Type 76	Western Grey Box	EEC: Y	Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	1	0
50 – 79 cm	4	0
30 – 49 cm	3	X
20 – 29 cm	0	✓
10 – 19 cm	0	X
5 – 9 cm	0	X
< 5 cm	0	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	9	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	80, 50, 60, 10, 1			
Average of the 5 subplots				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			grey-crowned babblers heard calling
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date: 26.08.20	Darrobalgle	PE	MC, RT.

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
T	Eucalyptus microcarpa	N	15	2		
G	Enteropogon acicularis.	N	20	200		
F	Calotis cuneifolia	N	0.1	50		
G	Austrostipa scabra	N	10	200		
–	Cirsium vulgare.	E	0.1	1		
F	Sida corrugata	N	0.1	20		
–	Lolium rigidum	E	20	1000		
G	Paspalidium constrictum	N	0.1	10		✓ PD 6"9
D	Convolvulus erubescens	N	0.1	3		
F	Enchylaena tomentosa.	N	0.1	30		
F	Goodenia pinnatifida	N	0.1	15		✓
–	Sonchus oleraceus	E	0.1	2		
–	Medicago minima	E	0.1	10		✓
–	Hypochaeris radicata	E	0.1	1		
F	Einadia nutans	N	0.5	30		
G	Rytidosperma sp.	N	0.1	12		✓
G	Aristida behriana	N	0.1	2		
F	Hypoxis glabella	N	0.1	1		✓
F	Cassinia sieberiana	N	0.1	10		✓
G	Lomandra sp.	N	0.1	1		✓
F	Maireana enchylaenoides	N	0.1	1		
–	Medicago arabica.	E	0.1	3		
F	Oxalis sp.	N	0.1	5		✓
F	Minuria leptophylla	N	0.1	3		✓
	Salsola australis	N	0.1	1		
–	Oxalis pes-caprae	E	0.5	100		
	Nidotheca calendula	E	0.1	5		
F	Wurmbea dioica	N	0.1	1		
G	Chloris ventricosa	N	0.1	20		
–	Brassica rapa	E	0.2	30		✓
S	Myoporum sp.	N	0.2	1		✓ pre
F	Solanum esuriale	N	0.1	1		
–	Erena fastuosa	E	0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:** 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no:

Survey Name	Zone ID	Recorders
Dandaloo		MC BT

Date	Zone	Datum	Plot ID	Plot dimensions	Photo #
26 08 20	55	GDA 94	PF	20 × 50	

Easting	Northing	IBRA region	Midline bearing from 0 m
597033	6311029	Riverina	244

Vegetation Class			Confidence: H M L
Plant Community Type	80 Derived	**EEC:**	Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	0	0	0	0	0															
Average of the 5 subplots	0																			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

-This document has not been endorsed or approved by Office of Environment and Heritage or Muddy Boots Environmental Training-

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 26 08 20	Darooblgie	PE	MC BT

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
G	Chloris verticosa	N	50	1000		
-	Echium plantagineum	E	1	50		
-	Avena fatua	E	0.1	20		
-	Salvia verbenaca	E	0.1	30		
G	Enteropogon acicularis	N	25	500		
-	Romulea rosea	HTE	0.5	1000		
G	Eragrostis parviflora	N	10	500		[illegible]
-	Arctotheca calendula	E	0.1	20		
e	Cheilanthes sieberi	N	0.1	3		
-	Trifolium arvense	E	0.2	200		
G	Aristida behriana	N	0.1	5		
G	Bothriochloa macra	N	5	50		
F	Vittadinia cuneata	N	0.1	4		
F	Crassula	N	0.1	3		[illegible]
-	Trifolium campestre	E	0.1	10		
G	Sporobolus caroli	N	0.1	10		
-	Medicago laciniata	E	0.1	1		
-	Hypochaeris radicata	E	0.1	2		
-	Lolium rigidum	E	0.1	30		
-	Trifolium angustifolia	E	0.1	5		
G	Cynodon dactylon	N	0.1	20		
F	Calotis cuneifolia	N	0.1	3		✓
F	Oxalis perennans	N	0.1	10		✓
G	Rytidosperma caespitosum	N	1	40		
F	Erodium crinitum	N	1	40		
-	Sonchus oleraceus	E	0.1	1		
-	Eragrostis cilianensis	E	0.1	10		
F	Goodenia pinnatifida	N	0.1	5		
G	Austrostipa sp	N	1	40		✓
☆	pod thing		0.1	6		
-	Taraxacum officinale	E	0.1	1		
F	Enchylaena tomentosa	N	0.1	2		
	Sclerolaena muricata	N	0.1	1		
G	Rytidosperma richardsonii	N	0.1	30		✓
-	Sisymbrium irio	E	0.1	1		pin.
G	Aristida ramosa	N	5	50		pin.
	Salsola australis	N	0.1	15		
G	Paspalum distichum	N	0.1	20		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

2 sheets

BAM Site – Field Survey Form – Murray Riverina

Site Sheet no: 1 of

		CA/EOI ID	MZ ID	Recorders			
Date	09/09/20			L. Mahoney, A. Edmonds			
Zone	Datum	Plot ID	DMR0025	Plot dimensions	50x20	Photo #	
Easting	Northing	IBRA region	SWS	Midline bearing from 0 m	264		
Vegetation Class		Western Slopes				Confidence: H M L	
EEC/TEC	80 Yes	WCP, Grey Box				Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	✓	x
50 – 79 cm	✓	
30 – 49 cm	✓	
20 – 29 cm	✓	
10 – 19 cm	✓	
5 – 9 cm	✓	
< 5 cm	✓	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	2	15	1	15	3															
Average of the 5 subplots	7.2																			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams

Notes: Threatened species, threatened species habitat or other details on site condition

x 2 stick nests is WCP.

Alternative 2C2

Full-floristic data sheet

400 m² plot: Sheet 2 of 2		CA/EOI ID	MZ ID	Plot ID	Recorders
Date	08 09 20			DAF002S	L. Maloney, A. Edmonds

Growth Form Code	Genus and species name	N, E or HTW	Cover	Abund	Voucher
T	Callitris glaucophylla	N	30		
-	Arctotheca calendula	E	10		
-	Lolium rigidum	E	20		
F	Crassula sieberana	N	0.3		
F	Sida corrugata	N	0.1		
-	Trifolium glomeratum	E	3		
-	Trifolium arvense	E	5		
S	Dodonaea viscosa subsp cuneata	N	1		
-	Sonchus oleraceus	E	0.3		
-	Cerastuium glomeratum	E	0.5		
-	Hypochaeris radicata	E	0.5		
-	Avena fatua	E	3		
-	Echium plantagineum	E	2		
F	Stuartina muelleri	N	0.1		
-	Anagalis arvense	E	0.3		
G	Chloris ventricosa	N	0.3		
F	Vittadinia cunneata	N	0.1		
F	Einadia nutans	N	0.1		
S	Sclerolena divaricata	N	0.1		
-	Romulea minutiflora	E	1		
G	Enteropogon acicularis	N	0.5		
F	Goodenia fasicularis	N	0.1		
F	Calotis cuneifolia	N	0.2		
-	Sisymbrium irio	E	0.8		
-	Lycium ferocissicm	HTE	0.2	2	
-	Lactuca serriola	E	0.1		
S	Alyogyne Hakeana Hakeana micrphylla	N	0.1		
F	Oxalis corniculata	N	0.1		
-	Erodium botrys	E	0.1		
F	Dichondra repens	N	0.1		
F	Maireana enchylnoides	N	0.1		
G	Bothriochloa macra	N	0.1		
F	Calotis hispidula	N	0.1		
-	Trifolium subterraneum	E	R		
F	Dianella longifolia	N	0.1		
F	Daucus glochidiatus	N	0.1		
-	Papaver (purple poppy)	E	0.1		-
-	Salvia verbenaca	E	0.1		
-	Hypericum perforatum	HTE	0.1		
S	Myoporum montanum	N	0.1		

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, 300 ..., 1000, 2000, 3000 **Note:** Count individual plants to 20 then estimate as per below.
Note: 30 plants~1 plant per 3.6 x 3.6m, 50 plants ~1 plant per 2.8 x 2.8m, 100 plants ~ 1 plant per 2 x 2m, 1000 plants ~ 2.5 plants per 1x1m
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover = leaves, branchlets and branches) **N:** native, **E:** exotic
Note: 0.1% cover ~ 63 x 63 cm, 0.5% cover ~ 1.4 x 1.4 m, 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m

- Vulpia bromoides 0.1 E
F Hirschfeldia communis 0.1 N

Lomandra filiformis 0.1
Linum marginale 0.1

BAM Site – Field Survey Form – Murray Riverina

Site Sheet no: 1 of

		CA/EOI ID	MZ ID	Recorders			
Date	07 / 09 / 20			L. Maloney, A. Edmonds			
Zone	Datum	Plot ID	PAR0001 Sep	Plot dimensions	50x20	Photo #	
Easting	Northing	IBRA region	SWS	Midline bearing from 0 m	370		
Vegetation Class						Confidence: H M L	
EEC/TEC	76	Grey Box Woodland				Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	✓	✓
50 – 79 cm	✓	✓
30 – 49 cm	✓	✓
20 – 29 cm	✓	✓
10 – 19 cm	✓	✓
5 – 9 cm	✓	✓
< 5 cm	✓	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	2	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg 10, 20, 30 .., 100, 200, 300 ..). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	2 | 7 | 2 | 1 | 3			
Average of the 5 subplots	2.4			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Notes: Threatened species, threatened species habitat or other details on site condition

Full-floristic data sheet

400 m² plot: Sheet 2 of 1		CA/EOI ID	MZ ID	Plot ID	Recorders
Date	07 09 20	DAR001S		DAR001Sp	L. Maloney, A. Edmonds

Growth Form Code	Genus and species name	N, E or HTW	Cover	Abund	Voucher
F	Crassula sieberana	N	5	3000	
-	Medicago polymorpha	E	1	500	
F	Calotis hispidula	N	0.3	100	
G	Austrostipa scabra	N	1	300	
-	Arctotheca calendula	E	2	100	
F	Goodenia pusiliflora	N	0.1	20	
S	Sclerolena divaricata	N	0.8	100	
F	Hypoxis glabra	N	0.1	20	
-	Romulea rosea	HTE	0.1	100	
S	Atriplex semibaccata	N	0.1	3	
I	Oxalis perennans	N	0.1	2	
F	Rhodanthe pygmaeus	N	0.1	5	✓
F	Sida corrugata	N	0.1	3	
-	Romulea minutiflora	E	0.2	200	
-	Poris sp	E	0.1	1	
-	Lolium rigidum	E	@ 3	1000	
F	Goodenia fasicularis	N	01	10	
F	Einadia nutans	N	0.1	3	
G	Enteropogon acicularis	N	0.2	20	
S	Salsola kali	N	0.1	5	
F	Mairana enchylaioides	N	0.1	5	
-	Lepidium africanum	E	0.1	5	
S	Sclerolaena brachii	N	0.1	2	
-	Medicago laciniata	E	@ 3	2000	
S	Sclerolaena muricata	N	0.3	100	
G	Rytidosperma sp	N	0.2	200	
-	Malva parviflora	E	0.1	3	
-	Hordeum leporinum	E	0.1	30	
T	Eucalyptus microcarpa	N	6	15	
F	Vittadinia cuneata	N	0.1	2	
-	Sonchus oleraceus	E	0.1	1	
NF	Wiry moon flower	N	0.3	5	✓
I	Crassula macrantha	N	0.2	100	

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, 300 ..., 1000, 2000, 3000 **Note:** Count individual plants to 20 then estimate as per below.
Note: 30 plants~1 plant per 3.6 x 3.6m, 50 plants ~1 plant per 2.8 x 2.8m, 100 plants ~ 1 plant per 2 x 2m, 1000 plants ~ 2.5 plants per 1x1m
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover = leaves, branchlets and branches) **N:** native, **E:** exotic
***Note:** 0.1% cover ~ 63 x 63 cm, 0.5% cover ~ 1.4 x 1.4 m, 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

BAM Site – Field Survey Form

Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	18/12/18	Darcobalgie		L. Maloney, B. Turner			
Zone	Datum	Plot ID	P1	Plot dimensions	50 x 20	Photo #	3427 → 3429
Easting	Northing	IBRA region	Riverina	Midline bearing from 0 m	92°		
604961	6308730						
Vegetation Class						Confidence:	(H) M L
Plant Community Type		360 Gilgai		EEC: N		Confidence:	(H) M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	0
	Shrubs	0
	Grasses etc.	9
	Forbs	8
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0
	Shrubs	0
	Grasses etc.	71.9
	Forbs	2
	Ferns	0
	Other	0
High Threat Weed cover		0

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	–	–
50 – 79 cm	–	–
30 – 49 cm	–	–
20 – 29 cm	–	–
10 – 19 cm	–	–
5 – 9 cm	–	–
< 5 cm	–	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0m	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	0.1 | 0.1 | 0.1 | 0 | 0			
Average of the 5 subplots	0.06			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), N=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet 2 of 2		Survey Name	Plot Identifier	Recorders
Date	18/12/18	Dorroobalgie SF	P1	L Maloney, B Turner

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
G	Cynodon dactylon	N	50	1000		
-	Echium plantagineum	E	0.1	2		
F	Oxalis corniculata	N	0.1	2		
G	Paspalum distichum	N	1	500		
F	Pratia concolor	N	1	500		
-	Sonchus oleraceus	E	0.1	20		
G	Digitaria sp	N	0.2	100		
F	Solanum esuriale	N	0.3	300		
-	Conyza bonariensis	E	0.1	5		
G	Chloris truncata	N	0.1	30		
F	Rumex brownii	N	0.1	1		
F	Centipeda cunninghamii	N	0.1	20		
F	Veronica plebia	N	0.1	50		
-	Medicago minima	E	0.1	100		
F	Rumex tenax	N	0.2	100		
-	Eragrostis cilianensis	E	0.1	20		
G	Rytidosperma fulleri	N	0.1	10		
-	Hypochaeris glabra	E	0.1	2		
-	Malva parviflora	E	0.1	2		
	Juncus usitatus	N	0.2	20		
-	Citrullus lanatus	E	0.1	2		
G	Enchichloa arundinacea	N	20	1000		
F	Euphorbia drummondii	N	0.1	1		
G	Sporobolus caroli	N	0.1	20		
G	Austrostipa bigeniculata	N	0.3	400		
-	Rumex crispus	E	0.5	50		
-	Avena fatua	E	0.1	20		
	Carex inversa	N	0.3	100		
-	Lolium rigidum	E	0.1	100		
-	Xanthium spinosum	E	0.1	2		
	Cyperus bifax	N	0.5	200		
	Marsilea drummondii	N	0.2	200		
	Lythrum hyssopifolium		0.1	1		
-	Arctotheca calendula	E	0.1	1		
	Eragrostis parviflora		0.2	100		
	Schenolirion atropurpureum		0.2	200		
	Persicaria decipiens	N	0.1	3		
-	Hordeum leporinum	E	0.1	20		
G	Sporobolus creber		0.1	10		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no: 1 of 2

Survey Name	Zone ID	Recorders
Dandaloo	55	L Maloney, B Turner

Date	Zone	Datum	Plot ID	Plot dimensions	Photo #
18/12/18	55	GDA 94	P2	50 x 20	

Easting	Northing	IBRA region	Midline bearing from 0 m
604490	6309878	Riverina	297

Vegetation Class	develop-site		Confidence: (H) M L
Plant Community Type	76 - Western Grey Box	EEC: Y	Confidence: (H) M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	1
	Shrubs	0
	Grasses etc.	1
	Forbs	3
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	10
	Shrubs	0
	Grasses etc.	0.1
	Forbs	5.2
	Ferns	0
	Other	0
High Threat Weed cover		0

BAM Attribute (1000 m² plot)		
DBH	**# Tree Stems Count**	**# Stems with Hollows**
80 + cm	2	2
50 – 79 cm	1	0
30 – 49 cm	0	—
20 – 29 cm	✓	—
10 – 19 cm	0	—
5 – 9 cm	0	—
< 5 cm	0	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	50m	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	1	0	0	0	0															
Average of the 5 subplots	0.02																			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element	gilgai	Landform Pattern		Microrelief	
Lithology		Soil Surface Texture	clay/brown	Soil Colour		Soil Depth	
Slope	—	Aspect		Site Drainage	gilgai	Distance to nearest water and type	dam 100 m

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), N=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet 2 of 2		Survey Name	Plot Identifier	Recorders
Date	18/12/18	Dorrobalgie SF	P2	L Maloney, B Turner

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
F	Veronica plebia	N	5	1000		
-	Lolium rigidum	E	0.5	500		
-	Malva parviflora	E	0.5	500		
-	Brassica rapa	E	5	1000		
-	Sisymbrium irio	E	2	500		
-	Hordeum leporinum	E	0.1	10		
T	Eucalyptus microcarpa	N	10	2		
-	Xanthium spinosum	HTE	0.1	3		
-	Medicago sativa	E	0.1	3		
-	Paspalum effusum	E	0.1	2		
~~F~~	Persicaria aviculare	N	0.1	5		
-	Citrullus lanatus	E	0.1	10		
-	Amaranthus retroflexus	E	0.5	100		✓
-	Heliotropeum europaeum	E	0.1	1		
F	Sclerobilitum aridicinum	N	0.1	2		
G	Cynodon dactylon	N	0.1	2		
~~F~~	Portulaca oleracea	E	0.1	2		
-	Arctotheca calendula	E	0.1	10		
-	Echium plantagineum	E	0.1	1		
-	Sonchus oleraceus	E	0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	18/12/18	Barooka Lane		L Maloney · B. Turner			
Zone	Datum	Plot ID	R3	Plot dimensions	50 x 20	Photo #	
55	GDA 94						
Easting	Northing	IBRA region	Riverina	Midline bearing from 0 m	283		
604319	6309514						
Vegetation Class						Confidence: H M L	
Plant Community Type	9	Planted (closest PCT fit)		EEC: N		Confidence: H (M) L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	1
	Shrubs	0
	Grasses etc.	6
	Forbs	7
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	2
	Shrubs	0
	Grasses etc.	31.7
	Forbs	0.9
	Ferns	0
	Other	0
High Threat Weed cover		0

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	0
50 – 79 cm	0	0
30 – 49 cm	0	0
20 – 29 cm	0	0
10 – 19 cm	✓	0
5 – 9 cm	✓	0
< 5 cm	✓	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	3	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	0.5	3	10	5	8															
Average of the 5 subplots	5.3																			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), N=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet 2 of 2	Survey Name	Plot Identifier	Recorders
Date: 18/12/18	Dorobalgai	P3	L Maloney B Turn

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
F	Pratia concolor	N	0.3	200		
-	Heliotropum europaeum	E	0.1	2		
G	Chloris truncata	N	1	100		
-	Lolium rigidum	E	0.5	200		
-	Avena fatua	E	2	500		
-	Phalaris paradoxa	E	0.3	100		
G	Panicum effusum	N	0.1	10		
G	Sporobolus creberii	N	0.1	2		
G	Paspalidium distichum	N	15	1000		
-	Citrullus lanatus	E	0.1	2		
-	Sonchus oleraceus	E	0.1	5		
-	Sorghum sp	E	0.1	1		
-	Rumex crispus	E	0.1	2		
F	Carex inversa	N	0.1	5		
F	Alternanthera denticulata	N	0.1	2		
G	Cynodon dactylon	N	0.5	100		
-	Lactuca serriola	N	0.1	2		
-	Hordeum leporinum	E	0.1	5		
-	Medicago sativa	E	0.1	1		
G	Echinochloa austrodensis	N	15	1000		
T	Eucalyptus camaldulensis	N	1	2		
F	Oxalis corniculata	N	0.1	2		
F	Rumex tenax	N	0.1	5		
	Eleocharis acuta	N	0.2	100		
-	Xanthium spinosum	E	0.1	1		
-	Medicago polymorpha	E	0.1	10		
F	Sida corrugata	N	0.1	1		
F	Boerhavia dominii	N	0.1	1		
-	Echium plantagineum	E	0.1	2		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

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BAM Site – Field Survey Form

Site Sheet no: 10/2

		Survey Name	Zone ID	Recorders		
Date	19/12/18	Daroobalgie		L Maloney, B Turner		
Zone: 55	Datum: GDA 94	Plot ID	P4	Plot dimensions	50x20	Photo #
Easting: 601655	Northing: 6310887	IBRA region	Riverina	Midline bearing from 0 m	217	
Vegetation Class		Transmission Line				Confidence: H M L
Plant Community Type	76	Western Grey Box 0	76	EEC: Yes		Confidence: (H) M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	1
	Shrubs	0
	Grasses etc.	10
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	10
	Shrubs	0
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	4	4
50 – 79 cm	1	1
30 – 49 cm	✓	0
20 – 29 cm	–	0
10 – 19 cm	–	0
5 – 9 cm	–	0
< 5 cm	—	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	8m	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	15	5	10	0	10															
Average of the 5 subplots	8																			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

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400 m² plot: Sheet 2 of 2	Survey Name	Plot Identifier	Recorders
Date 19/12/18	Dacobalgie	P4	L Maloney, R Turner

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
-	Paspalum dilatum	E	2	100		
-	Lactuca serriola	E	0.1	10		
-	Lolium rigidum	E	12	1000		
G	Sporobolus creber	N	15	1000		
-	Echium plantagineum	E	0.2	50		
-	Avena fatua	E	0.1	100		
-	Eragrostis cilianensis	E	0.1	20		
G	Panicum effusum	N	3	1000		
F	Portulaca oleracea	N	0.1	2		
-	Sonchus oleraceus	N	0.1	3		
-	Citrullus lanatus	E	0.2	100		
T	Eucalyptus microcarpa	N	10	100		
-	Rumex crispus	E	0.2	10		
G	Cynodon dactylon	N	0.2	500		
-	Cirsium vulgare	E	0.1	2		
F	Pratia concolor	N	5	1000		
F	Marsilea drummondii	N	15	1000		
-	Sorghum	E	5	1000		
F	Solanum nigrum	N	0.1	2		
-	Medicago polymorpha	E	0.2	500		
F	Cyperus bifax	N	0.3	500		
G	Juncus usitatus	N	0.2	50		
G	Paspalum distichum	N	20	1000		
G	Eriochloa australiensis	N	20	1000		
-	Arctotheca calendula	E	3	500		
F	Alternanthera denticulata	N	1	500		
F	Oxalis corniculata	N	0.1	5		
-	Xanthium spinosum	E	0.1	1		
G	Diplachne fusca	N	3	500		✓
G	Rytidosperma linkii	N	0.1	2		
F	Centipeda cunninghamii	N	0.1	3		
G	Eleocharis acuta	N	4	1000		
G	Carex inversa	N	0.2	20		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no: 1 of 2

		Survey Name	Zone ID	Recorders			
Date	19/12/18	Dareobalga		L. Maloney, B. Turner			
Zone	Datum	Plot ID	P5	Plot dimensions	50x20	Photo #	
55	GDA 94						
Easting	Northing	IBRA region	Riverina	Midline bearing from 0 m			
Vegetation Class						Confidence: (H) M L	
Plant Community Type		Weeping Myall - 26		EEC: Yes		Confidence: (H) M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	–
50 – 79 cm	0	–
30 – 49 cm	x	–
20 – 29 cm	✓	–
10 – 19 cm	✓	–
5 – 9 cm	✓	–
< 5 cm	✓	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	12m	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	20	45	80	70	30															
Average of the 5 subplots	41																			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), N=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet 2 of 2	Survey Name	Plot Identifier	Recorders
Date: 19/12/18	Daroobalgie	P5	L Maloney, B. Turner

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
T	Acacia pendula	N	20	10		
F	Enchylaena tomentosa	N	2	100		
-	Lycium ferocissimum	HTE	0.1	1		
G	Sporobolus caroli	N	0.1	20		
F	Solanum esuriale	N	0.2	50		
G	Bothriochloa macra	N	0.2	100		
G	Chloris truncata	N	0.5	1000		
F	Convolvulus erubescens	N	0.1	2		
F	Sclerolaena divaricata	N	0.1	1		
F	Salsola australis	N	0.1	10		
F	Austrostipa scabra	N	0.2	50		
F	Vittadinia muricata	N	0.1	20		
F	Maireana pentagona	N	R	500		
F	Atriplex semibaccata	N	0.3	100		
G	Bor grass Paspalidium constrictum	N	0.1	10		✓
G	Rytidosperma caespitosum	N	0.1	10		
F	Oxalis corniculata	N	0.1	10		
G	Austrostipa bigeniculata	N	0.3	100		
F	Einadia nutans	N	0.5	200		
F	Sida corrugata	N	0.1	5		
F	Abutilon	N	0.1	5		
G	Digitaria sp A	N	0.1	3		
-	Medicago polymorpha	E	0.1	3		
-	Sonchus oleraceus	E	0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no: 017

Survey Name	Zone ID	Recorders
Daroobalgie		L Mahony, B. Turner

Date: 19/12/18		Plot ID: P6	Plot dimensions: 50×20	Photo #:	
Zone: 55	Datum: GDA 94				
Easting: 597193	Northing: 6310322	IBRA region: Riverina	Midline bearing from 0 m: 180		
Vegetation Class					Confidence: H M L
Plant Community Type: 76	Western Grey Box 76		EEC: Y		Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	2	2
50 – 79 cm	1	1
30 – 49 cm	0	
20 – 29 cm	✓	
10 – 19 cm	✓	
5 – 9 cm	✓	
< 5 cm	✓	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	42.	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	40	25	20	15	10			
Average of the 5 subplots	22.							

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), N=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet 2 of 2	Survey Name	Plot Identifier	Recorders
Date 19/12/18	Daroobalgie	P6	L. Maloney, B. Turner

	GF Code	Top 3 native species in each growth form group: Full species name mandatory. All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	F	Carex inversa	N	1	100		
	T	Eucalyptus microcarpa	N	15	7		
	G	Paspalum distichum	N	5	1000		
	-	Paspalum dilatum	E	60	1000		
Chk		Juncus usitatus	N	1	50		
	-	Lolium rigidum	E	1	1000		
	-	Rumex crispus	E	0.1	10		
	F	Oxalis corniculata	N	0.2	100		
	F	Geranium solanderi	N	0.1	10		
	-	Cirsium vulgare	E	0.1	2		
	-	Raphanus rapistrosum	E	2	1000		
chk	T	Eremophila studtii	N	1	2		
	-	Avena fatua	E	2	100		
	F	Alternanthera denticulata	N	0.3	100		
chk		Eleocharis acuta	N	0.2	1000		
	G	Panicum effusum	N	0.5	500		
	G	Rytidosperma caespitosum	N	0.5	20		
	G	Walwhalleya	N	0.1	2		
check	T	White Cedar	(N)	3	20		
	F	Dichondra repens	N	0.5	1000		
	-	Chirorium intybus	E	0.3	5		
	G	Sporobolus creber	N	0.5	50		
	F	Solanum esuriale	N	1	200		
	G	Bothriochloa macra	N	0.2	100		
	G	Chloris divaricata	N	0.1	3		
	-	Fumaria muralis	E	0.1	3		
	F	Enchylaena tomentosa	N	0.1	1		
	F	Sida fibulifera	N	0.1	3		[illegible]

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no: 1 of 2

		Survey Name	Zone ID	Recorders			
Date	19 12 18	Carrabalgie		L. Maloney, B. Turner			
Zone: 55	Datum: GDA94	Plot ID	P7	Plot dimensions	50x20	Photo #	
Easting: 599931	Northing: 6310381	IBRA region	Riverina	Midline bearing from 0 m	082°		
Vegetation Class						Confidence: H M L	
Plant Community Type	76	Derived WGB grassland 76		EEC: Y		Confidence: H (M) L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	0
50 – 79 cm	6	6
30 – 49 cm	✓	✓
20 – 29 cm	✓	✓
10 – 19 cm	✓	✓
5 – 9 cm	✓	✓
< 5 cm	✓	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30…, 100, 200, 300…). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	0.1 | 0 | 0.1 | 0.1 | 1			
Average of the 5 subplots	0.26			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet 2 of 2	Survey Name	Plot Identifier	Recorders
Date 19 12 18	Darcobalgie	P7	L. Maloney, B. Turner

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
G	Chloris truncata	N	5	500		
F	Salsola australis	N	0.1	10		
-	Avena fatua	E	0.2	100		
Fern	Cheilanthes sieberi	N	0.1	5		
-	Medicago laciniata	E	0.1	10		
F	Solanum esuriale	N	0.1	10		
F	Ptilotus exaltatus	N	5	300		
G	Rytidosperma caespitosum	N	0.1	10		
F	Vittadinia cuneata	N	0.1	5		
F	Euphorbia drummondii	N	0.2	50		
F	Sclerolaena divaricata	N	0.1	10		
G	Digitaria bro	N	20	1000		✓
G	Sporobolus caroli	N	2	300		
F	Sida corrugata	N	0.3	80		
G	~~[illegible]~~ Tragus australianus	N	0.6	200		
G	Austrostipa aristiglumis	N	0.1	2		
F	Convolvulus erubescens	N	0.1	1		
F	Maireana enchylaenoides	N	0.1	5		
F	Sida fibuliflora	N	0.1	1		
F	Oxalis corniculata	N	0.1	1		
F	Senecio cunninghamii		0.1	5		✓
F	Veronica plebia	N	0.1	5		
-	Eragrostis cilianensis	E	0.1	10		
-	Xanthium spinosum	E	0.1	1		
G	Bothriochloa macra	N	0.1	1		
G	Paspalidium constrictum	N	0.1	2		
S	Sclerolaena muricata	N	0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no: 1 of 7

		Survey Name	Zone ID	Recorders			
Date	19 12 18	Darroobalgie		L. Maloney, B. Turner			
Zone 55	Datum GDA94	Plot ID	P8	Plot dimensions	✓	Photo #	
Easting 602427	Northing 6311375	IBRA region	Riverina	Midline bearing from 0 m	~~352°~~ 215°		
Vegetation Class						Confidence: H M L	
Plant Community Type 76		Derived WGB grassland ✓		EEC: Y		Confidence: H (M) L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	0
50 – 79 cm	0	0
30 – 49 cm	x	x
20 – 29 cm	✓	✓
10 – 19 cm	✓	✓
5 – 9 cm	x	✓
< 5 cm	0	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30 .., 100, 200, 300..). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	01 01 01 01 01			
Average of the 5 subplots	0.1			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 19 12 18	Darcobalgie	P8	L Maloney, B Turner

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
F	Solanum esuriale	N	0.3	200		
-	Avena fatua	E	1	500		
G	Panicum effusum	N	0.2	100		
G	Paspalidium constrictum	N	1	70		
F	Atriplex semibaccata	N	0.3	50		
F	Oxalis corniculata	N	0.1	10		
F	Veronica plebia	N	0.2	100		
-	Echium plantagineum	E	0.2	50		
-	Sonchus oleraceus	E	0.1	20		
G	Austrostipa aristaglumis	N	3	200		
-	Lolium rigidum	E	0.5	200		
F	Rumex brownii	N	0.1	1		
-	Lactuca serriola	E	0.1	10		
F	Sida corrugata	N	0.1	3		
-	Medicago polymorpha	E	0.1	3		
G	Sporobolus caroli	N	0.8	300		
G	Bothriochloa macr	N	2	300		
F	Euphorbia drummondii	N	0.1	10		
G	Cynodon dactylon	N	0.5	200		
-	Rumex crispus	E	0.1	2		
G	Paspalidium distichum	N	0.5	100		
-	Heliotropeum europeaum	E	0.1	5		
F	Pratia concolor	N	1	100		
F	Carex inversa	N	0.3	100		
G	Rytidosperma duttonii ?	N	0.5	100		
F	Vittadinia connata	N	0.1	10		
F	Convolvulus erubescens	N	0.2	100		
F	Maireana enchylaenoides	N	0.1	1		
F	Ptilotus exaltatus	N	0.1	3		
G	Diplachne	N	0.8	200		
F	Lythrum	N	0.1	10		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no: 1 of 2

Survey Name	Zone ID	Recorders
		L Maloney, B. Turner

Date	19/12/18			Plot dimensions	50×20	Photo #	
Zone 55	Datum GDA 94	Plot ID	P9				
Easting 600881	Northing 6310445	IBRA region	Riverina	Midline bearing from 0 m			
Vegetation Class						Confidence: H M L	
Plant Community Type 76	Western Grey Box			EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot. derived grassland

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	0
50 – 79 cm	0	0
30 – 49 cm	–	–
20 – 29 cm	–	–
10 – 19 cm	–	–
5 – 9 cm	–	–
< 5 cm	–	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0m	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	1 | 0 | 0.1 | 0.1 | 1			
Average of the 5 subplots	0.44			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), N=not recent (3-10yrs), O=old (>10yrs)

-This document has not been endorsed or approved by Office of Environment and Heritage or Muddy Boots Environmental Training-

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 19/12/18	Dorrobatyl C	P9	L Maloney, B. Turner

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
F	Ptilotus exaltatus	N	0.3	100		
F	Solanum esuriale	N	0.1	40		
F	Oxalis corniculata	N	0.1	10		
-	Avena fatua	E	0.3	100		
F	Veronica plebia	N	0.1	20		
G	Chloris truncata	N	5	500		
G	Austrostipa scabra	N	0.1	10		
G	Paspalidium constrictum	N	10	500		
G	Austrostipa bristaglumis	N	10	500		
F	Mentha diemenica	N	0.1	50		✓
G	Bothriocloa macra	N	0.2	100		
F	Convolvulus erubescens	N	0.1	20		
G	Panicum effusum	N	0.8	100		
F	Sida corrugata	N	0.1	30		
G	Sporobolus caroli	N	0.3	100		
-	Medicago polymorpha	E	0.1	10		
F	Grey Germander - Teucrium racemosum	N	0.1	10		
F	Euphorbia drummondii	N	0.1	5		
F	Senecio cunninghamii	N	0.1	2		
-	Sonchus oleraceaus	E	0.1	10		
F	Wahlenbergia stricta	N	0.1	20		
	Paspalidium		0.2	50		✓
G	Digitaria sp A	N	15	1000		
-	Citrullus lanatus	E	0.1	1		
F	Maireana enchylaoides	N	0.1	2		
-	Verbena bonariensis	E	0.1	1		
G	Rytidosperma caespitosum	N	0.1	2		
-	Eragrostis cilliansis	E	0.1	2		
-	Echium plantagineum	E	0.1	1		
F	Vittadinia cuneata	N	0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); *Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no: 1 of 2

Survey Name	Zone ID	Recorders
Darobalga		L. Maloney, B. Turner

Date	19/12/18	Plot ID	P10	Plot dimensions	50x20	Photo #	
Zone 55	Datum GDA 94						
Easting 591193	Northing 6310232	IBRA region	Riverina	Midline bearing from 0 m	071		
Vegetation Class						Confidence: H M L	
Plant Community Type	Weeping Myall - 26			EEC: Y		Confidence: (H) M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	0
50 – 79 cm	2	0
30 – 49 cm	x	
20 – 29 cm	x	
10 – 19 cm	✓	
5 – 9 cm	✓	
< 5 cm	✓	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	14	

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30 ..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	20	60	30	40	10			
Average of the 5 subplots	32							

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), N=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders
Date	19/12/18	Paroobalgie	P10	L. Maloney, B. Turne…

GF Code	Top 3 native species in each growth form group: Full species name mandatory. All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
F	Einadia nutans	N	0.2	50		
F	Sida fibuliflora	N	0.1	20		
G	Chloris truncata	N	30	1000		
G	Rytidosperma caespitosum	N	3	200		
T	Eucalyptus microcarpa	N	5	1		
T	Acacia pendula	N	3	5		
F	Marsilea drummondii	N	0.1	100		
F	Carex inversa	N	0.1	10		
S	Sclerolaena muricata	N	0.1	1		
F (check)	Maireriana pentagona	N	0.1	10		
G	Austrostipa aristiglumis	N	0.2	50		
F	Oxalis corniculata	N	0.1	2		
F	Asperula conferta	N	0.1	100		
-	Verbena bonariensis	E	0.1	1		
F	Maireana enchylaenoides	N	0.1	2		
F	Boerhavia dominii	N	0.1	1		
-	Paspalum (P9)	E	0.1	2		
G	Bothriochloa macra	N	31	50		
F	Sclerolaena divaricata	N	0.1	10		
~~F~~	~~Oxalis corniculata~~	~~N~~	~~0.1~~	~~2~~		
F	Convolvulus erubescens	N	0.1	1		
F	Enchylaena tomentosa	N	0.1	1		
F	Goodenia fascicularis	N	0.1	1		
G	Sporobolus caroli	N	0.1	5		
F	Solanum esuriale	N	0.1	2		
F	Calostemma purpureum	N	0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

BAM Site – Field Survey Form

Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders			
Date	16/06/22	DAR		BT CM			
Zone 55	Datum	Plot ID	JP01	Plot dimensions	50×20	Photo #	
Easting 596190	Northing 6311157	IBRA region	In m	Midline bearing from 0 m	63	Magnetic °	
Vegetation Class						Confidence: H M L	
Plant Community Type	Grey Box in Road reserve			EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0 m	Tally space

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	5	5	5	5	5	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e
Average of the 5 subplots	5																			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 16/06/22	DAR	JP01	BT CM

GF Code	*Top 3 native species in each growth form group: Full species name mandatory* *All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
	1 Austrostipa scabra	N	0.1	10		
	2 Conyza bonariensis	E	1	300		✓
	3 Juncus usitatus	N	25	500		✓
	4 Trifolium subterranneum	E	40	2000		✓
	5 Calotis lappulacea	N	0.1	3		
	6 Cotula australis	N	0.1	100		✓
	7 Arctotheca calendula	E	5	300		
	8 Medicago sativa	E	3	250		
	9 Lepidium africanum	E	0.3	600		
	10 Lolium rigidum	E	5	1000		
	11 Echium plantaginum	E	0.2	100		
	12 Poa annua	E	0.1	10		
	13 Cerastium glomeratum	E	0.1	100		✓
	14 Panicum capillare	E	0.1	20		✓
	15 Paspalidium constrictum	N	0.1	10		✓
	16 Avena sativa	E	0.1	50		✓
	17 Rumex tenax	N	0.1	5		✓
	18 Wahlenbergia sp.	N	0.1	1		
	19 Juncus sp 2	N	5	200		
	20 Polygonum aviculare	E	0.1	10		
	21 Sida corrugata	E	0.1	5		
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Location 8

grazed sheep. prev. sown

BAM Site – Field Survey Form

Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders			
Date	16 06 22	DAR		BT CM			
Zone	Datum	Plot ID	JP02	Plot dimensions	20x50	Photo #	
55							
Easting	Northing	IBRA region		Midline bearing from 0 m	114		
596590	6311100						
Vegetation Class						Confidence: H M L	
Plant Community Type		PCT 360		EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30 , 100, 200, 300) For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	5	15	25	35	45			
Average of the 5 subplots	16							

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 16/06/22	DAR	JP02	BT CM

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
	Austrostipa scabra	N	10	200		
	Dichanthium sericeum	N	5	100		
	Trifolium subterraneum	E	20	1000		
	Lolium rigidum	E	20	1000		
*	Forb small flower - sida like		0.1	5		
	Chloris truncata	N	3	200		
	Leiocarpa semicalva	N	0.4	10		
	Panicum effusum	N	0.2	10		
	Lycium ferrocissum	HTE	0.2	1		
	Vittadinia cuneata var cuneata	N	0.1	3		
	Maireana 'microphylla'	N	0.1	1		
	Medicago arabica	E	C	200		
	Medicago truncatula	E	15	1000		
	Atriplex semibaccata	N	0.5	30		
	Pasipalidium constrictum	N	0.2	20		
	Echium plantaginum	E	0.2	50		
	Euphorbia drumondii	N	0.1	2		
	Lolium perenne	E	1	200		
	Sonchus oleraceus	E	0.2	50		
	Lobelia concolor	N	0.2	100		
	Juncus sp.	N	5	500		
	Dead asteracea weed	E	0.1	1		
	Medicago polymorpha	E	0.5	200		
	Sclerolaena muricata	N	0.4	2		
	Arctotheca calendula	E	1	200		
	Rumex acetosella	E	0.1	2		
	Marsilea drummondii	N	0.1	20		
	Solanum esuriale	N	0.1	1		
*	Fat hare grass seed		0.1	5		
	Sclerolaena birchii	N	0.1	1		
	Carthamus lanatus	E	0.1	2		
	Xanthium spinosum	E	0.1	1		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Location 10

BAM Site – Field Survey Form

Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	16 06 22	DAR		BT CM			
Zone	Datum	Plot ID	JP03	Plot dimensions		Photo #	
Easting 598622	Northing 6210865	IBRA region		Midline bearing from 0 m	103		
Vegetation Class						Confidence: H M L	
Plant Community Type				EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)		

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30 , 100, 200, 300) For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	20 20 20 10 20			
Average of the 5 subplots				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age. R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 16/06/22	DAR;	JP03	BT CM.

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
	1 Chloris truncata		5	300		
	2 Sclerolaena muricata		0.8	25		
	3 Lolium rigidum		30	2000		
	4 Atriplex semibaccata		5	200		
	5 oxalis corniculata		2	300		
	6 Panicum capillare / aira - tinyseed		2	100		✓
	7 Medicago truncatulata		20	2000		
	8 Vittadinia cuneata var cuneata		1	20		
	9 Polygonum aviculare		0.1	5		
	10 Austrostipa scabra		3	30		
	11 Enteropogon acicularis		5	50		
	12 Malva parviflora		0.5	40		
	13 Erodium crinitum		0.1	10		
	14 Carex sp		2	50		
	15 Conyza bonariensis		0.4	50		
	16 Xanthium spinosum		0.1	4		
	17 Echium plantagineum		0.5	60		
	18 Solanum esuriale		0.1	2		
	19 Cynodon dactylon		0.5	20		
	20 Cirsium vulgare (purple?)		0.1	5		
	21 Juncus usitatus		0.5	15		
	22 Paspalidium constrictum		0.1	5		
	23 Panicum effusum		0.1	10		
	24 Sonchus oleraceus		0.4	100		
	25 Medicago sativa		0.3	150		
	26 Arctotheca calendula		2	1200		
	27 Cotula australis		0.2	50		
	28 Alternanthera denticulata		0.1	5		
	29 Plantago lhc		0.1	20		
	30 Trifolium sp. clover?		1	4800		
	31 Sida corrugata		0.1	2		
	32 Salsola australis		0.1	20		
	33 weed forb		0.1	2		
	34 Lepidium africanum		0.1	5		
	35 blue hairy sclerolaena		0.2	10		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Location 7

BAM Site – Field Survey Form

Site Sheet no:

		Survey Name	Zone ID	Recorders			
Date	16 06 22	DAR		BT CM			
Zone 55	Datum	Plot ID	JP04	Plot dimensions		Photo #	
Easting 598148	Northing 6310961	IBRA region		Midline bearing from 0 m	85		
Vegetation Class						Confidence: H M L	
Plant Community Type				EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)		

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30 , 100, 200, 300). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	20	25	10	0	45			
Average of the 5 subplots								

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 16/06/22	DAR	JP04	BT CM

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
	Chloris truncata		15	500		
	Dicanthium		2	50		
	Aira?		5	200		
	Enneapogon		5	30		
	Sclerolaena muricata		0.5	20		
	Lolium		20	1500		
	Solanum esuriale		0.1	10		
	Trifolium		20	1000		
	Austrostipa scabra		1	20		
	Vittadinia cuneata		1	30		
	Creeping trifolium no flower		0.2	20		
	Malva parviflora		0.2	20		
	Conyza bonariensis		0.1	20		
	Xanthium spinosum		0.1	5		
	Atriplex semibaccata		2	40		
	Mairenna microphyla		0.1	2		
	Bromus/vulpia like		0.1	5		
	Mairenna (c)		0.1	3		
	Sonchus oleraceus		0.4	20		
	Prahia concolor		0.6	100		
	Senecio?		0.1	4		
	Juncus		3	40		
	Carex		2	100		
	Paspalidium like.		0.5	50		
	Lepidium africanum		0.1	10		
	Oxalis perennans		0.1	10		
	Arctotheca calendula		1	100		
	Salsola australis		0.2	10		
	Alternanthera like		0.1	8		
	Trifolium creeping pods		0.1	5		
	Polygonum like		0.1	10		
	Kikuyu? cynodon.		0.5	50		
	Eleocharis?		0.5	40		
	weed?		0.1	1		
	Echium plantagineum		1	10		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

new location

BAM Site – Field Survey Form

Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders			
Date	16 06 22	DAR	4	BT CM			
Zone 55	Datum	Plot ID	JP05	Plot dimensions		Photo #	
Easting 602691	Northing 6311180	IBRA region		Midline bearing from 0 m	161		
Vegetation Class						Confidence: H M L	
Plant Community Type				EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)		

Counts apply when the **number of tree stems** within a size class is ≤ 10 Estimates can be used when > 10 (eg. 10, 20, 30 , 100, 200, 300 .) For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. Tree **stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	25	40	30	40	40															
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 16/06/22	DAR	JP05	BT CM

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	1 Atriplex semibaccata		5	100		
	2 Trifdium sp		15	1000		
	3 Chloris truncata		80 20	500		
	4 Medicago arabica		15	1500		
	5 Aira		2	200		
	Salsola australis		0.1	20		
	Sclerolaena muricata		0.2	5		
	Wahlenbergia like sp		0.1	2		
	long onion grass like		0.2	50		
	Digitaria like		0.4	20		
	Fumaria like		0.8	100		
	Lolium		15	1000		
	Alternanthera		0.2	20		
	Persicaria like		0.1	2		
	Juncus		2	30		
	Echium plantaginum		0.2	20		
	convov like long thin		0.1	5		
	Elegchaen's		0.2	10		
	Brachyscome microcarpa		0.5	50		
	Maireana brevifolia		0.1	2		
	Vittadinia cuneata		0.2	10		
	Lepidium africanum		0.1	10		
	Senecio - last plot		0.1	10		
			0.1	2		

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:** 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Location 1

BAM Site – Field Survey Form

Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders			
Date	16/06/22	DAR		BT CM			
Zone 55	Datum	Plot ID	JP06	Plot dimensions		Photo #	
Easting 600907	Northing 6310456	IBRA region	In m	Midline bearing from 0 m	251	Magnetic °	
Vegetation Class						Confidence: H M L	
Plant Community Type				EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	Tally space	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	5	5	10	5	10	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 16/06/22	DAR	JP06	BT CM

GF Code	*Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable*	N, E or HTE	Cover	Abund	stratum	voucher
	Atriplex semibaccata		5	100		
	Trifolium		15	1500		
	medicago arabica		10	1000		
	Lolium rigidum -thin leaves shiny		5	1000		
	Aira		5	200		
	Chloris truncata		10	200		
	Sclerolaena muricata		0.4	10		
	onion grass thing		0.2	600		
	Poa annua		0.1	200		
	Salsola australis		0.1	10		
	Arctotheca calendula		0.2	50		
	Daucus stuff		0.1	100		
	Conyza bonariensis		~~0.1~~ 0.1	5		
	Fumaria capillaire		0.5	30		
	Hypericum perforatum		0.1	20		
	Paspalidium like.					
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 6" a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25%*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

location 5

BAM Site – Field Survey Form

Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders			
Date	16/06/22	DAR		BT CM			
Zone 55	Datum	Plot ID	JP07	Plot dimensions		Photo #	
Easting 600553	Northing 6310467	IBRA region	In m	Midline bearing from 0 m	Magnetic		
Vegetation Class						Confidence: H M L	
Plant Community Type				EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	Tally space	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%).					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	10	10	10	5	5	a	b	c	d	e	a	b	c	d	e	a	b	c	d	e
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

-This document has not been endorsed or approved by Office of Environment and Heritage or Muddy Boots Environmental Training-

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 16/06/22	DAR.	JP07	BT CM

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	1 Sonchus oleraceus		0.5	~~8~~46		
	2 Lolium rigidum		15	1000		
	3 Trifolium		20	1500		
	4 Medicago arabica		20	1500		
	5 Chloris truncata		0.5	100		
	6 Salsola australis		0.1	10		
	7 Circium vulgare		0.2	20		
	8 Sclerolaena muricata		0.2	5		
	9 Atriplex semibaccata		0.5	50		
	10 Conyza bonariensis		0.1	20		
	11 Echium plantagineum		0.5	100		
	12 Polygonum like		0.1	10		
	13 Ewartiburgia		0.1	5		
	14 Lepidium africanum		0.2	~~5~~20		
	15 Sida corrugata like?		0.1	4		
	16 Oxalis perennans - seed?		0.5	~~8~~020		
	17 Arctotheca calendula		~~0~~1	100		
	18 Aira		~~0~~0.5	~~8~~ 150		
	19 Yellow callatis bush		0.2	2		
	20 Sclerolaena muricata		0.2	5		
	21 Abutilon like?		0.1	4		
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Location 4

BAM Site – Field Survey Form

Site Sheet no: 1 of

Survey Name	Plot Identifier	Recorders
	JP08	

Date	16/06/22	IBRA region		Photo #		Zone ID	
Zone 55	Datum						
Easting 591104	Northing 6311022	Dimensions	m	Orientation of midline from the 0 m point.	101° Magnetic		

Vegetation Class		Confidence: H M L
Plant Community Type	EEC:	Confidence: H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (20 x 50 m plot)		# Tree Stems Count	
dbh	Euc*	Non Euc	Hollows†
large trees for Euc* & Non Euc 80 + cm	0	Non Euc	Hollows
50 – 79 cm	0		
30 – 49 cm	0		
20 – 29 cm	✓		
10 – 19 cm	0		
5 – 9 cm	✓		n/a
< 5 cm	✓		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	Tally space		total

Record number of **living** eucalypt* (Euc*) and **living native** non-eucalypt (Non Euc) stems separately

* includes all species of *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Syncarpia*

† Record total number of stems by size class with hollows (including dead stems/trees)

Counts must apply to each size class when the **number of living tree stems** within the size class is ≤ 10. Estimates can be used when the number of living tree stems within a class is > 10. Estimates should draw from the number series: 10, 20, 30..., 100, 200, 300

For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. For **hollows** count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	25 25 25 15 25	c b c a c	a a c a a	a b c d a
Average of the 5 subplots	23%			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 21/06/22	DAR	JP08	BT CM

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	1 Hypericum perforatum		25	1500		
	2 Austrostipa scabra		20	500		
	3 Medicago arabica		6	800		
	4 Oxalis perennans		1	200		
	5 Cheilanthes sieberi		0.1	10		
	6 Salsola australis		0.1	20		
	7 Chloris truncata		0.5	200		
	8 Sida corrugata		0.1	20		
	9 Hypochaeris radicata		0.2	100		
	10 Acacia sp.		0.4	2		
	11 Shrub sp.		0.1	1		
	12 Salvia verbenaca		1	500		
	13 Trifolium arvense		0.6	200		
	14 Lolium		.1	500		
	15 Callitris glaucophylla		2	6		
	16 QL Blue grass like		0.2	40		
	17 Vittadinia cuneata		0.2	3		
	18 Einadia nutans		0.1	5		
	19 Brassica thing		0.1	3		
	20 Atriplex like		0.1	1		
	21 Rumex sp		0.1	5		
	22 Atriplex semibaccata		0.4	20		
	23 Anthosachne scabra		0.1	15		
	24 Sporobolus like		0.1	10		
	25 Whalenburgia		0.1	5		
	26 Ponytail grass stuff		0.1	2		
	27 Native geranium		0.1	10		
	28 Convolvulus erubescens		0.1			
	29 Sclerolaena sp		0.2	4		
	30 Yellow callitris		2	2		
	31 Lepidium africanum		0.1	10		
	32 Trifolium sp		3	1		
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Location 9.

Appendix D

BAM Calculator data

				Composition (species richness)							Structure (% cover)						Function														
Veg Zone	PCT	Condition	Plot	TG	SG	GG	FG	EG	OG	Total	TG	SG	GG	FG	EG	OG	Large trees	Hollow trees	Litter cover (%)	Fallen logs (m)	Tree DBH 5-10 (cm)	Tree DBH 10-20 (cm)	Tree DBH 20-30 (cm)	Tree DBH 30-50 (cm)	Tree DBH 50-80 (cm)	Tree regen	HTE cover (total)	Zone	Easting	Northing	Bearing
			Benchmark	**2**	**6**	**7**	**10**	**0**	**1**		**7**	**8**	**9**	**4**	**0**	**0**	**4**		**45**	**10**											
2	26	Good	2	1	5	10	12	1	1	30	25.0	1.7	18.1	3.6	1.0	0.1	1	1	4.4	4.0	1	1	0	0	1	1	0.2	55	599279	6310734	160
			Benchmark	**3**	**4**	**6**	**10**	**1**	**1**		**31**	**2**	**23**	**5**	**0**	**0**	**3**		**65**	**49**											
3	76	Good	P4	1	0	12	4	1	0	18	10.0	0.0	71.0	6.2	1.0	0.0	5	5	8.0	8.0	0	0	0	1	1	0	2.1	55	601655	6310887	217
			Benchmark	**3**	**4**	**6**	**10**	**1**	**1**		**31**	**2**	**23**	**5**	**0**	**0**	**3**		**65**	**49**											
4	76	DNG	P9	0	0	10	11	0	1	22	0.0	0.0	41.7	1.3	0.0	0.1	0	0	0.4	0.0	0	0	0	0	0	0	0.0	55	600881	6310445	260
	76	DNG	1	1	1	8	4	1	0	15	5.0	0.1	52.1	11.2	40.0	0.0	4	0	0.6	1.0	0	0	0	1	1	0	0.6	55	602475	6311253	89
			Benchmark	**3**	**4**	**6**	**10**	**1**	**1**		**31**	**2**	**23**	**5**	**0**	**0**	**3**		**65**	**49**											
5	80	Good	PD	3	7	7	8	1	0	26	35.1	3.4	40.5	0.8	0.1	0.0	0	0	15.0	2.0	1	1	1	1	0	1	0.6	55	597379	6311075	205
			Benchmark	**3**	**4**	**6**	**10**	**1**	**1**		**31**	**2**	**23**	**5**	**0**	**0**	**3**		**65**	**49**											
6	80	DNG	JP02	0	4	6	5	1	0	16	0.0	1.1	23.4	0.9	0.1	0.0	0	0	25.0	0.0	0	0	0	0	0	0	0.5	55	596590	6311100	114
	80	DNG	JP08	1	5	5	8	1	1	21	1.0	0.8	23.0	2.0	0.1	0.1	0	0	23.0	0.0	1	0	1	0	0	1	25.1	55	597105	6310923	101
			Benchmark	**3**	**4**	**6**	**10**	**1**	**1**		**31**	**2**	**23**	**5**	**0**	**0**	**3**		**65**	**49**											
7	80	Derived scrub	3	1	2	11	10	1	1	26	15.0	0.2	72.5	2.5	0.1	1.0	0	0	10.0	0.0	1	1	0	0	0	1	20.2	55	597334	6310936	263
			Benchmark	**3**	**4**	**6**	**10**	**1**	**1**		**31**	**2**	**23**	**5**	**0**	**0**	**3**		**36**	**55**								55			
8	244	Planting	4	2	2	11	10	0	0	25	20.5	0.2	33.4	1.7	0.0	0.0	0	0	15.0	0.0	1	1	0	0	0	0	0.5	55	601785	6311023	354
			Benchmark	**1**	**1**	**7**	**8**	**1**	**0**		**0**	**0**	**75**	**7**	**1**	**0**	**0**	**2**	**25**	**60**											
9	360	Poor	PA	0	4	6	8	1	0	19	0.0	0.4	36.3	3.6	0.1	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.5	55	599325	6310755	286
	360	Poor	PB	0	1	8	4	0	0	13	0.0	0.1	7.0	0.4	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.5	55	599040	6310820	270
			Benchmark	**1**	**1**	**7**	**8**	**1**	**0**		**0**	**0**	**75**	**7**	**1**	**0**	**0**	**2**	**25**	**60**											
10	360	Very Poor	PC	0	3	3	3	0	0	9	0.0	0.3	0.3	15.2	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.1	55	598348	6310931	289
	360	Very Poor	JP03	0	4	8	7	0	0	19	0.0	6.1	16.2	1.7	0.0	0.0	0	0	18.0	0.0	0	0	0	0	0	0	0.1	55	598623	6310886	103
	360	Very Poor	JP04	0	5	9	6	0	0	20	0.0	2.9	29.5	2.0	0.0	0.0	0	0	20.0	0.0	0	0	0	0	0	0	0.1	55	598149	6310961	85
			Benchmark	**3**	**4**	**6**	**10**	**1**	**1**		**31**	**2**	**23**	**5**	**0**	**0**	3		**65**	**49**											
1	76	Planted	P3	1	0	9	5	0	0	1	15	1.0	0.0	32.1	0.7	0.0	0.0	0	0	5.3	3.0	1	1	0	0	0	1	55	604320	6309514	283
				*TG=Tree; SG=Shrub; GG=Grass and grass-like; FG=forb; EG=Fern; OG=Other; HTE=High Threat Exotic																											

Appendix E

MNES assessments of significance

Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and derived native grasslands of South-eastern Australia - EEC

Community description

This community is a grassy woodland dominated or co-dominated by Grey Box (*Eucalyptus microcarpa*). The community also includes grassland understorey derived from the historic clearing of the woody components of the woodland. Both the grassy woodland and the derived native grassland provide vital support to a diverse range of native flora and fauna and are key to retaining regional, state and national biodiversity.

In grassy woodland occurrences, the shrub layer is variable, ranging from absent in areas of intense grazing, to moderately dense cover. In many situations, regrowth of the canopy trees may also be present in the mid layer. This community is heavily influenced by landscape factors and past land management practices. The ground layer varies in compositions, with a combination of grasses, herbs and smaller chenopods.

Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia (the Grey Box ecological community) supports fauna species from a variety of conditions, ranging from wetter forest and woodland ecosystems further east and south to the semi-arid environment to the west and north. The Grey Box Grassy Woodlands have a strong influence on bird assemblage composition and provides foraging, roosting and breeding habitat. Larger mammals such as kangaroos and wallabies often utilise this community for grazing and arboreal species such as possums utilise tree-hollows for shelter and breeding (DSEWPaC 2012a).

Key threats

The Grey Box Woodland ecological community is listed as an endangered ecological community due to the significant loss of integrity throughout much of its extent. This includes both vegetative and faunal components, combined with weed invasion, fragmentation and degradation of habitat. Clearing of this community continues to pose serious threats to the Grey Box Grassy Woodlands ecological community. Unfavourable management practices and a lack of protection in reserves are also highlighted as key threats for this ecological community (TSSC 2010).

Geographical distribution and extent

The Grey Box Woodland ecological community occurs from central NSW, through northern and central Victoria into eastern South Australia (DotE 2021)

This community was once widespread throughout south-eastern Australia but now, across its range, only 10 to 15 percent remains of its original extent. The community is found in an area known as the wheat-sheep belt of eastern Australia and as a result has been extensively cleared since European settlement. It is estimated that the extent of the ecological community has declined from between 1.8 to 2.0 million hectares to a present extent between 300 000 and 330 000 hectares in NSW (TSSC 2010). Most of the remaining areas of this ecological community occur on private land. At present, less than one percent of what remains of the community in NSW is in formal conservation reserves (OEH 2021b)

Community description in the study area

In the study area to the east of the Newell Highway this community occurs as remnant roadside vegetation and small, isolated patches within agricultural land. In this area the community has undergone modification and degradation by weed incursion and grazing pressure. Some remnant roadside vegetation is of higher quality, and contains a higher native understory species richness and cover. This includes areas of derived native grassland community, in areas where canopy vegetation has been removed and a predominantly native understory remains. A larger patch of higher quality remnant woodland exists within private property north of Forest Road.

A larger, fragmented patch of The Grey Box Woodland ecological community occurs to the west of the Newell Highway within the Crown Reserve. The community in this area is generally in good condition, containing a connected canopy and an understory dominated by predominantly native forbs and grasses.

Nature of impact

The proposal would remove or modify a total of 7.46 hectares of the community. Of the total area to be removed, 4.76 ha is derived native grassland, 1.64 ha is derived scrubland the remaining 1.06 ha is woodland. Much of the woodland to be removed is from the degraded edge of remnant roadside vegetation, woodland patches within

agricultural land, and from along the edge of a larger patch of vegetation within the Crown Reserve TSR at the western end of the ETL proposal site. Permanent vegetation removal is restricted to the canopy and tall shrub layer only, to facilitate the 45-metre transmission line easement, and to the immediate pole impact area, to facilitate the erection of transmission line poles throughout the proposal site. It has been assumed that all vegetation within the proposal site would be removed or modified, however in reality, this is likely to be an overestimate. Safety clearances along the ETL proposal site would require any vegetation that reaches ~6 m or higher to be removed, but there would be limited impacts to understorey vegetation post-construction.

Criteria	Discussion
According to the DotE (2013) 'significant impact criteria', an action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	
Reduce the extent of an ecological community	The proposal will result in the removal of up to 7.46 hectares of vegetation that is broadly commensurate with the community. The majority of the impacts would be within areas of derived native grassland, with only 1.06 ha of intact woodland impacted by the proposal. The areas of derived native grassland are in a disturbed condition and are used as grazing land for sheep and cattle farming. Species present are generally those species capable of withstanding grazing pressure in modified, disturbed areas. The proposal would result in the reduction in the overall extent of the ecological community from within the local area, however the full extent of impact is unlikely to be as much as the 7.46 ha considered in this assessment. Full clearing of the entire ETL proposal site is not likely to be necessary, however as final construction footprints for pads, laydown areas and access tracks are unknown, a worst case scenario has been assumed and all vegetation has been considered to be cleared. It is more likely that there would be removal of all midstorey and canopy species, with retention of understorey species outside of the areas of direct impact associated with pole installation. Post-construction, understorey between poles is likely to recover to a relatively comparable state.
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	The proposed clearing would result in a minor increase to the degree of fragmentation the community experiences in the local area. Within the local area, remnants of this community are restricted to occasional roadside patches, and a larger patch within the TSR at the western end of the ETL proposal site. There are numerous small, local roads that are established throughout the landscape, along with the Newell Highway and rail line, and various high-intensity agricultural activities such as a nearby livestock exchange, and waste depot. Vegetation that corresponds to this ecological community and which contains midstorey or canopy vegetation that will be impacted by this proposal is limited to those patches immediately adjacent to existing infrastructure, namely the Newell Highway, rail line and Daroobalgie Road. The proposal will remove up to 7.46 hectares of vegetation that broadly aligns with this ecological community from the edges of either small, isolated patches, or from the degraded edges of the larger patch associated with the TSR at the western end of the ETL proposal site. This will result in a minor increase in the loss of connectivity and a minor increase in the impact of edge effects. Disturbance as a result of construction is unlikely to significantly increase fragmentation of the community more than that which already occurs in the study area, given the existing degree of fragmentation, disturbance, and ongoing agricultural uses throughout the proposal site.
Adversely affect habitat critical to the survival of an ecological community	No critical habitat has been listed for the Grey Box Woodland ecological community under the EPBC Act. Habitat critical to the survival of a species or ecological community can also refer to areas that are necessary: – For activities such as foraging, breeding, roosting or dispersal – For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators) – To maintain genetic diversity and long term evolutionary development, or

Criteria	Discussion
	– For the reintroduction of populations or recovery of the species or ecological community (DoE, 2013). The proposal is unlikely to adversely affect any areas of vegetation commensurate with this ecological community such that the continued survival of the community is put at risk. The proposal would not result in barriers to movement for foraging, breeding, roosting or dispersal for species of relevance to this community. Similarly, the proposal is unlikely to result in any impacts to abiotic or biotic factors necessary for the long-term maintenance of the community, including factors such as pollinators.
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	The proposal will involve earthworks during the construction phase of the proposal which may alter local surface drainage flows within the proposal site temporarily. However, it is unlikely to cause substantial or permanent alterations of any surface water drainage patterns that are necessary for the long-term survival of the ecological community. The earthworks have the potential to cause soil erosion in the proposal site which may run off into adjacent vegetation outside of the proposal footprint. Standard industry mitigation measures to prevent any such negative impacts are recommended and should be adopted as part of the CEMP for the proposal. Additionally, vehicle and machinery traffic during construction may cause compaction of soil, which can lead to increased surface run-off and hence greater erosion potential. Similarly, mitigation measures that restrict the movement of construction vehicles, plant and machinery in areas outside the proposal site are recommended and should be adopted as part of the CEMP for the proposal. Despite these potential threats, the impacts associated with the proposal are unlikely to be substantially greater than the existing degree of disturbance and pressure the proposal site (and in particular, the occurrences of this community within the proposal site) are already exposed to. The proposal is unlikely to significantly modify abiotic factors critical to the long-term survival of the community
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	The proposal will remove or modify up to 7.46 hectares of the community from the proposal site. No patches would be completely removed or isolated, with all impacts occurring along the edges of larger patches, adjacent to existing roads or other infrastructure. The establishment and maintenance of the ETL would involve removal of all midstorey and canopy species that grow to more than 6 m high along its length, to maintain the necessary clearance required for the transmission line. There would be limited impacts to groundcover vegetation, with an area of permanent impact associated with each pole and stringer, as well as temporary impacts associated construction compounds, pads, laydown areas and access tracks. In areas where impacts will be temporary, understorey vegetation would be able to regrow in disturbed areas, in much the same way it currently does after grazing or drought events or following other agricultural activities that currently take place. The floristic diversity and structure and the suite of component fauna species within areas of derived native grassland is unlikely to be substantially altered; there are already no trees or midstorey species in these areas, and they are already subject to long-term disturbance associated with agricultural use. Within the woodland areas where canopy and midstorey vegetation would be impacted, there is less certainty over the degree of change that may occur post-construction of the ETL. With the removal of species from these strata, there is some likelihood that the species composition and structure in the ETL proposal site may change over time, with species that favour sunlight and can withstand disturbance and exposure more likely to thrive. Any such impacts are unlikely to impact any of the retained areas of Grey Box Woodland outside the proposal site; they would be limited to the areas that remain within the proposal site post-construction.
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:	The Grey Box Woodland ecological community is listed as an endangered ecological community due to the significant loss of integrity throughout much of its extent. This includes the loss of both vegetative and habitat components, combined with weed invasion, fragmentation and degradation of habitat. The proposed works will result in the removal or modification of up to 7.46 hectares of this community. Of the total area to be removed, 4.76 ha is derived

Criteria	Discussion
-assisting invasive species, that are harmful to the listed ecological community, to become established, or	native grassland, 1.64 ha is derived scrubland the remaining 1.06 ha is woodland. All areas of woodland and derived scrub would be removed from the degraded edges of existing fragmented patches of this community. Given impacts are restricted to the edges of patches, the degree of edge effect is unlikely to increase substantially. No entire patches of the community would be lost, fragmented or isolated and the impacts of the proposal are limited to the removal of trees and tall shrubs, to facilitate the transmission line easement. A small planted patch that conforms to this community would be lost from the solar farm site, however this was comprised of a juvenile planting of mixed native species, and would not function as a complete ecological community due to its composition and age structure. Invasive and exotic species are well-established across the proposal site, as is common in largely cleared agricultural landscapes. Given the existing number and type of invasive species present in the proposal site, any further impacts as a result of the proposal are unlikely. The agricultural practices that occur within and around the proposal site at present are just as likely to result in the introduction of potentially harmful invasive species as the proposal. Movement of vehicles, livestock, and machinery for agricultural purposes can already spread weeds throughout an area, and there is evidence of substantial weed infestations across much of the proposal site, particularly in areas used for grazing or adjacent to roadsides and cropping land. Mitigation measures relating to the ongoing management of vegetation during the operational phase of the proposal are recommended and should be adopted as part of the CEMP for the proposal. Any such measures would limit the potential for establishment of any new invasive species that may threatened the ongoing survival of the ecological community.
-causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants in to the ecological community which kill or inhibit the growth of species in the ecological community	Construction of the proposal has the potential to result in the mobilisation of contaminated sediments or chemical spill from vehicles or plants. The introduction of pollutants into the surrounding environment, if uncontrolled, could impact on surrounding areas of Grey Box Woodlands. Mitigation measures relating to standard industry protocols for storage and use of chemicals and pollutants are recommended for inclusion in the CEMP.
Interfere with the recovery of an ecological community	There is no national recovery plan for this ecological community. Given the occurrence of this community in the proposal site as isolated roadside vegetation, small remnant patches in agricultural land and a larger remnant patch within the Crown Reserve TSR in the west of the proposal site, the proposal is unlikely to substantially interfere with the recovery of the community, given the existing landscape context in which the proposal is located. There are existing pieces of infrastructure and land use that have fragmented and degraded occurrences of this ecological community throughout the local area; the proposal is unlikely to exacerbate any potential threat such that a viable patch of this ecological community is put at risk. Priority recovery and threat abatement actions listed in the approved conservation advice relevant to the proposal include: – Enabling recovery of additional sites. This would occur through future biodiversity offsets required for the proposal and impacts to this community. – Protecting remnants of the listed ecological community through the development of conservation agreements and covenants. Again, retiring of credits to offset residual impacts on the community within the proposal site would protect occurrences of the community in stewardship sites in perpetuity. The remaining patches are likely to still function as viable patches and contribute to the overall recovery of the ecological community by remaining as a source of parent material for natural regeneration of the community, and contributing to the ongoing local occurrence of the community.
Conclusion	The proposal is not likely to have a significant impact on the endangered Grey Box Woodlands ecological community given: – The relatively small area to be removed or modified (up to 7.46 ha, made up of 4.76 ha of grazed, derived native grassland, 1.64 ha of derived scrub and 1.06 ha of intact woodland).

Criteria	Discussion
	– The landscape context in which impacts will occur, with the only areas of woodland and derived scrub to be removed located along the existing edges of larger patches, adjacent to existing roads and infrastructure. – Impacts to derived native grassland would be restricted to areas of grazing land, which are already subject to disturbance and regular use for agricultural activities, rather than intact remnants of high condition – Permanent impacts are likely to be restricted to removal of midstorey and canopy vegetation within areas of woodland and derived scrub, as well as at pole locations along the ETL proposal site – There would be no increase to fragmentation or isolation of retained remnants of this community.

Weeping Myall Woodlands - EEC

Community description

Weeping Myall Woodlands occur as mid-high and low woodland to open woodland. Weeping Myall (*Acacia pendula*) is the sole or dominant overstorey species sometimes occurring with other canopy species such as Belah (*Casuarina cristata*) and Poplar Box (*Eucalyptus populnea*). The understorey includes an open layer of chenopod shrubs and forbs with an open ground layer of grasses and herbs (DEWHA 2008b).

This community can vary in structure throughout its range. In higher rainfall areas it typically forms an open woodland. As rainfall decreases the ecological community becomes increasingly restricted, tending to sparse or scattered stands of woodland occurring in discrete bands fringing better-watered country.

Key threats

The Weeping Myall Woodlands endangered ecological community is listed as endangered under the EPBC Act due its decline in geographic distribution (DEWHA 2008b). Other contributing factors have put stress on the Weeping Myall Woodlands, Clearing and lopping for drought fodder has removed Weeping Myall trees, and grazing combined with drought and changed fire regimes has eliminated much of the understorey. Most areas remaining in good condition are on lightly-grazed, uncropped sites, including areas conserved by farmers, road reserves and Travelling Stock Routes and Reserves. Weeping Myall is also highly susceptible to attack by the Bag-Shelter Moth (*Ochrogaster lunifer*) which can defoliate large trees to such an extent that they do not recover. Introduction of invasive species has impacted areas due to the poor ability of important species like chenopods to recover due to limited seed longevity and low competitive abilities (DEWHA 2008b).

Geographical distribution and extent

This community generally occurs on the inland alluvial plains west of the Great Dividing Range in NSW and QLD. It occurs on flat areas shallow depressions on raised alluvial plains. Throughout this range it occurs in small pockets of isolated remnant vegetation. Due to the occurrence of this community on highly fertile soils large areas have been cleared for agricultural use (TSSC 2009).

The national extent is estimated to be within the range of 220,000 to 361,000 hectares in 2006, a decline within the range of 82.1 to 93.5 percent from its pre-European extent. Within NSW the Weeping Myall Woodlands have declined from an estimated original extent between 1,900,000 and 3,300,000 hectares to a current extent of between 190,000 and 330,000 hectares (TSSC 2009). These estimates do not consider the condition of these remnant. Poor land management practices, minimal regeneration and destruction of the understorey make it likely that much of the remaining Weeping Myall Woodlands is in poor condition.

Community description in the study area

This community exists as a single 24.4 hectares patch north of Forest Road in the study area. It occurs as a scattered patch within agricultural land, within areas dominated by gilgais. In the study area, the community contains a predominantly native understory, although the presence of some exotic vegetation and agricultural weeds is evident.

Nature of impact

Impacts to this community are limited to the north-eastern edge of the patch. The proposal would remove or modify up to 0.65 hectares of vegetation from this area. Native groundcover vegetation would largely be unaffected, with the exception of disturbance areas around each pole and stringer.

Criteria	Discussion
According to the DotE (2013) 'significant impact criteria', an action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	
Reduce the extent of an ecological community	The proposal will remove a total of 0.65 ha of Weeping Myall Woodlands from one patch within private property. This patch extends across a paddock to the south of the ETL, before terminating at the Forest Road roadside reserve to the south. The patch is not connected to any other patches. The clearing will remove a linear 45 metre strip of the community from the north eastern edge of the patch. This represents a minor reduction in extent of the community in the study area.

Criteria	Discussion
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	Weeping Myall Woodlands occur on highly fertile and arable soils where there is considerable pressure to clear for cropping. This has resulted in this ecological community occurring predominantly as small, varied and fragmented patches (DEWHA 2008b). A small strip of Weeping Myall Woodland would be removed from the edge of the patch in the study area. As the removal would occur to the edge of the community, it is not likely to substantially contribute to the fragmentation of Weeping Myall Woodlands in the local area. Disturbance as a result of construction will likely exacerbate the effects of fragmentation, with introduction of weeds being of particular concern due to the poor ability of important species like chenopods to recover due to limited seed longevity and low competitive abilities. Construction impacts would not further increase fragmentation of the Weeping Myall Woodland patch in the broader region noting that this patch is already isolated from other patches of the community.
Adversely affect habitat critical to the survival of an ecological community	No critical habitat has been listed for the Weeping Myall Woodland ecological community under the EPBC Act 1999. Habitat critical to the survival of a species or ecological community also refers to areas that are necessary: – For activities such as foraging, breeding, roosting or dispersal – For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators) – To maintain genetic diversity and long term evolutionary development, or – For the reintroduction of populations or recovery of the species or ecological community (DoE, 2013) Due to the limited area of Weeping Myall Woodlands remaining across the landscape this patch of vegetation is important and its removal will contribute to the reduction of geographical extent of this community in NSW. However, as impacts to the community are minimal, and limited to the edge of an isolated patch in the study area, it is unlikely that the proposed works will have a significant adverse effect on the dispersal, maintenance, genetic diversity or recovery of Weeping Myall Woodlands.
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	Weeping Myall Woodlands is associated with flat areas, depressions, or gilgais on heavy clays and alluvials on raised alluvial plains. These areas are not associated with active channels and are rarely flooded, although the depressions and microreliefs may hold water during significant rain events. The proposal will not involve substantial earthworks in the area surrounding the Weeping Myall Woodland and will not subsequently alter local surface drainage flows within the proposal site. As such, it is unlikely to cause substantial alterations of surface water drainage patterns that are necessary for the long-term survival of the ecological community. Vehicle and machinery traffic could cause compaction of soil, which can lead to increased surface run-off and hence greater erosion potential. Although soil disturbance may have adverse impacts on the community, for example, by exacerbating weed impacts on functionally important species such as chenopods and Weeping Myall trees (see below). Standard industry measures for vegetation management and weed control are recommended for inclusion in the CEMP for the proposal, and are likely to minimise the potential impacts of changes to abiotic factors. The proposal is unlikely to significantly modify abiotic factors critical to the long-term survival of the community.
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	The proposal would remove Weeping Myall vegetation (predominantly small trees) that are functionally important to this ecological community. Construction will not result in the permanent removal of all groundcover vegetation within the alignment, although a conservative approach has been taken as part of this assessment and full clearing has been assumed when identifying the extent of impacts resulting from the proposal. Notably, the ecologically important chenopod shrub component of the community would likely be retained within much of this community within the ETL proposal site. Disturbance as a result of construction has the potential to indirectly affect remaining occurrences of chenopod shrubs, with the introduction of weeds being

Criteria	Discussion
	of particular concern due to the poor ability of chenopods to recover as a result of limited seed longevity and low competitive abilities (DEWHA 2008b). Mitigation measures that include standard industry vegetation management and weed control actions are recommended for inclusion in the CEMP and are likely to limit the impact of any weed infestations that occur as a result of the proposal. Within the woodland areas where canopy and midstorey vegetation would be impacted, there is uncertainty over the degree of change that may occur post-construction of the ETL. With the removal of species from the upper strata, there is some likelihood that the species composition and structure of understorey and low shrubland vegetation retained within the ETL proposal site may change over time, with species that favour sunlight and can withstand disturbance and exposure more likely to thrive. The construction and operation of the proposal may result in a minor increase in the degree of edge effect experiences by vegetation adjacent to the proposal site. It is possible that any weeds that are introduced may change and transform the composition of the ecological community by outcompeting chenopod shrubs, however, given the minor impacts associated with the proposal, and the recommended mitigation measures, this is unlikely.
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: -assisting invasive species, that are harmful to the listed ecological community, to become established, or	Within the proposal site, Weeping Myall Woodlands occur as a stand of canopy species over a predominantly native understorey. The proposal would result in the removal of canopy and tall shrub vegetation from within the proposal site to allow for the necessary clearance between vegetation and overhead wires. Vegetation outside of the proposal site that would not be directly impacted by the proposal is at some risk of indirect impacts resulting from the proposal, if appropriate mitigation measures are not adopted and implemented. The introduction of weeds poses a heightened threat due to the poor ability of important species like chenopods to recover as a result of limited seed longevity and low competitive abilities.
-causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants in to the ecological community which kill or inhibit the growth of species in the ecological community	Construction of the proposal has the potential to result in the mobilisation of contaminated sediments or chemical spill from vehicles or plants. The introduction of pollutants into the surrounding environment, if uncontrolled, could impact on surrounding areas of Weeping Myall Woodlands, however, would be managed via environmental safeguards. The potential for impacts associated with these pollutants is low, given the disturbed nature of much of the study area, lack of permanent flowing water on site, limited extent and duration of construction works and the environmental safeguards that would be implemented during the construction process.
Interfere with the recovery of an ecological community	There is no adopted or made national recovery plan for this ecological community listed. Priority recovery and threat abatement actions listed in the approved conservation advice include (DEWHA, 2008b): – Protecting remnants of the listed ecological community through the development of conservation agreements and covenants – The use of strategic grazing that allows regeneration – Replanting of understorey species where they have been depleted – Use of lopping methods that do not result in the death of the dominant tree species – Avoiding the application of fertilisers and herbicides in or near remnants – Protecting remnants from weeds including the speedy eradication of any new invasions – Raising awareness of the ecological community within the community The proposal will result in the clearing of 0.65 hectares of the community, from the edge of a larger patch within agricultural land. Clearing and modification and proliferation of invasive species are two key threats that may exacerbated by the proposal. The proposal will interfere with the following management actions and outcomes: – Protecting remnants of the listed ecological community through the development of conservation agreements and covenants – Protecting remnants from weeds including the speedy eradication of any new invasions

Criteria	Discussion
	The proposal is not entirely consistent with the relevant recommended actions listed above. The main conflict relates to the clearance of vegetation from within the vegetation community, which is unavoidable. The amount of this community to be impacted is small in the context of the extant NSW occurrence (0.65 hectare; or <0.0005% of the estimated NSW extent (TSSC 2010)) and is restricted to one patch Taking into account the small amount of this community to be impacted, and given that the remainder of relevant recommended actions are consistent with the outcomes and mitigation measures for the proposal, it is considered unlikely that the proposal will interfere with the overall recovery of the ecological community.
Conclusion	The small area of vegetation that forms part of the ecological community that will be removed is unlikely to affect the ongoing persistence of the community within the local area. The community has a relatively widespread although patchy and fragmented distribution. The proposal will impact on a small patch within the known range of the community through the removal of 0.65 hectares. Groundcover vegetation would largely be retained, meaning that local populations of many of the component species in the community would be maintained and connectivity of habitat would be partially maintained. Notwithstanding this, it is acknowledged that the proposal: – Is likely to increase the fragmentation and the operation of edge effects on a single patch of the community – Has potential to result in a reduction in the quality of the community, by increasing the risk of establishment of potentially harmful invasive species, or by increasing the risk of regular mobilisation of chemicals or pollutants that may be harmful to the community. These risks would be managed through the implementation of construction controls and other mitigation measures as part of the proposal

Superb Parrot (*Polytelis swainsonii*) - vulnerable

Description and habitat requirements

The breeding range of the Superb Parrot is divided into three main areas throughout eastern inland NSW: along the Murray and Edward Rivers, along the Murrumbidgee River; and in a triangle bounded by Molong, Yass and Young (DSE 2011). Superb Parrots breed in either River Red Gum forests and woodlands or box woodlands (Webster 1998).

At least part of the population of the Superb Parrot undertakes regular seasonal movements, vacating the breeding area after the conclusion of the breeding season, and then returning in spring, while others remain in the breeding areas throughout the year. In central New South Wales, movements are said to occur when eucalypts flower, and when food becomes scarce due to drought and birds seek alternative sources of food (Higgins 1999).

The species seasonally occurs in box-pine (Callitris) and Boree (Acacia pendula) woodlands (DSE 2011). The Superb Parrot feeds mainly on the ground, on the seeds of grasses as well as cereal crops and spilt grain. They also eat the seed-pods of many understorey species of wattles, and flowers and fruits of eucalypts, berries of mistletoe and lerps (OEH 2021b).

Geographical distribution

The Superb Parrot is found in NSW and northern Victoria, where it occurs on the inland slopes of the Great Divide and on adjacent plains, especially along the major river-systems; vagrants have also been recorded in southern Queensland (DSE 2011).

Habitat in the study area

The study area contains large tracts of Grey Box Woodland habitat to support the species, especially to the west of the study area within the Crown Reserve. Other treed habitat within the study area (including Weeping Myall Woodland, and planted native woodlands) would provide foraging and perching habitat for the species. The three individuals were recorded foraging within Grey Box Woodland along the transmission line route, east of the Newell Highway. Multiple individuals were also observed and heard flying over the study area towards the Lachlan River on multiple occasions.

No known breeding habitat for the species occurs in the study area however, River Red Gum woodland along the Lachlan River to the south of the study area may provide breeding habitat for the species. The recovery plan for the species maps the study area as where the species is likely to occur. No areas mapped as 'breeding likely to occur' are located in the study area, however there are scattered records of birds breeding outside these mapped areas (Baker-Gabb 2011). Based on the lack of known breeding habitat in the study area, an important population is not considered to be present.

Nature of impact

The proposal would remove numerous hollow-bearing trees occurring as isolated paddock trees from within the solar farm proposal site, however no breeding habitat occurs in the proposal site, and these are unlikely to be utilised by the species. Hollow-bearing trees within the proposed solar farm site are unlikely to provide nesting habitat for the species due to their isolated occurrence in a highly modified landscape cleared of almost all native vegetation cover. No evidence of breeding or hollow-use by this species was identified during field surveys, despite targeted searches.

Around 15.11 hectares of potential foraging habitat would be removed to facilitate the construction of the proposed solar farm and to allow for the 45 m wide transmission line easement required for the construction of the proposed transmission line. The 15.11 ha includes all vegetation within the proposal site, including woodland, derived scrub, derived native grassland, gilgai wetland and planted vegetation. All vegetation types have been considered broadly suitable foraging habitat for this species, given is known to use a wide range and variety of habitats.

Criteria	Discussion
According to the DotE (2013) 'significant impact criteria', an action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	No areas mapped as 'breeding likely to occur' are located in the study area (Baker-Gabb 2011). Individuals that occur are likely to be non-breeding visitors to the proposal site, with breeding more likely to occur within large, extensive tracts of vegetation along the Lachlan River to the west of the proposal site. Based on

Criteria	Discussion
	the lack of known breeding habitat in the study area, an important population is not considered to be present.
Lead to a long-term decrease in the size of an important population of a species	The proposal would not impact any known breeding habitat for the species. Species that occur in the area would be non-breeding visitors. Construction would remove or modify a maximum area of 15.11 hectares of potential foraging habitat from the proposal site. Clearing of this vegetation would permanently remove some canopy species from within woodland patches, and would also remove some areas of understorey vegetation. Vegetation removal would occur to the edges of scattered patches of woodland throughout the study area. The Superb Parrot is nomadic, moving large distance between breeding and non-breeding areas. The narrow gaps in overstorey vegetation created by the proposal are unlikely to affect movement of this species. Patches of vegetation would be retained throughout this foraging range. The proposed solar farm is unlikely to increase the risk of mortality or injury for the species, as no infrastructure proposed poses a threat. There could be a minor increase in injury or mortality due to bird strikes on the proposed transmission line. However due to the relatively small size of the Superb Parrot, bridging of the 132 kV transmission lines is unlikely. Given the lack of impact on breeding habitat, and limited extent of clearing through scattered foraging habitat, the proposal is unlikely to lead to a long-term decrease in the size of an important population of the species.
Reduce the area of occupancy of an important population	The Superb Parrot occurs through the inland slopes and plains of New South Wales (including the Australian Capital Territory) to northern Victoria (Baker-Gibb 2011). Most birds undertake regular seasonal movements between breeding and non-breeding areas. The proposal would not reduce the area of occupancy of an important population given the lack of impact on breeding habitat.
Fragment an existing important population into two or more populations	Most Superb Parrots undertake regular seasonal movements between breeding and non-breeding areas. Riparian corridors are also known to provide movement corridors for this species, however no riparian corridors would be impacted by the proposal. Impacts to woodland are limited to the already fragmented edges of scattered woodland patches, and would not result in a substantial increase in the distance between patches of trees and would not pose a barrier to movement for the species. Given the high mobility of the species, and large area of NSW in which it occurs, the proposal is unlikely to fragment an important population into two or more populations.
Adversely affect habitat critical to the survival of a species	Habitat critical to the survival of the species comprises breeding and foraging habitat (Baker-Gibb 2011). No breeding habitat occurs in the proposal site. After breeding, different populations move to different foraging grounds. Most of the breeding population from the inland slopes appears to move to the eucalypt-pine woodlands on the plains of west-central and north-central New South Wales (Webster 1988). The proposal would remove canopy and shrub species from the fragmented edges of scattered patches of woodland habitat along the proposal site. This would result in a minor loss in foraging resources for the species in the study area. Given the lack of impact on breeding habitat, and minor nature of clearing through scattered foraging habitat, the proposal is unlikely to adversely affect habitat critical to the survival of a species.
Disrupt the breeding cycle of an important population	No breeding habitat occurs in or near the proposal site. Hollow-bearing trees within the proposed solar farm site are unlikely to provide nesting habitat for the species due to their isolated occurrence in a highly modified landscape cleared of almost all native vegetation cover. The clearing of woodland and shrubs from the edges of scattered patches of foraging habitat would not affect the ability of the species to move between breeding and non-breeding areas. As such, the proposal would not disrupt the breeding cycle of an important population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No breeding habitat occurs in or near the proposal site. The proposal would remove or modify up to 15.11 hectares of broadly suitable foraging habitat from the proposal site. Clearing of vegetation from the fragmented

Criteria	Discussion
	edges of scattered patches of foraging habitat would not affect the ability of the species to move between breeding and non-breeding areas. Given the lack of impact on breeding habitat, and the minor nature of clearing through scattered foraging habitat, the proposal is unlikely to lead to a decline in the species.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Operation of the proposal has the potential to spread weeds and pests. The surrounding agricultural land already contains a high diversity of non-native species, and construction impacts could exacerbate the spread of these weeds into areas containing a predominantly more native understory. As this species forages on a variety of canopy and groundcover vegetation, including both native and non-native species, this is unlikely to detrimentally alter the availability of foraging resources for the species. Predator species have been shown to prefer moving down linear clearings, which could increase predation risk for other species (Dawson et al 2017). Feral species, such as cats and foxes, are a threat to this species. The study area has already undergone significant clearing for linear infrastructure (roadways, railways and transmission lines) and for agriculture, and the minor increase in clearing for the proposal is unlikely to increase the risk of predation for the Superb Parrot.
Introduce disease that may cause the species to decline	Psittacine beak and feather disease is a common and potentially deadly disease of parrots. Susceptibility to the infection may be influenced by environmental factors, such as climate, nutrition, habitat quality and social factors (DEH 2005). The proposal is unlikely to introduce Psittacine beak and feather disease, however cumulative impacts of further land clearing and impacts on habitat has the potential to increase susceptibility of individuals.
Interfere substantially with the recovery of the species	The long-term objective of recovery is to minimise the probability of extinction of the Superb Parrot in the wild, and to increase the probability of important populations becoming self-sustaining in the long term (Baker-Gibb 2011). Priority management areas are focused on breeding habitat for the species. Other priority actions include the identification and protection of key movement corridors. The proposal would not impact any breeding habitat for this species. Construction of the proposal would remove some minor foraging habitat for the species. Impacts of the proposal are limited to the already fragmented edges of scattered woodland patches, and the species is more likely to occur in areas of the proposal site containing substantial woodland (i.e to the west within the Crown Reserve, or south along the riparian corridor of the Lachlan River). Individuals that occur in the study area are most likely to be non-breeding vagrants, and the proposal is unlikely to interfere substantially with the recovery of the species, given that no breeding habitat is likely to be removed and the minimal clearing of foraging habitat from the edges of scattered woodlands.
Conclusion	The proposal is unlikely to have a significant impact on the Superb Parrot as: – No breeding habitat would be impacted – Clearing of patches of foraging habitat would not affect the ability of the species to move between breeding and non-breeding areas. – Loss of foraging habitat involves removal of canopy and shrubs from the fragmented edges of scattered woodlands, with larger areas of foraging habitat available to the west within the Crown Reserve, and south along the riparian corridor of the Lachlan River – The loss of vegetation from the fragmented edges of scattered woodland patches would not create any substantial gaps in vegetation likely to substantially disrupt the movement of the species between breeding and foraging areas, due to their high mobility.

Appendix F

Biodiversity credit reports

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00024310/BAAS17031/21/00024311

Proposal Name
Daroobalgie solar farm - solar farm site

BAM data last updated *
14/10/2022

Assessor Name

Assessor Number
BAAS17031

BAM Data version *
55

Proponent Names

Report Created
17/11/2022

BAM Case Status
Finalised

Assessment Revision
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Assessment Type
Major Projects

Date Finalised
17/11/2022

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Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Calyptorhynchus lathami / Glossy Black-Cockatoo
Grantiella picta / Painted Honeyeater

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	0.2	0	4	4

BAM Biodiversity Credit Report (Like for like)

76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	76_Planted	No	4	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like credit retirement options

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id
00024310/BAAS17031/21/00024311

Proposal Name
Daroobalgie solar farm - solar farm site

BAM data last updated *
14/10/2022

Assessor Name

Assessor Number
BAAS17031

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Proponent Name(s)

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Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

BAM Biodiversity Credit Report (Variations)

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Calyptorhynchus lathami / Glossy Black-Cockatoo
Grantiella picta / Painted Honeyeater

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	0.2	0	4	4.00

76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	76_Planted	No	4	Lower Slopes,Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Variation options

BAM Biodiversity Credit Report (Variations)

	Formation	Trading group	Zone	HBT	Credits	IBRA region
	Grassy Woodlands	Tier 1	76_Planted	No	4	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like options

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00024310/BAAS17031/21/00024316

Proposal Name
Daroobalgie solar farm - transmission line

BAM data last updated *
14/10/2022

Assessor Name

Assessor Number
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BAM Data version *
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Proponent Names

Report Created
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BAM Case Status
Finalised

Assessment Revision
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Assessment Type
Major Projects

Date Finalised
17/11/2022

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Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Grantiella picta / Painted Honeyeater
Sminthopsis macroura / Stripe-faced Dunnart

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

BAM Biodiversity Credit Report (Like for like)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	2.8	15	50	65
26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	0.7	21	0	21
80-Western Grey Box - White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	4.7	0	106	106
244-Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt).	Not a TEC	0.1	0	1	1
360-Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion	Not a TEC	6.5	0	130	130

26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region

	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions This includes PCT's: 26, 27, 37, 43, 49, 55, 145, 159, 1766	-	26_Good	Yes	21	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region

	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	76_Planted	No	1	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	76_Good	Yes	15	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	76_DNG	No	49	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
80-Western Grey Box - White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region

	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	80_Good	No	14	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	80_DNG	No	49	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	80_Derived_scrub	No	43	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

244-Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt).

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Floodplain Transition Woodlands This includes PCT's: 56, 74, 76, 80, 81, 82, 237, 244, 248, 251, 628	Floodplain Transition Woodlands >=70% and <90%	244_Planting	No	1	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

360-Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Inland Floodplain Swamps This includes PCT's: 205, 360	Inland Floodplain Swamps >=90%	360_Poor	No	51	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Inland Floodplain Swamps This includes PCT's: 205, 360	Inland Floodplain Swamps >=90%	360_VeryPoor	No	79	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

BAM Biodiversity Credit Report (Like for like)

Species	Vegetation Zone/s	Area / Count	Credits
Cercartetus nanus / Eastern Pygmy-possum	**80_Derived_scrub, 80_Good**	2.1	57.00

Credit Retirement Options

Like-for-like credit retirement options

Cercartetus nanus / Eastern Pygmy-possum	Spp	IBRA subregion
	Cercartetus nanus / Eastern Pygmy-possum	Any in NSW

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id
00024310/BAAS17031/21/00024316

Proposal Name
Daroobalgie solar farm - transmission line

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Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Grantiella picta / Painted Honeyeater
Sminthopsis macroura / Stripe-faced Dunnart

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	2.8	15	50	65.00
26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	0.7	21	0	21.00
80-Western Grey Box - White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	4.7	0	106	106.00
244-Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt).	Not a TEC	0.1	0	1	1.00
360-Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion	Not a TEC	6.5	0	130	130.00

26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions This includes PCT's: 26, 27, 37, 43, 49, 55, 145, 159, 1766	-	26_Good	Yes	21	Lower Slopes,Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Variation options

Formation	Trading group	Zone	HBT	Credits	IBRA region
Semi-arid Woodlands (Grassy sub-formation)	Tier 1	26_Good	Yes (including artificial)	21	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region

	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	76_Planted	No	1	Lower Slopes,Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	76_Good	Yes	15	Lower Slopes,Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	76_DNG	No	49	Lower Slopes,Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Variation options					
	Formation	Trading group	Zone	HBT	Credits	IBRA region

	Grassy Woodlands	Tier 1	76_Planted	No	1	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Grassy Woodlands	Tier 1	76_Good	Yes (including artificial)	15	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Grassy Woodlands	Tier 1	76_DNG	No	49	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
80-Western Grey Box - White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	80_Good	No	14	Lower Slopes,Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	80_DNG	No	49	Lower Slopes,Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248	-	80_Derived_scrub	No	43	Lower Slopes,Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Variation options

Formation	Trading group	Zone	HBT	Credits	IBRA region
Grassy Woodlands	Tier 3 or higher threat status	80_Good	No	14	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Grassy Woodlands	Tier 3 or higher threat status	80_DNG	No	49	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Grassy Woodlands	Tier 3 or higher threat status	80_Derived_scrub	No	43	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
244-Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt).	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Floodplain Transition Woodlands This includes PCT's: 56, 74, 76, 80, 81, 82, 237, 244, 248, 251, 628	Floodplain Transition Woodlands >=70% and <90%	244_Planting	No	1	Lower Slopes,Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Variation options					
	Formation	Trading group	Zone	HBT	Credits	IBRA region
	Grassy Woodlands	Tier 2 or higher threat status	244_Planting	No	1	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

360-Gilgai wetland mosaic in the southern NSW South Western Slopes Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Inland Floodplain Swamps This includes PCT's: 205, 360	Inland Floodplain Swamps >=90%	360_Poor	No	51	Lower Slopes,Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Inland Floodplain Swamps This includes PCT's: 205, 360	Inland Floodplain Swamps >=90%	360_VeryPoor	No	79	Lower Slopes,Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Variation options

Formation	Trading group	Zone	HBT	Credits	IBRA region
Freshwater Wetlands	Tier 1	360_Poor	No	51	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Freshwater Wetlands	Tier 1	360_VeryPoor	No	79	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Cercartetus nanus / Eastern Pygmy-possum	**80_Derived_scrub, 80_Good**	2.1	57.00

Credit Retirement Options

Like-for-like options

Cercartetus nanus/ Eastern Pygmy-possum	Spp	IBRA region	
	Cercartetus nanus/Eastern Pygmy-possum	Any in NSW	
	Variation options		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Fauna	Vulnerable	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00024310/BAAS17031/22/00034035

Proposal Name
Daroobalgie Solar Farm

BAM data last updated *
14/10/2022

Assessor Name
Kath Chesnut

Assessor Number
BAAS17031

BAM Data version *
55

Proponent Names

Report Created
17/11/2022

Date Finalised
17/11/2022

Assessment Revision
2

Assessment Type
Scattered Trees

BAM Case Status
Finalised

BOS entry trigger
Major Project

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Nil

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

Ecosystem Credit Summary

BAM Biodiversity Credit Report (Like for like)

PCT	TEC	HBT Cr	No HBT Cr	Credits
76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	10	16	26

Credit classes for 76

Like-for-like options

TEC	Trading group	HBT	Credits	IBRA region
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	-	Yes	10	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	-	No	16	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id
00024310/BAAS17031/22/00034035

Proposal Name
Daroobalgie Solar Farm

BAM data last updated *
14/10/2022

Assessor Name
Kath Chesnut

Assessor Number
BAAS17031

BAM Data version *
55

Proponent Name(s)

Report Created
17/11/2022

Assessment Type
Scattered Trees

Date Finalised
17/11/2022

Assessment Revision
2

BAM Case Status
Finalised

BOS entry trigger
Major Project

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Potential Serious and Irreversible Impacts

Nil

Additional Information for Approval

PCTs With Customized Benchmarks
No Changes

Ecosystem Credit Summary

PCT	TEC	HBT Cr	No HBT Cr	Credits
76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	10	16	26

BAM Biodiversity Credit Report (Variations)

Credit classes for 76

Like-for-like options

TEC	Trading group	HBT	Credits	IBRA region
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	-	Yes	10	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	-	No	16	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Variation options

Formation	Trading group	HBT	IBRA region
Grassy Woodlands	Tier 1	Yes (including artificial)	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00024310/BAAS17031/22/00035828

Proposal Name
Daroobalgie Solar Farm Troubalgie Road and Back Yamma Road upgrade

BAM data last updated *
14/10/2022

Assessor Name
Kath Chesnut

Assessor Number
BAAS17031

BAM Data version *
55

Proponent Names

Report Created
17/11/2022

Date Finalised
17/11/2022

Assessment Revision
1

Assessment Type
Scattered Trees

BAM Case Status
Finalised

BOS entry trigger
Major Project

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Potential Serious and Irreversible Impacts

Nil

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id
00024310/BAAS17031/22/00035828

Proposal Name
Daroobalgie Solar Farm Troubalgie Road and Back Yamma Road upgrade

BAM data last updated *
14/10/2022

Assessor Name
Kath Chesnut

Assessor Number
BAAS17031

BAM Data version *
55

Proponent Name(s)

Report Created
17/11/2022

Assessment Type
Scattered Trees

Date Finalised
17/11/2022

Assessment Revision
1

BAM Case Status
Finalised

BOS entry trigger
Major Project

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Nil

Additional Information for Approval

PCTs With Customized Benchmarks
No Changes

Ecosystem Credit Summary

PCT	TEC	HBT Cr	No HBT Cr	Credits
11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	0	1	1

76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	3	0	3

Credit classes for 11

Like-for-like options

Class	Trading group	HBT	Credits	IBRA region
Inland Riverine Forests	Inland Riverine Forests <50%	No	1	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Variation options

Formation	Trading group	HBT	IBRA region
Forested Wetlands	Tier 4	No	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Credit classes for 76

Like-for-like options

TEC	Trading group	HBT	Credits	IBRA region

	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	-	Yes	3	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Variation options

Formation	Trading group	HBT	IBRA region
Grassy Woodlands	Tier 1	Yes (including artificial)	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

Ecosystem Credit Summary

PCT	TEC	HBT Cr	No HBT Cr	Credits
76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	3	0	3
11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	0	1	1

Credit classes for 11

Like-for-like options

Class	Trading group	HBT	Credits	IBRA region
Inland Riverine Forests	Inland Riverine Forests <50%	No	1	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Credit classes for 76

Like-for-like options

TEC	Trading group	HBT	Credits	IBRA region

	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	-	Yes	3	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

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