



Burroway Solar Farm Scoping Report

Burroway, NSW

Request for Secretary's Environmental Assessment Requirements (SEARs)

February 2023



Appendix J Preliminary Biodiversity Assessment, OzArk Environment and Heritage



SCOPING REPORT – PRELIMINARY ECOLOGICAL ASSESSMENT

Burroway Solar Power Station

Narromine Shire Council Local Government Area, NSW

NOVEMBER 2022

Report prepared by
OzArk Environment & Heritage
for Edify Energy Pty Ltd

OzArk Environment & Heritage

145 Wingewarra St
(PO Box 2069)
Dubbo NSW 2830
Phone: (02) 6882 0118
Fax: (02) 6882 0630
enquiry@ozarkehm.com.au
www.ozarkehm.com.au

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Prepared for	Prepared by		
Patrick Dale Project Development Manager Edify Energy Level 3, 201 Charlotte Street, Brisbane, QLD 4000 Mobile: 0487 177 136 patrick.dale@edifyenergy.com	Dr David Orchard Ecologist OzArk Environment & Heritage 145 Wingewarra Street (PO Box 2069) Dubbo NSW 2830 P: 02 6882 0118 david@ozarkehm.com.au		
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Executive summary

Edify Energy Pty Ltd (Edify; the proponent) proposes to construct a hybrid solar-plus-battery power station at Burroway, in the Central West and Orana region of New South Wales. OzArk Environment & Heritage (OzArk) was engaged by Edify to conduct a preliminary ecological assessment of the proposal according to the requirements of the Biodiversity Assessment Method 2020 (BAM) and to prepare this report to accompany a Scoping Report to be compiled by Edify.

The proposal site is located approximately 18 kilometres (km) northeast of Narromine and 29 km northwest of Dubbo. An area of approximately 512 hectares (ha; the subject land) was included in this preliminary assessment. It is not anticipated that all of this area would be required for the final proposal, and it is likely that most, or all, impacts to native vegetation would be avoided. The subject land is identified as Lot 70 DP1251856. As the proposal would be a State Significant Development (SSD), it would automatically trigger entry into the NSW Biodiversity Offsets Scheme (BOS). For this reason, a Biodiversity Development Application Report (BDAR) will be required, and the proponent would be required to offset all impacts to native vegetation.

The field assessment identified four Plant Community Types (PCTs) on the subject land:

- 55 - Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions.
- 82 - Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion.
- 88 - Pilliga Box - White Cypress Pine - Buloke shrubby woodland in the Brigalow Belt South Bioregion.
- 202 - Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion

PCT 55 occurred in four distinct condition states and was divided into four vegetation zones (55_Good, 55_Moderate, 55_Derived, and 55_Planted) accordingly. The remaining PCTs each occurred in a single condition state (82_Moderate, 88_Good, and 202_Good).

No vegetation zone in its entirety met the criteria to be considered an example of any listed Threatened Ecological Community (TEC); however, sections of zone 202_Good may meet the threshold conditions for the *Biodiversity Conservation Act 2016* (BC Act)-listed Critically Endangered Ecological Community (CEEC) *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* and the equivalent *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)-listed CEEC *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland*. Areas of this zone in which Blakely's Red Gum (*Eucalyptus blakelyi*) is dominant and in which the understorey is predominantly grassy are likely to represent examples of the former CEEC, and may additionally represent examples of the latter CEEC. Owing to the relatively short duration of the survey and the complexity of the mapping effort required to delineate these

areas, this has not been attempted. If impacts to this zone would likely result from this proposal, additional survey may be required to define TEC extents.

A land category assessment was conducted in order to determine whether any part of the subject land constitutes Category 1 – exempt land, which is not subject to the requirements of the BAM. This proposal could not determine whether any part of the subject land constitutes Category 1 land owing to evidence in aerial photographs of clearing subsequent to the January 1, 1990 cut-off date. As most of the subject land was found to be non-native, however, this may not ultimately be of importance.

Offset calculations using the BAM Calculator (BAM-C) generated a total of 1792 ecosystem credits and 19,195 species credits. However, this figure assumes that all c. 512 ha of the assessed area will be cleared and that no targeted surveys are conducted to determine whether species credit species are present. These calculations were used primarily to identify the most significant constraints to the proposal. These are:

- The generation of 1792 ecosystem credits. Most of these credits were associated with PCTs 55 (1198) and 202 (416).
- The possible occurrence of the *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland* CEECs.
- The generation of 19,195 species credits. Targeted surveys or expert reports may be used to reduce or eliminate this offset obligation, with the most productive months for survey being September-November.
- Potential impacts to fauna habitat associated with hollow-bearing trees, as well as less significant impacts to human-made structures and dams.
- The potential occurrence of a species considered to be at risk of a Serious and Irreversible Impact (SAII), namely the leek orchid *Prasophyllum* sp. Wybong. This species is associated with 202_Good.

Note that if impacts to native vegetation are entirely avoided by the proposal, the above potential impacts will be averted.

Thirteen vegetation integrity plots (i.e., BAM plots) were completed during the site assessment. If the proposal entails a greater impact to native vegetation than currently anticipated, or if the consent authority requires stronger proof that the subject land is predominantly non-native, additional plots may be required.

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1 Introduction

1.1 Background

Edify Energy Pty Ltd (Edify) proposes to develop a hybrid solar power station and battery energy storage system at Burroway, in the Central West and Orana region of New South Wales. The proposal site is located approximately 18 km northeast of Narromine and 29 km northwest of Dubbo. The proposal will occupy up to 470 ha on Lot 70 DP1251856. The relevant property has a minimum lot size of 400 ha. The assessed area and cadastral boundaries are mapped in **Figure 1-1**.

OzArk Environment & Heritage (OzArk) was engaged by Edify (the proponent) to conduct a preliminary biodiversity assessment for the proposal. This assessment will support a scoping report to be prepared by Edify. As the development is to be assessed as a State Significant Development (SSD), it will automatically trigger entry into the NSW Biodiversity Offsets Scheme (BOS). In accordance with the NSW *Biodiversity Conservation Act 2016* (BC Act), it will require the preparation of a Biodiversity Development Assessment Report (BDAR). For this reason, the preliminary assessment was conducted according to the requirements of the Biodiversity Assessment Method (BAM) 2020.

This report documents the results of this assessment and details the proponent's biodiversity offset requirement (number of ecosystem and species credits), with the understanding that this requirement will change as the final development footprint is refined.

1.2 The Proposal

The subject land is located approximately 18 km northeast of Narromine on the eastern side of Eumungerie Road. The assessment area includes all of Lot 70 DP1251856, with the final footprint to be decided at a later stage. At present, the site is utilised almost entirely for cropping. The entirety of the subject land is zoned RU1 – Primary Production.

Final details of the proposal will be determined as planning continues. At present, the project is anticipated to have a rating of approximately 100 MW generating capacity, coupled with an integrated battery energy storage system 100 MW / 400 MWh energy storage capacity. The footprint will include the following elements:

- Solar farm consisting of 'array blocks,' typically of 3 MVA and 6 MVA;
- Battery Energy Storage System(s) (BESS);
- Site office and car park;
- Access and perimeter tracks;
- Security fence surrounding boundary of development area;
- Site buildings, including Operation and Maintenance;
- High-voltage Substation.

The project will connect into the existing Essential Energy 132kV Dubbo to Nevertire transmission line. The substation is expected to be located on the southern boundary of Lot 70 DP 1251856.

1.3 Aims

The purpose of this report is to provide the following:

- Mapping of Plant Community Types (PCTs) present on the Subject Land
- Mapping of any identified Threatened Ecological Communities (TECs)
- Identification of candidate species requiring survey according to the BAM
- Results of database searches, including review of the BioNet Atlas
- Assessment of potential impacts to waterways and Groundwater Dependent Ecosystems (GDEs)
- Preliminary BAM calculator outputs
- Results of a land category assessment.

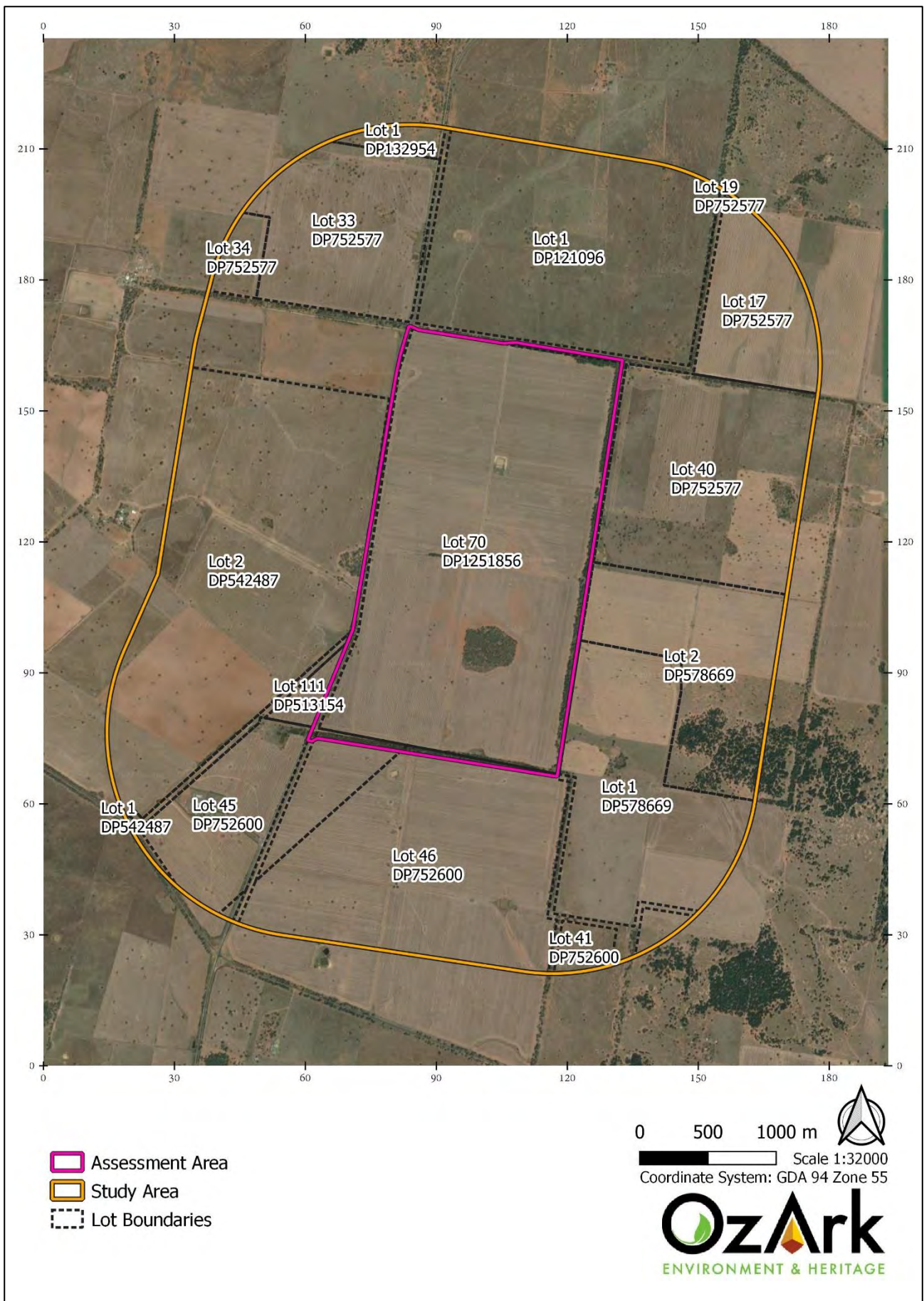


Figure 1-1. Proposal area, including cadastral boundaries.

1.4 Relevant Terms

The following terms and definitions are used to describe the land assessed in this study.

Subject land – The area of land that is directly impacted by the proposed development (including building footprints and associated infrastructure). While it is understood that native vegetation in two blocks within the subject land will be retained, as will vegetation in corridors surrounding the site, this preliminary study assumes that all vegetation within the subject land will be cleared. This is to allow for flexibility in the final design and to identify the key constraints associated with the proposal.

Study area – Land within a 1,500 m buffer from the outside edge of the subject land. The study area is assessed for the purpose of establishing landscape context including native vegetation cover and associated threatened species.

10 km search area – The area within a 10 km radius of the subject land. This 10 km buffer has been used to search information sources, including the Protected Matters Search Tool (PMST) (Department of Agriculture, Water and the Environment 2022) and BioNet Atlas (DPIE, 2022) threatened species sightings.

1.5 Site Details

The site is identified under the *Narromine Local Environment Plan 2011* and on the NSW Planning Portal as follows.

- **Lot/Section/Plan No:** Lot 70 DP1251856.
- **Land Zoning:** RU1 – Primary Production
- **Minimum Lot Size:** 400 ha
- **Terrestrial Biodiversity:** The assessed area includes areas mapped as having high terrestrial biodiversity value (**Appendix A**); however, it is understood that these areas, corresponding to the larger of two remnants within the lot and the surrounding vegetation corridors, will be excluded from the final design.

The location of the proposal is shown on the site map (**Figure 1-1**).

1.6 Regulatory Context

The Proposal will be assessed as a State Significant Development (SSD). Under the BC Act and associated regulations, all SSDs trigger entry into the BOS and require the preparation of a BDAR. Consequently, it is expected that the BOS will apply to this proposal.

The subject land has been identified as bushfire-prone land, according to mapping provided by the NSW Rural Fire Service, and as such, under Section 4.15 of the EP&A Act, the proponent will be required to address the relevant bushfire protection requirements of the Rural Fire Service Document *Planning for Bush Fire Protection*. It is assumed that Asset Protection Zones (APZ) will be included in the development footprint supplied by the proponent for the purposes of this report.

1.7 Purpose

The purpose of this preliminary biodiversity assessment is to determine the biodiversity assets, including flora, fauna, threatened species, threatened communities and habitat values, of the subject land.

This report also identifies any constraints on the proposal according to relevant Federal and NSW environmental legislations and includes the calculation of ecosystem and/or species credits requiring offset.

1.8 Legislation

1.8.1 International legislation

- Japan-Australia Migratory Bird Agreement (JAMBA)
- China-Australia Migratory Bird Agreement (CAMBA)
- Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA)
- Ramsar Convention on Wetlands (Ramsar).

1.8.2 Commonwealth legislation

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), including EPBC Act Environmental Offsets Policy and Significant Impact Guidelines Version 1.1, 2013.

1.8.3 NSW legislation

Environmental Planning and Assessment Act 1979 (EP&A Act)

The EP&A Act provides the legal framework for the assessment and approval of the proposed activities. Part 4 of the EP&A Act requires the proponent to examine and consider to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity.

Biodiversity Conservation Act 2016 (BC Act)

Under the BC Act, the proponent has an obligation to consider impacts to all threatened species, populations and ecological communities listed in NSW, as well as ensuring the proposal does not exacerbate a Key Threatening Process (KTP). Entry to the BOS is triggered automatically in the case of an SSD.

Biodiversity Conservation Regulation 2017 (BCR)

The BCR defines the triggers and entry thresholds for the BOS. It also provides the rules for meeting offset obligations, triggers for authorities to refuse development applications and compliance provisions.

Biosecurity Act 2015

From 1 July 2017, the *Biosecurity Act 2015* and its subordinate legislation commenced. The *Noxious Weeds Act 1993* and part of the *Local Land Services Act 2013* (Part 10 Pests), among other acts, have been repealed under the new *Biosecurity Act 2015*. Schedule 1 of the *Biosecurity Act 2015* contains the special provisions relating to weeds and duty to control weeds which pose a biosecurity risk.

The Department of Primary Industries (DPI) maintains a list of 'Priority Weeds' (previously referred to as noxious weeds) in NSW for the State and each region which impose an obligation on landholders to prevent, eliminate or minimise, so far as is reasonably practicable, any biosecurity risk they may pose. In addition, Local Government Areas may include their own priority weeds.

Fisheries Management Act 1994 (FM Act)

The objects of the FM Act are to:

- Conserve fish stocks and key fish habitats.
- Conserve threatened species, populations and ecological communities of fish and marine vegetation.
- Promote ecologically sustainable development, including the conservation of biological diversity.

Consistently with those objectives, the FM Act aims to:

- Promote viable commercial fishing and aquaculture industries.
- Promote quality recreational fishing opportunities.
- Appropriately share fisheries resources between the users of those resources.
- Provide social and economic benefits for the wider community of NSW.
- Recognise the spiritual, social and customary significance to Aboriginal persons of fisheries resources and to protect, and promote the continuation of, Aboriginal cultural fishing.

Section 201 of the FM Act states that a person other than a government authority must seek a permit from NSW Department of Primary Industries – Fisheries (DPI – Fisheries) for dredging or reclamation in a waterway. Dredging work means any work that involves excavating water land. Reclamation work means any work that involves depositing any material on water land.

Water Management Act 2000 (WM Act)

The WM Act aims to provide for the ‘sustainable and integrated management of the water sources of the state for the benefit of both present and future generations.’

The WM Act provides for the granting of various licenses and approvals, including for the use of water and water supply work. Additionally, the WM Act identifies provisions relating to ‘controlled activities’ which includes (among other definitions):

The erection of a building or the carrying out of a work (within the meaning of the EPA Act)

The removal of material (whether or not extractive material) or vegetation from land, whether by way of excavation or otherwise.

It includes laying pipes and cables.

Approval (via a ‘controlled activity’ approval) is required from the Minister for Primary Industries under the WM Act if it is on ‘waterfront land’. ‘*Waterfront land*’ means the bed of any river, lake or estuary, and the land within 40 m of the riverbanks, lake shore or estuary mean high water mark.

State Environmental Planning Policy (Biodiversity and Conservation) 2021

The SEPP (Biodiversity and Conservation) 2021 is the collation of biodiversity and conservation related SEPPs. Chapters 3 (formerly the SEPP – Koala Habitat Protection 2020) and 4 (formerly the SEPP – Koala Habitat Protection 2021) aim to encourage the ‘proper conservation and management of areas of natural vegetation that provide habitat for Koalas to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline’.

Chapter 3 applies to land zoned RU1, RU2 and RU3, excluding 9 LGAs within the Sydney basin. Chapter 4 applies to all other zoned land within the additional 74 LGAs. The subject land is zoned as RU1 within the Narromine LGA; therefore, Chapter 3 applies to the present proposal.

A formal assessment of possible impacts to the Koala under both the SEPP (Biodiversity and Conservation) 2021 and the EPBC Act should be included in a BDAR. Considering the lack of nearby Koala records, it is unlikely that the proposal will impact critical habitat for this species.

2 Land Category Assessment

According to section 6.8(3) of the BC Act, land defined as Category 1 – exempt land (within the meaning of Part 5A of the *Local Land Services Act 2013*) is to be excluded from assessment under the BAM. For this reason, impacts to Category 1 land do not contribute to the clearing threshold for entry into the NSW BOS. Category 1 exemption applies to rural land (zoned RU1, RU2, or RU3) that was cleared of native vegetation as of 1 January 1990 or lawfully cleared of vegetation between 1 January 1990 and 25 August 2017. At present, complete public mapping of Category 1 land is not available; however, an assessment of the likely categorisation of the subject land can be conducted by consulting the following sources of information:

- Land zoning maps in the applicable Local Environment Plan (Narromine LEP 2011).
- Public land use mapping (DPIE, 2017).
- NSW woody vegetation extent mapping (DPIE, 2011).
- Transitional Native Vegetation Regulatory Map (DPE, 2022).
- Historical aerial photographs accessed via the NSW Government Spatial Services platform (Spatial Services, 2022).
- Vegetation surveys conducted during the field assessment.

2.1 Land Zoning

The subject land is zoned as RU1 – Primary Production. This zoning is compatible with Category 1 classification.

2.2 Land Use

Two land use types have been mapped within the subject land. Of these, one is compatible with Category 1 listing and one incompatible, according to the classification outlined in the Native Vegetation Regulatory Map method statement (OEH, 2017). These are:

Compatible

- 3.3.0 Cropping.

Incompatible

- 2.1.0 Grazing native vegetation

With the exception of two stands of remnant or planted native vegetation within the paddock and the vegetation corridors surrounding the site, the assessment area is mapped to landuse 3.3.0.

2.3 Historical aerial photography

Historical aerial imagery shows that the site appeared to host significantly more woody vegetation in 1995 (**Figure 2-1** and **Figure 2-2**). Category 1 exemption applies to land that was cleared prior to 1990 or lawfully cleared between 1 January 1990 and 25 August 2017. It is uncertain when the vegetation visible on the aerial photographs was cleared and under what circumstances. If the landholder is able to provide clarity on this point, it may be possible to map areas of Category 1 land within the site.

2.4 Woody Vegetation Extent

Woody vegetation is largely confined to the surrounding vegetation corridors and to two major patches within the paddock. While aerial imagery shows significant number of paddock trees within the lot,

these are no longer present. Areas possessing woody vegetation are assumed to be ineligible for Category 1 listing.

2.5 Transitional Native Vegetation Regulatory Map

The most recent version of the Transitional Native Vegetation Regulatory Map (TNVRM) does not identify any regulated land within the assessed area.

2.6 Vegetation surveys

Much of the site is now used for cropping and only minor occurrences of native plant species – typically ‘weedy’ native annuals – were noted within the cropped areas. Larger remnants and the surrounding corridors possessed significantly greater native vegetation cover and are ineligible for Category 1 listing.

2.7 Conclusion

Owing to uncertainty concerning the date and legality of past clearing on the subject land, it is not clear whether the subject land constitutes Category 1 – Exempt Land. However, the cropped land is considered non-native here and will not attract an offset obligation.

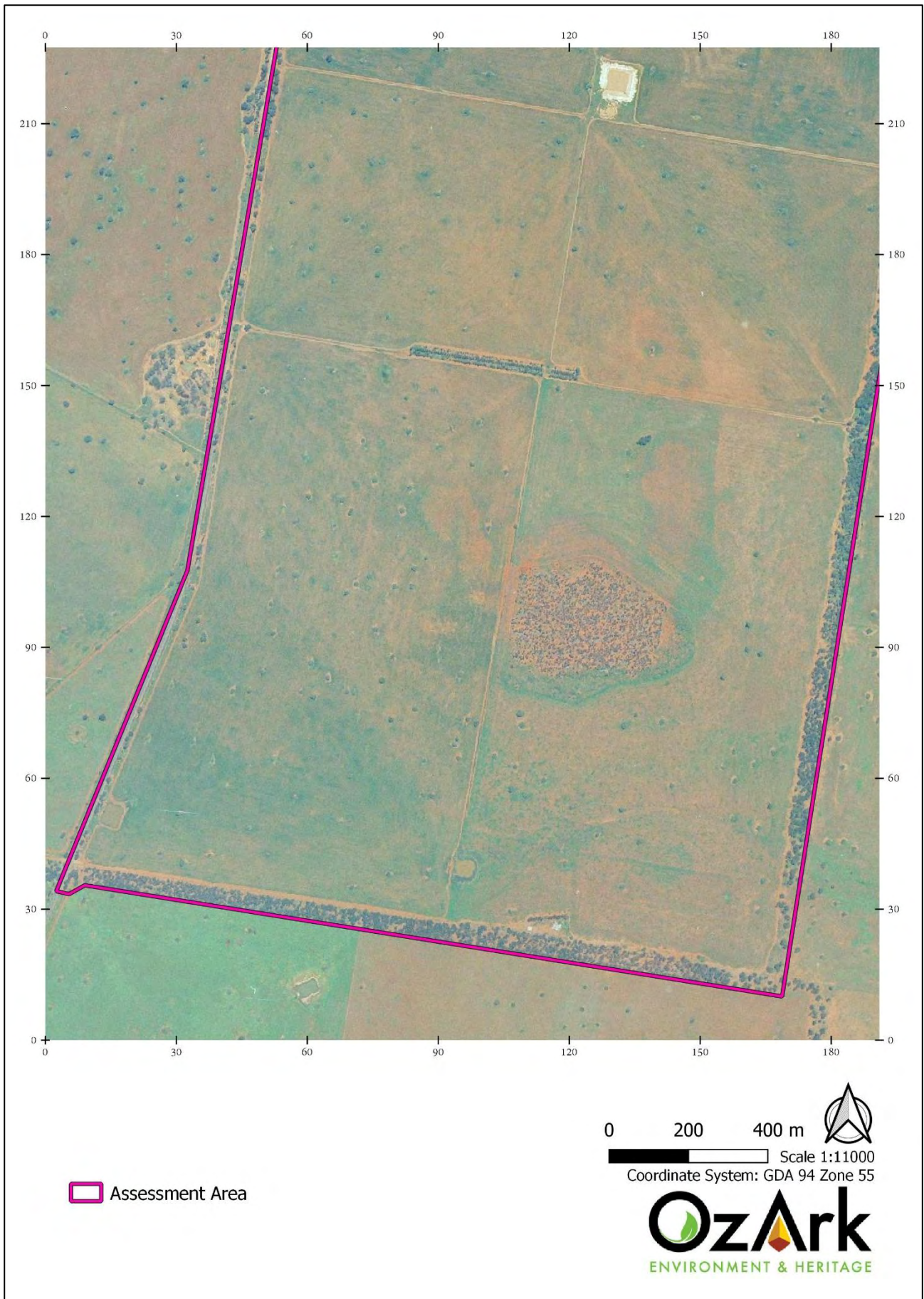


Figure 2-1. Aerial view of the subject land (south), 1995.

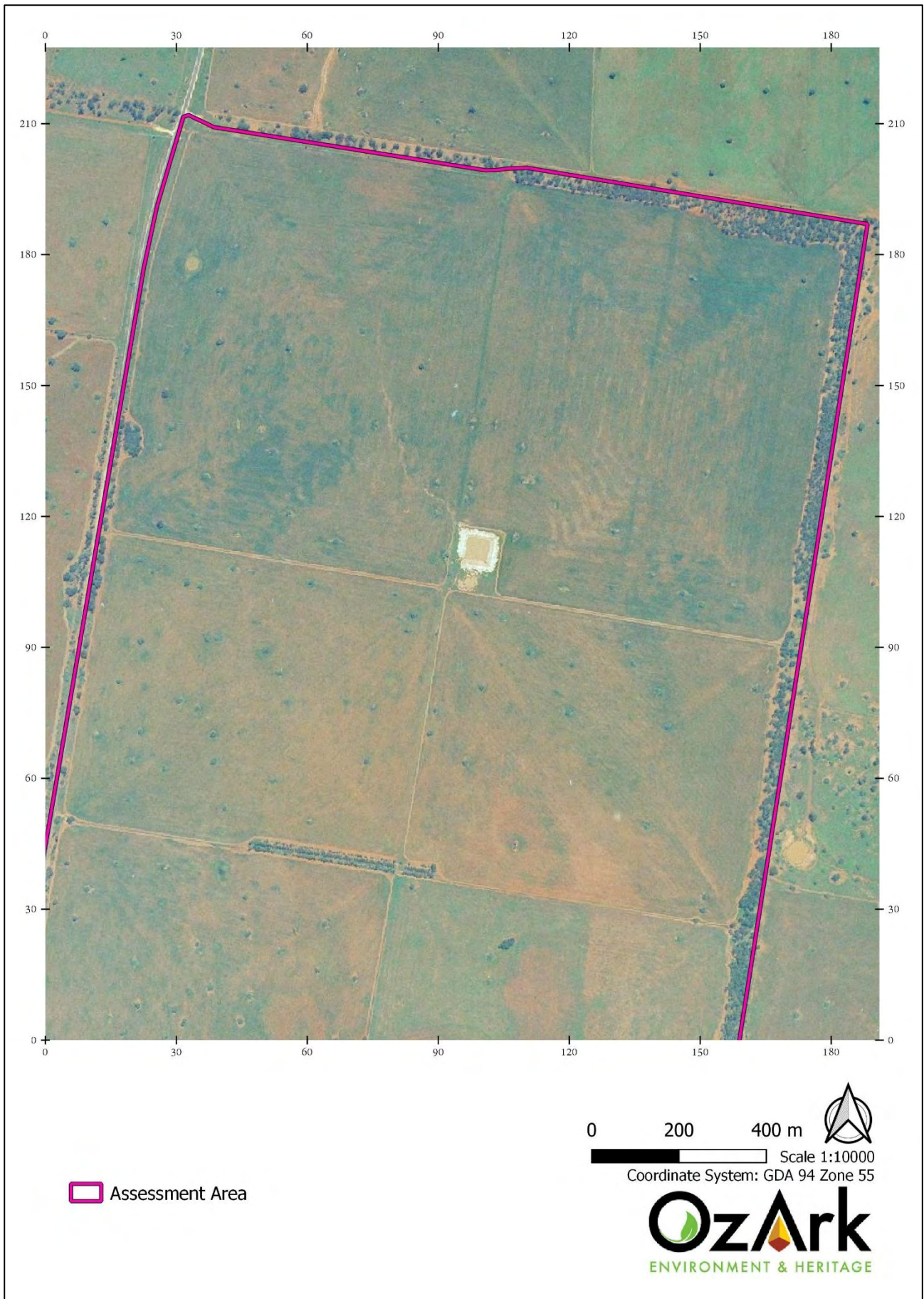


Figure 2-2. Aerial view of the subject land (north), 1995.

3 Methods

The ecological assessment was carried out in three stages:

1. Desktop searches and review of ecological databases and information to identify threatened species, populations or ecological communities listed in the BC Act, FM Act or the EPBC Act that have the potential to occur in the study area.
2. Field survey of the subject land to conduct BAM plots, identify vegetation communities and habitat features present and target predicted threatened species and ecological communities. Where a threatened species or community or habitat feature is identified, document the nature and extent of the protected matter, and describe its 'viable local population' or occurrence.
3. Preparation of a biodiversity chapter, for the overarching Scoping Report, that describes the impacts of the proposed activity on native vegetation and threatened species, populations and ecological communities, and provides recommendations to avoid, minimise and mitigate these impacts. This chapter also includes a biodiversity credit summary that identifies the number of ecosystem credits and species credits required to offset the development.

3.1 Personnel

OzArk Environment & Heritage Pty Ltd (OzArk) operates under NSW Scientific Research License 101908, and NSW Department of Primary Industries (DPI) Accreditation of a corporation as an animal research establishment Ref No. AW2022/012. The role and key details of personnel involved in the project are provided in **Table 3-1**.

Table 3-1. Summary of OzArk personnel qualifications and roles in the assessment.

Name	Position	Role	CV Details
Dr David Orchard	Ecologist	Vegetation integrity plots (BAM plots), vegetation mapping, preliminary BAM-C calculations, reporting	<ul style="list-style-type: none"> • Accredited BAM assessor – Accreditation #BAAS21028 • Doctor of Philosophy – Charles Sturt University • Graduate Diploma in Science (Botany) – University of New England • Bachelor of Arts – Australian National University • First aid training • WH&S Induction Training for Construction Work
Dr Crystal Graham	Senior Ecologist	Quality control, technical review	<ul style="list-style-type: none"> • Accredited BAM assessor – Accreditation #BAAS22024 • Postdoctoral Fellow – Smithsonian Tropical Research Institute • Doctor of Philosophy – Biology – University of Sydney • Honours 1 – Biology – University of Sydney • Bachelor of Advanced Science – University of Sydney • 4WD Training • WH&S Induction Training for Construction Work

			<ul style="list-style-type: none"> • BAM training 2021
Lucca Brozler	Ecologist	Fieldwork, including assisting with BAM plots	<ul style="list-style-type: none"> • Masters in Conservation Biology – The University of Queensland • Bachelor of Biological Science – The University of Queensland • WH&S Induction Training for Construction Work

3.2 Desktop review

Existing information sources were reviewed to contextualise the study area, identify entities for targeted surveys, predict possible constraints, refine field survey methodology and assist with assessing the impacts of the proposal. Information sources consulted included:

- NSW Government Web Map Service (WMS) layers for NSW Imagery (compiled imagery, NSW Property, NSW Base Map and NSW Topographic Map) (<http://spatialservices.finance.nsw.gov.au>).
- EPBC Protected Matters Search Tool (<https://www.environment.gov.au/epbc/protected-matters-search-tool>)
- NSW DPI threatened fish indicative distribution maps (www.dpi.nsw.gov.au/fishing/species-protection/threatened-species-distributions-in-nsw/freshwater-threatened-species-distribution-maps)
- NSW BioNet Wildlife Atlas Vegetation classification (<https://www.environment.nsw.gov.au/research/Visclassification.htm>)
- NSW BioNet Threatened Biodiversity Data Collection (www.bionet.nsw.gov.au/)
- NSW BioNet Atlas (www.bionet.nsw.gov.au/)
- Register of Declared Areas of Outstanding Biodiversity Value (www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/about-threatened-species/critical-habitats)
- PlantNET, NSW Flora Online (www.plantnet.rbgsyd.nsw.gov.au/)
- Department of Environment and Planning *Biodiversity Values Map* (<https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap>)
- Mapping of Vulnerable Lands – Steep and Highly Erodible (NSW Office of Environment and Heritage, 2011)
- Acid Sulphate Soils Risk mapping (NSW Office of Environment and Heritage, 1998)
- Directory of Important Wetlands of Australia (DIWA) (<https://www.environment.gov.au/water/wetlands/australian-wetlands-database/directory-important-wetlands>)
- NSW wetlands mapping (NSW Office of Environment and Heritage, 2010)

- Important area mapping for Regent Honeyeater and draft important area mapping for Swift Parrot available from the Biodiversity Offsets and Agreement Management System (BOAMs).

All databases were searched prior to conducting initial fieldwork in October 2022 and reviewed (and updated where applicable) in November 2022 prior to final submission.

Results of the database searches are provided in **Appendix A**.

3.3 Field survey

3.3.1 *BAM survey methodology*

Vegetation communities are identified in accordance with the online NSW Master Plant Community Type Classification (OEH, 2018b), which is the current state-wide vegetation classification system for Plant Community Types (PCTs). This classification system is used for vegetation mapping, development assessment and site planning purposes. It describes over 1,500 PCTs across the state, and groups the vegetation communities into vegetation Class and Formation / Sub-formation as per Keith (2004).

In this study, PCTs were identified on the basis of the following inputs:

- Professional ecological knowledge about locally occurring vegetation types and landscape, soil and topographic patterns, including transitions from one community to another and potential for intergrades between plant communities.
- Field survey results to confirm the flora species present, vegetation structure, landscape position and soil type on the subject land and the extent and condition of native vegetation.
- The BioNet Vegetation Classification database, this being used to identify the candidate vegetation communities likely to be present based on the site conditions (flora species present, vegetation structure, bioregion, and landscape position and soil type) and the relevant published PCT descriptions.

If any of the PCTs were identified as having potential to be part of a Threatened Ecological Community (TEC), the relevant identification guidelines (NSW Scientific Committee listing criteria and Commonwealth identification guides) were consulted to determine the status of the vegetation community present. These guidelines provide the identification criteria used to positively identify the community as being part of the TEC. The criteria include location, species present, overstorey species, weed cover, number and type of native species including whether certain 'important' native species are present.

Plant identification followed nomenclature in the Royal Botanic Gardens PlantNet online database (Royal Botanic Gardens and Domain Trust, 2022).

In total, thirteen BAM plots were completed between 27 and 28 October 2022 (see **Figure 5-1**).

The plot locations were randomly selected whilst ensuring adequate survey effort within each vegetation zone (

Table 3-2). Note that, if the impacts of the final proposal are larger than anticipated, additional plots may be required.

Table 3-2. Minimum number of plots and transects required per zone area (DPIE, 2020a).

Vegetation zone area (ha)	Minimum number of plots/transects
<2	1 plot/transect
>2 – 5	2 plots/transects
>5 – 20	3 plots/transects
>20 – 50	4 plots/transects
>50 – 100	5 plots/transects
>100 – 250	6 plots/transects
>250 – 1000	7 plots/transects; more plots may be needed if the condition of the vegetation is variable across the zone
>1000	8 plots/transects; more plots may be needed if the condition of the vegetation is variable across the zone

Plots were surveyed according to the BAM (2020) as follows:

- The survey plots consisted of nested 20 m × 50 m and 20 m × 20 m plots
 - Where conditions did not allow for the use of plots of this size, alternative plot sizes were used. For example, roadside plots were reduced in width to 10 m × 50 m.
- Species composition and structure (species and percent cover) data collected from within 20 m × 20 m (or 10 m × 40 m where necessary) plot.
- Vegetation function data (size and number of trees, presence of hollow-bearing trees and woody debris) collected from within the full plot.
- Percent of litter cover data collected within five 1 m × 1 m squares positioned at 5 m, 15 m, 25 m, 35 m and 45 m points of the 50 m plot.
- The plots were positioned within the subject land and their GPS locations were recorded (GDA 94 / MGA Zone 55).

The remainder of the subject land was traversed by foot or by vehicle to confirm the nature of vegetation (i.e. native or non-native) and search for habitat features such as hollow bearing trees, rock outcrops, and nests.

3.3.2 Incidental surveys

Incidental flora and fauna sightings were recorded while undertaking the BAM plots and searching the subject land for hollow-bearing trees and other potential habitat features. Potential habitat such as rock, loose bark and coarse woody debris was recorded and examined for signs of cryptic species. Tracks and other areas of suitable substrate were searched for animal tracks. Other evidence of fauna presence on the subject land, such as scats, feathers and sloughed skins were also recorded.

3.4 Limitations

This study is based upon the species data available at the time of the study, and the environmental conditions, season, and time constraints imposed by the project for the field survey. Specific limitations on this study include the following:

- The survey was undertaken in late October, during which time certain flora and fauna species may have been absent, difficult to detect, or difficult to identify.
- Formal targeted surveys for relevant species credit species have not been undertaken.

The above-mentioned constraints were also considered when preparing the recommendations of avoiding, minimising and mitigating potential impacts.

4 Landscape Features

4.1 Overview

A series of background searches were performed to comply with legal standards (**Table 4-1**).

Table 4-1. Environmental protection areas within the study area.

Environmental Protection Areas	Presence in the Study Area
Land identified on the Biodiversity Values Map under the <i>NSW BC Act 2016</i>	No (Appendix A).
Area of Outstanding Biodiversity Value (AOBV) under the <i>NSW BC Act 2016</i>	No.
Watercourse mapped as Key Fish Habitat (KFH) and/or within the extent of an aquatic Endangered Ecological Community, listed under the <i>Fisheries Management Act 1994</i> .	No.
An area reserved or dedicated under the <i>National Parks and Wildlife Act 1974</i> or <i>Wilderness Act 1987</i> .	No.
Is the proposal located within land reserved or dedicated within the meaning of the <i>Crown Lands Act 1989</i> for preservation of other environmental protection purposes.	No.
A World Heritage Area.	No.
Environmental Protection Zones in environmental planning instruments.	Yes. Terrestrial biodiversity mapping, Narromine LEP 2011.
Lands protected under the <i>State Environmental Planning Policy (Biodiversity and Conservation) 2021</i>	Yes. All lands zoned RU1, RU2, or RU3 within the Narromine LGA are protected under Chapter 3 of the SEPP. The subject land is zoned RU1.
Aquatic reserves dedicated under the <i>Fisheries Management Act 1994</i> .	No.
Wetland areas dedicated under the Ramsar Wetlands Convention.	No.
Land subject to a conservation agreement under the <i>National Parks and Wildlife Act 1974</i> .	No.
Land identified as State Forest under the <i>Forestry Act 1916</i> .	No.
Acid sulphate area.	No.

4.2 Bioregion

The study area is situated in the Pilliga subregion of the Brigalow Belt South Bioregion, as per the Interim Biogeographic Regionalisation of Australia (IBRA) (Thackway & Cresswell, 1995). The 10 km search area also extends into the Bogan-Macquarie subregion of the Darling Riverine Plains Bioregion. These subregions are characterised by geology, landforms, soil types and vegetation as described in **Table 4-2** and **Table 4-3**.

Table 4-2. Description of the Pilliga IBRA subregion (NSW NPWS 2003).

Bioregion	Brigalow Belt South
Subregion	Pilliga
Geology	Horizontal Jurassic quartz sandstones, limited shales, Tertiary basalt caps and plugs plus the sediments derived from these rocks.
Landforms	Stepped sandstone ridges with low cliff faces and high proportion of rock outcrop. Long gentle outwash slopes intersected by sandy stream beds and prior stream channels. A few patches of heavy clay. Includes the spectacular mountain landscape of volcanic domes, plugs and dykes in the Warrumbungles.
Soils	Shallow black earths and red loams on basalts. Extensive harsh texture contrast soils, linear patterns of deep yellow sand, stony red brown earths.
Vegetation	White Box with White Cypress-pine and Kurrajong on the basalt hills. Blue-leaved Ironbark, White Gum, Black Cypress-pine, Whitewood, and Rough-barked Apple on stony sandstone plateau and streams. Narrow-leaved Ironbark, White Cypress-pine, Red Stringybark, patches of mallee and broom heath on gentler sandstone slopes. Pilliga Box with Grey Box, Poplar Box, Fuzzy Box, Bulloak, Rosewood, Wilga, and Budda on heavier soils in the west and north. River Red Gum lines all streams.

Table 4-3. Description of the Bogan-Macquarie IBRA subregion (NSW NPWS 2003).

Bioregion	Darling Riverine Plains
Subregion	Bogan-Macquarie
Geology	Bogan and Macquarie River alluvial fans of Quaternary age. Western margin is bedrock of the Cobar bioregion. Alluvial sediments from mixed Palaeozoic bedrock bury basement rock to 100 m. Underlying sediments of Cretaceous and Jurassic age form part of the Great Artesian Basin.
Landforms	Channels, floodplains, and through-flow swamps of past and present river systems.
Soils	Grey and brown clays on the plains and depressions with texture contrast soils on the low rises of former levees and channels.
Vegetation	River Red Gum and River Cooba on the channels. White Cypress-pine and Poplar Box on coarser levees. Black Box, Belah, Myall and Lignum on floodplains. Complex patterns of Common Reed, Cumbungi, and Water Couch depending on water levels in marshes. Poplar Box woodland with Wilga, Budda, White Cypress-pine, Grey Box, Yellow Box, and Blakely's Red Gum on red soils on fan margins.

4.3 NSW (Mitchell) Landscapes

Landscapes with relatively homogenous geomorphology, soils and broad vegetation types in NSW have been classified and mapped at a 1:250, 000 scale. These landscapes are referred to as NSW (or Mitchell) Landscapes (Mitchell, 2002).

The subject land spans the Goonoo Slopes and Macquarie Alluvial Plains landscapes (**Figure 4-1**). The characteristics of these landscapes are described below.

Goonoo Slopes

Extensive undulating to stepped low hills with long slopes on sub-horizontal Triassic/Jurassic quartz sandstone, conglomerates, siltstone, shale and some coal. General elevation 300 to 500 m with

overall westerly slope, poorly defined drainage network, local relief to 30 m. Stony yellow earths with sandstone outcrop on ridgelines to yellow harsh texture-contrast soils in shallow valleys.

Red Ironbark (*Eucalyptus fibrosa*) and Black Cypress-pine (*Callitris endlicheri*) on ridges, Red Ironbark, Narrow-leaved Ironbark (*Eucalyptus crebra*), Mugga Ironbark (*Eucalyptus sideroxylon*), Common Fringe-myrtle (*Calytrix tetragona*), Spur-wing Wattle (*Acacia triptera*), Club-leaved Phebalium (*Phebalium obcordatum*), Daphne Heath (*Brachyloma daphnoides*) on slopes with patches of Green Mallee (*Eucalyptus viridis*), Dwyer's Red Gum (*Eucalyptus dwyeri*) and Broombush (*Melaleuca uncinata*). Grey Box (*Eucalyptus microcarpa*), Mugga Ironbark, Red Stringybark (*Eucalyptus macrorhyncha*), Fuzzy Box (*Eucalyptus conica*) and Blakely's Red Gum (*Eucalyptus blakelyi*) with Knob Sedge (*Carex inversa*), and Tall Sedge (*Carex appressa*) along streams.

Clearing status: Not overcleared (66% cleared).

Macquarie Alluvial Plains

Holocene fluvial sediments of backplain facies of the Marra Creek Formation associated with the Macquarie River main alluvial fan and distributary stream system, relief 1 to 3 m. Dark yellow-brown silty clay with patches of sand and carbonate nodules deposited from suspended sediments in floodwater, often with gilgai. Slightly elevated areas with red-brown texture-contrast soils.

Open grasslands with scattered Coolibah (*Eucalyptus coolabah*), Black Box (*Eucalyptus largiflorens*), River Cooba (*Acacia stenophylla*), Bimble Box (*Eucalyptus populnea*), Belah (*Casuarina cristata*), Lignum (*Duma florulenta*) and Myall (*Acacia pendula*).

Clearing status: Overcleared (78% cleared).

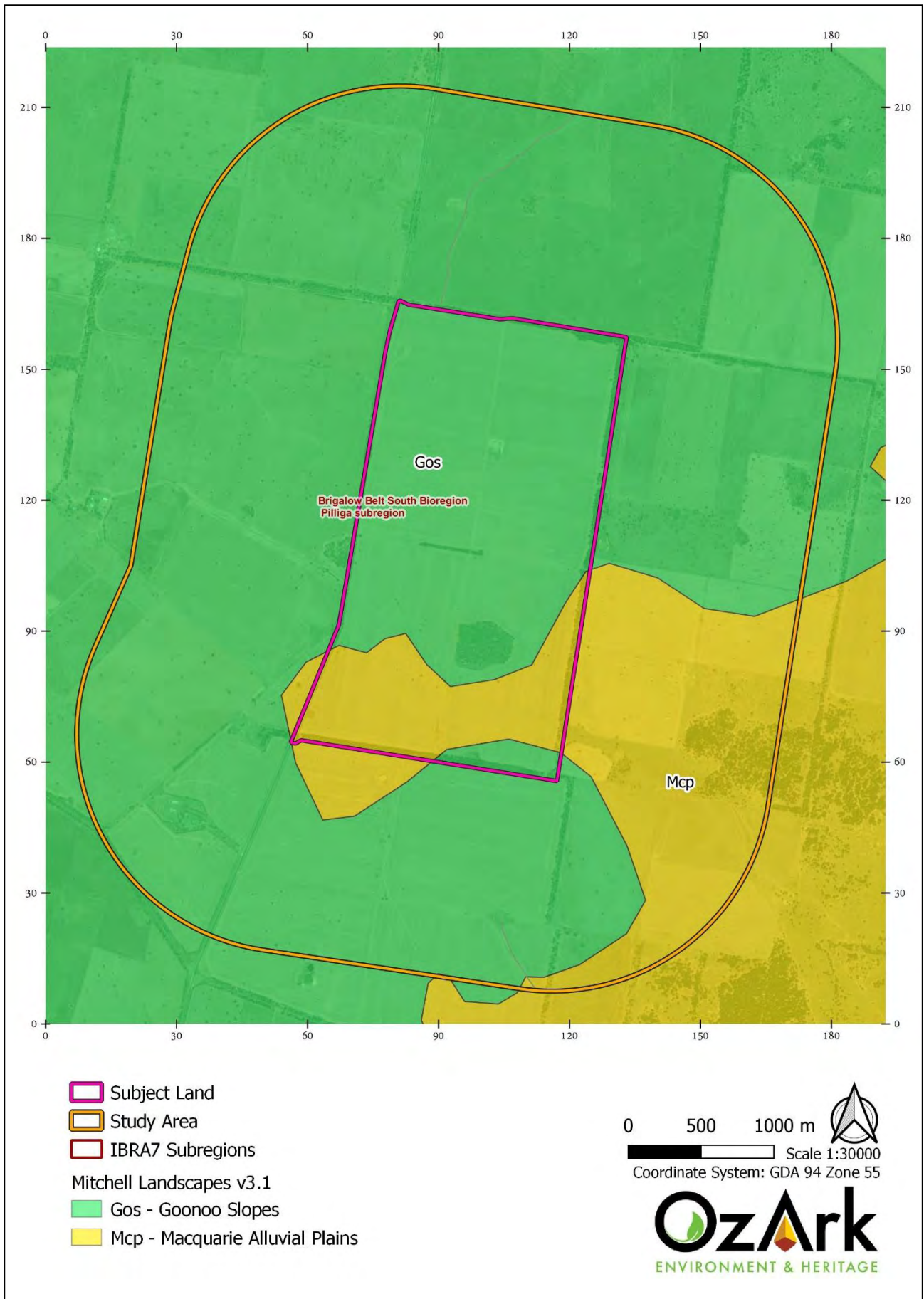


Figure 4-1. IBRA subregions and NSW (Mitchell) Landscapes within the subject land.

4.4 Geology, Cave, Karst and Soil Features

The underlying geology and soil typical of the wider study area are described in **Sections 4-2** and **4-3**. The subject land lacks significant geological features. No rock outcrops, areas of embedded rock, or substantial areas of loose surface rock were noted during the assessment.

4.5 Climate and Weather Data

The closest weather station to the subject land to provide current rainfall and temperature data is Dubbo Airport Automatic Weather Station (Station ID 065070) approximately 24 km south of the subject land (Bureau of Meteorology [BOM], 2022).

The study area generally experiences warm to hot summers, with the highest mean maximum temperature of 33.6°C experienced in January. Winters are mild, with temperatures in the coldest month (July) ranging from a mean minimum of 3.0°C to a mean maximum of 15.7°C (BOM, 2022; **Figure 4-2**).

The field assessment was conducted on October 27 and 28, 2022. Weather conditions at the time of the survey were mild, reaching a maximum of 23.7°C, with 2.0 mm of rain recorded at Dubbo Airport during this time.

An average of 569.6 mm of rainfall is recorded annually at Dubbo Airport. Rainfall is generally summer led, with the five wettest months being October to January and March (BOM, 2022). In the period prior to and during the field survey, the region experienced rainfall well above the monthly average for three consecutive months (August-October 2022). Total rainfall for this period was 412.8 mm, against an average of 132.1 mm (**Figure 4-2**).

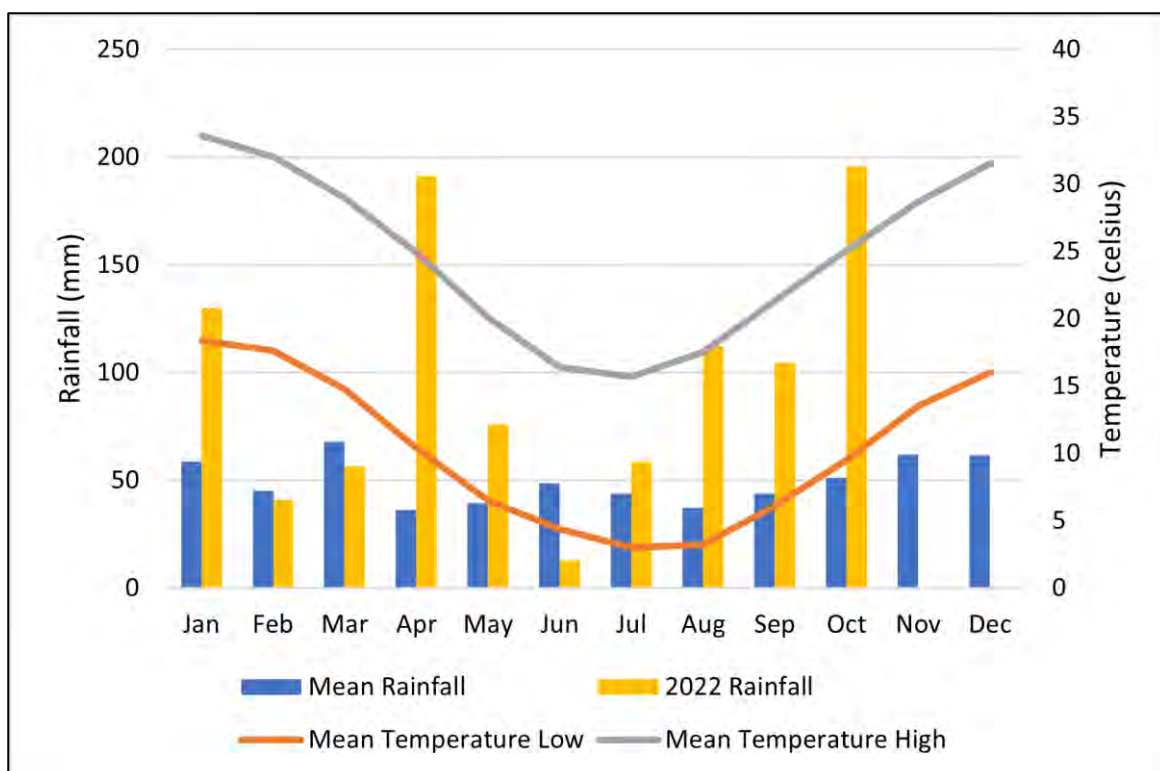


Figure 4-2. Climate data for Dubbo Airport (Station ID 065070).

4.6 Biodiversity Values Map

The Biodiversity Values Map (BV Map) identifies land with high biodiversity value, as defined by the BCR 2017. Impacts to areas included on the BV Map will trigger entry into the NSW BOS and the requirement to prepare a BDAR.

The subject land does not contain any areas mapped on the BV Map (**Appendix A**).

4.7 Areas of Outstanding Biodiversity Value

The site does not contain any currently listed Areas of Outstanding Biodiversity Value (AOBV).

4.8 SEPP (Biodiversity and Conservation) 2021

The subject land is zoned RU1 within the Narromine LGA; consequently, Chapter 3 of the SEPP applies. No Koala Plan of Management exists for this region. The subject land possesses at least three known Koala food trees – Blakely's Red Gum (*Eucalyptus blakelyi*), Fuzzy Box (*Eucalyptus conica*), and Grey Box (*Eucalyptus microcarpa*). There are no records of the species within 10 km. For these reasons, use of the subject land by Koalas is likely to be limited and the subject land is unlikely to constitute core Koala habitat.

4.9 Native vegetation cover

Native vegetation cover (woody vegetation, including regrowth and plantations comprised of plants native to New South Wales and non-woody vegetation with no apparent signs of cultivation) was assessed within the study area and the subject land. Native cover was estimated as the proportion of the study area retaining native vegetation. A summary of the vegetation cover estimate is provided in **Table 4-4**. For the purposes of the BAM, the native vegetation cover class has been determined as <10%.

Table 4-4. Native vegetation cover estimates in the study area.

Vegetation Cover Type	Description	Cover Within Study Area (ha)	Total area of Study Area (ha)	Native Cover within Study Area (%)
Native vegetation	Remnant woodland and both natural and derived grassland.	244.30	2596.70	9.41

4.10 Rivers, Streams, Wetlands and Key Fish Habitat

No watercourses are mapped as occurring on the subject land. Three watercourses occur within the study area (**Figure 4-3**). All are Strahler 1st order minor, non-perennial streams. No streams mapped as Key Fish Habitat by the Department of Primary Industries – Fisheries occur within the study area.

Artificial dams occur within the subject land. These were not observed to possess native flanking vegetation and are likely to offer only limited wetland habitat.

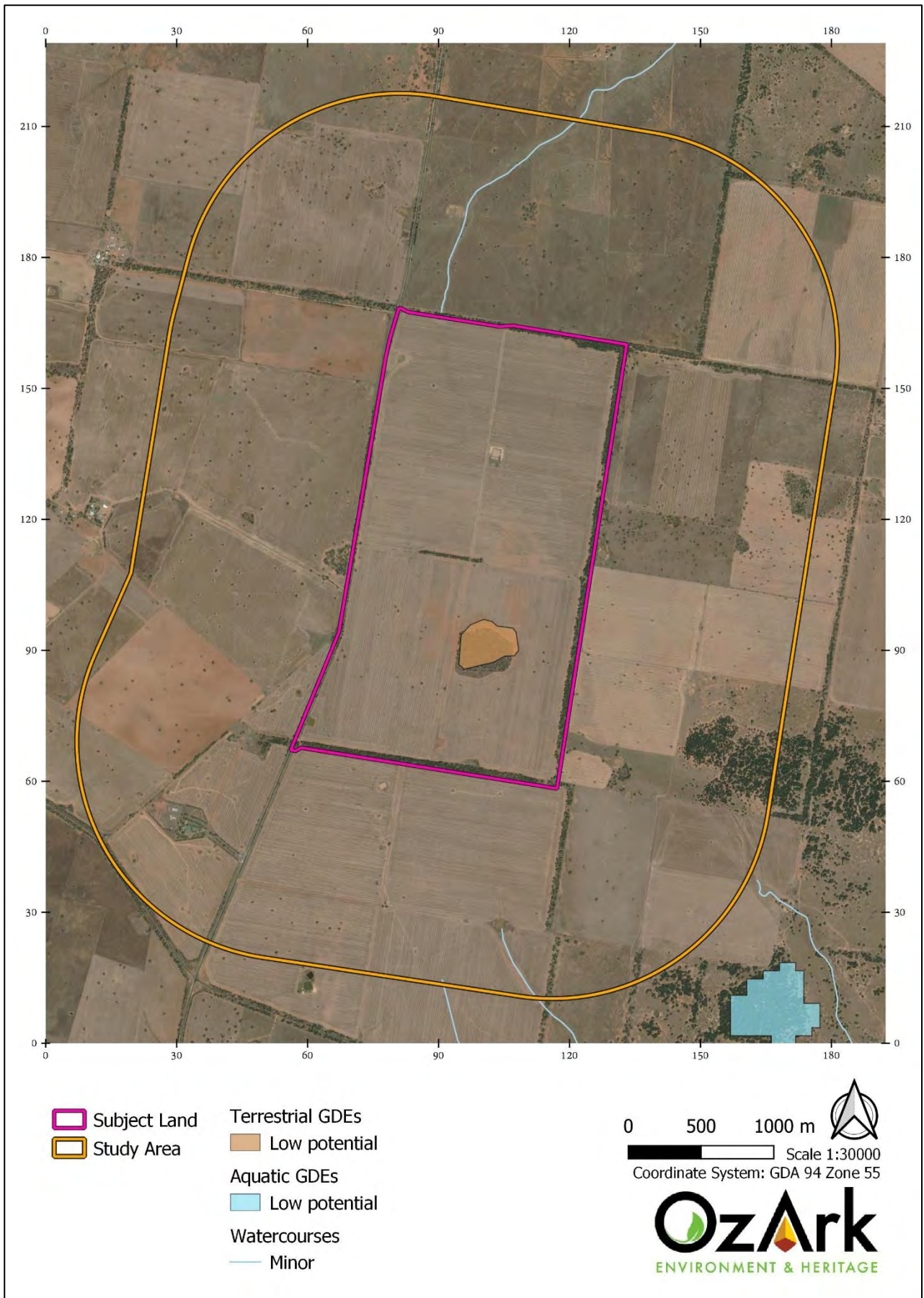


Figure 4-3. Watercourses and groundwater-dependent ecosystems (GDEs) within the study area.

4.11 Groundwater Dependent Ecosystems

Groundwater plays an important ecological role in directly and indirectly supporting terrestrial and aquatic ecosystems. Groundwater sustains terrestrial and aquatic ecosystems by supporting vegetation and providing discharge to channels, lacustrine and palustrine wetlands, and both the estuarine and marine environment.

The degree of groundwater dependence of ecosystems can be categorised into three broad categories:

- Non-dependent ecosystems that occur mostly in recharge areas and have no connection with groundwater
- Facultative GDEs that require groundwater in some locations but not in others, particularly where an alternative source of water can be accessed to maintain ecological function. Minor changes to the groundwater regime in facultative GDEs with proportional or opportunistic groundwater dependence may not have any adverse impacts but these ecosystems can be damaged or destroyed if a lack of access to groundwater is prolonged
- Obligate GDEs that are restricted to locations of groundwater discharge and ecosystems located within aquifers (e.g. subterranean cave and stygofauna communities (Kuginis *et al.* 2012). Aquifer ecosystems are inherently groundwater dependent.

Groundwater dependent ecosystems have been classified into seven types under two broad categories as follows (Kuginis *et al.* 2012):

- Subsurface ecosystems – Underground ecosystems
- Karst systems and caves (limestone geology)
- Subsurface aquifer (phreatic) ecosystems
- Baseflow streams (hyporheic or subsurface component)
- Surface ecosystems – Above ground ecosystems
- Groundwater dependent wetlands
- Baseflow surface streams (surface/free-water component)
- Estuarine and near shore marine ecosystems
- Groundwater dependent terrestrial ecosystems; dependent on subsurface groundwater (phreatophytic).

The Bureau of Meteorology Atlas of Groundwater Dependent Ecosystems identifies a single low-potential terrestrial GDE within the subject land (**Figure 4-3**; BOM, 2017). No moderate- or high-potential GDEs are predicted to occur within the site.

The proposal does not include the extraction of groundwater; however, contamination from construction operations could impact on the quality of groundwater if adequate mitigation measures are not taken.

4.12 Connectivity Features

Vegetation corridors surrounding the subject land form part of a network of similar linear remnants that together provide connectivity across the landscape. This connectivity appears to extend to nearby waterways and to larger woodland remnants, including the Goonoo forests. Linear remnants such as those that border the subject land are likely to be extremely important for the movement of nomadic species and for maintaining gene flow in the local landscape.

Only two woodland areas (one remnant, one planted) occur inside the boundaries of the relevant lot, along with a small number of isolated paddock trees or shrubs. These are separated from the surrounding corridors by distances exceeding 300 m and are unlikely to contribute significantly to local connectivity.

5 Ecological Assessment Results

5.1 Plant Community Types

Plant Community Types (PCTs) are the basic units of vegetation mapping in New South Wales. A primary objective of the field survey was to identify the PCTs present within the subject land and to map the boundaries of each community. Vegetation within the subject land was found to consist largely of non-native crops, with remnants of native vegetation confined to one large natural patch, one planted shelter belt, a small number of isolated trees, and the surrounding road corridor and fenced remnants. Remnant vegetation was observed to belong to the following four PCTs:

- 55 - Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions.
- 82 - Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Penneplain Bioregion.
- 88 - Pilliga Box - White Cypress Pine - Buloke shrubby woodland in the Brigalow Belt South Bioregion.
- 202 - Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion

In keeping with the requirements of the BAM, PCTs were further stratified into vegetation zones based on observed condition. Most PCTs occurred in only one condition state; however, PCT 55 varied more substantially in condition and composition, with four distinct condition states being recognised:

- Good: A high to very high-quality woodland possessing a dense canopy cover, mature trees, and a diverse native understorey.
- Moderate: A moderate- to high-quality woodland with a sparser canopy and exhibiting clearer signs of historical disturbance.
- Derived: A grassland community in which Belah (*Casuarina cristata*) is thought to have formerly been dominant but now occurs only as scattered trees.
- Planted: A planted community containing a mixture of canopy species, including Belah, and retaining a native understorey.

A description of each PCT as it occurs within the boundaries of the subject land is given in **Table 5-1**. The area of each PCT mapped within the assessed area is also given in **Table 5-1**. PCTs are mapped in **Figure 5-1**.

In total, thirteen Vegetation Integrity Plots (i.e., BAM plots) were conducted during the site assessment. The locations of these plots are given in **Figure 5-1**. Additional plot details, including photographs, are given in **Appendix B**.

Table 5-1. Plant Community Types (PCTs) within the subject land

PCT	Condition State	Vegetation Zone	Description	Area ¹	Plots	Location
55	Good	55_Good	<ul style="list-style-type: none"> A tall closed woodland community in which Belah (<i>Casuarina cristata</i>) is the dominant canopy species, with localised occurrences of Grey Box (<i>Eucalyptus microcarpa</i>), Pilliga Box (<i>Eucalyptus pilligaensis</i>), and Poplar Box (<i>Eucalyptus populnea</i> subsp. <i>bimbil</i>). The tall shrub Wilga (<i>Geijera parviflora</i>) is common, as are the smaller chenopod shrubs Spiny Saltbush (<i>Rhagodia spinescens</i>) and Black Rolypoly (<i>Sclerolaena muricata</i>). The understorey is composed of a mixture of small shrubs, forbs, grasses, and sedges. Native plant species diversity is high (average 29.5 native species per 0.04 ha floristic plot). 	21.72 ha	BU06 BU11	Accounts for most of the vegetation in remnant corridors to the north, east, and south of the lot.
55	Moderate	55_Moderate	<ul style="list-style-type: none"> A tall woodland community in which Belah (<i>Casuarina cristata</i>) is the dominant canopy species, with localised occurrences of Pilliga Box (<i>Eucalyptus pilligaensis</i>), and Poplar Box (<i>Eucalyptus populnea</i> subsp. <i>bimbil</i>). White Cypress-pine (<i>Callitris glaucophylla</i>) and Kurrajong (<i>Brachychiton populneus</i>) occur where the community grades into PCTs 82 or 88. Canopy cover is moderately dense but interrupted by treeless patches. The tall shrub Wilga (<i>Geijera parviflora</i>) is present but typically less abundant than in 55_Good. Small shrubs are present, the most common of which are Western Boobialla (<i>Myoporum montanum</i>) and the low-growing species Grey Copperburr (<i>Sclerolaena diacantha</i>). The understorey is dominated by grasses, most notably Plump Windmill Grass (<i>Chloris ventricosa</i>), speargrasses (<i>Austrostipa</i> spp.), and wallaby grasses (<i>Rytidosperma</i> spp.). Native plant species diversity is moderately high (19 native species per 0.04 ha floristic plot). 	2.26 ha	BU08	Excepting a single paddock tree, confined to the roadside corridor, where it grades into PCTs 82 and 88.
55	Derived	55_Derived	<ul style="list-style-type: none"> A grassland community with sparse remnant or regrowth individuals of Belah (<i>Casuarina cristata</i>). 	2.38 ha	BU07	Confined to the roadside corridor, most obviously at the northern and

			<ul style="list-style-type: none"> • Shrubs are generally scarce, with the exception of the low-growing chenopod shrub Grey Copperburr (<i>Sclerolaena diacantha</i>). • The understorey is dominated by grasses – e.g. Plump Windmill Grass (<i>Chloris ventricosa</i>) and Speargrasses (<i>Austrostipa scabra</i>) – with a range of forbs, rushes, and sedges. • Native plant species diversity is moderately high (21 native species per 0.04 ha floristic plot). 			southern extents of the property.
55	Planted	55_Planted	<ul style="list-style-type: none"> • A planted shelterbelt with a remnant native understorey, in which the canopy includes a range of <i>Eucalyptus</i> species, together with Belah (<i>Casuarina cristata</i>) and Kurrajong (<i>Brachychiton populneus</i>). • Shrubs are generally scarce. Minor occurrences of Wilga (<i>Geijera parviflora</i>), Western Boobialla (<i>Myoporum montanum</i>), and the chenopod shrubs Spiny Saltbush (<i>Rhagodia spinescens</i>), Ruby Saltbush (<i>Enchylaena tomentosa</i>), Black Rolypoly (<i>Sclerolaena muricata</i>), Galvanized Burr (<i>Sclerolaena birchii</i>), and Small-leaf Bluebush (<i>Maireana microphylla</i>) were noted. • The understorey is dominated by grasses – e.g. Plump Windmill Grass (<i>Chloris ventricosa</i>) and Speargrasses (<i>Austrostipa scabra</i>) – with a range of forbs, rushes, and sedges. • Weeds are common, particularly exotic grasses (e.g. <i>Lolium rigidum</i> and <i>Hordeum</i> sp.) • Native plant species diversity remains moderately high (25 native species per 0.04 ha floristic plot). 	1.20 ha	BU04	Confined to a single shelterbelt in the middle of the lot.
82	Moderate	82_Moderate	<ul style="list-style-type: none"> • An open woodland community in which Poplar Box (<i>Eucalyptus populnea</i> subsp. <i>bimbi</i>) and White Cypress-pine (<i>Callitris glaucophylla</i>) dominate. • A moderately dense tall shrub layer is present, dominated by Wilga (<i>Geijera parviflora</i>). • Common smaller shrubs include Western Boobialla (<i>Myoporum montanum</i>), Sticky Hop-bush (<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>), Spiny Saltbush (<i>Rhagodia spinescens</i>), Butterbush (<i>Pittosporum angustifolium</i>), and Grey Copperburr (<i>Sclerolaena diacantha</i>). 	0.40 ha	BU13	Confined to the roadside corridor, where it grades into PCTs 55 and 88.

			<ul style="list-style-type: none"> The zone possessed high cover and diversity of native grasses and forbs. Speargrasses (<i>Austrostipa</i> spp.), Burr-daisies (<i>Calotis</i> spp.), and Plump Windmill Grass (<i>Chloris ventricosa</i>) dominate the understorey. Native plant species diversity is high (37 native species per 0.04 ha floristic plot). 			
88	Good	88_Good	<ul style="list-style-type: none"> Woodland or open woodland in which Pilliga Box (<i>Eucalyptus pilligaensis</i>) is the dominant tree, with minor occurrences of Belah (<i>Casuarina cristata</i>) where the community grades into PCT 55. A patchy tall shrub layer is present, containing Wilga (<i>Geijera parviflora</i>) and sometimes Budda (<i>Eremophila mitchellii</i>) or Warrior Bush (<i>Apophyllum anomalum</i>). Small shrub cover and diversity is high, with the dominant species being the chenopods Grey Copperburr (<i>Sclerolaena diacantha</i>), Black Rolyoly (<i>Sclerolaena muricata</i>), Spiny Saltbush (<i>Rhagodia spinescens</i>), and Ruby Saltbush (<i>Enchylaena tomentosa</i>), and the non-chenopod shrub Western Boobialla (<i>Myoporum montanum</i>). Speargrasses (<i>Austrostipa</i> spp.) and small forbs dominate the understorey. Native plant species diversity is high (average 36 native species per 0.04 ha floristic plot). 	5.21 ha	BU05 BU10	Found in the road corridor and in remnant vegetation at the south-eastern boundary of the lot.
202	Good	202_Good	<ul style="list-style-type: none"> A woodland composed largely of relatively recent regrowth, in which Fuzzy Box (<i>Eucalyptus conica</i>) co-occurs with a large number of other tree species, including Blakely's Red Gum (<i>Eucalyptus blakelyi</i>), Dirty Gum (<i>Eucalyptus chloroclada</i>), Grey Box (<i>Eucalyptus microcarpa</i>), Pilliga Box (<i>Eucalyptus pilligaensis</i>), White Cypress-pine (<i>Callitris glaucophylla</i>), and Buloke (<i>Allocasuarina luehmannii</i>). This community includes plants that could not be assigned to Grey Box or Pilliga Box based on published keys and may represent intermediate forms or hybrids ("<i>Eucalyptus woollsiana</i>"). Red gums possessing ambiguous features were also noted. The dominant tree varies across the extent of the patch, with Fuzzy Box only a minor component of the canopy. The prevalence of relatively juvenile trees precluded identification of the dominant species in certain areas. The patch contains both shrubby and grassy sections. A dense tall shrub layer dominated by Wilga (<i>Geijera parviflora</i>) is present in some areas. The wattles 	10.30 ha	BU01 BU02 BU03	Occurs as a single large patch in the southern half of the lot. A small number of outlying isolated trees have been assigned to this PCT.

			<p><i>Acacia deanei</i> and <i>Acacia spectabilis</i> are common throughout, and localised patches of Cough Bush (<i>Cassinia laevis</i>) were also noted.</p> <ul style="list-style-type: none"> • Foxtail Speargrass (<i>Austrostipa densiflora</i>) is common throughout, with Mulga Grasses (<i>Thyridolepis</i> spp.), other speargrasses (<i>Austrostipa</i> spp.), and Purple Wiregrass (<i>Aristida ramosa</i>) locally common. • Native plant species diversity is relatively high (average 25.67 native species per 0.04 ha floristic plot). 			
0	Non-native	Non-native	<ul style="list-style-type: none"> • Areas in which native vegetation is absent or extremely scarce. This includes cleared tracks, dam surfaces, cropping paddocks, bare ground, and human-made structures. • Minor occurrences of short-lived native species were noted in some locations. Species included the Tall Annual Bluebell (<i>Wahlenbergia gracilentia</i>) and “weedy” species such as Common Cotula (<i>Cotula australis</i>) and Jersey Cudweed (<i>Pseudognaphalium luteoalbum</i>). The annual plant Hyssop Loosestrife (<i>Lythrum hyssopifolia</i>) occurs in wet depressions. • Total native cover varied from 0 to 0.2% in survey plots. • Includes many areas that appear on arials to contain remnant trees or shrubs. The field survey determined that few of these plants still remain. 	464.67	BU09 BU12	Accounts for the majority of the lot, with the exception of zones 202_Good and 55_Planted, isolated paddock trees, and the surrounding remnant corridors.

¹“Area” refers to extent within the full assessment area, not within the paddock. This includes roadsides and remnant woodland corridors.

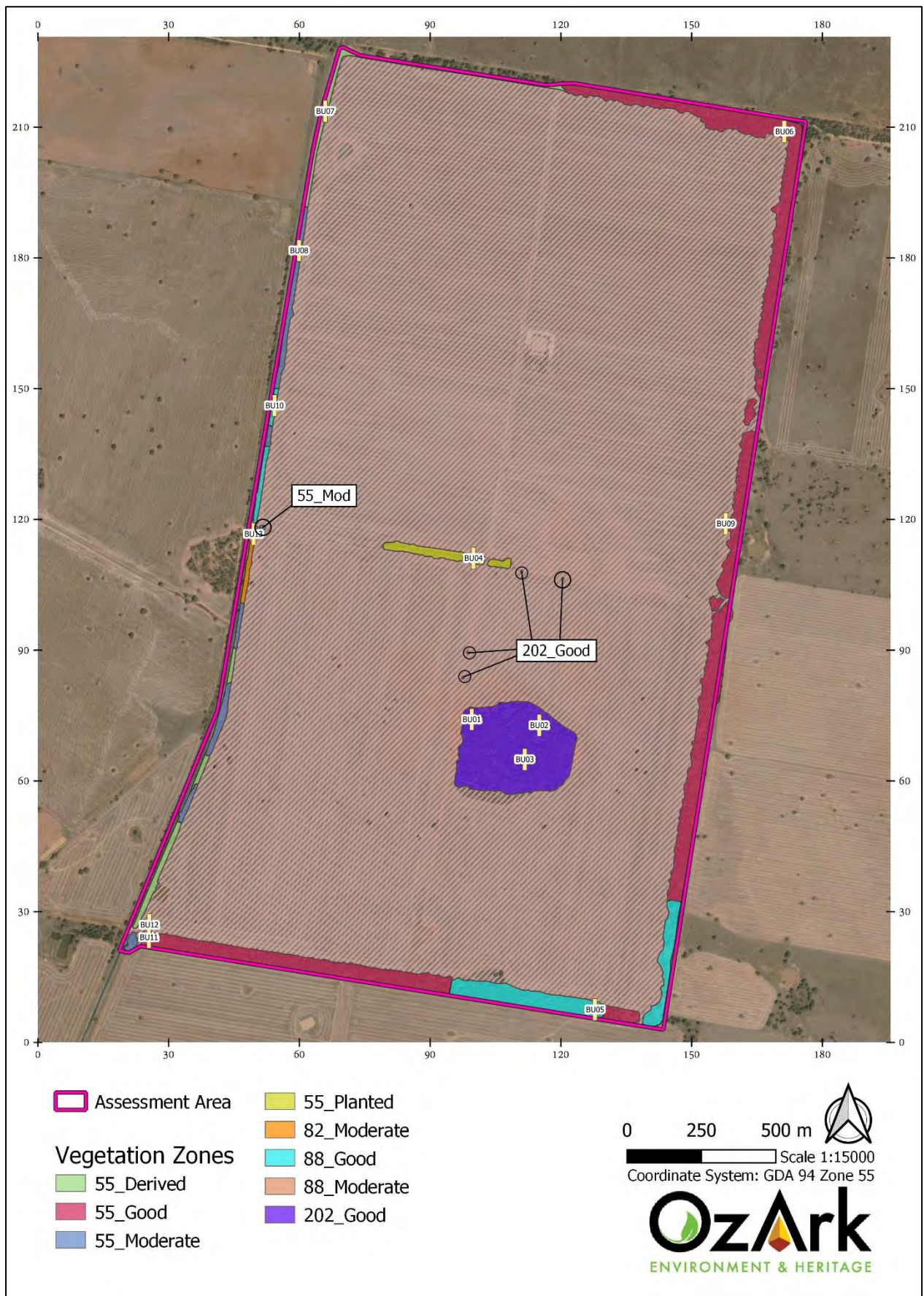


Figure 5-1. Vegetation Zones recorded within the subject land.

5.2 Flora Species Observed

The field survey identified a total of 180 flora species within the subject land (**Appendix C**). Of these, 130 species (72.22%) were native and 50 (27.88%) were exotic.

No threatened plant species were recorded during the field survey.

Six species listed as High Threat Exotic weeds (HTE) under the BAM were recorded within the subject land (**Table 5-2**). One of these species – African Boxthorn (*Lycium ferocissimum*) – is also listed as a statewide Priority Weed (PW) and as a Weed of National Significance (WoNS).

Table 5-2. Significant weeds recorded on the subject land.

Growth Form	Scientific Name	Common Name	HTE	PW	WoNS
SG	<i>Lycium ferocissimum</i>	African Boxthorn	Y	Y	Y
GG	<i>Bromus diandrus</i>	Great Brome	Y	N	N
GG	<i>Chloris gayana</i>	Rhodes Grass	Y	N	N
GG	<i>Cyperus eragrostis</i>	Umbrella Sedge	Y	N	N
GG	<i>Eragrostis curvula</i>	African Lovegrass	Y	N	N
FG	<i>Carthamus lanatus</i>	Saffron Thistle	Y	N	N

Plot data, plot photographs and a list of all flora species observed during the field assessment are provided in **Appendices B and C**.

5.3 Fauna Species Observed

The field survey identified a total of 25 fauna species within the subject land (**Appendix C**), comprising 18 birds, three mammals, two reptiles, and one amphibian. Of these, 22 species (88%) were native and three (12%) were exotic.

No threatened fauna species were recorded during the field survey.

5.4 Threatened Species

No threatened flora or fauna species or populations were recorded during the field survey.

Threatened species which may potentially make use of the subject land are given in **Appendix A**.

5.5 Threatened Ecological Communities

All four of the PCTs recorded within the subject land are associated with Threatened Ecological Communities (TECs). These are identified in

Table 5-3. The occurrence of each PCT within the subject land was assessed against the relevant composition and condition criteria for each TEC to determine whether that TEC is present. Note that PCT 202 is not conventionally associated with the BC Act- or EPBC Act-listed White Box-Yellow Box-Blakely's Red Gum TECs; however, owing to the variable composition of this PCT, in which Blakely's Red Gum (*Eucalyptus blakelyi*) or Yellow Box (*Eucalyptus melliodora*) may be dominant or co-dominant, it was considered appropriate to assess the occurrence of this PCT against the threshold criteria for these threatened communities.

Table 5-3. Threatened Ecological Communities associated with each PCT recorded within the subject land.

PCT ID	TEC	Meets Criteria	Justification
55	<u>BC Act, Endangered</u> Semi-evergreen Vine Thicket in the Brigalow Belt South and Nandewar Bioregions	No	Associated vegetation (low, dry rainforest with vines) absent from subject land.
	<u>BC Act, Endangered</u> Coolibah-Black Box Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penepplain and Mulga Lands Bioregions	No	Coolibah (<i>Eucalyptus coolabah</i>) and Black Box (<i>Eucalyptus largiflorens</i>) absent from subject land.
	<u>BC Act, Endangered</u> Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penepplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	No	Myall (<i>Acacia pendula</i>) absent from subject land.
	<u>BC Act, Endangered</u> Native Vegetation on Cracking Clay Soils of the Liverpool Plains	No	Subject land not within the Liverpool Plains region.
82	<u>BC Act, Endangered</u> Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions	No	Canopy is dominated by Poplar Box (<i>Eucalyptus populnea</i> subsp. <i>bimbil</i>), not Grey Box (<i>Eucalyptus microcarpa</i>).
	<u>EPBC Act, Endangered</u> Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	No	Canopy is dominated by Poplar Box (<i>Eucalyptus populnea</i> subsp. <i>bimbil</i>), not Grey Box (<i>Eucalyptus microcarpa</i>).
88	<u>EPBC Act, Endangered</u> Poplar Box Grassy Woodland on Alluvial Plains	No	Canopy is dominated by Pilliga Box (<i>Eucalyptus pilligaensis</i>), not Poplar Box.
202	<u>BC, Endangered:</u> Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	No	Fuzzy Box (<i>Eucalyptus conica</i>) is a minor component of this occurrence of PCT 202.
	<u>BC, Critically Endangered:</u> White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	Partly	Portions of this PCT in which Blakely's Red Gum (<i>Eucalyptus blakelyi</i>) is dominant and in which the understorey is grassy are likely to belong to this CEEC.
	<u>EPBC, Critically Endangered:</u> White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Partly	Portions of this PCT in which Blakely's Red Gum (<i>Eucalyptus blakelyi</i>) is dominant and in which the understorey is grassy may belong to this CEEC.

Assessment of the recorded PCTs against the relevant condition and composition thresholds for each community determined that, with the exception of portions of PCT 202, none of the mapped communities belong to any TEC. Within the recorded occurrence of PCT 202 there is considerable variation in canopy composition and shrub cover. It is likely that fine-scale survey and mapping would identify occurrences of the BC Act-listed Critically Endangered Ecological Community (CEEC) *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*. This listing would apply only to areas in which *Eucalyptus blakelyi* was dominant or co-dominant and in which shrub cover was <30%. An example of a potential occurrence of these CEECs is given in **Figure 5-2**. Certain of these areas may also meet the thresholds for the equivalent listing under the EPBC Act, though the minimum size threshold imposed by that listing may exclude some or all of these areas. As it is understood that no impacts to this area are proposed, this fine-scale mapping has not been attempted.



Figure 5-2. Regrowth grassy woodland within PCT 202 in which red gums, including Blakely's Red Gum (*Eucalyptus blakelyi*), are dominant. Patches such as this may represent examples of the BC Act- and/or EPBC Act-listed White Box-Yellow Box-Blakely's Red Gum CEECs.

5.6 Habitat Features

The subject land was assessed for its potential to provide habitat for threatened flora and fauna known or predicted to occur in the study area. Habitat features including but not limited to rock outcrops, caves, hollow-bearing trees, nests, wetlands (including dams), and watercourses were searched for and recorded, if present.

Geological habitat features (caves, crevices, outcrops and similar) are discussed in **Section 4.4**. Wetlands and watercourses are discussed in **Section 4.10**.

Human-made structures are also regarded as potential habitat for fauna species, including bats and reptiles. Two such structures occur near the southern limit of the subject land. Impacts to these structures may be considered prescribed impacts (see **Section 5.7**).

Forty-four hollow-bearing trees were recorded within the subject site, comprising 39 live trees and five standing dead trees (stags). Most trees (n=35) were found to possess only small hollows (diameter <20 cm). Nine trees were recorded with at least one large hollow (diameter >20 cm). Note that searches for hollow-bearing trees were confined to vegetation within the paddock remnants and parts of the roadside and woodland corridors, particularly those parts closest to the paddocks. It is highly likely that additional unmapped hollow-bearing trees occur within the surrounding vegetation.

Habitat features are mapped in **Figure 5-3**.



Figure 5-3. Habitat features recorded within the subject land.

5.7 Prescribed Impacts

The subject land was searched for habitat features associated with prescribed impacts identified under the BAM. These are detailed in **Table 5-4**.

Table 5-4. Potential prescribed impacts of the proposal.

Prescribed Impacts	Site Assessment
Impacts on the habitat of threatened species or ecological communities associated with karst, caves, crevices, cliffs and other features of geological significance.	No relevant features were recorded during the site assessment.
Impacts of development on the habitat of threatened species or ecological communities associated with rocks.	No relevant features were recorded during the site assessment.
Impacts of development on the habitat of threatened species or ecological communities associated with human made structures.	Small human-made structures occur within the footprint (Figure 5-3).
Impacts of development on the habitat of threatened species or ecological communities associated with non-native vegetation.	Non-native vegetation on the subject land may still provide habitat for species or ecosystem credit species. These impacts may require consideration of mitigation strategies. As much of this vegetation consists of monocultural stands of crop plants, it is unlikely to provide significant habitat.
Impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range.	Remnant vegetation corridors surrounding the subject land are likely to contribute significantly to landscape connectivity (see Section 4.12). It is understood that no impacts are proposed to these areas; consequently, impacts to connectivity are unlikely.
Impacts of the development on movement of threatened species that maintains their life cycle.	Impacts to connectivity features (see above and Section 4.12) may have adverse effects on the movement of threatened species. As no such impacts are proposed, no adverse effects are anticipated.
Impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities.	As there are no watercourses or significant waterbodies within the area proposed for development, no impacts of this kind are anticipated.
Impacts of wind turbine strikes on protected animals.	None associated with the proposal.
Impact of vehicle strikes on threatened species of animals or on animals that are part of a TEC.	An increase in overall traffic movement is anticipated due to the construction and ongoing operation of the proposal. Maintaining suitably low speed limits on site will help to mitigate impacts that arise from this increase.

5.8 Matters of National Environmental Significance

Under the environmental assessment provisions of the EPBC Act, Matters of National Environmental Significance (MNES) and impacts on Commonwealth land must be considered to assist in determining whether the proposal should be referred to the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW).

The EPBC Act protected matters search has identified four Wetlands of International Importance, six TECs, 32 threatened species, nine listed migratory species and 16 listed marine species with the potential to occur within the 10 km search area (**Appendix A**). The likelihood of the proposal causing a significant impact to any of these listed entities will depend on the final construction footprint. These impacts must be assessed as part of a BDAR.

One MNES entity may be present within site (namely parts of PCT 202):

- TEC:
 - Critically Endangered: *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*.

Impacts to this entity may require referral to DCCEEW. It is understood that the proponent intends to avoid impacts to PCT 202; consequently, it is unlikely that this entity would be impacted by the proposal and similarly unlikely that referral to DCCEEW would be required.

The Protected Matters Search Tool identified four EPBC Act-listed threatened species with the potential to occur within the impact area that are either not listed under the BC Act or were not identified by BioNet as occurring in the relevant IBRA subregions. These are listed in **Table 5-5**. None are considered likely to occur on the subject land.

Table 5-5. MNES entities not identified by BioNet searches

Class	Scientific Name	Common Name	*Comm. status	Likelihood of Occurrence
Actinopterygii	<i>Maccullochella macquariensis</i>	Trout Cod	E	Unlikely. The site lacks appropriate aquatic habitat.
Actinopterygii	<i>Macquaria australasica</i>	Macquarie Perch	E	Unlikely. The site lacks appropriate aquatic habitat.
Actinopterygii	<i>Maccullochella peelii</i>	Murray Cod	V	Unlikely. The site lacks appropriate aquatic habitat.
Reptilia	<i>Hemiaspis damelii</i>	Grey Snake	E	Unlikely. Not known to occur within 100 km.

*Comm. Status: V = Vulnerable, E = Endangered

6 Preliminary BAM-C Outputs

Data derived from the 13 BAM plots conducted during the site assessment were entered into the BAM Calculator (BAM-C) to determine the offset cost associated with each vegetation zone. As the likely footprint of the proposal is presently unknown, this assessment assumes that all vegetation within the c. 512 ha assessment area will be cleared. While this will significantly overstate the credit obligation likely to be generated by the proposal, it will allow for the identification of areas with a greater credit price. This should aid in project planning.

The BAM-C generates two classes of credit:

- Ecosystem credits account for direct impacts to PCTs, TECs, and habitat for threatened species that can be reliably predicted to occur within each PCT. Ecosystem credit species cannot be ruled out by targeted surveys (DPIE, 2020a). Ecosystem credit costs can be reduced only by reducing the area of impact or eliminating PCTs from the impact area.
- Species credits account for species whose likelihood of occurrence cannot be predicted by vegetation surrogates and/or landscape features and can be reliably detected by survey. A targeted survey or expert report is required to confirm presence/absence of these species (DPIE, 2020a). Alternatively, species credit species can be assumed present; however, this approach is likely to result in extremely high offset costs and may not be approved by the consent authority.

Credit outputs and indicative costings from this preliminary analysis are provided in **Appendix D** and **Appendix E** and discussed in **Section 6.1** and **Section 6.2**. Strategies to reduce the offset obligation generated by the proposal are given in **Section 7.2**.

6.1 Ecosystem Credits

Ecosystem credits account for direct impacts to PCTs, TECs, and habitat for threatened species that can be reliably predicted to occur within each PCT. In total, the BAM-C generated 26 predicted species for the identified PCTs (

Table 6-1). One of these, the White-bellied Sea-eagle (*Haliaeetus leucogaster*) could be discounted as an Ecosystem Credit species because of habitat constraints for foraging (the site is more than 1 km from a suitably large waterbody). The remaining 25 species could not be ruled out on the basis of habitat constraints and cannot be ruled out by targeted surveys. Ecosystem credits can only be reduced by reducing the area of impact to associated PCTs.

Note that the habitat requirements for a species may differ depending on whether it is being assessed as an ecosystem credit species or a species credit species. This typically reflects the differences in habitat requirements for foraging activity (ecosystem credits) and breeding activity (species credits). A site may contain suitable habitat for foraging while lacking key features required for breeding. In cases like this, a species may be assumed present as an ecosystem credit species (for foraging) while being ruled out as a species credit species (for breeding). In general, few species can be ruled out as ecosystem credit species. Almost all ecosystem credit species must be assumed present.

Table 6-1. Ecosystem credit species predicted to occur and the nature of their presence within, or absence from, the subject land.

Common Name	Scientific Name	Presence
Black Falcon	<i>Falco subniger</i>	Assumed Present (PCTs 55, 82, 88)
Black-breasted Buzzard	<i>Hamirostra melanosternon</i>	Assumed Present (PCTs 55, 88)
Brolga	<i>Grus rubicunda</i>	Assumed Present (PCT 82)
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	Assumed Present (PCTs 88, 202)
Diamond Firetail	<i>Stagonopleura guttata</i>	Assumed Present (PCTs 55, 82, 88, 202)
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	Assumed Present (PCTs 55, 82, 88, 202)
Flame Robin	<i>Petroica phoenicea</i>	Assumed Present (PCT 82)
Glossy Black-cockatoo	<i>Calyptorhynchus lathami</i>	Assumed Present (PCTs 55, 82, 88, 202)
Grey Falcon	<i>Falco hypoleucos</i>	Assumed Present (PCTs 55, 82)
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</i>	Assumed Present (PCTs 55, 82, 88, 202)
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Assumed Present (PCTs 55, 202)
Hooded Robin (southeastern form)	<i>Melanodryas cucullata cucullata</i>	Assumed Present (PCTs 55, 82, 88, 202)
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	Assumed Present (PCTs 55, 88, 202)
Little Lorikeet	<i>Glossopsitta pusilla</i>	Assumed Present (PCT 202)
Major Mitchell's Cockatoo	<i>Lophochroa leadbeateri</i>	Assumed Present (PCTs 55, 82, 88)
Pilliga Mouse	<i>Pseudomys pilligaensis</i>	Assumed Present (PCT 88)
Regent Honeyeater	<i>Anthochaera phrygia</i>	Assumed Present (PCT 202)
Scarlet Robin	<i>Petroica boodang</i>	Assumed Present (PCTs 82, 88, 202)
Speckled Warbler	<i>Chthonicola sagittata</i>	Assumed Present (PCTs 55, 82, 88, 202)
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	Assumed Present (PCT 202)
Superb Parrot	<i>Polytelis swainsonii</i>	Assumed Present (PCTs 55, 82, 88, 202)
Swift Parrot	<i>Lathamus discolor</i>	Assumed Present (PCTs 82, 88, 202)
White-throated Needletail	<i>Hirundapus caudacutus</i>	Assumed Present (PCTs 55, 82, 88, 202)
White-bellied Sea-eagle	<i>Haliaeetus leucogaster</i>	Absent (habitat constraint)

Ecosystem credit outputs are given in **Table 6-2**. The majority of the estimated final credit obligation is associated with PCT 55 and PCT 202. Avoiding impacts to these PCTs would significantly reduce the total ecosystem credit obligation.

Table 6-2. Ecosystem credits for PCTs, TECS, and threatened species habitat.

Zone	TEC	VI Score	Change in VI Score	Area (ha)	Sensitivity to Loss	Sensitivity to Gain Class	Biodiversity Risk Weighting	SAll	Ecosystem Credits
55_Good	No.	93.8	-93.8	21.7	PCT Cleared - 83%	High Sensitivity to Potential Gain	2.00	False	1018
55_Moderate	No.	77.9	-77.9	2.3	PCT Cleared - 83%	High Sensitivity to Potential Gain	2.00	False	88
55_Derived	No.	37.9	-37.9	2.4	PCT Cleared - 83%	High Sensitivity to Potential Gain	2.00	False	47
55_Planted	No.	77.9	-77.9	1.2	PCT Cleared - 83%	High Sensitivity to Potential Gain	2.00	False	45
82_Moderate	No.	75.9	-75.9	0.4	PCT Cleared - 75%	High Sensitivity to Potential Gain	2.00	False	15
88_Good	No.	83.5	-83.5	5.2	PCT Cleared - 38%	High Sensitivity to Potential Gain	1.50	False	163
202_Good	Partly (see Section 5.5). Note that the figures provided here assume that this patch as a whole does not constitute a TEC. If all or part of this patch were to be considered a TEC, the associated credit obligation would increase.	80.8	-80.8	10.3	PCT Cleared - 75%	High Sensitivity to Potential Gain	2.00	False	416
TOTAL									1792

6.2 Species Credits

In total, 24 species credit species were generated by the BAM-C (

Table 6-3). According to the BAM, if suitable habitat for these species occurs on the subject land, they must be the subject of targeted survey according to recommended guidelines, or else assumed present. For the purposes of this preliminary assessment, all species have been assumed present within their appropriate vegetation zones unless specific geographic limitations were identified or required habitat features were absent; six species were ruled out in this way:

- Black-breasted Buzzard (*Hamirostra melanosternon*) – Subject land is not within 40 m of riparian woodland.
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – No breeding camps recorded on site.
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*) – No caves, tunnels, mines or other potential breeding structures on site.
- Regent Honeyeater (*Anthochaera phrygia*) – Subject land is not included in important habitat mapping.
- Swift Parrot (*Lathamus discolor*) – Subject land is not included in important habitat mapping.
- White-bellied Sea-eagle (*Haliaeetus leucogaster*) – No potential nesting trees occur within 1 km of a suitable waterbody.

The remaining 18 species were assumed present. These estimates are necessarily imprecise and may be subsequently refined, which would alter the credit output.

Table 6-3. Species credit species predicted to occur and the nature of their presence within, or absence from, the subject land.

Common Name	Scientific Name	Presence
Australian Bustard	<i>Ardeotis australis</i>	Assumed Present
Glossy Black-cockatoo	<i>Calyptorhynchus lathami</i>	Assumed Present
Commersonia procumbens	<i>Commersonia procumbens</i>	Assumed Present
Sloane's Froglet	<i>Crinia sloanei</i>	Assumed Present
Bluegrass	<i>Dichanthium setosum</i>	Assumed Present
Finger Panic Grass	<i>Digitaria porrecta</i>	Assumed Present
Pine Donkey Orchid	<i>Diuris tricolor</i>	Assumed Present
Spiny Peppergrass	<i>Lepidium aschersonii</i>	Assumed Present
Major Mitchell's Cockatoo	<i>Lophochroa leadbeateri</i>	Assumed Present
Squirrel Glider	<i>Petaurus norfolcensis</i>	Assumed Present
Koala	<i>Phascolarctos cinereus</i>	Assumed Present
Native Milkwort	<i>Polygala linariifolia</i>	Assumed Present
Superb Parrot	<i>Polytelis swainsonii</i>	Assumed Present
Prasophyllum sp. Wybong	<i>Prasophyllum</i> sp. Wybong	Assumed Present
Greenhood Orchid	<i>Pterostylis cobarensis</i>	Assumed Present
Slender Darling Pea	<i>Swainsona murrayana</i>	Assumed Present
Silky Swainson-pea	<i>Swainsona sericea</i>	Assumed Present
Tylophora linearis	<i>Tylophora linearis</i>	Assumed Present
Black-breasted Buzzard	<i>Diuris aequalis</i>	Absent (habitat constraint)
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Absent (habitat constraint)
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	Absent (habitat constraint)
Regent Honeyeater	<i>Anthochaera phrygia</i>	Absent (habitat constraint)
Swift Parrot	<i>Lathamus discolor</i>	Absent (habitat constraint)
White-bellied Sea-eagle	<i>Haliaeetus leucogaster</i>	Absent (habitat constraint)

Species credit outputs are given in **Table 6-4**, which also identifies the vegetation zones associated with each species credit species. Reducing or avoiding impacts to these zones will reduce or eliminate this credit obligation. Where impacts cannot be avoided, targeted surveys or expert reports may be used to determine whether a species is present or absent. Where targeted surveys determine that a species is absent, the associated credit obligation is eliminated.

Targeted surveys must be carried out using an approved methodology and in the appropriate month. Targeted survey requirements for the species credit species generated by this proposal are given in **Section 6.3**.

A significant caveat in this assessment is that the BAM-C is unable to generate credit outputs for entities that are listed under the Commonwealth EPBC Act but not the NSW BC Act. This applies to *Pterostylis* sp. Wybong, a species listed as threatened under the EPBC Act but not listed as threatened in NSW. If the associated PCTs are to be impacted, and the species is not ruled out by a targeted survey or an expert report, consultation with the DAWE is required.

Table 6-4. Species credits for threatened species assumed present.

Species	Associated Vegetation Zones	BC Act Status	No. Credits
<i>Ardeotis australis</i> / Australian Bustard	55_Derived, 55_Planted, 55_Moderate, 55_Good, 82_Moderate, 202_Good	Endangered	1629
<i>Calyptorhynchus lathami</i> / Glossy Black-Cockatoo	55_Derived, 55_Planted, 55_Moderate, 55_Good, 82_Moderate, 88_Good, 202_Good	Vulnerable	1847
<i>Commersonia procumbens</i>	88_Good, 202_Good	Vulnerable	634
<i>Crinia sloanei</i> / Sloane's Froglet	82_Moderate	Vulnerable	11
<i>Dichanthium setosum</i> / Bluegrass	55_Derived, 55_Planted, 55_Moderate, 55_Good, 202_Good	Vulnerable	1614
<i>Digitaria porrecta</i> / Finger Panic Grass	55_Derived, 55_Planted, 55_Moderate, 55_Good, 202_Good	Endangered	1614
<i>Diuris tricolor</i> / Pine Donkey Orchid	82_Moderate, 88_Good, 202_Good	Vulnerable	486
<i>Lepidium aschersonii</i> / Spiny Peppergrass	55_Derived, 55_Planted, 55_Moderate, 55_Good, 88_Good	Vulnerable	1416
<i>Lophochroa leadbeateri</i> / Major Mitchell's Cockatoo	55_Derived, 55_Planted, 55_Moderate, 55_Good, 82_Moderate, 88_Good	Vulnerable	1431
<i>Petaurus norfolcensis</i> / Squirrel Glider	82_Moderate, 88_Good, 202_Good	Vulnerable	649
<i>Phascolarctos cinereus</i> / Koala	55_Derived, 55_Planted, 55_Moderate, 55_Good, 82_Moderate, 88_Good, 202_Good	Endangered	1847
<i>Polygala linariifolia</i> / Native Milkwort	88_Good	Endangered	218
<i>Polytelis swainsonii</i> / Superb Parrot	55_Derived, 55_Planted, 55_Moderate, 55_Good, 82_Moderate, 88_Good, 202_Good	Vulnerable	1847
<i>Prasophyllum</i> sp. Wybong	202_Good	EPBC Only (Critically endangered)	624
<i>Pterostylis cobarensis</i> / Greenhood Orchid	88_Good, 202_Good	Vulnerable	634
<i>Swainsona murrayana</i> / Slender Darling Pea	55_Derived, 55_Planted, 55_Moderate, 55_Good, 82_Moderate, 202_Good	Vulnerable	1629
<i>Swainsona sericea</i> / Silky Swainson-pea	82_Moderate, 202_Good	Vulnerable	431
<i>Tylophora linearis</i>	88_Good, 202_Good	Vulnerable	634
TOTAL			19,195

6.3 Targeted Surveys

Targeted surveys may be carried out to determine whether a threatened species is present on the subject land. Where a species credit species is determined by survey to be absent, the credit obligation associated with that species is eliminated. Survey requirements vary depending on the nature of the threatened entity – e.g. threatened plants have different requirements to threatened birds – and a targeted survey plan, if required, can be tailored to the species credit species associated with the final impact footprint. Surveys must also be carried out at the appropriate time of the year. **Table 6-5** identifies the appropriate time period for each species credit species generated by the proposal. The most productive period for survey is likely to be October (12 species). Note, however, that if the final footprint omits certain PCTs, associated species credit species may also be eliminated and no longer require survey. If only non-native vegetation is impacted, there would be no requirement for targeted surveys. A list of threatened species recorded within 10 km of the subject land is given in

Table 6-6. This provides an indication of the likelihood that targeted surveys may detect the presence of a species credit species within the impact area.

Table 6-5. Species credit species predicted to occur and the nature of their presence within, or absence from, the subject land.

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Ardeotis australis</i> / Australian Bustard	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Calyptorhynchus lathamii</i> / Glossy Black-Cockatoo	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N
<i>Commersonia procumbens</i>	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y
<i>Crinia sloanei</i> / Sloane's Froglet	N	N	N	N	N	N	Y	Y	N	N	N	N
<i>Dichanthium setosum</i> / Bluegrass	Y	Y	Y	Y	Y	N	N	N	N	N	Y	Y
<i>Digitaria porrecta</i> / Finger Panic Grass	Y	Y	N	N	N	N	N	N	N	N	N	N
<i>Diuris tricolor</i> / Pine Donkey Orchid	N	N	N	N	N	N	N	N	Y	Y	N	N
<i>Lepidium aschersonii</i> / Spiny Peppergrass	Y	Y	Y	Y	N	N	N	N	N	N	Y	Y
<i>Lophochroa leadbeateri</i> / Major Mitchell's Cockatoo	N	N	N	N	N	N	N	N	Y	Y	Y	Y
<i>Petaurus norfolcensis</i> / Squirrel Glider	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Phascolarctos cinereus</i> / Koala	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<i>Polygala linariifolia</i> / Native Milkwort	Y	Y	N	N	N	N	N	N	N	Y	Y	Y
<i>Polytelis swainsonii</i> / Superb Parrot	N	N	N	N	N	N	N	N	Y	Y	Y	N
<i>Prasophyllum</i> sp. Wybong	N	N	N	N	N	N	N	N	Y	Y	N	N

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Pterostylis cobarensis</i> / Greenhood Orchid	N	N	N	N	N	N	N	N	N	Y	N	N
<i>Swainsona murrayana</i> / Slender Darling Pea	N	N	N	N	N	N	N	N	Y	N	N	N
<i>Swainsona sericea</i> / Silky Swainson-pea	N	N	N	N	N	N	N	N	Y	Y	Y	N
<i>Tylophora linearis</i>	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	Y
Total no. species available for survey	10	10	8	8	7	4	5	6	11	12	11	9

Table 6-6. BioNet species records from within 10 km of the subject land.

Scientific Name	Common Name	*NSW Status	+Comm. Status	No. Records
<i>Chalinolobus picatus</i>	Little Pied Bat	V		2
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	V		9
<i>Commersonia procumbens</i>		V	V	1
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V		3
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V		1
<i>Hieraaetus morphnoides</i>	Little Eagle	V		2
<i>Polytelis swainsonii</i>	Superb Parrot	V,3	V	2
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V		5
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V		1
<i>Tylophora linearis</i>		V	E	1

*NSW Status: V = Vulnerable, 3 = Category 3 Sensitive Species. +Comm. Status: V = Vulnerable, E – Endangered.

6.4 Serious and Irreversible Impacts

Threatened entities are considered to be at risk of serious and irreversible impacts (SAILs) if those impacts are “likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct” (BAM 2020). The BAM-C identified one entity as being at risk of an SAIL:

- *Prasophyllum* sp. Wybong (202_Good)

7 Constraints and Recommendations

7.1 Summary of Constraints

The following constraints were identified during the preliminary ecological assessment:

- Threatened Ecological Communities:
 - Portions of PCT 202 may represent occurrences of the EPBC Act-listed CEEC *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland*.
 - Portions of PCT 202 are likely to represent occurrences of the BC Act-listed CEEC *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*.
- Threatened Species:
 - No threatened species were recorded on site. Threatened species with the potential to occur in the impact footprint are discussed in **Section 5.4**, **Section 6.2**, and **Appendix A**.
- Serious and Irreversible Impacts:
 - One entity – the orchid *Prasophyllum* sp. Wybong – is regarded as being at risk of an SAIL. It is associated with zone 202_Good.
- Ecosystem Credits:
 - Potential impacts to vegetation within the subject land generated 1792 ecosystem credits, most of which is accounted for by zones 55_Good (1018) and 202_Good (416).
- Species Credits:
 - Potential impacts to threatened species generated 19,195 species credits.
- Fauna Habitat:
 - Fauna habitat associated with hollow-bearing trees and existing nests occurs on the subject land.
- Groundwater-dependent Ecosystems:
 - Vegetation zone 202_Good is mapped as having low potential for groundwater interaction. No other GDEs are mapped on the subject land.
- Prescribed Impacts:
 - Impacts to human-made structures may result from this proposal.
 - Impacts to non-native vegetation may also impact habitat for threatened species and must be considered in any ecological assessment.

7.2 Avoidance, Minimisation and Mitigation Recommendations

It is understood that the proponent intends to avoid all impacts to remnant vegetation. Confining the impacts of the proposal to non-native vegetation would effectively avoid most of the ecological constraints identified during the site assessment. In the event that some impacts to vegetation are required, the following guidance is offered to avert the most significant impacts:

- Avoid impacts to vegetation zones 55_Good and 202_Good. These zones account for most of the ecosystem credit obligation and the sole SAIL species associated with the proposal. Zone 202_Good also likely contains patches of the BC Act-listed CEEC *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*.
- Avoid or minimise impacts to zones 88_Good, 55_Moderate, and 55_Planted. If impacts to vegetation in the road corridor are required, confining these impacts to zone 55_Derived would result in the smallest offset obligation.
- Maintain a suitable buffer between development activities and woodland remnants where possible.
- Retain any remnant paddock trees where possible. In particular, avoid impacts to the active Wedge-tailed Eagle (*Aquila audax*) nest tree located towards the eastern edge of the paddock.
- While dams within the site offer only very limited habitat value, it is preferable to minimise impacts to these areas.
- If impacts to vegetation are required, conduct targeted surveys for threatened species within the impact areas. September, October and November are likely to be the most productive months for these surveys.
- Biosecurity measures should be implemented to reduce the spread of significant weeds. There may be opportunities to implement control measures for these weeds during construction activities.

Note that as estimated offset costs are no longer published via the BAM Calculator, it is not possible to identify the species that are likely to result in the greatest financial obligation.

8 Conclusion

The following summary of findings is provided to aid in ongoing project planning. It should be read in concert with the detailed summary of constraints and recommendations provided in **Section 7**.

The proposal for a hybrid solar-plus-battery power station at Burroway, in the Central West and Orana region of New South Wales, will automatically trigger entry into the NSW Biodiversity Offset Scheme by virtue of being a State Significant Development. This will necessitate the production of a BDAR and require the proponent to offset any impacts to native vegetation resulting from the proposal. As currently conceived, however, the proposal is unlikely to result in any such impacts, as the proponent intends to situate the development within an area of non-native vegetation, namely a cropping paddock. If the final design avoids impacts to mapped areas of native vegetation, the development will not attract an offset obligation.

Despite the above, this preliminary assessment assumes that all vegetation within the c. 512 ha assessed area would be cleared by proposal activities. This is intended to provide flexibility in the final design and to allow the proponent to correctly implement avoidance and minimisation strategies in the event that some impacts are required.

Land category assessment could not determine whether any part of the subject land constitutes Category 1 – exempt land. This is due to evidence in aerial photographs of clearing subsequent to the January 1, 1990 cut-off date.

Four PCTs were recorded within the subject land:

- 55 - Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions.
- 82 - Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Penepplain Bioregion.
- 88 - Pilliga Box - White Cypress Pine - Buloke shrubby woodland in the Brigalow Belt South Bioregion.
- 202 - Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion

Parts of the subject land mapped to PCT 202 are likely to constitute examples of the BC Act-listed CEEC *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* and may constitute examples of the EPBC Act-listed CEEC *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland*.

The most significant constraints to the proposal were as follows:

- The generation of 1792 ecosystem credits. Most of these credits were associated with PCTs 55 (1198) and 202 (416).
- The possible occurrence of the *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland* CEECs.

- The generation of 19,195 species credits. Targeted surveys or expert reports may be used to reduce or eliminate this offset obligation, with the most productive months for survey being September-November.
- Potential impacts to fauna habitat associated with hollow-bearing trees, as well as less significant impacts human-made structures and dams.
- The potential occurrence of an SAll species (*Prasophyllum* sp. Wybong) within zone 202_Good.

Note that the credit figures above assume total clearance of the 512-ha assessed area. It is not anticipated that the proposal will entail total clearance in this manner. This calculation has been carried out to allow for the identification of constraints to project planning.

Thirteen vegetation integrity plots (i.e., BAM plots) were completed during the site assessment. If the proposal entails a greater impact to native vegetation than currently anticipated, or if the consent authority requires stronger proof that the subject land is predominantly non-native, additional plots may be required.

Assessments of significance to BC Act and EPBC Act entities should be completed once the final impact footprint is known.

Bibliography

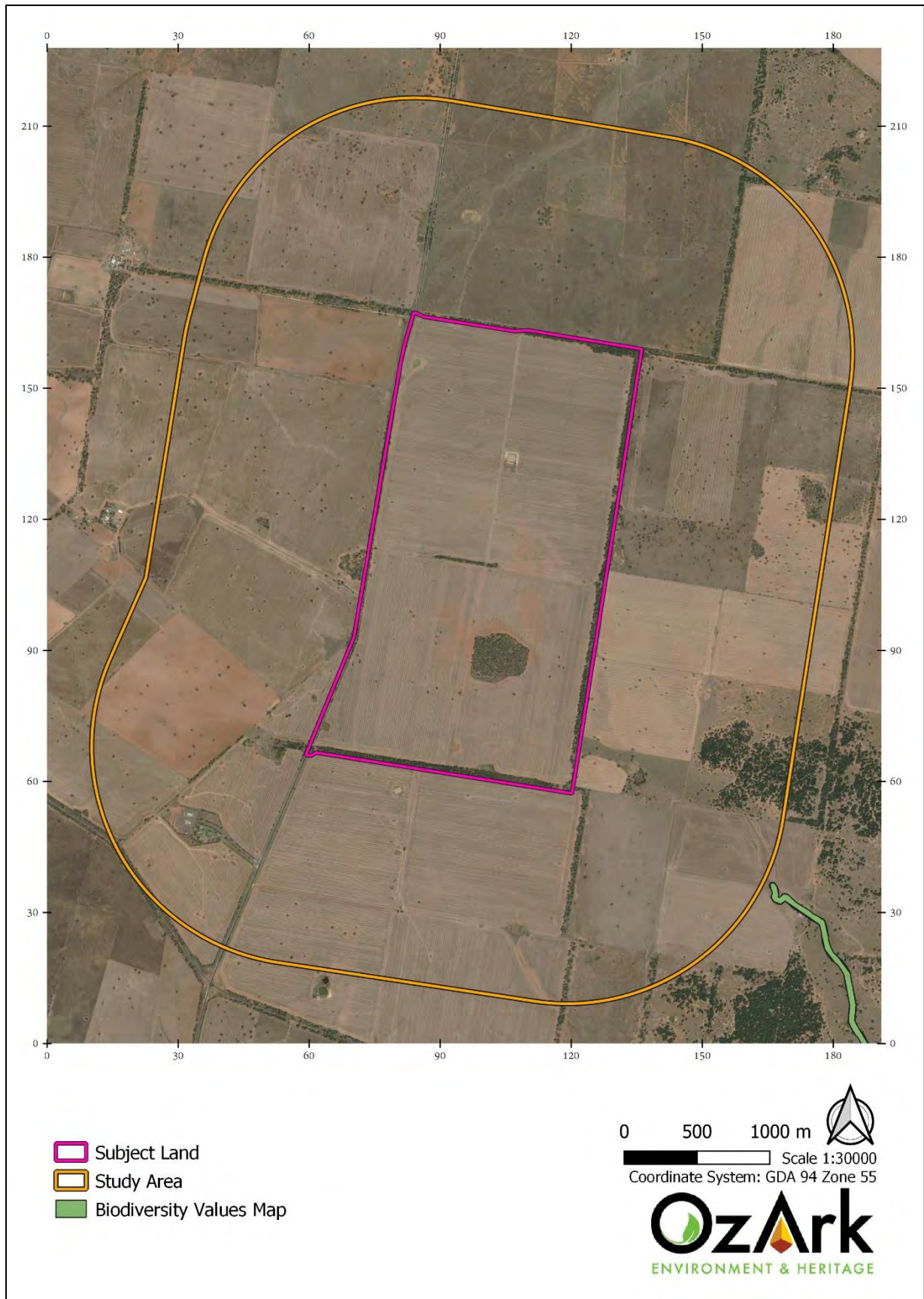
- Australian Government Department of Agriculture, Water and the Environment. (2022). Protected Matters Search Tool. Retrieved from: <https://www.awe.gov.au/environment/epbc/protected-matters-search-tool>
- Australian Government Department of Sustainability, Environment, Water, Population and Communities. (2012). Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (Subregions). Canberra.
- Bureau of Meteorology. (2017, November). *Atlas of Groundwater Dependent Ecosystems*. Retrieved from Australian Government Bureau of Meteorology: <http://www.bom.gov.au/water/groundwater/gde/map.shtml>
- Bureau of Meteorology. (2022). *Climate Data Online*. Retrieved from Australian Government Bureau of Meteorology: <http://www.bom.gov.au/climate/data/index.shtml>
- Department of Environment and Conservation. (2003). *Wetlands of New South Wales*. Sydney.
- DoE. (2013). *Matters of National Environmental Significance - Significant impact guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999*. Department of the Environment. Canberra, ACT: Commonwealth of Australia. Retrieved from http://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf
- Fairfull, S. (2013). *Policy and Guidelines for Fish Habitat Conservation and Management*. Sydney: NSW Department of Primary Industries.
- Keith, D. (2004). *Ocean Shores to Desert Dunes: the Vegetation of New South Wales and the ACT*. Department of Environment and Conservation NSW.
- Mitchell. (2002). *Descriptions for NSW (Mitchell) Landscapes*. NSW: Department of Environment and Climate Change.
- New South Wales Government. (2022, Nov 21). *Narromine Local Environmental Plan 2011*. Retrieved from NSW Legislation: <https://legislation.nsw.gov.au/view/html/inforce/current/epi-2011-0648>
- NSW Department of Environment, Climate Change and Water. (2010). *Mitchell Landscapes NSW OEH v3 2011*. Biregional Assessment Source Dataset.
- NSW Department of Planning and Environment . (2022). *NSW Planning Portal*. Retrieved from NSW Department of Planning and Environment: <https://www.planningportal.nsw.gov.au/publications/environmental-planning-instruments/cooma-monaro-local-environmental-plan-2013>
- NSW Department of Planning and Environment. (2022). *Threatened species*. Retrieved from NSW Government Department of Planning and Environment: <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet>
- NSW Department of Planning and Environment. (2022). *BioNet Atlas*. Retrieved from NSW Government Department of Planning and Environment: <https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species>

- NSW Department of Planning and Environment. (2022). *Transitional Native Vegetation Regulatory Map*. Retrieved from NSW Government Department of Planning and Environment: <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/native-vegetation-regulatory-map>
- NSW Department of Planning, Industry and Environment. (2015). *NSW Woody Vegetation Extent 2011*. Retrieved from SEED: <https://datasets.seed.nsw.gov.au/dataset/nsw-woody-vegetation-extent-2011c0569>
- NSW Department of Planning, Industry and Environment. (2017). *NSW Landuse 2017*. Retrieved from SEED: <https://datasets.seed.nsw.gov.au/dataset/nsw-landuse-2017>
- NSW Department of Primary Industries. (2022). *Listed threatened species, populations and ecological communities*. Retrieved from NSW Government Department of Primary Industries: <http://www.dpi.nsw.gov.au/fishing/species-protection/conservation/what-current>
- NSW Department of Primary Industries. (2018, September 26). *Freshwater threatened species distribution maps*. Retrieved from NSW Department of Primary Industries: <https://www.dpi.nsw.gov.au/fishing/threatened-species/threatened-species-distributions-in-nsw/freshwater-threatened-species-distribution-maps>
- NSW Government Spatial Services. (2022). *Historical, Aerial and Satellite Imagery*. Retrieved from NSW Government Spatial Services: https://www.spatial.nsw.gov.au/products_and_services/aerial_and_historical_imagery
- NSW Office of Environment and Heritage. (1998). *Acid Sulfate Soils Risk*. Sydney.
- NSW Office of Environment and Heritage. (2010). *NSW Wetlands*. Sydney.
- NSW Office of Environment and Heritage. (2011). *Vulnerable Land - Steep or Highly Erodible*. Sydney.
- NSW Office of Environment and Heritage. (2016). *NSW Guide to Surveying Threatened Plants*. Sydney: NSW Office of Environment and Heritage.
- NSW Office of Environment and Heritage. (2018, December 20). *Bioregions of NSW*. Retrieved from Office of Environment and Heritage: <https://www.environment.nsw.gov.au/bioregions/SouthEasternHighlands-Subregions.htm>
- NSW Office of Environment and Heritage. (2020). *Biodiversity Assessment Method*. Sydney: Office of Environment and heritage for the NSW Governement.
- NSW Office of Environment and Heritage. (2022). *NSW Vegetation Information System: Classification*. Retrieved from NSW Office of Environment & Heritage: <http://www.environment.nsw.gov.au/NSWVCA20PRapp/default.aspx>
- Royal Botanic Gardens and Domain Trust. (2022). *PlantNET*. (Royal Botanic Gardens and Domain Trust) Retrieved 2022, from PlantNET - The Plant Information Network System of The Royal Botanic Gardens and Domain Trust: <http://plantnet.rbgsyd.nsw.gov.au>

Thackway, R., & Cresswell, I. (1995). *An interim biogeographic regionalisation for Australia: a framework for setting priorities in the National Reserves System Cooperative Program*. Canberra: Australian Nature Conservation Agency.

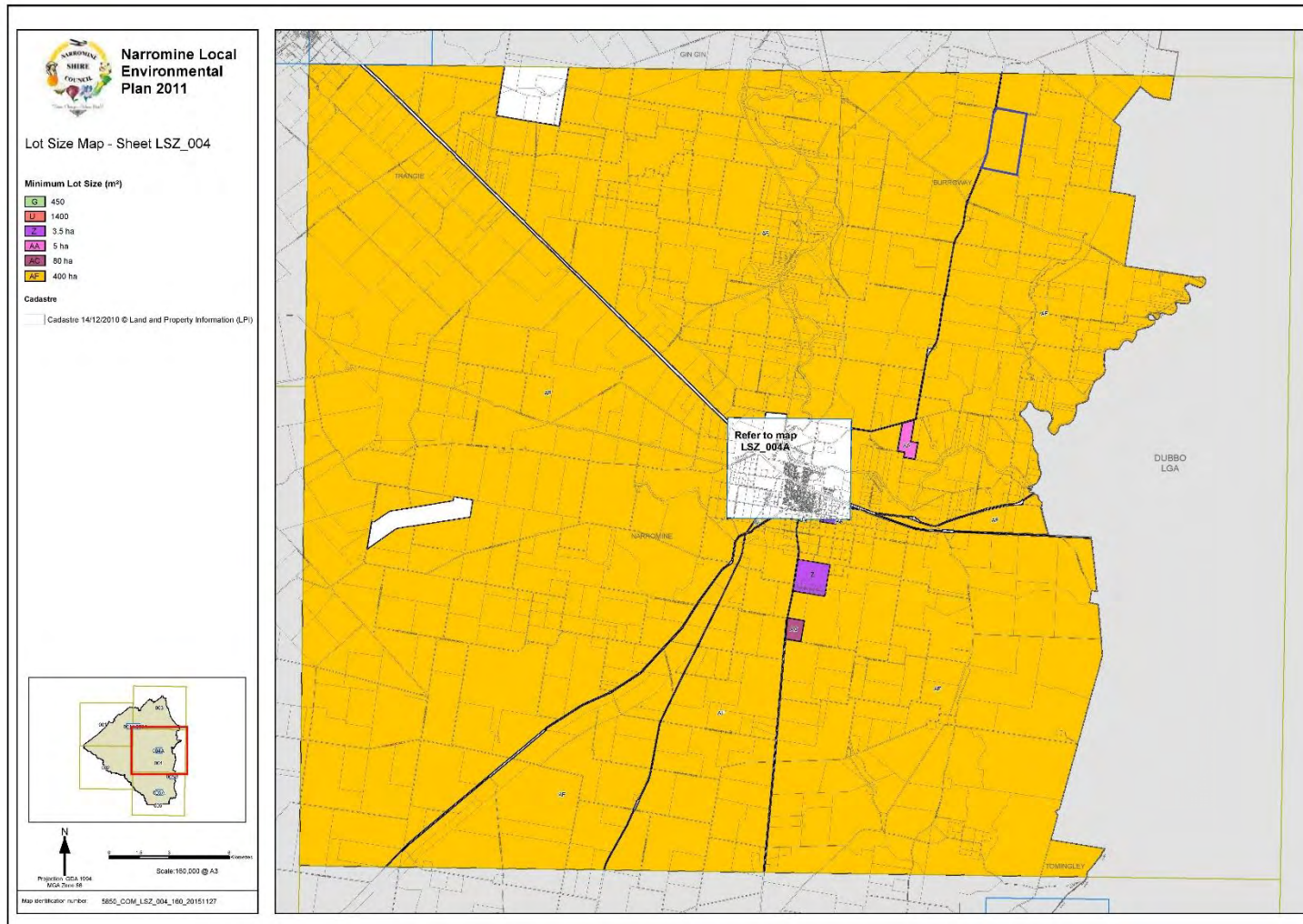
Appendix A: Database search results

Biodiversity Values Map



Minimum Lot Size and Area Clearing Threshold

Lots relevant to the present proposal are outlined in blue. All lots have been assigned a minimum lot size of 400 ha and hence the area clearing threshold is 1 ha.



Narromine Local Environmental Plan 2011 – Terrestrial Biodiversity Values Mapping.

The location of the subject land is indicated in blue.



EPBC Act Protected Matters Report



Australian Government
Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

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

Report created: 21-Nov-2022

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	32
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	16
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

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

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	700 - 800km upstream from Ramsar site	In feature area
Riverland	700 - 800km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	800 - 900km upstream from Ramsar site	In feature area
The macquarie marshes	100 - 150km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities [Resource Information]

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

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area	In feature area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area	In feature area
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community may occur within area	In feature area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area	In feature area
Weeping Myall Woodlands	Endangered	Community likely to occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area	In feature area

Community Name	Threatened Category	Presence Text	Buffer Status
Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
FISH			
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area
FROG			
Crinia sloanei Sloane's Froglet [59151]	Endangered	Species or species habitat may occur within area	In feature area
MAMMAL			
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area	In feature area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Androcalva procumbens [87153]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Austrostipa wakoolica [66623]	Endangered	Species or species habitat may occur within area	In buffer area only
Homoranthus darwinioides [12974]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Lepidium aschersonii Spiny Pepper-cress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium monolocoides Winged Pepper-cress [9190]	Endangered	Species or species habitat may occur within area	In feature area
Prasophyllum sp. Wybong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area	In feature area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Swainsona recta Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area	In buffer area only
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
Vincetoxicum forsteri listed as Tylophora linearis [92384]	Endangered	Species or species habitat may occur within area	In feature area
REPTILE			
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hemiaspis damelii Grey Snake [1179]	Endangered	Species or species habitat may occur within area	In feature area
Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands[\[Resource Information \]](#)

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

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [14060]	NSW	In buffer area only

Listed Marine Species[\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans			
Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat may occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

EPBC Act Referrals **[Resource Information]**

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Bioregional Assessments

SubRegion	BioRegion	Website	Buffer Status
Central West	Northern Inland Catchments	BA website	In feature area

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

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

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[Department of Climate Change, Energy, the Environment and Water](#)
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111

BioNET Atlas search – threatened species predicted to occur within Pilliga subregion of the Brigalow Belt South bioregion and the Bogan-Macquarie subregion of the Darling Riverine Plains bioregion

*NSW Status: P=Protected, P13=Protected native plant, V=Vulnerable, E1=Endangered, E2=Endangered population, E4=Extinct, E4A=Critically endangered, 2=Category 2 sensitive species, 3=Category 3 sensitive species.

+Comm. Status: C=CAMBA, J=JAMBA, K=ROKAMBA, CE=Critically endangered, E=Endangered, V=Vulnerable.

'Records: Number of records, P = predicted to occur, K = known to occur.

Clade	Scientific Name	Common Name	*NSW status	+Comm. status	'Records
Amphibia	<i>Crinia sloanei</i>	Sloane's Froglet	V,P	E	157
Amphibia	<i>Litoria booroolongensis</i>	Booroolong Frog	E1,P	E	34
Amphibia	<i>Litoria raniformis</i>	Southern Bell Frog	E1,P	V	12
Aves	<i>^Calyptorhynchus banksii samueli</i>	Red-tailed Black-Cockatoo (inland subspecies)	V,P,2		5
Aves	<i>^Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V,P,2		1093
Aves	<i>^Falco hypoleucos</i>	Grey Falcon	E1,P,2		8
Aves	<i>^Lophochroa leadbeateri</i>	Major Mitchell's Cockatoo	V,P,2		57
Aves	<i>Actitis hypoleucos</i>	Common Sandpiper	P	C,J,K	8
Aves	<i>Anseranas semipalmata</i>	Magpie Goose	V,P		167
Aves	<i>Anthochaera phrygia</i>	Regent Honeyeater	E4A,P	CE	229
Aves	<i>Apus pacificus</i>	Fork-tailed Swift	P	C,J,K	56
Aves	<i>Ardeotis australis</i>	Australian Bustard	E1,P		24
Aves	<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V,P		2803
Aves	<i>Botaurus poiciloptilus</i>	Australasian Bittern	E1,P	E	68
Aves	<i>Burhinus grallarius</i>	Bush Stone-curlew	E1,P		27
Aves	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	P	C,J,K	102
Aves	<i>Calidris ferruginea</i>	Curlew Sandpiper	E1,P	CE,C,J,K	6
Aves	<i>Calidris ruficollis</i>	Red-necked Stint	P	C,J,K	7
Aves	<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V,P,3	E	376
Aves	<i>Certhionyx variegatus</i>	Pied Honeyeater	V,P		9
Aves	<i>Chthonicola sagittata</i>	Speckled Warbler	V,P		2553
Aves	<i>Circus assimilis</i>	Spotted Harrier	V,P		209
Aves	<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	V,P		6078
Aves	<i>Cuculus optatus</i>	Oriental Cuckoo	P	C,J,K	1
Aves	<i>Daphoenositta chrysoptera</i>	Varied Sittella	V,P		846
Aves	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E1,P		12
Aves	<i>Epthianura albifrons</i>	White-fronted Chat	V,P		148
Aves	<i>Falco subniger</i>	Black Falcon	V,P		155
Aves	<i>Gallinago hardwickii</i>	Latham's Snipe	P	J,K	176

Clade	Scientific Name	Common Name	*NSW status	+Comm. status	'Records
Aves	<i>Gelochelidon nilotica</i>	Gull-billed Tern	P	C	11
Aves	<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet	V,P,3		9
Aves	<i>Glossopsitta pusilla</i>	Little Lorikeet	V,P		743
Aves	<i>Grantiella picta</i>	Painted Honeyeater	V,P	V	136
Aves	<i>Grus rubicunda</i>	Brolga	V,P		218
Aves	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V,P		257
Aves	<i>Hamirostra melanosternon</i>	Black-breasted Buzzard	V,P,3		6
Aves	<i>Hieraaetus morphnoides</i>	Little Eagle	V,P		521
Aves	<i>Hirundapus caudacutus</i>	White-throated Needletail	P	V,C,J,K	191
Aves	<i>Hydroprogne caspia</i>	Caspian Tern	P	J	23
Aves	<i>Ixobrychus flavicollis</i>	Black Bittern	V,P		2
Aves	<i>Lathamus discolor</i>	Swift Parrot	E1,P,3	CE	239
Aves	<i>Leipoa ocellata</i>	Malleefowl	E1,P	V	72
Aves	<i>Limosa lapponica</i>	Bar-tailed Godwit	P	C,J,K	1
Aves	<i>Limosa limosa</i>	Black-tailed Godwit	V,P	C,J,K	2
Aves	<i>Lophoictinia isura</i>	Square-tailed Kite	V,P,3		87
Aves	<i>Melanodryas cucullata cucullata</i>	Hooded Robin (south-eastern form)	V,P		912
Aves	<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)	V,P		683
Aves	<i>Neophema pulchella</i>	Turquoise Parrot	V,P,3		927
Aves	<i>Nettapus coromandelianus</i>	Cotton Pygmy-Goose	E1,P		2
Aves	<i>Ninox connivens</i>	Barking Owl	V,P,3		232
Aves	<i>Ninox strenua</i>	Powerful Owl	V,P,3		26
Aves	<i>Oxyura australis</i>	Blue-billed Duck	V,P		60
Aves	<i>Pachycephala inornata</i>	Gilbert's Whistler	V,P		147
Aves	<i>Pandion cristatus</i>	Eastern Osprey	V,P,3		2
Aves	<i>Petroica boodang</i>	Scarlet Robin	V,P		778
Aves	<i>Petroica phoenicea</i>	Flame Robin	V,P		710
Aves	<i>Petroica rodinogaster</i>	Pink Robin	V,P		2
Aves	<i>Phaethon rubricauda</i>	Red-tailed Tropicbird	V,P	C,J	1
Aves	<i>Polytelis swainsonii</i>	Superb Parrot	V,P,3	V	4653
Aves	<i>Pomatostomus halli</i>	Hall's Babbler	V,P		1
Aves	<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V,P		3093
Aves	<i>Pycnoptilus floccosus</i>	Pilotbird	P	V	1
Aves	<i>Rostratula australis</i>	Australian Painted Snipe	E1,P	E	21

Clade	Scientific Name	Common Name	*NSW status	+Comm. status	'Records
Aves	<i>Stagonopleura guttata</i>	Diamond Firetail	V,P		1851
Aves	<i>Stictonetta naevosa</i>	Freckled Duck	V,P		80
Aves	<i>Thalasseus bergii</i>	Crested Tern	P	J	1
Aves	<i>Tringa glareola</i>	Wood Sandpiper	P	C,J,K	5
Aves	<i>Tringa nebularia</i>	Common Greenshank	P	C,J,K	68
Aves	<i>Tringa stagnatilis</i>	Marsh Sandpiper	P	C,J,K	20
Aves	<i>Turnix maculosus</i>	Red-backed Button-quail	V,P		P
Aves	<i>Tyto longimembris</i>	Eastern Grass Owl	V,P,3		1
Aves	<i>Tyto novaehollandiae</i>	Masked Owl	V,P,3		19
Mammalia	<i>Aepyprymnus rufescens</i>	Rufous Bettong	V,P		2
Mammalia	<i>Antechinomys laniger</i>	Kultarr	E1,P		2
Mammalia	<i>Bettongia lesueur graii</i>	Boodie, Burrowing Bettong (mainland)	E4,P	X	2
Mammalia	<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V,P		45
Mammalia	<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V,P	V	46
Mammalia	<i>Chalinolobus picatus</i>	Little Pied Bat	V,P		76
Mammalia	<i>Conilurus albipes</i>	White-footed Tree-rat	E4,P	X	2
Mammalia	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V,P	E	53
Mammalia	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V,P		20
Mammalia	<i>Leporillus apicalis</i>	Lesser Stick-nest Rat	E4,P	X	1
Mammalia	<i>Leporillus conditor</i>	Greater Stick-nest Rat	E4,P	V	2
Mammalia	<i>Macropus dorsalis</i>	Black-striped Wallaby	E1,P		676
Mammalia	<i>Macrotis lagotis</i>	Bilby	E4,P	V	3
Mammalia	<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V,P		118
Mammalia	<i>Myotis macropus</i>	Southern Myotis	V,P		20
Mammalia	<i>Nyctophilus corbeni</i>	Corben's Long-eared Bat	V,P	V	107
Mammalia	<i>Petauroides volans</i>	Greater Glider	P	E	97
Mammalia	<i>Petaurus australis</i>	Yellow-bellied Glider	V,P	V	2
Mammalia	<i>Petaurus norfolcensis</i>	Squirrel Glider	V,P		1818
Mammalia	<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E1,P	V	56
Mammalia	<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V,P		K
Mammalia	<i>Phascolarctos cinereus</i>	Koala	E1,P	E	486
Mammalia	<i>Pseudomys novaehollandiae</i>	New Holland Mouse	P	V	8
Mammalia	<i>Pseudomys oralis</i>	Hastings River Mouse	E1,P	E	1
Mammalia	<i>Pseudomys pilligaensis</i>	Pilliga Mouse	V,P	V	173

Clade	Scientific Name	Common Name	*NSW status	+Comm. status	'Records
Mammalia	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V,P	V	269
Mammalia	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V,P		166
Mammalia	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V,P		P
Mammalia	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart	V,P		1
Mammalia	<i>Vespadelus troughtoni</i>	Eastern Cave Bat	V,P		15
Reptilia	<i>Aprasia parapulchella</i>	Pink-tailed Legless Lizard	V,P	V	152
Reptilia	<i>Aspidites ramsayi</i>	Woma	V,P		P
Reptilia	<i>Delma impar</i>	Striped Legless Lizard	V,P	V	4
Reptilia	<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake	V,P		3
Reptilia	<i>Tympanocryptis lineata</i>	Canberra Grassland Earless Dragon	E4A,P	E	4
Reptilia	<i>Varanus rosenbergi</i>	Rosenberg's Goanna	V,P		6
Insecta	<i>Keyacris scurra</i>	Key's Matchstick Grasshopper	E1		P
Insecta	<i>Synemon plana</i>	Golden Sun Moth	V	V	50
Flora	<i>Caladenia arenaria</i>	Sand-hill Spider Orchid	E1,P,2	E	6
Flora	<i>Caladenia concolor</i>	Crimson Spider Orchid	E1,P,2	V	504
Flora	<i>Caladenia rosella</i>	Rosella Spider Orchid	E4,P,2	E	1
Flora	<i>Caladenia tessellata</i>	Thick Lip Spider Orchid	E1,P,2	V	1
Flora	<i>Cymbidium canaliculatum</i>	Cymbidium canaliculatum population in the Hunter Catchment	E2,P,2		1
Flora	<i>Diuris tricolor</i>	Pine Donkey Orchid	V,P,2		80
Flora	<i>Myriophyllum implicatum</i>		E4A,2		P
Flora	<i>Prasophyllum petilum</i>	Tarengo Leek Orchid	E1,P,2	E	25
Flora	<i>Pterostylis cobarensis</i>	Greenhood Orchid	V,P,2		175
Flora	<i>Acacia ausfeldii</i>	Ausfeld's Wattle	V		3928
Flora	<i>Acacia meiantha</i>		E1	E	P
Flora	<i>Acacia pendula</i>	Acacia pendula population in the Hunter catchment	E2		P
Flora	<i>Acacia phasmoides</i>	Phantom Wattle	V	V	91
Flora	<i>Ammobium craspedioides</i>	Yass Daisy	V	V	823
Flora	<i>Amphibromus fluitans</i>	Floating Swamp Wallaby-grass	V	V	30
Flora	<i>Atriplex infrequens</i>	A saltbush	V	V	1
Flora	<i>Austrostipa wakoolica</i>	A spear-grass	E1	E	P
Flora	<i>Bertya opponens</i>	Coolabah Bertya	V	V	234

Clade	Scientific Name	Common Name	*NSW status	+Comm. status	'Records
Flora	<i>Boronia granitica</i>	Granite Boronia	V,P	E	1
Flora	<i>Bossiaea fragrans</i>		E4A	CE	55
Flora	<i>Brachyscome muelleroides</i>	Claypan Daisy	V	V	1
Flora	<i>Caesia parviflora</i> var. <i>minor</i>	Small Pale Grass-lily	E1		3
Flora	<i>Carex raleighii</i>	Raleigh Sedge	E1		1
Flora	<i>Cheilanthes sieberi</i> subsp. <i>pseudovellea</i>		E1,3		22
Flora	<i>Commersonia procumbens</i>		V	V	181
Flora	<i>Cullen parvum</i>	Small Scurf-pea	E1		7
Flora	<i>Cynanchum elegans</i>	White-flowered Wax Plant	E1	E	P
Flora	<i>Dichanthium setosum</i>	Bluegrass	V	V	11
Flora	<i>Digitaria porrecta</i>	Finger Panic Grass	E1		18
Flora	<i>Eriocaulon australasicum</i>	Austral Pipewort	E1	E	P
Flora	<i>Eucalyptus aggregata</i>	Black Gum	V	V	1
Flora	<i>Eucalyptus alligatrix</i> subsp. <i>alligatrix</i>		V	V	2
Flora	<i>Eucalyptus camaldulensis</i>	Eucalyptus camaldulensis population in the Hunter catchment	E2		P
Flora	<i>Eucalyptus cannonii</i>	Capertee Stringybark	V		8
Flora	<i>Eucalyptus robertsonii</i> subsp. <i>hemisphaerica</i>	Robertson's Peppermint	V	V	P
Flora	<i>Euphrasia arguta</i>		E4A	CE	1
Flora	<i>Euphrasia collina</i> subsp. <i>muelleri</i>	Mueller's Eyebright	E1	E	P
Flora	<i>Grevillea wilkinsonii</i>	Tumut Grevillea	E4A	E	17
Flora	<i>Homoranthus darwinioides</i>	Fairy Bells	V	V	161
Flora	<i>Homoranthus prolixus</i>	Granite Homoranthus	V	V	1
Flora	<i>Indigofera efoliata</i>	Leafless Indigo	E1,3	E	6
Flora	<i>Lepidium aschersonii</i>	Spiny Peppercross	V	V	3
Flora	<i>Lepidium monoplacoides</i>	Winged Peppercross	E1	E	P
Flora	<i>Leucochrysum albicans</i> var. <i>tricolor</i>	Hoary Sunray		E	33
Flora	<i>Monotaxis macrophylla</i>	Large-leafed Monotaxis	E1		2
Flora	<i>Muehlenbeckia</i> sp. <i>Mt Norman</i>	Scrambling Lignum	V		1
Flora	<i>Persoonia marginata</i>	Clandulla Geebung	V,P	V	P
Flora	<i>Pilularia novae-hollandiae</i>	Austral Pillwort	E1,3		5
Flora	<i>Pimelea bracteata</i>		E4A		1
Flora	<i>Polygala linariifolia</i>	Native Milkwort	E1		14
Flora	<i>Pomaderris cotoneaster</i>	Cotoneaster Pomaderris	E1	E	P

Clade	Scientific Name	Common Name	*NSW status	+Comm. status	'Records
Flora	<i>Pomaderris queenslandica</i>	Scant Pomaderris	E1		44
Flora	<i>Prasophyllum sp. Wybong</i>		P	CE	P
Flora	<i>Pultenaea humilis</i>	Dwarf Bush-pea	V		8
Flora	<i>Senecio garlandii</i>	Woolly Ragwort	V		72
Flora	<i>Swainsona murrayana</i>	Slender Darling Pea	V	V	5
Flora	<i>Swainsona plagiotropis</i>	Red Darling Pea	V	V	4
Flora	<i>Swainsona recta</i>	Small Purple-pea	E1	E	736
Flora	<i>Swainsona sericea</i>	Silky Swainson-pea	V		233
Flora	<i>Thesium australe</i>	Austral Toadflax	V	V	2
Flora	<i>Tylophora linearis</i>		V	E	199
Flora	<i>Zieria ingramii</i>	Keith's Zieria	E1	E	312
Flora	<i>Zieria obcordata</i>	Granite Zieria	E1	E	26

BioNET Atlas search – threatened ecological communities predicted to occur within the Pilliga subregion of the Brigalow Belt South bioregion and the Bogan-Macquarie subregion of the Darling Riverine Plains bioregion

*NSW Status: E3=Endangered Ecological Community, E4B= Critically Endangered Ecological Community

+Comm. Status: CE=Critically Endangered, E=Endangered.

'Records: K = known, P= predicted.

TEC	*NSW status	+Comm. status	'Records
Alpine Sphagnum Bogs and Associated Fens		E	K
Artesian Springs Ecological Community in the Great Artesian Basin	E4B		K
Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions	E3		K
Brigalow-Gidgee woodland/shrubland in the Mulga Lands and Darling Riverine Plains Bioregions	E3		P
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions		E	K
Carex Sedgeland of the New England Tableland, Nandewar, Brigalow Belt South and NSW North Coast Bioregions	E3		K
Central Hunter Valley eucalypt forest and woodland		CE	K
Coolac-Tumut Serpentine Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions	E3		K
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions		E	K
Coolibah-Black Box Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penepplain and Mulga Lands Bioregions	E3		K
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	E3		K
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia		E	K
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions	E3		K
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penepplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	E3		K
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland		CE	K
Pilliga Outwash Ephemeral Wetlands in the Brigalow Belt South Bioregion	E3		K
Poplar Box Grassy Woodland on Alluvial Plains		E	K
The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin		E	K
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion		E	K
Weeping Myall Woodlands		E	K
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and	E4B		K
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		CE	K

BioNET Atlas search – key threatening processes (KTPs) predicted to occur within the within the Pilliga subregion of the Brigalow Belt South bioregion and the Bogan-Macquarie subregion of the Darling Riverine Plains bioregion



Common Name	NSW status	Comm status	Records
Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners, <i>Manorina melanocephala</i> (Latham, 1802)	KTP	KTP	P
Alteration of habitat following subsidence due to longwall mining	KTP		P
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	KTP		P
Anthropogenic Climate Change	KTP	KTP	P
Bushrock removal	KTP		P
Clearing of native vegetation	KTP	KTP	P
Competition and grazing by the feral European Rabbit, <i>Oryctolagus cuniculus</i> (L.)	KTP	KTP	P
Competition and habitat degradation by Feral Goats, <i>Capra hircus</i> Linnaeus 1758	KTP	KTP	P
Competition from feral honey bees, <i>Apis mellifera</i> L.	KTP		P
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	KTP		P
Habitat degradation and loss by Feral Horses (brumbies, wild horses), <i>Equus caballus</i> Linnaeus 1758	KTP		P
Herbivory and environmental degradation caused by feral deer	KTP		P
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	KTP		P
Importation of Red Imported Fire Ants <i>Solenopsis invicta</i> Buren 1972	KTP	KTP	P
Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	KTP	KTP	P
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	KTP	KTP	P
Infection of native plants by <i>Phytophthora cinnamomi</i>	KTP	KTP	P
Introduction of the Large Earth Bumblebee <i>Bombus terrestris</i> (L.)	KTP		P
Invasion and establishment of exotic vines and scramblers	KTP		P
Invasion and establishment of Scotch Broom (<i>Cytisus scoparius</i>)	KTP		P
Invasion and establishment of the Cane Toad (<i>Bufo marinus</i>)	KTP	KTP	P
Invasion of native plant communities by African Olive <i>Olea europaea</i> subsp. <i>cuspidata</i> (Wall. ex G. Don) Cif.	KTP		P
Invasion of native plant communities by <i>Chrysanthemoides monilifera</i>	KTP		P
Invasion of native plant communities by exotic perennial grasses	KTP		P
Invasion of the Yellow Crazy Ant, <i>Anoplolepis gracilipes</i> (Fr. Smith) into NSW	KTP		P
Invasion, establishment and spread of Lantana (<i>Lantana camara</i> L. sens. Lat)	KTP		P
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	KTP	KTP	P
Loss of Hollow-bearing Trees	KTP		P
Loss or degradation (or both) of sites used for hill-topping by butterflies	KTP		P
Predation and hybridisation by Feral Dogs, <i>Canis lupus familiaris</i>	KTP		P
Predation by <i>Gambusia holbrooki</i> Girard, 1859 (Plague Minnow or Mosquito Fish)	KTP		P
Predation by the European Red Fox <i>Vulpes vulpes</i> (Linnaeus, 1758)	KTP	KTP	P

Common Name	NSW status	Comm status	Records
Predation by the Feral Cat <i>Felis catus</i> (Linnaeus, 1758)	KTP	KTP	P
Predation, habitat degradation, competition and disease transmission by Feral Pigs, <i>Sus scrofa</i> Linnaeus 1758	KTP	KTP	P
Removal of dead wood and dead trees	KTP		P



Appendix B: Vegetation plot locations

Plot Name	PCT	Condition	Easting (Zone 55)	Northing (Zone 55)	Photographs
BU01	202	Good	627343	6449227	 The 'Photographs' column contains two side-by-side photographs of a wooded area. The left photograph shows a dense stand of trees with green foliage and a grassy undergrowth. The right photograph shows a similar scene, but with a prominent white vertical marker or stake in the foreground, likely used for field identification or measurement.

<p>BU02</p>	<p>202</p>	<p>Good</p>	<p>627570</p>	<p>6449208</p>		
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<p>BU03</p>	<p>202</p>	<p>Good</p>	<p>627521</p>	<p>6449093</p>		
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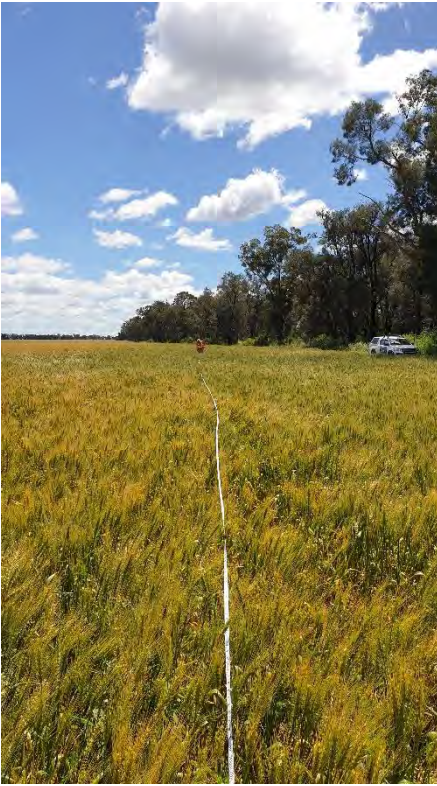
<p>BU04</p>	<p>55</p>	<p>Planted</p>	<p>627405</p>	<p>6449769</p>		
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<p>BU05</p>	<p>88</p>	<p>Good</p>	<p>627757</p>	<p>6448252</p>		
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<p>BU06</p>	<p>55</p>	<p>Good</p>	<p>628394</p>	<p>6451203</p>		
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BU07	55	Derived	626851	6451271		
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BU08	55	Moderate	626763	6450803		
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<p>BU09</p>	<p>0</p>	<p>Non-native</p>	<p>628197</p>	<p>6449885</p>		
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<p>BU10</p>	<p>88</p>	<p>Good</p>	<p>626680</p>	<p>6450282</p>		
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BU11	55	Good	626258	6448495		
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<p>BU12</p>	<p>0</p>	<p>Non-native</p>	<p>626259</p>	<p>6448537</p>		
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BU13	82	Moderate	626610	6449850		
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Appendix C: Field survey results

BAM Data Sheets

BAM Plot - Field Survey Sheet

Page 1 of (2)

Date	27/10/2022	Survey Name	Burroway Solar Power Station
Recorders	David Orchard (DO), Lucca Brozler (LB)	Plot ID #	BU01
Photo #		Zone ID	202_Good
Datum	GDA94	Plot dimensions	20 x 50 m
Zone	55	Plot bearing along midline	188
Easting	627343	Northing	6449227

Record easting, northing at plot marker (0 m point), Photos taken vertically and horizontally at 0m point and 50 m point, looking into plot

IBRA region	Brigalow Belt South
Subregion	Pilliga
Likely Vegetation Class	Western Slopes Grassy Woodlands
Plant Community Type	202
Condition state	Good

Floristics plot is centred on the midline, at 0 m point, 10 m either side

Function plot is an extension of floristics plot out to 50 m along midline (or equiv. area)

BAM Composition / Structure plot (400m²)		
Dimensions (circle applicable size)		
20 x 20 m	10 x 40 m	Sum values*
Native Richness (count of native species)	Trees	5
	Shrubs	4
	Grasses etc	5
	Forbs	9
	Ferns	0
Cover (sum of cover of natives species)	Trees	28.2
	Shrubs	15.3
	Grasses etc	55.2
	Forbs	25.7
	Ferns	0
	Other	0.2
High threat weed cover		0

*These values summarise the floristic data for input into BAM calculator

BAM Function plot (1000m²)		
Dimensions (circle applicable size)		
20 x 50 m	10 x 100 m	
Tree stem DBH (cm) Notes on function attributes:		
>80	0	Stem size class records # large trees (cf. benchmark)
50 - 79	0	Record stems for living trees only, and for all species
30 - 49	+	For multistemmed trees, record only the largest stem
20 - 29	+	Presence of <5cm stems records regeneration
10 - 19	+	Record # trees with hollows, not number of hollows
5 - 9	+	Count as one stem where tree is multistemmed
< 5	+	Hollow bearing stem may be a dead stem (incl. stag)
# Trees with hollows	<20cm	0
	>20cm**	0
Length of logs		Total (m)
		52

Measure length of logs >10cm, fully or partly in contact with the ground, and within the plot.

**Hollows of >20cm are recorded for habitat for some threatened species

BAM Litter/ Groundcover (1 x 1 m plots)							
Litter cover is used for BAM, other attributes are useful for recording site condition in general							
		1	2	3	4	5	Average
Sub-plot score (% cover)	Litter	80	70	90	90	60	78
	Bare ground						
	Cryptogam						
	Rock						

Litter / groundcover plots are located at 5, 15, 25, 35, 45 m (alternating sides) along the midline of Function plot.

Other plot information (not essential for BAM)

Disturbance	Severity	Timing	Landform
Cleaning (incl. logging)			Microrelief
Cultivation			Slope
Grazing (native / stock)			Aspect
Soil erosion			Soil surface texture
Firewood removal			Soil colour
Fire (ground stratum, mid, canopy burn?)			Site drainage
Storm damage			Distance to nearest water
Weediness			Distance to nearest rock outcrop /cave

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

Timing code: R= recent (<3y), NR= not recent, O= old/historic

Notes

BAM Plot - Field Survey Sheet

Date	27/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU02	Zone ID	202_Good
Photo #			Plot dimensions	20 x 50 m		
Datum	GDA94	Zone	55	Plot bearing along midline	224	
Easting	627570	Northing	6449208	Record magnetic bearing along midline from 0 m point		

Record easting, northing at plot marker (0 m point), Photos taken vertically and horizontally at 0m point and 50 m point, looking into plot

IBRA region	Brigalow Belt South		
Subregion	Pilliga		
Likely Vegetation Class	Western Slopes Grassy Woodlands		
Plant Community Type	202	Condition state	Good

Floristic plot is centred on the midline, at 0 m point, 10 m either side

Function plot is an extension of floristic plot out to 50 m along midline (or equiv. area)

BAM Composition / Structure plot (400m ²)		
Dimensions (circle applicable size)		
20 x 20 m	10 x 40 m	Sum values*
Native Richness (count of native species)	Trees	4
	Shrubs	5
	Grasses etc	7
	Forbs	8
	Ferns	0
Cover (sum of cover of natives species)	Trees	27.1
	Shrubs	2.8
	Grasses etc	51.3
	Forbs	3.6
	Ferns	0
Other	0	
High threat weed cover	0	

*These values summarise the floristic data for input into BAM calculator

BAM Function plot (1000m ²)		
Dimensions (circle applicable size)		
20 x 50 m	10 x 100 m	
Tree stem DBH (cm) Notes on function attributes:		
>80	0	Stem size class records # large trees (cf. benchmark)
50 - 79	0	Record stems for living trees only, and for all species
30 - 49	+	For multistemmed trees, record only the largest stem
20 - 29	+	Presence of <5cm stems records regeneration
10 - 19	+	Record # trees with hollows, not number of hollows
5 - 9	+	Count as one stem where tree is multistemmed
< 5	+	Hollow bearing stem may be a dead stem (incl. stag)
# Trees with hollows	<20cm	0
	>20cm**	0
Length of logs		Total (m)
		225

Measure length of logs >10cm, fully or partly in contact with the ground, and within the plot.

**Hollows of >20cm are recorded for habitat for some threatened species

BAM Litter/ Groundcover (1 x 1 m plots)							
		1	2	3	4	5	Average
Sub-plot score (% cover)	Litter	70	70	100	60	60	72
	Bare ground						
	Cryptogam						
	Rock						

Litter / groundcover plots are located at 5, 15, 25, 35, 45 m (alternating sides) along the midline of Function plot

Other plot information (not essential for BAM)

Disturbance	Severity	Timing	Landform
Clearing (incl. logging)			Microrelief
Cultivation			Slope
Grazing (native / stock)			Aspect
Soil erosion			Soil surface texture
Firewood removal			Soil colour
Fire (ground streams, mid. canopy burn?)			Site drainage
Storm damage			Distance to nearest water
Weediness			Distance to nearest rock outcrop /cave

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

Timing code: R= recent (<3y), NR = not recent, O = old/historic

Notes

BAM Plot - Field Survey Sheet

Date	27/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU03	Zone ID	202_Good
Photo #			Plot dimensions	20 x 50 m		
Datum	GDA94	Zone	55	Plot bearing along midline	108	
Easting	627521	Northing	6449093	Record magnetic bearing along midline from 0 m point		

Record easting, northing at plot marker (0 m point). Photos taken vertically and horizontally at 0m point and 50 m point, looking into plot

IBRA region	Brigalow Belt South		
Subregion	Pilliga		
Likely Vegetation Class	Western Slopes Grassy Woodlands		
Plant Community Type	202	Condition state	Good

Floristics plot is centred on the midline, at 0 m point, 10 m either side

Function plot is an extension of floristics plot out to 50 m along midline (or equiv. area)

BAM Composition / Structure plot (400m ²)		
Dimensions (circle applicable size)		
20 x 20 m	10 x 40 m	Sum values*
Native Richness (count of native species)	Trees	3
	Shrubs	8
	Grasses etc	7
	Forbs	11
	Ferns	0
Cover (sum of cover of natives species)	Other	0
	Trees	12
	Shrubs	4.8
	Grasses etc	28.3
	Forbs	15.9
	Ferns	0
	Other	0
High threat weed cover	0	

*These values summarise the floristic data for input into BAM calculator

BAM Function plot (1000m ²)			
Dimensions (circle applicable size)			
20 x 50 m	10 x 100 m		
Tree stem DBH (cm)			
>80	0	Notes on function attributes: Stem size class records # large trees (cf. benchmark) Record stems for living trees only, and for all species For multistemmed trees, record only the largest stem Presence of <5cm stems records regeneration Record # trees with hollows, not number of hollows Count as one stem where tree is multistemmed Hollow bearing stem may be a dead stem (incl. stag)	
50 - 79	0		
30 - 49	+		
20 - 29	+		
10 - 19	+		
5 - 9	+		
< 5	+		
# Trees with hollows	<20cm	0	Total #
	>20cm**	0	0
Length of logs			Total (m)
			167

Measure length of logs >10cm, fully or partly in contact with the ground, and within the plot.

**Hollows of >20cm are recorded for habitat for some threatened species

BAM Litter/ Groundcover (1 x 1 m plots)							
Litter cover is used for BAM, other attributes are useful for recording site condition in general							
		1	2	3	4	5	Average
Sub-plot score (% cover)	Litter	90	70	80	90	80	82
	Bare ground						
	Cryptogam						
	Rock						

Litter / groundcover plots are located at 5, 15, 25, 35, 45 m (alternating sides) along the midline of Function plot

Other plot information (not essential for BAM)

Disturbance	Severity	Timing	Landform
Clearing (incl. logging)			Microrelief
Cultivation			Slope
Grazing (native / stock)			Aspect
Soil erosion			Soil surface texture
Firewood removal			Soil colour
Fire (ground/stratum, mid/canopy burnt?)			Site drainage
Storm damage			Distance to nearest water
Weediness			Distance to nearest rock outcrop /cave

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

Timing code: R = recent (<3y), NR = not recent, O = old/historic

Notes

BAM Plot - Field Survey Sheet

Page 1 of (2)

Date	27/10/2022	Survey Name	Burroway Solar Power Station
Recorders	David Orchard (DO), Lucca Brozler (LB)	Plot ID #	BU04
Photo #		Zone ID	55_Planted
Datum	GDA94	Plot dimensions	20 x 50 m
Easting	627349	Plot bearing along midline	276
Northing	6449769	Record magnetic bearing along midline from 0m point	

Record easting, northing at plot marker (0 m point), Photos taken vertically and horizontally at 0m point and 50 m point, looking into plot

IBRA region	Brigalow Belt South
Subregion	Pilliga
Likely Vegetation Class	North-west Floodplain Woodlands
Plant Community Type	55
Condition state	Planted

Floristics plot is centred on the midline, at 0 m point, 10 m either side

Function plot is an extension of floristics plot out to 50 m along midline (or equiv. area)

BAM Composition / Structure plot (400m ²)		
Dimensions (circle applicable size)		
20 x 20 m	10 x 40 m	Sum values*
Native Richness (count of native species)	Trees	5
	Shrubs	7
	Grasses etc	6
	Forbs	7
	Ferns	0
Cover (sum of cover of natives species)	Other	0
	Trees	40.1
	Shrubs	2.8
	Grasses etc	16.4
	Forbs	1.6
	Ferns	0
	Other	0
High threat weed cover		0.3

*These values summarise the floristic data for input into BAM calculator

BAM Function plot (1000m ²)		
Dimensions (circle applicable size)		
20 x 50 m	10 x 100 m	
Tree stem DBH (cm)		
>80	0	Notes on function attributes: Stem size class records # large trees (cf. benchmark) Record stems for living trees only, and for all species For multistemmed trees, record only the largest stem Presence of <5cm stems records regeneration Record # trees with hollows, not number of hollows Count as one stem where tree is multistemmed Hollow bearing stem may be a dead stem (incl. stag)
50 - 79	1	
30 - 49	10	
20 - 29	+	
10 - 19	+	
5 - 9	-	
< 5	+	
# Trees with hollows	<20cm 0	Total #
	>20cm** 0	0
Length of logs		Total (m)
		52.9

Measure length of logs >10cm, fully or partly in contact with the ground, and within the plot.

**Hollows of >20cm are recorded for habitat for some threatened species

BAM Litter/ Groundcover (1 x 1 m plots)							
Litter cover is used for BAM, other attributes are useful for recording site condition in general							
		1	2	3	4	5	Average
Sub-plot score (% cover)	Litter	30	70	30	15	25	34
	Bare ground						
	Cryptogam						
	Rock						

Litter / groundcover plots are located at 5, 15, 25, 35, 45 m (alternating sides) along the midline of Function plot

Other plot information (not essential for BAM)

Disturbance	Severity	Timing	Landform
Clearing (incl. logging)			Microrelief
Cultivation			Slope
Grazing (native / stock)			Aspect
Soil erosion			Soil surface texture
Firewood removal			Soil colour
Fire (ground stratum; mid. canopy burn?)			Site drainage
Storm damage			Distance to nearest water
Weediness			Distance to nearest rock outcrop /cave

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

Timing code: R = recent (<3y), NR = not recent, O = old/historic

Notes

BAM Plot - Field Survey Sheet

Page 1 of (2)

Date	27/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU05	Zone ID	88_Good
Photo #			Plot dimensions	20 x 50 m		
Datum	GDA94	Zone	55	Plot bearing along midline	276	
Easting	627757	Northing	6448252	Record magnetic bearing along midline from 0 m point		

Record easting, northing at plot marker (0 m point). Photos taken vertically and horizontally at 0m point and 50 m point, looking into plot

IBRA region	Brigalow Belt South				
Subregion	Pilliga				
Likely Vegetation Class	Pilliga Outwash Dry Sclerophyll Forests				
Plant Community Type	88	Condition state	Good		

Floristic plot is centred on the midline, at 0 m point, 10 m either side

Function plot is an extension of floristic plot out to 50 m along midline (or equiv. area)

BAM Composition / Structure plot (400m²)		
Dimensions (circle applicable size)		
20 x 20 m	10 x 40 m	Sum values*
Native Richness (count of native species)	Trees	2
	Shrubs	11
	Grasses etc	5
	Forbs	11
	Ferns	0
	Other	1
Cover (sum of cover of natives species)	Trees	36
	Shrubs	53.3
	Grasses etc	30.1
	Forbs	7.1
	Other	0.1
High threat weed cover	5	

*These values summarise the floristic data for input into BAM calculator

BAM Function plot (1000m²)		
Dimensions (circle applicable size)		
20 x 50 m	10 x 100 m	
Tree stem DBH (cm) Notes on function attributes:		
>80	0	Stem size class records # large trees (cf. benchmark)
50 - 79	2	Record stems for living trees only, and for all species
30 - 49	+	For multistemmed trees, record only the largest stem
20 - 29	+	Presence of <5cm stems records regeneration
10 - 19	-	Record # trees with hollows, not number of hollows
5 - 9	-	Count as one stem where tree is multistemmed
< 5	+	Hollow bearing stem may be a dead stem (incl. stag)
# Trees with hollows	<20cm	Total #
	>20cm**	
Length of logs		Total (m)
		19.6

Measure length of logs >10cm, fully or partly in contact with the ground, and within the plot.

**Hollows of >20cm are recorded for habitat for some threatened species

BAM Litter/ Groundcover (1 x 1 m plots)							
Litter cover is used for BAM, other attributes are useful for recording site condition in general							
		1	2	3	4	5	Average
Sub-plot score (% cover)	Litter	80	70	90	90	60	78
	Bare ground						
	Cryptogam						
	Rock						

Litter / groundcover plots are located at 5, 15, 25, 35, 45 m (alternating sides) along the midline of Function plot

Other plot information (not essential for BAM)

Disturbance	Severity	Timing	Landform
Clearing (incl. logging)			Microrelief
Cultivation			Slope
Grazing (native / stock)			Aspect
Soil erosion			Soil surface texture
Firewood removal			Soil colour
Fire (ground stratum, mid, canopy burnt?)			Site drainage
Storm damage			Distance to nearest water
Weediness			Distance to nearest rock outcrop /cave

Severity code: 0=no evidence, 1=slight, 2=moderate, 3= severe
Timing code: R= recent (<3y), NR = not recent, O = old/historic

Notes

BAM Plot - Field Survey Sheet

Page 1 of (3)

Date	27/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU06	Zone ID	55_Good
Photo #			Plot dimensions	20 x 50 m		
Datum	GDA94	Zone	55	Plot bearing along midline	290	
Easting	628394	Northing	6451203	Record magnetic bearing along midline from 0 m point		

Record easting, northing at plot marker (0 m point). Photos taken vertically and horizontally at 0m point and 50 m point, looking into plot

IBRA region	Brigalow Belt South				
Subregion	Pilliga				
Likely Vegetation Class	North-west Floodplain Woodlands				
Plant Community Type	55	Condition state	Good		

Floristics plot is centred on the midline, at 0 m point, 10m either side

Function plot is an extension of floristics plot out to 50 m along midline (or equiv. area)

BAM Composition / Structure plot (400m ²)		
Dimensions (circle applicable size)		
20 x 20 m	10 x 40 m	Sum values*
Native Richness (count of native species)	Trees	3
	Shrubs	7
	Grasses etc	7
	Forbs	14
	Ferns	0
Cover (sum of cover of natives species)	Trees	40.5
	Shrubs	33.3
	Grasses etc	55.4
	Forbs	7.2
	Ferns	0
Other	0.3	
High threat weed cover	5.1	

*These values summarise the floristic data for input into BAM calculator

BAM Function plot (1000m ²)		
Dimensions (circle applicable size)		
20 x 50 m	10 x 100 m	
Tree stem DBH (cm)		Notes on function attributes:
>80	0	Stem size class records # large trees (d. benchmark)
50 - 79	1	Record stems for living trees only, and for all species
30 - 49	7	For multistemmed trees, record only the largest stem
20 - 29	+	Presence of <5cm stems records regeneration
10 - 19	-	Record # trees with hollows, not number of hollows
5 - 9	-	Count as one stem where tree is multistemmed
< 5	+	Hollow bearing stem may be a dead stem (incl. snag)
# Trees with hollows	<20cm	Total #
	>20cm**	3
Length of logs	Total (m)	
	124.2	

Measure length of logs >10cm, fully or partly in contact with the ground, and within the plot.

**Hollows of >20cm are recorded for habitat for some threatened species

BAM Litter/ Groundcover (1 x 1 m plots)							
Litter cover is used for BAM, other attributes are useful for recording site condition in general							
		1	2	3	4	5	Average
Sub-plot score (% cover)	Litter	50	30	60	70	60	54
	Bare ground						
	Cryptogam						
	Rock						

Litter / groundcover plots are located at 5, 15, 25, 35, 45 m (alternating sides) along the midline of Function plot

Other plot information (not essential for BAM)

Disturbance	Severity	Timing	Landform
Clearing (incl. logging)			Microrelief
Cultivation			Slope
Grazing (native / stock)			Aspect
Soil erosion			Soil surface texture
Firewood removal			Soil colour
Fire (ground stratum, mid, canopy burnt?)			Site drainage
Storm damage			Distance to nearest water
Weediness			Distance to nearest rock outcrop /cave

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

Timing code: R= recent (<3y), NR= not recent, O = old/historic

Notes

BAM Plot - Field Survey Sheet

Page 2 of (3)

Date	27/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU06	Zone ID	55_Good
GF code	Genus species	(tick if photographed or sample taken)	Cover %	Abund (count)	N, E, HTE	Stratum
TG	<i>Casuarina cristata</i>		35		N	
TG	<i>Eucalyptus pilligaensis</i>		5		N	
SG	<i>Eremophila mitchellii</i>		10		N	
TG	<i>Alectryon oleifolius</i>		0.5	1	N	
SG	<i>Geijera parviflora</i>		15		N	
NN	<i>Lycium ferocissimum</i>		5		HTE	
GG	<i>Austrostipa blackii</i>		30		N	
GG	<i>Austrostipa verticillata</i>		20		N	
FG	<i>Verbena gaudichaudii</i>		0.1	10	N	
FG	<i>Abutilon fraseri</i>		2		N	
FG	<i>Sida corrugata</i>		0.1	10	N	
GG	<i>Enteropogon acicularis</i>		0.1	10	N	
GG	<i>Rytidosperma caespitosum</i>		5		N	
FG	<i>Parietaria debilis</i>		2		N	
NN	<i>Lolium rigidum</i>		20		E	
NN	<i>Sonchus oleraceus</i>		1		E	
NN	<i>Medicago polymorpha</i>		2		E	
FG	<i>Dichondra repens</i>		1		N	
SG	<i>Rhagodia spinescens</i>		5		N	
FG	<i>Oxalis perennans</i>		0.1	20	N	
FG	<i>Calotis lappulacea</i>		0.1	20	N	
NN	<i>Conyza bonariensis</i>		0.1	10	E	
FG	<i>Bulbine semibarbata</i>		0.1	20	N	
SG	<i>Maireana microphylla</i>		0.2	2	N	
SG	<i>Sclerolaena muricata</i>		2		N	
FG	<i>Einadia polygonoides</i>		0.2	50	N	
FG	<i>Sida trichopoda</i>		0.2	40	N	
SG	<i>Atriplex leptocarpa</i>		0.1	2	N	
NN	<i>Sisymbrium orientale</i>		0.1	7	E	
OG	<i>Convolvulus angustissimus</i>		0.1	1	N	
NN	<i>Lactuca saligna</i>		0.1	1	E	
NN	<i>Hypochoeris radicata</i>		2		E	
FG	<i>Wahlenbergia communis</i>		0.1	10	N	
FG	<i>Oxytes brachypoda</i>		0.1	1	N	
NN	<i>Carthamus lanatus</i>		0.1	1	HTE	
NN	<i>Sisymbrium erysimoides</i>		0.1	20	E	
FG	<i>Einadia trigonos</i>		1		N	
SG	<i>Sclerolaena diacantha</i>		1		N	
NN	<i>Cirsium vulgare</i>		0.1	2	E	
FG	<i>Brunoniella australis</i>		0.1	5	N	
NN	<i>Sonchus asper</i>		0.1	10	E	

Growth Form (see BAM Appendix 4) - Tree (TG), Shrub (SG), Grass & grasslike (GG), Forb (FG), Fern (EG), Other (OG)
Cover: 0.1, 0.2, 0.3, ... 1, 2, 3, ... 10, 15, 20, 25, ... 100% (incl. leaf, branch, stem cover per species).
Abundance for each species with ≤5% cover: 1, 2, 3, 4, ... 10, 20, 30, ... 100, 500, 1000, 1500, 2000 stems
N=native, E=exotic, HTE=high threat exotic
 All species in a plot must be recorded. If you can only ID to genus, separate different species by unique identifier e.g. *Genus* sp1, *Genus* sp2 etc
 Identify top 3 dominants in each stratum (use own stratum definitions) Cover area examples: 0.1% = 63x63cm, 0.5% = 1.4x1.4m, 1% = 2x2 m, 5%=4x5m, 25%=10x10m

KH - Version 1.1 - Date 1/12/2017

BAM Plot - Field Survey Sheet

Date	28/10/2022	Survey Name	Burroway Solar Power Station
Recorders	David Orchard (DO), Lucca Brozler (LB)	Plot ID #	BU07
Photo #		Zone ID	55_Derived
Datum	GDA94	Plot dimensions	20 x 50 m
Zone	55	Plot bearing along midline	196
Easting	626851	Northing	6451271

Record easting, northing at plot marker (0 m point), Photos taken vertically and horizontally at 0m point and 50 m point, looking into plot

IBRA region	Brigalow Belt South
Subregion	Pilliga
Likely Vegetation Class	North-west Floodplain Woodlands
Plant Community Type	55
Condition state	Derived

Floristics plot is centred on the midline, at 0 m point, 10 m either side

Function plot is an extension of floristics plot out to 50 m along midline (or equiv. area)

BAM Composition / Structure plot (400m²)		
Dimensions (circle applicable size)		
20 x 20 m	10 x 40 m	Sum values*
Native Richness (count of native species)	Trees	1
	Shrubs	1
	Grasses etc	7
	Forbs	11
	Ferns	1
Cover (sum of cover of natives species)	Other	0
	Trees	5
	Shrubs	2
	Grasses etc	51.3
	Forbs	1.1
	Ferns	0.1
	Other	0
High threat weed cover		0.2

*These values summarise the floristic data for input into BAM calculator

BAM Function plot (1000m²)		
Dimensions (circle applicable size)		
20 x 50 m	10 x 100 m	
Tree stem DBH (cm) Notes on function attributes:		
>80	0	Stem size class records # large trees (cf. benchmark)
50 - 79	0	Record stems for living trees only, and for all species
30 - 49	1	For multistemmed trees, record only the largest stem
20 - 29	-	Presence of <5cm stems records regeneration
10 - 19	-	Record # trees with hollows, not number of hollows
5 - 9	-	Count as one stem where tree is multistemmed
< 5	+	Hollow bearing stem may be a dead stem (incl. stag)
# Trees with hollows	<20cm	Total #
	>20cm**	0
Length of logs		Total (m)
		0

Measure length of logs >10cm, fully or partly in contact with the ground, and within the plot.

**Hollows of >20cm are recorded for habitat for some threatened species

BAM Litter/ Groundcover (1 x 1 m plots)							
		1	2	3	4	5	Average
Sub-plot score (% cover)	Litter	30	5	2	5	5	9.4
	Bare ground						
	Cryptogam						
	Rock						

Litter / groundcover plots are located at 5, 15, 25, 35, 45 m (alternating sides) along the midline of Function plot.

Other plot information (not essential for BAM)

Disturbance	Severity	Timing	Landform
Cleaning (incl. logging)			Microrelief
Cultivation			Slope
Grazing (native / stock)			Aspect
Soil erosion			Soil surface texture
Firewood removal			Soil colour
Fire (ground stratum, mid, canopy burn?)			Site drainage
Storm damage			Distance to nearest water
Weediness			Distance to nearest rock outcrop /cave

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

Timing code: R= recent (<3y), NR= not recent, O= old/historic

Notes

BAM Plot - Field Survey Sheet

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Date	28/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU07	Zone ID	55_Derived
GF code	Genus species	Cover %	Abund (count)	N, E, HTE	Stratum	
TG	<i>Casuarina cristata</i>	5		N		
FG	<i>Sonchus oleraceus</i>	1		E		
FG	<i>Goodenia pinnatifida</i>	0.1	20	N		
FG	<i>Lepidium bonariense</i>	0.2	100	E		
FG	<i>Lepidium africanum</i>	0.1	20	E		
GG	<i>Avena fatua</i>	10		E		
FG	<i>Crassula sieberiana</i>	0.1		N		
GG	<i>Lolium rigidum</i>	25		E		
FG	<i>Wahlenbergia communis</i>	0.1	100	N		
GG	<i>Chloris ventricosa</i>	30		N		
FG	<i>Lysimachia arvensis</i>	0.1	20	E		
FG	<i>Trifolium glomeratum</i>	1		E		
EG	<i>Cheilanthes sieberi</i>	0.1	3	N		
FG	<i>Leontodon rhagadioloides</i>	0.1	20	E		
FG	<i>Einadia polygonoides</i>	0.1	10	N		
FG	<i>Conyza bonariensis</i>	0.1	30	E		
GG	<i>Carex inversa</i>	1		N		
FG	<i>Oxalis perennans</i>	0.1	20	N		
FG	<i>Dichondra repens</i>	0.1	20	N		
FG	<i>Gamochaeta</i> sp.	0.1	7	E		
GG	<i>Enteropogon acicularis</i>	0.1	10	N		
GG	<i>Austrostipa blackii</i>	18		N		
SG	<i>Sclerolaena diacantha</i>	2		N		
FG	<i>Vittadinia cervicalis</i>	0.1	20	N		
FG	<i>Trifolium arvense</i>	1		E		
FG	<i>Velleia paradoxa</i>	0.1	7	N		
FG	<i>Trifolium angustifolium</i>	1		E		
FG	<i>Carthamus lanatus</i>	0.1	1	HTE		
FG	<i>Leiocarpa panaetioides</i>	0.1	10	N		
GG	<i>Rytidosperma caespitosum</i>	0.1	10	N		
GG	<i>Juncus subsecundus</i>	2		N		
FG	<i>Verbena gaudichaudii</i>	0.1	2	N		
FG	<i>Wahlenbergia gracilentia</i>	0.1	30	N		
FG	<i>Rumex crispus</i>	0.2	20	E		
GG	<i>Bromus diandrus</i>	0.1	20	HTE		
FG	<i>Cyclospemum leptophyllum</i>	0.1	1	E		
GG	<i>Dichanthium sericeum</i>	0.1	5	N		
GG	<i>Vulpia</i> sp.	0.1	10	E		
GG	<i>Bromus hordeaceus</i>	0.1	3	E		

Growth Form (see BAM Appendix 4) - Tree (TG), Shrub (SG), Grass & grasslike (GG), Forb (FG), Fern (EG), Other (OG)
Cover: 0.1, 0.2, 0.3, ... 1, 2, 3, ...10, 15, 20, 25, ...100% (incl. leaf, branch, stem cover per species).
Abundance for each species with ≤5% cover: 1, 2, 3, 4, ... 10, 20, 30, ... 100, 500, 1000, 1500, 2000 stems
N=native, E=exotic, HTE=high threat exotic
 All species in a plot must be recorded. If you can only ID to genus, separate different species by unique identifier e.g. *Genus* sp1, *Genus* sp2 etc
 Identify top 3 dominants in each stratum (use own stratum definitions) Cover area examples: 0.1% = 63x63cm, 0.5% = 1.4x1.4m, 1% = 2x2 m, 5% = 4x5m, 25% = 10x10m

KH - Version 1.1 - Date 1/12/2017

BAM Plot - Field Survey Sheet

Page 1 of (1)

Date	28/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU08	Zone ID	55_Moder.
Photo #			Plot dimensions	10 x 50 m		
Datum	GDA94	Zone	55	Plot bearing along midline	190	
Easting	626763	Northing	6450803	Record magnetic bearing along midline from 0 m point		

Record easting, northing at plot marker (0 m point), Photos taken vertically and horizontally at 0m point and 50 m point, looking into plot

IBRA region	Brigalow Belt South		
Subregion	Pilliga		
Likely Vegetation Class	North-west Floodplain Woodlands		
Plant Community Type	55	Condition state	Moderate

Floristics plot is centred on the midline, at 0 m point, 10 m either side

Function plot is an extension of floristics plot out to 50 m along midline (or equiv. area)

BAM Composition / Structure plot (400m ²)		
Dimensions (circle applicable size)		
10 x 40 m	10 x 40 m	Sum values*
Native Richness (count of native species)	Trees	1
	Shrubs	6
	Grasses etc	7
	Forbs	6
	Ferns	0
	Other	0
Cover (sum of cover of natives species)	Trees	50
	Shrubs	4.2
	Grasses etc	41.2
	Forbs	0.6
	Ferns	0
	Other	0
High threat weed cover	1	

*These values summarise the floristic data for input into BAM calculator

BAM Function plot (1000m ²)		
Dimensions (circle applicable size)		
10 x 50 m	10 x 100 m	
Tree stem DBH (cm) Notes on function attributes:		
>80	0	Stem size class records # large trees (cf. benchmark)
50 - 79	1	Record stems for living trees only, and for all species
30 - 49	5	For multistemmed trees, record only the largest stem
20 - 29	+	Presence of <5cm stems records regeneration
10 - 19	-	Record # trees with hollows, not number of hollows
5 - 9	-	Count as one stem where tree is multistemmed
< 5	+	Hollow bearing stem may be a dead stem (incl. stag)
# Trees with hollows	<20cm	Total #
	>20cm**	0
Length of logs		Total (m)
		103.7

Measure length of logs >10cm, fully or partly in contact with the ground, and within the plot.

**Hollows of >20cm are recorded for habitat for some threatened species

BAM Litter/ Groundcover (1 x 1 m plots)							
Litter cover is used for BAM, other attributes are useful for recording site condition in general							
Sub-plot score (% cover)	Litter	1	2	3	4	5	Average
	Bare ground	100	100	5	20	100	65
	Cryptogam						
	Rock						

Litter / groundcover plots are located at 5, 15, 25, 35, 45 m (alternating sides) along the midline of Function plot

Other plot information (not essential for BAM)

Disturbance	Severity	Timing	Landform
Clearing (incl. logging)			Microrelief
Cultivation			Slope
Grazing (native / stock)			Aspect
Soil erosion			Soil surface texture
Firewood removal			Soil colour
Fire (ground streams, mid. canopy burn?)			Site drainage
Storm damage			Distance to nearest water
Weediness			Distance to nearest rock outcrop /cave

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

Timing code: R= recent (<3y), NR = not recent, O = old/historic

Notes

BAM Plot - Field Survey Sheet

Date	28/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU09	Zone ID	Non-native
Photo #			Plot dimensions	20 x 50 m		
Datum	GDA94	Zone	55	Plot bearing along midline	192	
Easting	628197	Northing	6449885	Record magnetic bearing along midline from 0 m point		

Record easting, northing at plot marker (0 m point). Photos taken vertically and horizontally at 0m point and 50 m point, looking into plot

IBRA region	Brigalow Belt South		
Subregion	Pilliga		
Likely Vegetation Class	Non-native		
Plant Community Type	0	Condition state	Non-native

Floristics plot is centred on the midline, at 0 m point, 10m either side

Function plot is an extension of floristics plot out to 50 m along midline (or equiv. area)

BAM Composition / Structure plot (400m ²)		
Dimensions (circle applicable size)		
20 x 20 m	10 x 40 m	Sum values*
Native Richness (count of native species)	Trees	0
	Shrubs	0
	Grasses etc	0
	Forbs	2
	Ferns	0
Cover (sum of cover of natives species)	Other	0
	Trees	0
	Shrubs	0
	Grasses etc	0
	Forbs	0.2
	Ferns	0
	Other	0
High threat weed cover	0	

*These values summarise the floristic data for input into BAM calculator

BAM Function plot (1000m ²)		
Dimensions (circle applicable size)		
20 x 50 m	10 x 100 m	
Tree stem DBH (cm)		Notes on function attributes:
>80	0	Stem size class records # large trees (cf. benchmark)
50 - 79	0	Record stems for living trees only, and for all species
30 - 49	-	For multistemmed trees, record only the largest stem
20 - 29	-	Presence of <5cm stems records regeneration
10 - 19	-	Record # trees with hollows, not number of hollows
5 - 9	-	Count as one stem where tree is multistemmed
< 5	-	Hollow bearing stem may be a dead stem (incl. stag)
# Trees with hollows	<20cm	Total #
	>20cm**	0
Length of logs		Total (m)
		0

Measure length of logs >10cm, fully or partly in contact with the ground, and within the plot.

**Hollows of >20cm are recorded for habitat for some threatened species

BAM Litter/ Groundcover (1 x 1 m plots)							
Litter cover is used for BAM, other attributes are useful for recording site condition in general							
		1	2	3	4	5	Average
Sub-plot score (% cover)	Litter	1	1	2	1	5	2
	Bare ground						
	Cryptogam						
	Rock						

Litter / groundcover plots are located at 5, 15, 25, 35, 45 m (alternating sides) along the midline of Function plot

Other plot information (not essential for BAM)

Disturbance	Severity	Timing	Landform
Clearing (incl. logging)			Microrelief
Cultivation			Slope
Grazing (native / stock)			Aspect
Soil erosion			Soil surface texture
Firewood removal			Soil colour
Fire (ground/stratum, mid/ canopy burnt?)			Site drainage
Storm damage			Distance to nearest water
Weediness			Distance to nearest rock outcrop /cave

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

Timing code: R = recent (<3y), NR = not recent, O = old/historic

Notes

BAM Plot - Field Survey Sheet

Page 1 of (3)

Date	28/10/2022	Survey Name	Burroway Solar Power Station
Recorders	David Orchard (DO), Lucca Brozler (LB)	Plot ID #	BU10
Photo #		Zone ID	88_Good
Datum	GDA94	Plot dimensions	10 x 50 m
Easting	626680	Plot bearing along midline	191
Northing	6450282	Record magnetic bearing along midline from 0m point	

Record easting, northing at plot marker (0 m point), Photos taken vertically and horizontally at 0m point and 50 m point, looking into plot

IBRA region	Brigalow Belt South
Subregion	Pilliga
Likely Vegetation Class	Pilliga Outwash Dry Sclerophyll Forests
Plant Community Type	88
Condition state	Good

Floristics plot is centred on the midline, at 0 m point, 10 m either side

Function plot is an extension of floristics plot out to 50 m along midline (or equiv. area)

BAM Composition / Structure plot (400m ²)		
Dimensions (circle applicable size)		
10 x 40 m	10 x 40 m	Sum values*
Native Richness (count of native species)	Trees	1
	Shrubs	5
	Grasses etc	14
	Forbs	18
	Ferns	0
Cover (sum of cover of natives species)	Other	2
	Trees	35
	Shrubs	35.8
	Grasses etc	47.7
	Forbs	2
	Ferns	0
	Other	1.1
	High threat weed cover	1.1

*These values summarise the floristic data for input into BAM calculator

BAM Function plot (1000m ²)		
Dimensions (circle applicable size)		
10 x 50 m	10 x 100 m	
Tree stem DBH (cm)		
>80	2	Notes on function attributes:
50 - 79	0	Stem size class records # large trees (cf. benchmark)
30 - 49	-	Record stems for living trees only, and for all species
20 - 29	-	For multistemmed trees, record only the largest stem
10 - 19	+	Presence of <5cm stems records regeneration
5 - 9	+	Record # trees with hollows, not number of hollows
< 5	+	Count as one stem where tree is multistemmed
# Trees with hollows		Hollow bearing stem may be a dead stem (incl. stag)
	<20cm	Total #
	>20cm**	2
Length of logs		Total (m)
		14.1

Measure length of logs >10cm, fully or partly in contact with the ground, and within the plot.

**Hollows of >20cm are recorded for habitat for some threatened species

BAM Litter/ Groundcover (1 x 1 m plots)							
Litter cover is used for BAM, other attributes are useful for recording site condition in general							
		1	2	3	4	5	Average
Sub-plot score (% cover)	Litter	100	80	100	90	5	75
	Bare ground						
	Cryptogam						
	Rock						

Litter / groundcover plots are located at 5, 15, 25, 35, 45 m (alternating sides) along the midline of Function plot

Other plot information (not essential for BAM)

Disturbance	Severity	Timing	Landform
Clearing (incl. logging)			Microrelief
Cultivation			Slope
Grazing (native / stock)			Aspect
Soil erosion			Soil surface texture
Firewood removal			Soil colour
Fire (ground stratum; mid. canopy burn?)			Site drainage
Storm damage			Distance to nearest water
Weediness			Distance to nearest rock outcrop /cave

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

Timing code: R = recent (<3y), NR = not recent, O = old/historic

Notes

BAM Plot - Field Survey Sheet

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Date	28/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU10	Zone ID	88_Good
GF code	Genus species	Cover %	Abund (count)	N, E, HTE	Stratum	
TG	<i>Eucalyptus pilligaensis</i>	35		N		
SG	<i>Geijera parviflora</i>	20		N		
FG	<i>Sisymbrium irio</i>	0.1	4	E		
GG	<i>Austrostipa verticillata</i>	0.2	10	N		
NN	<i>Sonchus oleraceus</i>	0.2	50	E		
NN	<i>Avena fatua</i>	2		E		
SG	<i>Myoporum montanum</i>	10		N		
FG	<i>Oxalis perennans</i>	0.1	30	N		
GG	<i>Lolium rigidum</i>	5		E		
FG	<i>Solanum nigrum</i>	0.1	2	E		
FG	<i>Einadia nutans</i>	0.2	10	N		
FG	<i>Hypochaeris radicata</i>	0.1	10	E		
FG	<i>Calotis lappulacea</i>	0.1	7	N		
FG	<i>Minuria leptophylla</i>	0.1	20	N		
GG	<i>Chloris ventricosa</i>	35		N		
FG	<i>Dichondra repens</i>	0.1	10	N		
FG	<i>Brachyscome chrysoglossa</i>	0.2	50	N		
FG	<i>Bulbine semibarbata</i>	0.1	20	N		
GG	<i>Eragrostis brownii</i>	0.1	20	N		
FG	<i>Dianella longifolia</i>	0.1	6	N		
FG	<i>Gamochaeta sp.</i>	0.1	20	E		
SG	<i>Sclerolaena diacantha</i>	5		N		
OG	<i>Jasminum lineare</i>	1		N		
FG	<i>Aster subulatus</i>	0.1	20	E		
OG	<i>Convolvulus angustissimus</i>	0.1	1	N		
GG	<i>Paspalidium constrictum</i>	1	1	N		
FG	<i>Arthropodium minus</i>	0.1	1	N		
FG	<i>Wahlenbergia stricta</i>	0.1	10	N		
GG	<i>Austrostipa blackii</i>	5		N		
GG	<i>Themeda triandra</i>	0.1	20	N		
GG	<i>Austrostipa elegantissima</i>	1		N		
GG	<i>Juncus bufonius</i>	0.1	10	N		
FG	<i>Spergularia brevifolia</i>	0.1	20	N		
GG	<i>Rytidosperma caespitosum</i>	2		N		
FG	<i>Wahlenbergia communis</i>	0.1	10	N		
FG	<i>Xerochrysum viscosum</i>	0.1	20	N		
FG	<i>Medicago polymorpha</i>	0.1	20	E		
FG	<i>Rhodanthe corymbiflora</i>	0.1	1	N		
SG	<i>Pittosporum angustifolium</i>	0.3	1	N		
FG	<i>Lactuca serriola</i>	0.1	1	E		
SG	<i>Lycium ferocissimum</i>	1		HTE		

Growth Form (see BAM Appendix 4) - Tree (TG), Shrub (SG), Grass & grasslike (GG), Forb (FG), Fern (EG), Other (OG)
Cover: 0.1, 0.2, 0.3, ... 1, 2, 3, ... 10, 15, 20, 25, ... 100% (incl. leaf, branch, stem cover per species).
Abundance for each species with ≤5% cover: 1, 2, 3, 4, ... 10, 20, 30, ... 100, 500, 1000, 1500, 2000 stems
N=native, E=exotic, HTE=high threat exotic
 All species in a plot must be recorded. If you can only ID to genus, separate different species by unique identifier e.g. *Genus* sp1, *Genus* sp2 etc
 Identify top 3 dominants in each stratum (use own stratum definitions) Cover area examples: 0.1% = 63x63cm, 0.5% = 1.4x1.4m, 1% = 2x2 m, 5%=4x5m, 25%=10x10m

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BAM Plot - Field Survey Sheet

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Date	28/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU11	Zone ID	55_Good
Photo #			Plot dimensions	20 x 50 m		
Datum	GDA94	Zone	55	Plot bearing along midline	102	
Easting	626258	Northing	6448495	Record magnetic bearing along midline from 0 m point		

Record easting, northing at plot marker (0 m point). Photos taken vertically and horizontally at 0m point and 50 m point, looking into plot

IBRA region	Brigalow Belt South		
Subregion	Pilliga		
Likely Vegetation Class	North-west Floodplain Woodlands		
Plant Community Type	55	Condition state	Good

Floristic plot is centred on the midline, at 0 m point, 10 m either side

Function plot is an extension of floristic plot out to 50 m along midline (or equiv. area)

BAM Composition / Structure plot (400m²)		
Dimensions (circle applicable size)		
20 x 20 m	10 x 40 m	Sum values*
Native Richness (count of native species)	Trees	2
	Shrubs	5
	Grasses etc	6
	Forbs	11
	Ferns	0
	Other	0
Cover (sum of cover of natives species)	Trees	60
	Shrubs	25.2
	Grasses etc	26.2
	Forbs	2.9
	Other	0
High threat weed cover	0.2	

*These values summarise the floristic data for input into BAM calculator

BAM Function plot (1000m²)		
Dimensions (circle applicable size)		
20 x 50 m	10 x 100 m	
Tree stem DBH (cm)		
>80	0	Notes on function attributes: Stem size class records # large trees (cf. benchmark) Record stems for living trees only, and for all species For multistemmed trees, record only the largest stem Presence of <5cm stems records regeneration Record # trees with hollows, not number of hollows Count as one stem where tree is multistemmed Hollow bearing stem may be a dead stem (incl. stag)
50 - 79	1	
30 - 49	13	
20 - 29	+	
10 - 19	-	
5 - 9	-	
< 5	+	
# Trees with hollows	<20cm	Total #
	>20cm**	1
Length of logs		Total (m)
		17.1

Measure length of logs >10cm, fully or partly in contact with the ground, and within the plot.

**Hollows of >20cm are recorded for habitat for some threatened species

BAM Litter/ Groundcover (1 x 1 m plots)							
Litter cover is used for BAM, other attributes are useful for recording site condition in general							
		1	2	3	4	5	Average
Sub-plot score (% cover)	Litter	30	90	100	30	100	70
	Bare ground						
	Cryptogam						
	Rock						

Litter / groundcover plots are located at 5, 15, 25, 35, 45 m (alternating sides) along the midline of Function plot

Other plot information (not essential for BAM)

Disturbance	Severity	Timing	Landform
Clearing (incl. logging)			Microrelief
Cultivation			Slope
Grazing (native / stock)			Aspect
Soil erosion			Soil surface texture
Firewood removal			Soil colour
Fire (ground stratum, mid, canopy burnt?)			Site drainage
Storm damage			Distance to nearest water
Weediness			Distance to nearest rock outcrop /cave

Severity code: 0=no evidence, 1=slight, 2=moderate, 3= severe
Timing code: R= recent (<3y), NR = not recent, O = old/historic

Notes

BAM Plot - Field Survey Sheet

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Date	28/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU11	Zone ID	55_Good
GF code	Genus species	Cover %	Abund (count)	N, E, HTE	Stratum	
TG	<i>Casuarina cristata</i>	58		N		
SG	<i>Geijera parviflora</i>	8		N		
TG	<i>Eucalyptus microcarpa</i>	2		N		
SG	<i>Myoporum montanum</i>	2		N		
FG	<i>Einadia nutans</i>	1		N		
FG	<i>Einadia polygonoides</i>	1		N		
SG	<i>Rhagodia spinescens</i>	15		N		
FG	<i>Cirsium vulgare</i>	0.1	8	E		
FG	<i>Lactuca serriola</i>	0.1	6	E		
GG	<i>Lolium rigidum</i>	40		E		
FG	<i>Wahlenbergia communis</i>	0.1	30	N		
SG	<i>Lycium ferocissimum</i>	0.1	10	HTE		
FG	<i>Rumex crispus</i>	0.1	10	E		
GG	<i>Juncus continuus</i>	15		N		
FG	<i>Dichondra repens</i>	0.1	8	N		
FG	<i>Oxalis perennans</i>	0.1	30	N		
GG	<i>Hordeum sp.</i>	0.1	20	E		
GG	<i>Austrostipa elegantissima</i>	5		N		
GG	<i>Carex inversa</i>	5		N		
GG	<i>Walwhalleya subxerophila</i>	1		N		
FG	<i>Dianella longifolia</i>	0.1	3	N		
SG	<i>Dodonaea viscosa subsp. spatulata</i>	0.1	2	N		
FG	<i>Rumex tenax</i>	0.1	4	N		
FG	<i>Sonchus oleraceus</i>	0.1	10	E		
FG	<i>Lepidium bonariense</i>	0.1	10	E		
FG	<i>Rumex brownii</i>	0.1	3	N		
FG	<i>Rumex dumosus</i>	0.1	20	N		
FG	<i>Damasonium minus</i>	0.1	10	N		
FG	<i>Lythrum hyssopifolia</i>	0.1	20	N		
FG	<i>Solanum nigrum</i>	0.1	2	E		
GG	<i>Austrostipa verticillata</i>	0.1	10	N		
SG	<i>Sclerolaena muricata</i>	0.1	1	N		
GG	<i>Rytidosperma caespitosum</i>	0.1	2	N		
GG	<i>Cyperus eragrostis</i>	0.1	1	HTE		
FG	<i>Conyza bonariensis</i>	0.1	10	E		
FG	<i>Lepidium africanum</i>	0.1	3	E		
FG	<i>Medicago polymorpha</i>	0.1	2	E		
FG	<i>Verbena officinalis</i>	0.1	1	E		

Growth Form (see BAM Appendix 4) - Tree (TG), Shrub (SG), Grass & grasslike (GG), Forb (FG), Fern (EG), Other (OG)
Cover: 0.1, 0.2, 0.3, ... 1, 2, 3, ...10, 15, 20, 25, ...100% (incl. leaf, branch, stem cover per species).
Abundance for each species with s5% cover: 1, 2, 3, 4, ... 10, 20, 30, ... 100, 500, 1000, 1500, 2000 stems
N=native, E=exotic, HTE=high threat exotic
 All species in a plot must be recorded. If you can only ID to genus, separate different species by unique identifier e.g. *Genus* sp1, *Genus* sp2 etc
 Identify top 3 dominants in each stratum (use own stratum definitions) Cover area examples: 0.1% = 63x63cm, 0.5% = 1.4x1.4m, 1% = 2x2 m, 5%=4x5m, 25%=10x10m

BAM Plot - Field Survey Sheet

Page 1 of (2)

Date	28/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU12	Zone ID	Non-native
Photo #			Plot dimensions	20 x 50 m		
Datum	GDA94	Zone	55	Plot bearing along midline	77	
Easting	626259	Northing	6448537	Record magnetic bearing along midline from 0 m point		

Record easting, northing at plot marker (0 m point). Photos taken vertically and horizontally at 0m point and 50 m point, looking into plot

IBRA region	Brigalow Belt South				
Subregion	Pilliga				
Likely Vegetation Class	Non-native				
Plant Community Type	0	Condition state	Non-native		

Floristics plot is centred on the midline, at 0 m point, 10 m either side

Function plot is an extension of floristics plot out to 50 m along midline (or equiv. area)

BAM Composition / Structure plot (400m ²)		
Dimensions (circle applicable size)		
20 x 20 m	10 x 40 m	Sum values*
Native Richness (count of native species)	Trees	0
	Shrubs	0
	Grasses etc	0
	Forbs	0
	Ferns	0
Cover (sum of cover of natives species)	Trees	0
	Shrubs	0
	Grasses etc	0
	Forbs	0
	Ferns	0
Other	0	
High threat weed cover	0	

*These values summarise the floristic data for input into BAM calculator

BAM Function plot (1000m ²)		
Dimensions (circle applicable size)		
20 x 50 m	10 x 100 m	
Tree stem DBH (cm)		Notes on function attributes:
>80	0	Stem size class records # large trees (d. benchmark)
50 - 79	0	Record stems for living trees only, and for all species
30 - 49	-	For multistemmed trees, record only the largest stem
20 - 29	-	Presence of <5cm stems records regeneration
10 - 19	-	Record # trees with hollows, not number of hollows
5 - 9	-	Count as one stem where tree is multistemmed
< 5	-	Hollow bearing stem may be a dead stem (incl. snag)
# Trees with hollows	<20cm	Total #
	>20cm**	0
Length of logs		Total (m)
		0

Measure length of logs >10cm, fully or partly in contact with the ground, and within the plot.

**Hollows of >20cm are recorded for habitat for some threatened species

BAM Litter/ Groundcover (1 x 1 m plots)							
Litter cover is used for BAM, other attributes are useful for recording site condition in general							
		1	2	3	4	5	Average
Sub-plot score (% cover)	Litter	1	0	2	1	1	1
	Bare ground						
	Cryptogam						
	Rock						

Litter / groundcover plots are located at 5, 15, 25, 35, 45 m (alternating sides) along the midline of Function plot

Other plot information (not essential for BAM)

Disturbance	Severity	Timing	Landform
Clearing (incl. logging)			Microrelief
Cultivation			Slope
Grazing (native / stock)			Aspect
Soil erosion			Soil surface texture
Firewood removal			Soil colour
Fire (ground stratum, mid, canopy burnt?)			Site drainage
Storm damage			Distance to nearest water
Weediness			Distance to nearest rock outcrop /cave

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

Timing code: R= recent (<3y), NR= not recent, O = old/historic

Notes

BAM Plot - Field Survey Sheet

Date	28/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU13	Zone ID	82_Moder.
Photo #			Plot dimensions	10 x 50 m		
Datum	GDA94	Zone	55	Plot bearing along midline	188	
Easting	626610	Northing	6449850	Record magnetic bearing along midline from 0 m point.		

Record easting, northing at plot marker (0 m point), Photos taken vertically and horizontally at 0m point and 50 m point, looking into plot

IBRA region	Brigalow Belt South		
Subregion	Pilliga		
Likely Vegetation Class	Floodplain Transition Woodlands		
Plant Community Type	82	Condition state	Moderate

Floristics plot is centred on the midline, at 0 m point, 10 m either side

Function plot is an extension of floristics plot out to 50 m along midline (or equiv. area)

BAM Composition / Structure plot (400m²)		
Dimensions (circle applicable size)		
10 x 40 m	10 x 40 m	Sum values*
Native Richness (count of native species)	Trees	2
	Shrubs	9
	Grasses etc	9
	Forbs	14
	Ferns	1
Cover (sum of cover of natives species)	Trees	20
	Shrubs	23.1
	Grasses etc	48.4
	Forbs	22.5
	Ferns	0.1
	Other	0.2
High threat weed cover		1

*These values summarise the floristic data for input into BAM calculator

BAM Function plot (1000m²)		
Dimensions (circle applicable size)		
10 x 50 m	10 x 100 m	
Tree stem DBH (cm) Notes on function attributes:		
>80	0	Stem size class records # large trees (cf. benchmark)
50 - 79	0	Record stems for living trees only, and for all species
30 - 49	+	For multistemmed trees, record only the largest stem
20 - 29	+	Presence of <5cm stems records regeneration
10 - 19	+	Record # trees with hollows, not number of hollows
5 - 9	+	Count as one stem where tree is multistemmed
< 5	+	Hollow bearing stem may be a dead stem (incl. stag)
# Trees with hollows	<20cm	Total #
	>20cm**	0
Length of logs		Total (m)
		14.9

Measure length of logs >10cm, fully or partly in contact with the ground, and within the plot.

**Hollows of >20cm are recorded for habitat for some threatened species

BAM Litter/ Groundcover (1 x 1 m plots)							
		1	2	3	4	5	Average
Sub-plot score (% cover)	Litter	100	90	20	70	100	76
	Bare ground						
	Cryptogam						
	Rock						

Litter / groundcover plots are located at 5, 15, 25, 35, 45 m (alternating sides) along the midline of Function plot.

Other plot information (not essential for BAM)

Disturbance	Severity	Timing	Landform
Cleaning (incl. logging)			Microrelief
Cultivation			Slope
Grazing (native / stock)			Aspect
Soil erosion			Soil surface texture
Firewood removal			Soil colour
Fire (ground stratum, mid, canopy burnt?)			Site drainage
Storm damage			Distance to nearest water
Weediness			Distance to nearest rock outcrop /cave

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

Timing code: R= recent (<3y), NR= not recent, O= old/historic

Notes

BAM Plot - Field Survey Sheet

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Date	28/10/2022	Survey Name	Burroway Solar Power Station			
Recorders	David Orchard (DO), Lucca Brozler (LB)		Plot ID #	BU13	Zone ID	82_Moder.
GF code	Genus species	Cover %	Abund (count)	N, E, HTE	Stratum	
TG	<i>Eucalyptus populnea</i> subsp. <i>bimbil</i>	12		N		
TG	<i>Callitris glaucophylla</i>	8		N		
SG	<i>Geijera parviflora</i>	20		N		
SG	<i>Myoporum montanum</i>	1		N		
FG	<i>Calotis lappulacea</i>	8		N		
FG	<i>Calotis cuneifolia</i>	8		N		
GG	<i>Chloris ventricosa</i>	20		N		
FG	<i>Wahlenbergia gracilentia</i>	0.1	80	N		
FG	<i>Xerochrysum viscosum</i>	0.5	200	N		
GG	<i>Austrostipa aristiglumis</i>	1		N		
NN	<i>Hypochaeris radicata</i>	0.2	200	E		
GG	<i>Rytidosperma caespitosum</i>	0.1	30	N		
GG	<i>Austrostipa scabra</i>	25		N		
NN	<i>Conyza bonariensis</i>	0.1	50	E		
NN	<i>Sonchus oleraceus</i>	0.1	30	E		
FG	<i>Einadia nutans</i>	5		N		
NN	<i>Lycium ferocissimum</i>	1		HTE		
GG	<i>Panicum effusum</i>	1		N		
OG	<i>Glycine clandestina</i>	0.1	2	N		
FG	<i>Arthropodium minus</i>	0.1	10	N		
EG	<i>Cheilanthes sieberi</i>	0.1	8	N		
NN	<i>Avena fatua</i>	2		E		
SG	<i>Enchylaena tomentosa</i>	0.1	2	N		
FG	<i>Dianella longifolia</i>	0.1	1	N		
NN	<i>Lactuca serriola</i>	0.1	10	E		
NN	<i>Hordeum</i> sp.	0.1	20	E		
FG	<i>Bulbine semibarbata</i>	0.1	10	N		
NN	<i>Aster subulatus</i>	0.1	3	E		
SG	<i>Acacia deanei</i>	0.2	4	N		
FG	<i>Wahlenbergia communis</i>	0.1	20	N		
GG	<i>Austrostipa nodosa</i>	1		N		
SG	<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>	0.3	10	N		
SG	<i>Rhagodia spinescens</i>	0.3	10	N		
FG	<i>Triptilodiscus pygmaeus</i>	0.1	80	N		
GG	<i>Lomandra multiflora</i>	0.1	1	N		
FG	<i>Pseudognaphalium luteoalbum</i>	0.1	1	N		
FG	<i>Goodenia cycloptera</i>	0.1	20	N		
SG	<i>Pittosporum angustifolium</i>	0.1	3	N		
FG	<i>Erodium crinitum</i>	0.1	1	N		
OG	<i>Jasminum lineare</i>	0.1	2	N		
SG	<i>Sclerolaena birchii</i>	0.1	1	N		

Growth Form (see BAM Appendix 4) - Tree (TG), Shrub (SG), Grass & grasslike (GG), Forb (FG), Fern (EG), Other (OG)
Cover: 0.1, 0.2, 0.3, ... 1, 2, 3, ...10, 15, 20, 25, ...100% (incl. leaf, branch, stem cover per species).
Abundance for each species with ≤5% cover: 1, 2, 3, 4, ... 10, 20, 30, ... 100, 500, 1000, 1500, 2000 stems
N=native, E=exotic, HTE=high threat exotic
 All species in a plot must be recorded. If you can only ID to genus, separate different species by unique identifier e.g. *Genus* sp1, *Genus* sp2 etc
 Identify top 3 dominants in each stratum (use own stratum definitions) Cover area examples: 0.1% = 63x63cm, 0.5% = 1.4x1.4m, 1% = 2x2 m, 5%=4x5m, 25%=10x10m

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Flora species list

In total, 180 flora species were recorded during the biodiversity survey in January, of which 130 (72.22%) were native and 50 (27.78%) introduced. The following table should not be regarded as a comprehensive listing of all species occurring on the subject land.

¹Growth form: TG = Tree, SG = Shrub, FG = Forb, GG = Grass and Grass-like, EG = Fern, OG = Other

²Status: N = Native, I = Introduced.

³HTE = High Threat Exotic.

⁴WoNS = Weed of National Significance.

⁵PW = Priority weed for NSW or for the Narromine LGA.

¹ Growth Form	Scientific name	Common name	² Status	³ HTE	⁴ WoNS	⁵ PW
TG	<i>Alectryon oleifolius</i>	Western Rosewood	N	No	No	No
TG	<i>Allocasuarina luehmannii</i>	Buloke	N	No	No	No
TG	<i>Brachychiton populneus</i>	Kurrajong	N	No	No	No
TG	<i>Callitris glaucophylla</i>	White Cypress Pine	N	No	No	No
TG	<i>Casuarina cristata</i>	Belah	N	No	No	No
TG	<i>Eucalyptus blakelyi</i>	Blakely's Red Gum	N	No	No	No
TG	<i>Eucalyptus camaldulensis</i>	River Red Gum	N	No	No	No
TG	<i>Eucalyptus chloroclada</i>	Dirty Gum	N	No	No	No
TG	<i>Eucalyptus conica</i>	Fuzzy Box	N	No	No	No
TG	<i>Eucalyptus microcarpa</i>	Grey Box	N	No	No	No
TG	<i>Eucalyptus pilligaensis</i>	Narrow-Leaved Grey Box	N	No	No	No
TG	<i>Eucalyptus polyanthemus</i>	Red Box	N	No	No	No
TG	<i>Eucalyptus populnea</i> subsp. <i>bimbil</i>	Poplar Box	N	No	No	No
TG	<i>Melia azedarach</i>	White Cedar	N	No	No	No
SG	<i>Acacia deanei</i>	Green Wattle	N	No	No	No
SG	<i>Acacia ixodes</i>	Motherumbung	N	No	No	No
SG	<i>Acacia lanigera</i>	Woolly Wattle	N	No	No	No
SG	<i>Acacia spectabilis</i>	Mudgee Wattle	N	No	No	No
SG	<i>Apophyllum anomalum</i>	Warrior Bush	N	No	No	No
SG	<i>Atriplex leptocarpa</i>	Slender-Fruit Saltbush	N	No	No	No
SG	<i>Cassinia laevis</i>	Cough Bush	N	No	No	No
SG	<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>	Sticky Hopbush	N	No	No	No
SG	<i>Enchylaena tomentosa</i>	Ruby Saltbush	N	No	No	No
SG	<i>Eremophila mitchellii</i>	Budda	N	No	No	No
SG	<i>Geijera parviflora</i>	Wilga	N	No	No	No
SG	<i>Indigofera coronillifolia</i>	Native Indigo	N	No	No	No
SG	<i>Lissanthe strigosa</i>	Peach Heath	N	No	No	No

¹ Growth Form	Scientific name	Common name	² Status	³ HTE	⁴ WoNS	⁵ PW
SG	<i>Maireana microphylla</i>	Small-Leaf Bluebush	N	No	No	No
SG	<i>Myoporum montanum</i>	Western Boobialla	N	No	No	No
SG	<i>Pittosporum angustifolium</i>	Butterbush	N	No	No	No
SG	<i>Pultenaea cinerascens</i>	Grey Bush-pea	N	No	No	No
SG	<i>Rhagodia spinescens</i>	Spiny Saltbush	N	No	No	No
SG	<i>Sclerolaena birchii</i>	Galvanized Burr	N	No	No	No
SG	<i>Sclerolaena diacantha</i>	Grey Copperburr	N	No	No	No
SG	<i>Sclerolaena muricata</i>	Black Rolypoly	N	No	No	No
SG	<i>Senna artemisioides</i>	Silver Cassia	N	No	No	No
SG	<i>Solanum cinereum</i>	Narrawa Burr	N	No	No	No
SG	<i>Solanum ferocissimum</i>	Spiny Potato Bush	N	No	No	No
GG	<i>Anthosachne scabra</i>	Common Wheatgrass	N	No	No	No
GG	<i>Aristida leichhardtiana</i>	Wiregrass	N	No	No	No
GG	<i>Aristida ramosa</i>	Purple Wiregrass	N	No	No	No
GG	<i>Austrostipa aristiglumis</i>	Plains Grass	N	No	No	No
GG	<i>Austrostipa blackii</i>	Speargrass	N	No	No	No
GG	<i>Austrostipa densiflora</i>	Foxtail Speargrass	N	No	No	No
GG	<i>Austrostipa elegantissima</i>	Feather Speargrass	N	No	No	No
GG	<i>Austrostipa nodosa</i>	Speargrass	N	No	No	No
GG	<i>Austrostipa scabra</i>	Speargrass	N	No	No	No
GG	<i>Austrostipa verticillata</i>	Slender Bamboo Grass	N	No	No	No
GG	<i>Bromus arenarius</i>	Sand Brome	N	No	No	No
GG	<i>Carex inversa</i>	Inverse Grass	N	No	No	No
GG	<i>Chloris truncata</i>	Windmill Grass	N	No	No	No
GG	<i>Chloris ventricosa</i>	Plump Windmill Grass	N	No	No	No
GG	<i>Dichanthium sericeum</i>	Queensland Bluegrass	N	No	No	No
GG	<i>Digitaria divaricatissima</i>	Umbrella Grass	N	No	No	No
GG	<i>Enteropogon acicularis</i>	Curly Windmill Grass	N	No	No	No
GG	<i>Eragrostis brownii</i>	Brown's Lovegrass	N	No	No	No
GG	<i>Juncus bufonius</i>	Toad Rush	N	No	No	No
GG	<i>Juncus continuus</i>	Rush	N	No	No	No
GG	<i>Juncus subsecundus</i>	Rush	N	No	No	No
GG	<i>Lomandra multiflora</i>	Many-Flowered Mat-Rush	N	No	No	No
GG	<i>Microlaena stipoides</i>	Weeping Grass	N	No	No	No
GG	<i>Panicum effusum</i>	Hairy Panic	N	No	No	No
GG	<i>Paspalidium aversum</i>	Paspalidium	N	No	No	No
GG	<i>Paspalidium constrictum</i>	Knottybutt Grass	N	No	No	No
GG	<i>Rytidosperma caespitosum</i>	Ringed Wallaby Grass	N	No	No	No
GG	<i>Rytidosperma setaceum</i>	Smallflower Wallaby Grass	N	No	No	No

¹ Growth Form	Scientific name	Common name	² Status	³ HTE	⁴ WoNS	⁵ PW
GG	<i>Themeda triandra</i>	Kangaroo Grass	N	No	No	No
GG	<i>Thyridolepis xerophila</i>	Mulga Mitchell Grass	N	No	No	No
GG	<i>Walwhalleya subxerophila</i>	Gilgai Grass	N	No	No	No
FG	<i>Abutilon fraseri</i>	Dwarf Lantern-Flower	N	No	No	No
FG	<i>Arthropodium minus</i>	Small Vanilla-lily	N	No	No	No
FG	<i>Brachyscome chrysoglossa</i>	Yellow-Tongue Daisy	N	No	No	No
FG	<i>Brachyscome multifida</i>	Cut-Leaved Daisy	N	No	No	No
FG	<i>Brunonia australis</i>	Blue Pincushion	N	No	No	No
FG	<i>Brunoniella australis</i>	Blue Trumpet	N	No	No	No
FG	<i>Bulbine semibarbata</i>	Native Leek	N	No	No	No
FG	<i>Calotis cuneifolia</i>	Purple Burr-Daisy	N	No	No	No
FG	<i>Calotis lappulacea</i>	Yellow Burr-Daisy	N	No	No	No
FG	<i>Cotula australis</i>	Carrot Weed	N	No	No	No
FG	<i>Crassula sieberiana</i>	Australian Stonecrop	N	No	No	No
FG	<i>Damasonium minus</i>	Starfruit	N	No	No	No
FG	<i>Daucus glochidiatus</i>	Native Carrot	N	No	No	No
FG	<i>Dianella longifolia</i>	Blue Flax-Lily	N	No	No	No
FG	<i>Dichondra repens</i>	Kidney Weed	N	No	No	No
FG	<i>Einadia nutans</i>	Climbing Saltbush	N	No	No	No
FG	<i>Einadia polygonoides</i>	Climbing Saltbush	N	No	No	No
FG	<i>Einadia trigonos</i>	Fishweed	N	No	No	No
FG	<i>Erodium crinitum</i>	Blue Crowfoot	N	No	No	No
FG	<i>Euchiton sphaericus</i>	Star Cudweed	N	No	No	No
FG	<i>Gonocarpus elatus</i>	Hill Raspwort	N	No	No	No
FG	<i>Goodenia cycloptera</i>	Goodenia	N	No	No	No
FG	<i>Goodenia pinnatifida</i>	Scrambled Eggs	N	No	No	No
FG	<i>Leiocarpa panaetioides</i>	Woolly Buttons	N	No	No	No
FG	<i>Linum marginale</i>	Native Flax	N	No	No	No
FG	<i>Lythrum hyssopifolia</i>	Hyssop Loosestrife	N	No	No	No
FG	<i>Minuria leptophylla</i>	Minnie Daisy	N	No	No	No
FG	<i>Oxalis perennans</i>	Grassland Wood-sorrel	N	No	No	No
FG	<i>Oxytes brachypoda</i>	Large Tick-Trefoil	N	No	No	No
FG	<i>Parietaria debilis</i>	Native Pellitory	N	No	No	No
FG	<i>Portulaca oleracea</i>	Pigweed	N	No	No	No
FG	<i>Pseudognaphalium luteoalbum</i>	Jersey Cudweed	N	No	No	No
FG	<i>Rhodanthe corymbiflora</i>	Small White Sunray	N	No	No	No
FG	<i>Rumex brownii</i>	Swamp Dock	N	No	No	No
FG	<i>Rumex dumosus</i>	Wiry Dock	N	No	No	No
FG	<i>Rumex tenax</i>	Shiny Dock	N	No	No	No

¹ Growth Form	Scientific name	Common name	² Status	³ HTE	⁴ WoNS	⁵ PW
FG	<i>Schenkia australis</i>	Spike Centaury	N	No	No	No
FG	<i>Sida corrugata</i>	Corrugated Sida	N	No	No	No
FG	<i>Sida trichopoda</i>	Hairy Sida	N	No	No	No
FG	<i>Solanum eremophilum</i>	Nightshade	N	No	No	No
FG	<i>Solanum esuriale</i>	Quena	N	No	No	No
FG	<i>Spergularia brevifolia</i>	Lesser Sea-Spurrey	N	No	No	No
FG	<i>Stuartina muelleri</i>	Spoon Cudweed	N	No	No	No
FG	<i>Triptilodiscus pygmaeus</i>	Common Sunray	N	No	No	No
FG	<i>Velleia paradoxa</i>	Spur Velleia	N	No	No	No
FG	<i>Verbena gaudichaudii</i>	Native Vervain	N	No	No	No
FG	<i>Vittadinia cervicalis</i>	New Holland Daisy	N	No	No	No
FG	<i>Vittadinia cuneata</i>	Fuzzweed	N	No	No	No
FG	<i>Vittadinia pterochaeta</i>	Winged New Holland Daisy	N	No	No	No
FG	<i>Wahlenbergia communis</i>	Tufted Bluebell	N	No	No	No
FG	<i>Wahlenbergia gracilentia</i>	Annual Bluebell	N	No	No	No
FG	<i>Wahlenbergia stricta</i>	Tall Bluebell	N	No	No	No
FG	<i>Xerochrysum bracteatum</i>	Golden Everlasting	N	No	No	No
FG	<i>Xerochrysum viscosum</i>	Sticky Everlasting	N	No	No	No
EG	<i>Cheilanthes sieberi</i>	Poison Rock Fern	N	No	No	No
OG	<i>Convolvulus angustissimus</i>	Bindweed	N	No	No	No
OG	<i>Glycine clandestina</i>	Twining Glycine	N	No	No	No
OG	<i>Glycine tabacina</i>	Variable Glycine	N	No	No	No
OG	<i>Grona varians</i>	Slender Tick-Trefoil	N	No	No	No
OG	<i>Jasminum lineare</i>	Desert Jasmine	N	No	No	No
OG	<i>Parsonsia eucalyptophylla</i>	Gargaloo	N	No	No	No
SG	<i>Lycium ferocissimum</i>	African Boxthorn	I	Yes	Yes	Yes
GG	<i>Avena fatua</i>	Wild Oats	I	No	No	No
GG	<i>Avena sativa</i>	Oats	I	No	No	No
GG	<i>Bromus diandrus</i>	Great Brome	I	Yes	No	No
GG	<i>Bromus hordeaceus</i>	Soft Brome	I	No	No	No
GG	<i>Chloris gayana</i>	Rhodes Grass	I	Yes	No	No
GG	<i>Cyperus eragrostis</i>	Umbrella Sedge	I	Yes	No	No
GG	<i>Eragrostis curvula</i>	African Lovegrass	I	Yes	No	No
GG	<i>Hordeum</i> sp.	Barley Grass	I	No	No	No
GG	<i>Lolium rigidum</i>	Wimmera Ryegrass	I	No	No	No
GG	<i>Phalaris paradoxa</i>	Paradoxa Grass	I	No	No	No
GG	<i>Triticum aestivum</i>	Common Wheat	I	No	No	No
GG	<i>Vulpia bromoides</i>	Squirrel Tail Fescue	I	No	No	No
FG	<i>Arctotheca calendula</i>	Capeweed	I	No	No	No

¹ Growth Form	Scientific name	Common name	² Status	³ HTE	⁴ WoNS	⁵ PW
FG	<i>Aster subulatus</i>	Wild Aster	I	No	No	No
FG	<i>Brassica x napus</i>	Canola	I	No	No	No
FG	<i>Carthamus lanatus</i>	Saffron Thistle	I	Yes	No	No
FG	<i>Cerastium glomeratum</i>	Mouse-Ear Chickweed	I	No	No	No
FG	<i>Cirsium vulgare</i>	Spear Thistle	I	No	No	No
FG	<i>Conyza bonariensis</i>	Flaxleaf Fleabane	I	No	No	No
FG	<i>Conyza sumatrensis</i>	Tall Fleabane	I	No	No	No
FG	<i>Cyclosporum leptophyllum</i>	Slender Celery	I	No	No	No
FG	<i>Echium plantagineum</i>	Paterson's Curse	I	No	No	No
FG	<i>Gamochaeta</i> sp.	Cudweed	I	No	No	No
FG	<i>Hirschfeldia incana</i>	Buchan Weed	I	No	No	No
FG	<i>Hypochaeris radicata</i>	Flatweed	I	No	No	No
FG	<i>Lactuca saligna</i>	Willow-Leaved Lettuce	I	No	No	No
FG	<i>Lactuca serriola</i>	Prickly Lettuce	I	No	No	No
FG	<i>Leontodon rhagadioloides</i>	Cretan Weed	I	No	No	No
FG	<i>Lepidium africanum</i>	African Peppercross	I	No	No	No
FG	<i>Lepidium bonariense</i>	Argentine Peppercross	I	No	No	No
FG	<i>Lysimachia arvensis</i>	Scarlet Pimpernel, Blue Pimpernel	I	No	No	No
FG	<i>Medicago laciniata</i>	Cut-Leaved Medic	I	No	No	No
FG	<i>Medicago polymorpha</i>	Burr Medic	I	No	No	No
FG	<i>Polygonum arenastrum</i>	Wireweed	I	No	No	No
FG	<i>Raphanus raphanistrum</i>	Wild Radish	I	No	No	No
FG	<i>Rumex crispus</i>	Curled Dock	I	No	No	No
FG	<i>Salvia reflexa</i>	Mintweed	I	No	No	No
FG	<i>Silybum marianum</i>	Variegated Thistle	I	No	No	No
FG	<i>Sisymbrium erysimoides</i>	Smooth Mustard	I	No	No	No
FG	<i>Sisymbrium irio</i>	London Rocket	I	No	No	No
FG	<i>Sisymbrium orientale</i>	Indian Hedge Mustard	I	No	No	No
FG	<i>Solanum nigrum</i>	Black-Berry Nightshade	I	No	No	No
FG	<i>Soliva stolonifera</i>	Carpet Burweed	I	No	No	No
FG	<i>Sonchus asper</i>	Prickly Sowthistle	I	No	No	No
FG	<i>Sonchus oleraceus</i>	Common Sowthistle	I	No	No	No
FG	<i>Trifolium angustifolium</i>	Narrow-Leaved Clover	I	No	No	No
FG	<i>Trifolium arvense</i>	Haresfoot Clover	I	No	No	No
FG	<i>Trifolium glomeratum</i>	Clustered Clover	I	No	No	No
FG	<i>Verbena officinalis</i>	Vervain	I	No	No	No

Fauna species list

In total, 25 fauna species were recorded during the biodiversity survey, of which 22 (88.0%) were native and 3 (12.0%) introduced. None of the detected fauna species are listed under the BC or EPBC Act. The following table should not be regarded as a comprehensive listing of all species likely to make use of the subject land.

¹Status: N = Native, I = Introduced

Class	Species Name	Common Name	¹ Status
Amphibia	<i>Litoria latopalmata</i>	Broad-palmed Rocket Frog	N
Aves	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	N
Aves	<i>Aquila audax</i>	Wedge-tailed Eagle	N
Aves	<i>Colluricincla harmonica</i>	Grey Shrike-thrush	N
Aves	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	N
Aves	<i>Corcorax melanorhamphos</i>	White-winged Chough	N
Aves	<i>Corvus coronoides</i>	Australian Raven	N
Aves	<i>Egretta novaehollandiae</i>	White-faced Heron	N
Aves	<i>Eolophus roseicapilla</i>	Galah	N
Aves	<i>Grallina cyanoleuca</i>	Magpie-lark	N
Aves	<i>Gymnorhina tibicen</i>	Australian Magpie	N
Aves	<i>Hirundo neoxena</i>	Welcome Swallow	N
Aves	<i>Manorina flavigula</i>	Yellow-throated Miner	N
Aves	<i>Manorina melanocephala</i>	Noisy Miner	N
Aves	<i>Ocyphaps lophotes</i>	Crested Pigeon	N
Aves	<i>Phaps chalcoptera</i>	Common Bronzewing	N
Aves	<i>Platycercus eximius</i>	Eastern Rosella	N
Aves	<i>Rhipidura leucophrys</i>	Willie Wagtail	N
Aves	<i>Struthidea cinerea</i>	Apostlebird	N
Aves	<i>Sturnus vulgaris</i>	Common Starling	I
Mammalia	<i>Capra hircus</i>	Feral Goat	I
Mammalia	<i>Macropus giganteus</i>	Eastern Grey Kangaroo	N
Mammalia	<i>Vulpes vulpes</i>	Red Fox	I
Reptilia	<i>Cryptoblepharus</i> sp.	Snake-eyed Skink	N
Reptilia	<i>Ctenotus robustus</i>	Robust Ctenotus	N

Appendix D: BAM Credit Summary Report



BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00036365/BAAS21028/22/00036366	Burroway Solar Power Station - Preliminary	14/10/2022
Assessor Name	Report Created	BAM Data version *
David Orchard	01/11/2022	55
Assessor Number	BAM Case Status	Date Finalised
BAAS21028	Open	To be finalised
Assessment Revision	Assessment Type	
0	Major Projects	

* 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.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAIL	Ecosystem credits
Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions.												
1	55_Derived	Not a TEC	37.9	37.9	2.4	PCT Cleared - 83%	High Sensitivity to Gain			2.00		45

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2	55_Planted	Not a TEC	77.9	77.9	1.2	PCT Cleared - 83%	High Sensitivity to Gain	2.00	47
3	55_Moderate	Not a TEC	77.9	77.9	2.3	PCT Cleared - 83%	High Sensitivity to Gain	2.00	88
4	55_Good	Not a TEC	93.8	93.8	21.7	PCT Cleared - 83%	High Sensitivity to Gain	2.00	1018
								Subtotal	1198
Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion									
7	202_Good	Not a TEC	80.8	80.8	10.3	PCT Cleared - 75%	High Sensitivity to Gain	2.00	416
								Subtotal	416
Pilliga Box - White Cypress Pine - Buloke shrubby woodland in the Brigalow Belt South Bioregion									
6	88_Good	Not a TEC	83.5	83.5	5.2	PCT Cleared - 38%	High Sensitivity to Gain	1.50	163
								Subtotal	163

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Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion

5	82_Moderate	Not a TEC	75.9	75.9	0.4	PCT Cleared - 75%	High Sensitivity to Gain			2.00	15
										Subtotal	15
										Total	1792

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAll	Species credits
Ardeotis australis / Australian Bustard (Fauna)									
55_Derived		37.9	37.9	2.4 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	45
55_Planted		77.9	77.9	1.2 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	47

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55_Moderate	77.9	77.9	2.3	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	88
55_Good	93.8	93.8	21.7	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	1018
82_Moderate	75.9	75.9	0.4	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	15
202_Good	80.8	80.8	10.3	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	416
Subtotal									1629
<i>Calyptorhynchus lathami / Glossy Black-Cockatoo (Fauna)</i>									
55_Derived	37.9	37.9	2.4	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	45

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55_Planted	77.9	77.9	1.2 Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	47
55_Moderate	77.9	77.9	2.3 Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	88
55_Good	93.8	93.8	21.7 Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1018
82_Moderate	75.9	75.9	0.4 Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	15
88_Good	83.5	83.5	5.2 Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	218
202_Good	80.8	80.8	10.3 Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	416
Subtotal								1847

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Commersonia procumbens / Commersonia procumbens (Flora)

88_Good	83.5	83.5	5.2 Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	218
202_Good	80.8	80.8	10.3 Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	416
Subtotal								634

Crinia sloanei / Sloane's Froglet (Fauna)

82_Moderate	75.9	75.9	0.4 Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Endangered	False	11
Subtotal								11

Dichanthium setosum / Bluegrass (Flora)

55_Derived	37.9	37.9	2.4 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	45
55_Planted	77.9	77.9	1.2 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	47

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55_Moderate	77.9	77.9	2.3 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	88
55_Good	93.8	93.8	21.7 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	1018
202_Good	80.8	80.8	10.3 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	416
Subtotal								1614
<i>Digitaria porrecta / Finger Panic Grass (Flora)</i>								
55_Derived	37.9	37.9	2.4 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	45
55_Planted	77.9	77.9	1.2 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	47

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55_Moderate	77.9	77.9	2.3 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	88
55_Good	93.8	93.8	21.7 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	1018
202_Good	80.8	80.8	10.3 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	416
Subtotal								1614
<i>Diuris tricolor / Pine Donkey Orchid (Flora)</i>								
82_Moderate	75.9	75.9	0.4 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	11
88_Good	83.5	83.5	5.2 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	163

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202_Good	80.8	80.8	10.3	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	312
Subtotal									486
<i>Lepidium aschersonii / Spiny Peppergrass (Flora)</i>									
55_Derived	37.9	37.9	2.4	Geographic Distribution	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	45
55_Planted	77.9	77.9	1.2	Geographic Distribution	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	47
55_Moderate	77.9	77.9	2.3	Geographic Distribution	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	88
55_Good	93.8	93.8	21.7	Geographic Distribution	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1018
88_Good	83.5	83.5	5.2	Geographic Distribution	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	218
Subtotal									1416

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Lophochroa leadbeateri / Major Mitchell's Cockatoo (Fauna)

55_Derived	37.9	37.9	2.4	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	45
55_Planted	77.9	77.9	1.2	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	47
55_Moderate	77.9	77.9	2.3	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	88
55_Good	93.8	93.8	21.7	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1018
82_Moderate	75.9	75.9	0.4	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	15
88_Good	83.5	83.5	5.2	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	218
Subtotal									1431

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Petaurus norfolcensis / Squirrel Glider (Fauna)

82_Moderate	75.9	75.9	0.4	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	15
88_Good	83.5	83.5	5.2	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	218
202_Good	80.8	80.8	10.3	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	416
Subtotal									649

Phascolarctos cinereus / Koala (Fauna)

55_Derived	37.9	37.9	2.4	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	45
55_Planted	77.9	77.9	1.2	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	47

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55_Moderate	77.9	77.9	2.3	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	88
55_Good	93.8	93.8	21.7	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	1018
82_Moderate	75.9	75.9	0.4	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	15
88_Good	83.5	83.5	5.2	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	218
202_Good	80.8	80.8	10.3	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	416
Subtotal									1847

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Polygala linariifolia / Native Milkwort (Flora)

88_Good	83.5	83.5	5.2 Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Not Listed	False	218
Subtotal								218

Polytelis swainsonii / Superb Parrot (Fauna)

55_Derived	37.9	37.9	2.4 Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	45
55_Planted	77.9	77.9	1.2 Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	47
55_Moderate	77.9	77.9	2.3 Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	88
55_Good	93.8	93.8	21.7 Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	1018
82_Moderate	75.9	75.9	0.4 Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	15

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88_Good	83.5	83.5	5.2 Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	218
202_Good	80.8	80.8	10.3 Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	416
Subtotal								1847
<i>Prasophyllum sp. Wybong / Prasophyllum sp. Wybong (Flora)</i>								
202_Good	80.8	80.8	10.3 Environment Protection and Conservation Act listing status	Effectiveness of management in controlling threats	Not Listed	Critically Endangered	True	624
Subtotal								624
<i>Pterostylis cobarensis / Greenhood Orchid (Flora)</i>								
88_Good	83.5	83.5	5.2 Geographic Distribution	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	218
202_Good	80.8	80.8	10.3 Geographic Distribution	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	416
Subtotal								634

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Swainsona murrayana / Slender Darling Pea (Flora)

55_Derived	37.9	37.9	2.4 Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	45
55_Planted	77.9	77.9	1.2 Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	47
55_Moderate	77.9	77.9	2.3 Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	88
55_Good	93.8	93.8	21.7 Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	1018
82_Moderate	75.9	75.9	0.4 Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	15
202_Good	80.8	80.8	10.3 Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Vulnerable	False	416
Subtotal								1629

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Swainsona sericea / Silky Swainson-pea (Flora)

82_Moderate	75.9	75.9	0.4 Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	15
202_Good	80.8	80.8	10.3 Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Not Listed	False	416
Subtotal								431

Tylophora linearis / Tylophora linearis (Flora)

88_Good	83.5	83.5	5.2 Biodiversity Conservation Act listing status	Quantity class of viable seeds produced	Vulnerable	Endangered	False	218
202_Good	80.8	80.8	10.3 Biodiversity Conservation Act listing status	Quantity class of viable seeds produced	Vulnerable	Endangered	False	416
Subtotal								634

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Appendix E: Terms and abbreviations

Terms and abbreviations used in this report

Abbreviation	Terminology	Description
BC Act	<i>Biodiversity Conservation Act 2016</i> (NSW)	The purpose of this Act is to 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. This Act contains schedules relating to the listing of threatened species, populations and communities in NSW. It also outlines the framework regulating development impact assessments in relation to biodiversity.
	<i>Biosecurity Act 2015</i> (NSW)	The broad objectives for biosecurity in NSW are to manage biosecurity risks from animal and plant pests and diseases, weeds and contaminants by <ul style="list-style-type: none"> • Preventing their entry into NSW • Quickly finding, containing and eradicating any new entries • Effectively minimising the impacts of those pests, diseases, weeds and contaminants that cannot be eradicated through robust management arrangements. <p>The <i>Biosecurity Act 2015</i> provides a statutory framework to help achieve these objectives.</p>
CAMBA	China-Australia Migratory Bird Agreement	A bilateral migratory bird agreement with China entered into in 1986. It provides an important mechanism for pursuing conservation outcomes for migratory birds, including migratory waterbirds.
	Direct impacts	Directly affect the habitat and individuals. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat. When applying each factor, consideration must be given to all of the likely direct impacts of the proposed activity or development.
DAWE	Australian Government Department of Agriculture, Water, and the Environment	DAWE designs and implements the Australian Government's policies and programmes to protect and conserve the environment, water and heritage and promote climate action.
DP	Deposited Plan	A plan of land deposited in Land and Property Information (part of the Land Management Authority) and used for legal identification purposes. They most commonly depict a subdivision of a parcel of land.
EEC	Endangered Ecological Community	An ecological community identified by relevant legislation likely to become extinct or is in immediate danger of extinction.
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW).	Provides the legislative framework for land use planning and development assessment in NSW.
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth).	Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
FM Act	<i>Fisheries Management Act 1994</i> (NSW)	The objects of this Act are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. This Act protects aquatic habitats and species which are not protected under the BC Act.
IBRA	Interim Biogeographic Regionalisation of Australia	The Interim Biogeographic Regionalisation for Australia (IBRA) is a biogeographic regionalisation of Australia developed by the Australian Government's Department of the Environment. Each region is a land area made up of a group of interacting ecosystems repeated in similar form across the landscape.

	Indirect impacts	Occur when project-related activities affect species, populations or ecological communities in a manner other than direct loss. Indirect impacts can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas. As with direct impacts, consideration must be given, when applying each factor, to all of the likely indirect impacts of the proposed activity or development.
JAMBA	Japan-Australia Migratory Bird Agreement	A bilateral migratory bird agreement with Japan entered into in 1974. It provides an important mechanism for pursuing conservation outcomes for migratory birds, including migratory waterbirds.
KTP	Key Threatening Process	A key threatening process is defined as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities. A requirement of their listing on the TSC Act is that the process adversely affects two or more threatened species, populations or ecological communities, or may cause species, populations or ecological communities not threatened to become threatened.
	Native Vegetation	<p>1. For the purposes of this Part, native vegetation means any of the following types of plants native to New South Wales:</p> <ol style="list-style-type: none"> trees (including any sapling or shrub or any scrub), understorey plants, groundcover (being any type of herbaceous vegetation), plants occurring in a wetland. <p>2. A plant is native to New South Wales if it was established in New South Wales before European settlement. The regulations may authorise conclusive presumptions to be made of the species of plants native to New South Wales by adopting any relevant classification in an official database of plants that is publicly accessible.</p> <p>3. For the purposes of this Part, native vegetation extends to a plant that is dead or that is not native to New South Wales if:</p> <ol style="list-style-type: none"> the plant is situated on land that is shown on the native vegetation regulatory map as category 2-vulnerable regulated land, and it would be native vegetation for the purposes of this Part if it were native to New South Wales. <p>4. For the purposes of this Part, native vegetation does not extend to marine vegetation (being mangroves, seagrasses or any other species of plant that at any time in its life cycle must inhabit water other than fresh water). A declaration under Section 14.7 of the BC Act that specified vegetation is or is not marine vegetation also has effect for the purposes of this Part.</p>
	Local population (species)	<p>A local population of a threatened plant species comprises those individuals occurring in a defined area or a cluster of individuals extend into habitat adjoining and contiguous with the study area where the individuals could reasonably be expected to cross-pollinate.</p> <p>A local population of fauna species comprises those individuals known or likely to occur in in a defined area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area.</p> <p>The local population of migratory or nomadic fauna species comprises those individuals likely to occur in the study area from time to time.</p>
	Local occurrence (EEC)	The ecological community present within the study area. However, the local occurrence may include adjacent areas if the ecological community on the study area forms part of a larger contiguous area of the ecological community and the movement of individuals and exchange of genetic material across the boundary of the study area can be clearly demonstrated.

	Low condition (vegetation)	<p>Vegetation in low condition means:</p> <p>a) woody native vegetation with native over-storey percent foliage cover less than 50% of the lower value of the over-storey percent foliage cover benchmark for that vegetation type, and where either:</p> <ul style="list-style-type: none"> - less than 50% of ground cover vegetation is indigenous species, or - greater than 90% of ground cover vegetation is cleared <p>OR</p> <p>b) native grassland, wetland or herbfield where either:</p> <ul style="list-style-type: none"> - less than 50% of ground cover vegetation is indigenous species, or - more than 90% of ground cover vegetation is cleared <p>If native vegetation is not in low condition, it is in moderate to good condition. The percentages for the ground cover calculations must be made in a season when the proportion of native ground cover vegetation compared to non-native ground cover vegetation in the area is likely to be at its maximum.</p> <p>NOTE: Clearing the habitat of threatened species, populations or communities for the purposes of reducing its condition prior to assessment under the methodology may be a breach of environmental legislation, including sections 118A and 118D of the <i>National Parks and Wildlife Act 1974</i> (NPW Act), the <i>Native Vegetation Act 2003</i> (NV Act) and/or the <i>Environmental Planning and Assessment Act 1979</i> (EP&A Act).</p>
MNES	Matters of national environmental significance	Refers to the seven matters of national environmental significance outlined under the EPBC Act.
NPW Act	<i>National Parks and Wildlife Act 1974</i> (NSW)	<p>The objects of this Act are as follows:</p> <ul style="list-style-type: none"> • The conservation of nature, including, but not limited to, the conservation of: <ul style="list-style-type: none"> • habitat, ecosystems and ecosystem processes, and • biological diversity at the community, species and genetic levels, and • landforms of significance, including geological features and processes, and • landscapes and natural features of significance including wilderness and wild rivers, <p>The conservation of objects, places or features (including biological diversity) of cultural value within the landscape, including, but not limited to:</p> <ul style="list-style-type: none"> • places, objects and features of significance to Aboriginal people, and • places of social value to the people of New South Wales, and • places of historic, architectural or scientific significance, • Fostering public appreciation, understanding and enjoyment of nature and cultural heritage and their conservation, • Providing for the management of land reserved under this Act in accordance with the management principles applicable for each type of reservation. <p>The objects of this Act are to be achieved by applying the principles of ecologically sustainable development.</p>
PoEO Act	<i>Protection of the Environment Operations Act 1997</i>	<p>The objects of this Act are as follows:</p> <ul style="list-style-type: none"> • to protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development, • to provide increased opportunities for public involvement and participation in environment protection, • to ensure the community has access to relevant and meaningful information about pollution, • to reduce risks to human health and prevent the degradation of the environment by the use of mechanisms promoting: <ul style="list-style-type: none"> • pollution prevention and cleaner production, • the reduction to harmless levels of the discharge of substances likely to cause harm to the environment, • the elimination of harmful wastes, • the reduction in the use of materials and the re-use, recovery or recycling of materials,

		<ul style="list-style-type: none"> • the making of progressive environmental improvements, including the reduction of pollution at source, • the monitoring and reporting of environmental quality on a regular basis, • to rationalise, simplify and strengthen the regulatory framework for environment protection, • to improve the efficiency of administration of the environment protection legislation, • to assist in the achievement of the objectives of the <i>Waste Avoidance and Resource Recovery Act 2001</i>.
RAMSAR	Convention on Wetlands of International Importance	The Ramsar Convention's broad aims are to halt the worldwide loss of wetlands and to conserve, through wise use and management, those remaining. This requires international cooperation, policy making, capacity building and technology transfer.
	Risk of extinction	The likelihood that the local population will become extinct either in the short-term or in the long-term as a result of direct or indirect impacts on the viability of that population.
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement	A bilateral migratory bird agreement with the Republic of Korea entered into in 2007. It provides an important mechanism for pursuing conservation outcomes for migratory birds, including migratory waterbirds.
RF Act	<i>Rural Fires Act 1997</i>	<p>The objects of this Act are to provide:</p> <ul style="list-style-type: none"> • for the prevention, mitigation and suppression of bush and other fires in local government areas (or parts of areas) and other parts of the State constituted as rural fire districts, and • for the co-ordination of bush firefighting and bush fire prevention throughout the State, and • for the protection of persons from injury or death, and property from damage, arising from fires, and • for the protection of infrastructure and environmental, economic, cultural, agricultural and community assets from damage arising from fires, and • for the protection of the environment by requiring certain activities referred to in paragraphs (a)-(c1) to be carried out having regard to the principles of ecologically sustainable development described in section 6 (2) of the <i>Protection of the Environment Administration Act 1991</i>.
Significant impact		A 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity.
SIS	Species Impact Statement	<p>A document included with an Environmental Impact Statement which details a full description of the action proposed, including its nature, extent, location, timing and layout and, to the fullest extent reasonably practicable, the information referred to in this section.</p> <p>The requirements as to the contents of an SIS for different categories of protected species are given in section 110 of the TSC Act.</p>
Strahler stream order		<p>Strahler stream order and are used to define stream size based on a hierarchy of tributaries.</p> 