ACCESS ENVIRONMENTAL PLANNING

Biodiversity Development Assessment Report (BDAR)

Project Name*: Dubbo North West Urban Release Area*

Prepared for: Dubbo Council

Prepared by: Renae Hill, Accredited Assessor No. 23003

Final Report: March 2024

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Signature: ____ _____

Date: _____14/03/2024_____

BAM Assessor Accreditation no: _____23003_____

Executive Summary

Access Environmental Planning Pty Ltd (AEP) was commissioned by the proponent to prepare a Biodiversity Development Assessment Report (BDAR) for the proposed new residential subdivision at Bunglegumbie Road in Dubbo. Inclusions for the assessment and reporting are as prescribed by the NSW Biodiversity Conservation (BC) Act 2016 and the corresponding Biodiversity Assessment Method (BAM) 2020.

The proposal

The Precinct Plan aims to rezone the land into four land zoning categories: R1 General Residential, R2 Low Density, E1 Neighbourhood Centre, and RE1 Public Recreation zones. The Precinct Plan demonstrates delivering of a variety of housing typologies (about 5,300 dwellings) from detached, semi-attached and multi-dwelling housings to walk-up apartments and shop-top housing. The planning of the precinct intends to increase housing diversity and housing choice, make a place for everyone and create a lasting positive legacy for Dubbo.

Proponent	*Dubbo Regional Council*
Proposal	*Dubbo Northwest Urban Release Area (DNWURA)*
Property Location	*Bunglegumbie Road, Dubbo, NSW 2830*
Cadastre	*Lot 1 DP120681/ Lots 1,2 DP958250, Lot 3 DP217195, Lots 7/10 DP250606, Lots 1/2 DP802180, Lots 15/16/17/18/23/24/25/26 DP1285243, Lot 32 DP1219695, Lots 51/52 DP1282381, Lot 62 DP753233, Lot 2 DP1206861, Lots 59/60 DP753233 Lots 581/582 DP595112, Lots 14/15/16 DP242992, Lots 8/53/133 DP753233, Lot 1 DP653795, Lot 87 DP753233.*
Land use zoning	*Current: RE1 Public Recreation, R2 Low Density Residential and RU5 Primary Production Large Lots.* *Proposed: R1 General Residential, R2 Low Density, E1 Neighbourhood Centre, RE1 Public recreation.*
Latitude and longitude	*Lat -32.23 Long 148.59*
Accredited Assessor	*Renae Hill (BAAS No. 23003)*

Biodiversity Offset Scheme

The Biodiversity Offset Scheme (BOS) has an area threshold trigger providing an allowance for clearing native vegetation based on the minimum lot size of the property or its associated land zoning. It has an additional trigger which is based on whether the property for the proposed development is identified on the NSW State Biodiversity Values Map (BVM). If the proposed development requires more native vegetation clearance than the area threshold or the proposed development area is on the BVM then the development requires a Biodiversity Assessment resulting in a Biodiversity Development Assessment Report (BDAR). This will determine the Biodiversity Offset Credit (BOC) obligation. The area of proposed clearing is expected to exceed the area threshold allowance, so the BOS is triggered and a BDAR is necessary. The BOS scheme allows compensatory measures to be assessed and calculated in an effort to mitigate the loss of ecological value caused by development.

The environment

Vegetation at the site is predominantly grassland or derived grassland that has been modified by agriculture and has a high proportion of exotic grasses and weeds. The site contains small area of planted vegetation known as Bunglegumbie woods, planted as part of Dubbo's Sewerage Treatment Plant; used as a mechanism for effluent water use. There are scattered remnant trees located on the

Property, with a riparian zone consisting primarily of river red gums (*E. camaldulensis*) immediately adjacent to the Macquarie River.

Avoid and minimise

The proposed residential subdivision has been planned on land that had been previously modified by Council infrastructure, urban servicing activities and agricultural land management in an effort to avoid biodiversity impacts. Provision has also been made for green space in the development, including all the land adjacent to the river, which will act to minimise disturbance to the riparian corridor.

Assessment Summary

Large areas of the subject land are cropped or contain low conservation value grasslands and the native vegetation types at the development site were confirmed as:

81	Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
438	River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion
78	River red gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
248	Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
454	River red gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
45	Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion

There is one threatened ecological community (TEC) at the Development Site. In the western grey box – cypress pine shrub grass tall woodland (PCT 81) (north western section of Lot 1 DP 1206861) the endangered ecological community 'Inland grey box woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions' is present.

This is a preliminary estimate of potential biodiversity credit obligation. Limitations including lack of access to grassland areas, on the western extent of the proposed development area, and assumptions about uniform grassland condition is likely to have elevated the actual credit obligation. Insufficient vegetation plots were performed in the grassland sections, due to areas having been recently burnt and access constraints. Supporting vegetation plots conducted in the adjacent road reserve zones could have been in superior condition than the grassland in areas that have been used for long term agricultural grazing purposes, adding to uncertainty about the calculated credit burden. Also, future refinement of the subdivision plans may further reduce biodiversity impacts and credit obligations.

At this stage, 113 species credits are required for the glossy black cockatoo (*Calyptorhynchus lathami*) (assumed present) for habitat that will be removed in the grassy woodland zones. The habitat features present at the development site are unlikely to support breeding of the glossy black cockatoo and future biodiversity assessment work undertaken in the required survey months could refine the actual versus potential habitat and reduce the number of species credits.

Serious and Irreversible Impacts (SAII) are not expected to occur at the Development Site due to lack of existing foraging and breeding resources. The Development site is not identified on the Important Areas Map for the regent honeyeater or swift parrot and no critically endangered ecological community was identified.

With the current design of the residential subdivision only PCT 81, 248 and 45 will be directly impacted resulting in clearing or modification to approximately 58 ha of native vegetation. A total of **759 ecosystem credits** are required to be offset for the planned disturbance to vegetation at the proposed subdivision site. However, further BAM vegetation plots and threatened species searches are required for the western section of the subject land that is predominantly grassland. This area was not fully sampled due to access constraints and parts of the land being recently burnt.

Many mature paddock trees have been reserved in open spaces in current subdivision plans. To help further mitigate impacts larger trees, especially hollow bearing trees, should be retained where possible. Planned open space areas should be aligned with remnant native vegetation, the threatened ecological community and hollow bearing trees. Ensuring open green spaces have various woody native vegetation and shrubs and green access corridors will help maintain some connectivity for birds and small animals. Residential housing development construction should be staged to allow transition time and facilitate fauna finding alternative habitat resources.

Table E1: Impacts that require an offset – ecosystem credits.

Veg Zone	PCT	TEC/EC	Impact Area (ha)	Ecosystem Credits Required
81_Regrowth	Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion	Inland grey box woodland	4.2	49
438_Emelliodora	River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion	-	0	0
78_Riparian	River red gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	-	0	0
248_Yellow	Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW	-	5.0	86
454_RRG	River red gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion	-	0	1
45_Grassland	Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	-	48.95	623
	Total			759

Table E2: Impacts that require an offset – species credits.

Common name	Scientific name	Loss of habitat ((ha) or individuals	Species Credits Required
Glossy black cockatoo	*Calyptorhynchus lathami*	17.9	113

Glossary of Terms and Abbreviations

Term	Meaning
APZ	Asset Protection Zone
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator (online)
BC Act	Biodiversity Conservation Act 2016
BC Regulation	Biodiversity Conservation Regulation 2017
BDAR	Biodiversity Development Assessment Report
BOC	Biodiversity Offset Credit
BOS	Biodiversity Offset Scheme
BVM	Biodiversity Values Map
CEEC	Critically endangered ecological community
DCCEEW	Department Climate Change, Energy, the Environment and Water
DBH	Diameter at breast height over bark
DPE	Department of Planning and Environment
DPIE	Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EMP	Environmental Management Plan
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Reg	Environmental Planning and Assessment Regulation 2021
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EPI	Environmental Planning Instrument
FM Act	Fisheries Management Act 1994
GIS	Geographic Information System
IBRA	Interim Biogeographic Regionalisation of Australia
KTP	Key Threatening Processes
LEP	Local Environmental Plan
LGA	Local Government Area
MNES	Matters of National Environmental Significance
MWRC	Mid-Western Regional Council
NP&W Reg	National Parks and Wildlife Regulation 2009
NP&W Act	National Parks and Wildlife Act 1974
PCT	Plant Community Type
PMST	Protected Matters Search Tool
POEO	Protection of the Environment Operations Act 1997
REP	Regional Environmental Plan
RF Act	Rural Fires Act 1997
SAII	Serious and Irreversible Impacts
SCA	State Conservation Area
SEED	Sharing and Enabling Environmental Data
SEPP	State Environmental Planning Policy
TEC	Threatened Ecological Community

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1. INTRODUCTION

Scope

Access Environmental Planning (AEP) was engaged on behalf of the proponent to undertake a biodiversity assessment (up to Stage 1) and formulate a Biodiversity Development Assessment Report (BDAR) as specified under the NSW Biodiversity Conservation (BC) Act 2016 using the Biodiversity Assessment Method (BAM) (DPE 2020). This assessment has been undertaken to support a Development Application (DA) for a proposed new residential subdivision (the Proposal) within Lot/s: 1 DP120681, 1/2 DP958250, 3 DP217195, 7/10 DP250606, 1/2 DP802180, 15/16/17/18/23/24/25/26 DP1285243, 2 DP34102, 32 DP1219695, 51/52 DP1282381, 62 DP753233, 2 DP1206861, 59/60 DP753233 581/582 DP595112, 312 DP705991, 14/15/16 DP242992, 8/53/133 DP753233 at Bunglegumbie Rd, Dubbo NSW (Figure 3).

Where used throughout this report –

- 'Development Site' is the subject land and describes the area to be directly impacted by the proposed development on Lots:
  1 DP120681, 1/2 DP958250, 3 DP217195, 7/10 DP250606, 1/2 DP802180, 15/16/17/18/23/24/25/26 DP1285243, 2 DP34102, 32 DP1219695, 51/52 DP1282381, 62 DP753233, 2 DP1206861, 59/60 DP753233, 581/582 DP595112, 312 DP705991, 14/15/16 DP242992, 8/53/133 DP753233, Lot 1 DP653795, Lot 87 DP753233 at Bunglegumbie Rd, Dubbo NSW (**Figure 2**),
- 'the Property' describes the entire land parcel contained within Lots:
  1 DP120681, 1/2 DP958250, 3 DP217195, 7/10 DP250606, 1/2 DP802180, 15/16/17/18/23/24/25/26 DP1285243, 2 DP34102, 32 DP1219695, 51/52 DP1282381, 62 DP753233, 2 DP1206861, 59/60 DP753233, 581/582 DP595112, 312 DP705991, 14/15/16 DP242992, 8/53/133 DP753233, 1 DP653795, 87 DP753233 at Bunglegumbie Rd, Dubbo NSW (**Figures 2 and 4**) and
- 'the Assessment Area' includes the Development Site and a 1500 metre (m) buffer from the outside edge of the Development Site's boundary (**Figure 10**).

The legislative pathway for the proposed development requires consideration and consent under Part 4 of the EP&A Act.

Project Background

The Proposal is located approximately 2.5 km north west of Dubbo town centre, with the Macquarie River bordering the eastern portion of the site, and the Dubbo Regional Airport located immediately adjacent to the site on the north western portion of the site. The land is owned by various stakeholders, including the Dubbo Regional Council, Dubbo Local Aboriginal Land Council (LALC), Transport for NSW (TfNSW) and private individuals. This area is zoned as low-density residential (R2), large lot residential (R5) and public recreation (RE1) under the Dubbo Regional Council Local Environmental Plan (DRC LEP) 2022.

The Precinct Plan aims to rezone the land into four land zoning categories: R1 General Residential, R2 Low Density, E1 Neighbourhood Centre, and RE1 Public Recreation zones. The plan proposes a variety of housing types, ranging from single dwellings and multi-residential dwellings to residential flat buildings, to increase housing supply, diversity, and affordability.

The Property is 372 (ha) (**Figure 2**), with the majority of the land incorporating low density and large-lot residential lots. Vegetation at the site is predominantly grassland that has a high proportion of exotic grasses and weeds with some areas that are also routinely cropped. The site contains small area of planted vegetation known as Bunglegumbie woods, planted as part of Dubbo's Sewerage Treatment Plant; as a mechanism for effluent water use. There are some scattered remnant trees which are part of the natural landscape, with many areas of planted trees (close to the roads, lining driveways around existing houses and in established plantation zones) located on the Property. A riparian zone consisting primarily of River Red Gums (*Eucalyptus camaldulensis*) aligns the eastern portion of the Property, lining the adjacent Macquarie River.

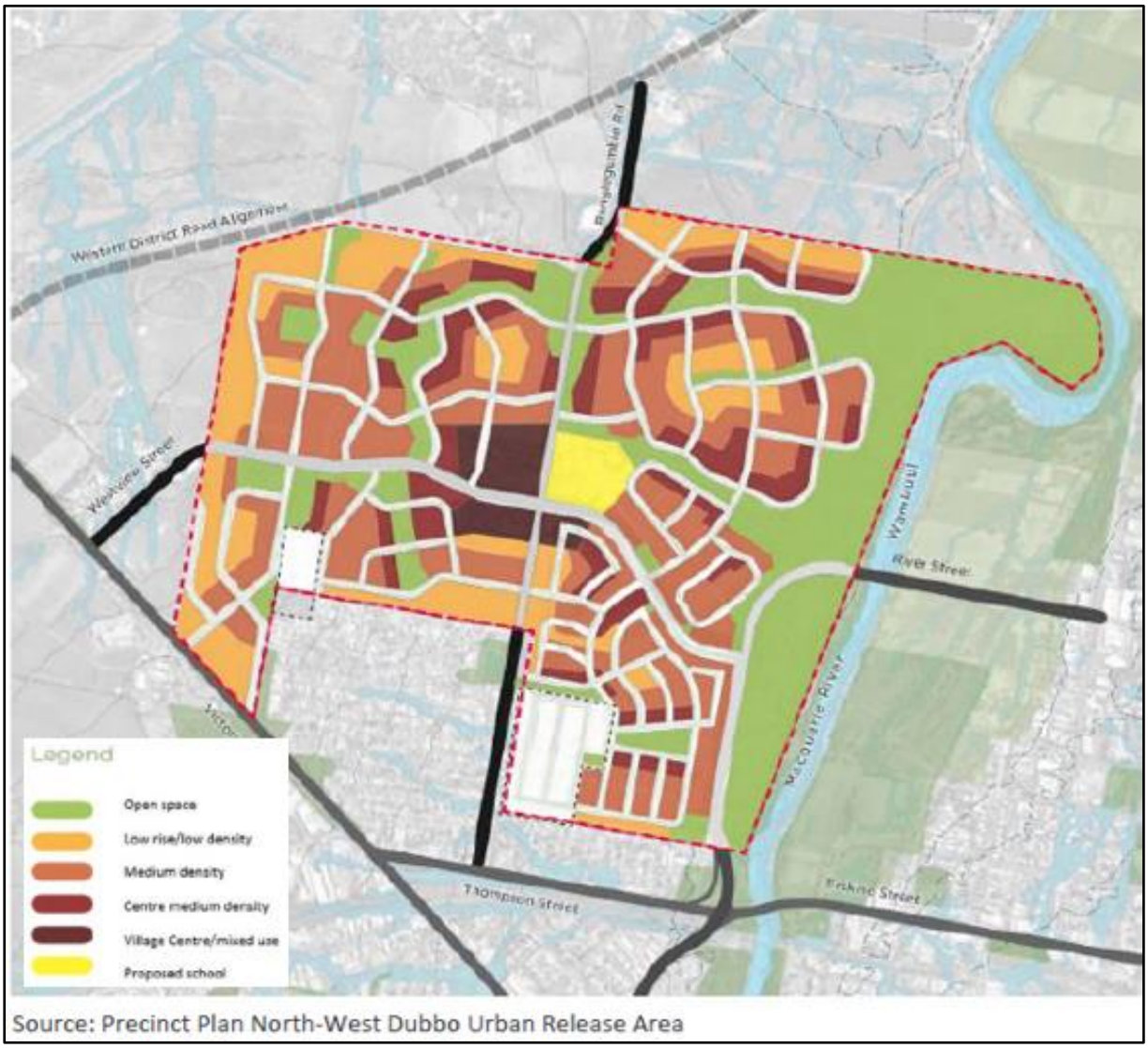

Figure 1: Indicative layout plan of DNWURA (Source: Precinct Plan North-West Dubbo Urban Release Area).

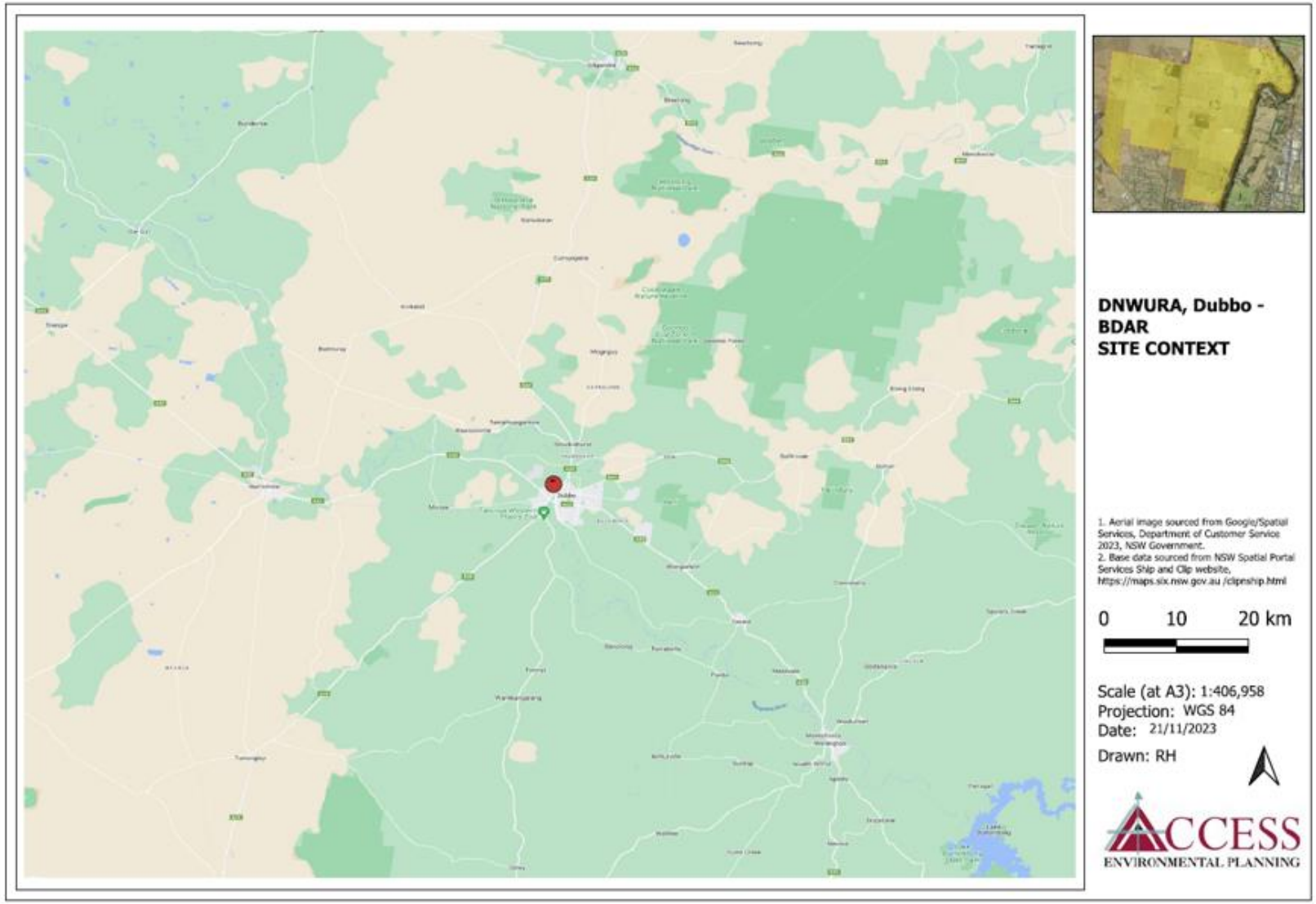

Figure 2: Site context for Dubbo NWURA.

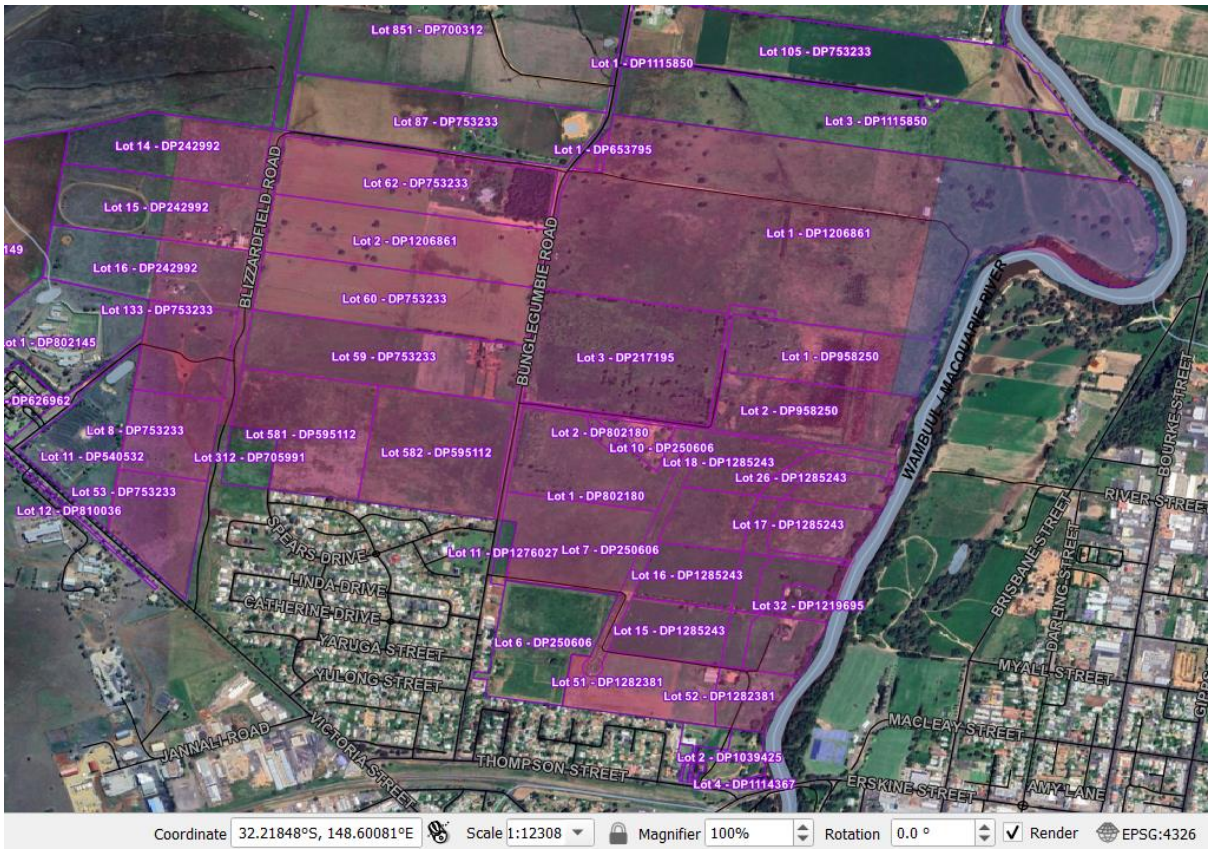

Figure 3: Lot and DP numbers located on the proposed development site.

Local Context

The Development Site occurs within the Dubbo Regional Council Local Government Area (LGA) and is approximately 2.5 km from the town centre. Surrounding lands include residential and industrial areas and farms.

Proposed development

The proposed development consists of a new residential subdivision with provision for bushfire planning associated with subdivisions. Access to the new residential lots will be via Bunglegumbie Road with additional roads to be constructed over time with development stages of the subdivision.

The Biodiversity Offsets Scheme (BOS) applies to the development because approximately 58 ha of native vegetation may be cleared exceeding the area threshold (**Figures 1 and 3**) which automatically triggers assessment under the BOS.

Key construction activities for the Proposal include:

- Subdivision of the existing lot creating 5300 additional house lots by 2040,
- Installation or upgrade of site roads and access,
- Installation of water services,
- Electrical cabling, connection and provision of power,
- Provision of bushfire protection measures for residential subdivision.

Site details / selection

The Property contains existing lots within Dubbo Regional Council Local Government Area (LGA) and is identified on the NSW Planning Portal as follows:

- Address: Bunglegumbie Rd, Dubbo, NSW 2830
- Development Site – Lot 1 DP120681, Lots 1,2 DP958250, Lots 3 DP217195, Lots 7,10 DP250606, Lots 1,2 DP802180, Lots 15,16,17,18,23,24,25,26 DP1285243, Lot 2 DP34102, Lot 32 DP1219695, Lots 51,52 DP1282381, Lot 62 DP753233, Lot 2 DP1206861, Lots 59,60 DP753233 Lots 581,582 DP595112, Lot 312 DP705991, Lots 14,15,16 DP242992, Lots 8,53,133 DP753233, Lot 1 DP653795, Lot 87 DP753233.
- Council: Dubbo Regional Council (DRC)
- Land Zoning: RE1 Public Recreation, R2 Low Density Residential and R5 Large Lot Residential.
- Minimum lot size: R2 600 m^2, R5 8 hectares (ha)
- Actual lot size: variable

The Development Site was selected as it best satisfies subdivision requirements, close to the existing Dubbo Central Business District (CBD), taking advantage of the new bridge river crossing and allowing adequately sized lots with good access to the public road network. The development layout (**Figure 1**) operational footprint, construction footprint area is approximately 372 ha. The Property contains red to brown earthy soils and is located on Quaternary alluvium deposits derived from various rock types within the Macquarie River. The Dubbo draft Bushfire Prone Land Map identifies the entirety of the Precinct as Bushfire Prone Land. This predominately includes Vegetation Category 3 as grasslands. In planning the Development Site, consideration was given to:

- Flooding hazards and protection of riparian areas.
- Available house sites on the land with suitable topographic characteristics.
- Proximity to other residential areas
- Proximity to existing electrical infrastructure.
- Bushfire hazard characteristics.
- Other planned land management activities.
- The disturbance to site vegetation and the Avoid, Minimise, Offset hierarchy of the BOS.

Excluded impacts

Previously Assessed Land

Part of the Property has been previously assessed for biodiversity impacts (Jacobs 2019) regarding work for the New Dubbo Bridge development which is currently progressing (**Figure 4**).

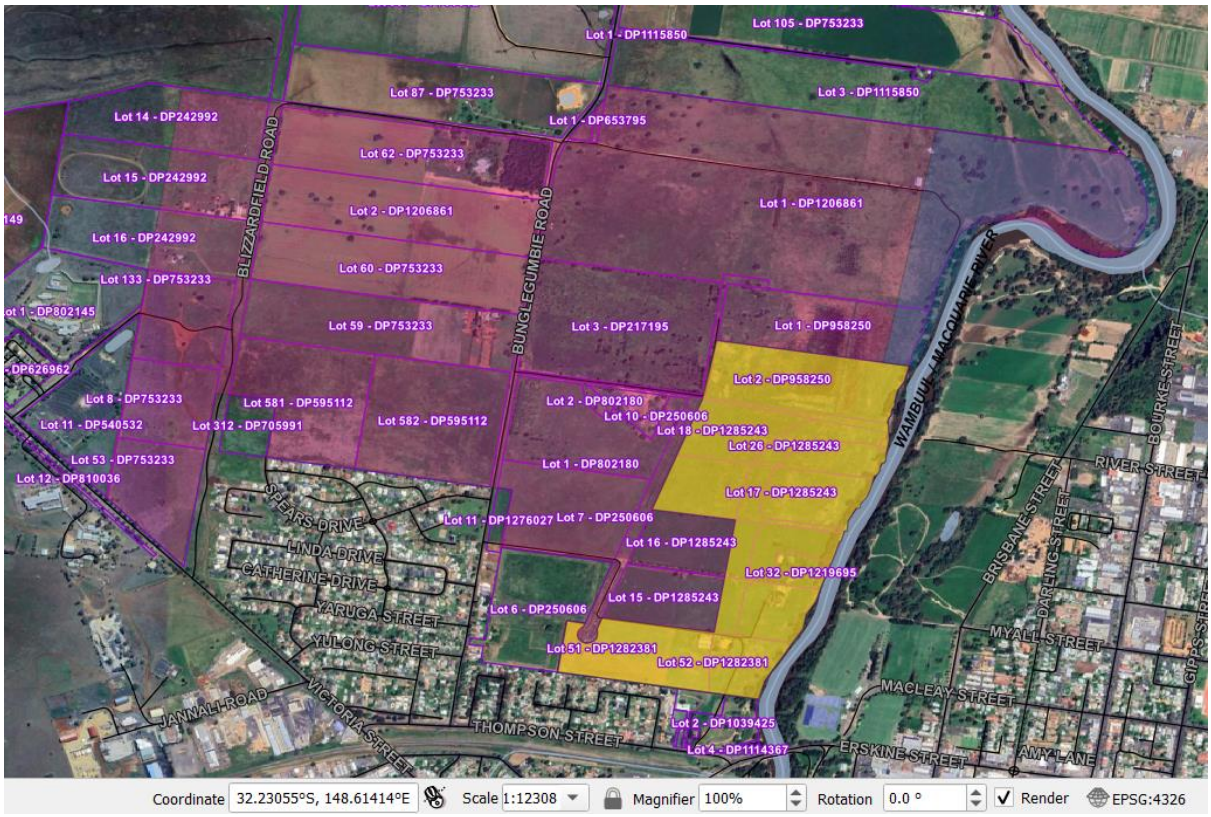

Figure 4: Land previously assessed for new bridge works.

Category 1 Land

The transitional Native Vegetation Regulatory (NVR) Map (**Figure 14**) displays some of the land categories established under the LLS Act that apply to land regulated by Part 5A of the LLS Act (excluded land, category 2 - vulnerable land and category 2 - sensitive land). The Property is excluded from the native vegetation provisions of the LLS Act due to land zoning. It does however have a long history of agricultural activities with some areas being intensively farmed and subject to routine cultivation, grazing, fertilizer and herbicide application.

Land that is proven to satisfy the definition of category 1 – exempt land (regardless of the actual land zoning and status with regard to LLS Act applicability) is considered under section 1.5 (1(d)) of the BAM and is only assessed for prescribed biodiversity impacts. Even though the land in the study area is excluded from the native vegetation allowable clearing provisions of the Local Land Services (LLS) Act 2013 due to land zoning, some zones satisfy the requirements for classification as category 1 – exempt land (as defined in the LLS Act 2013) because:

(a) existing cleared areas on the land were cleared of native vegetation as at 1 January 1990, or
(b) the land was lawfully cleared of native vegetation after January 1990, or
(c) the land contains low conservation value grasslands.

Historical aerial imagery (**Appendix 6**) shows many areas of the site have been cropped over the years which totally removes or modifies the composition and structure of native groundcover. The land use map (**Figure 5**) available through the Sharing and Enabling Environmental Data (SEED) portal shows the majority of the site is classified as grazing modified pastures and site survey (using transects conducted following the Interim Grasslands and other Groundcover Assessment Method (OEH 2017) guidelines) confirms most of the agricultural / grazing zones to have low conservation value (LCV) grasslands (**Figure 15**). The BAM does not assess biodiversity impacts on category 1 – exempt land

other than prescribed impacts. Consideration of impacts under the Biodiversity Conservation (BC) Act 2016 (a test of significance) and the Environment Protection Biodiversity Conservation (EPBC) Act 1999 is necessary for areas in proposed developments where the BAM may not apply.

BAM assessment of planted native vegetation (established for functional, aesthetic, horticultural or plantation forestry purposes) needs to consider the possible provision of habitat for threatened species only. Planted exotic vegetation is not relevant to BAM assessment unless it is found to be used for habitat of threatened species.

Preliminary analysis of field data allows designation and mapping of cropped areas and LCV grasslands which fit the criteria for category 1 - exempt land and will only be considered for prescribed biodiversity impacts under the BAM (**Figure 15**).

The 2017 Land Use mapping (SEED) shows the majority of the Property is mapped with grazing modified pastures then also with areas of grazing native vegetation, residential and farm infrastructure, plantation/forests, irrigated perennial horticulture and other minimal use. The surrounding land use is service (industry), cropping, irrigated cropping and residential/urban.

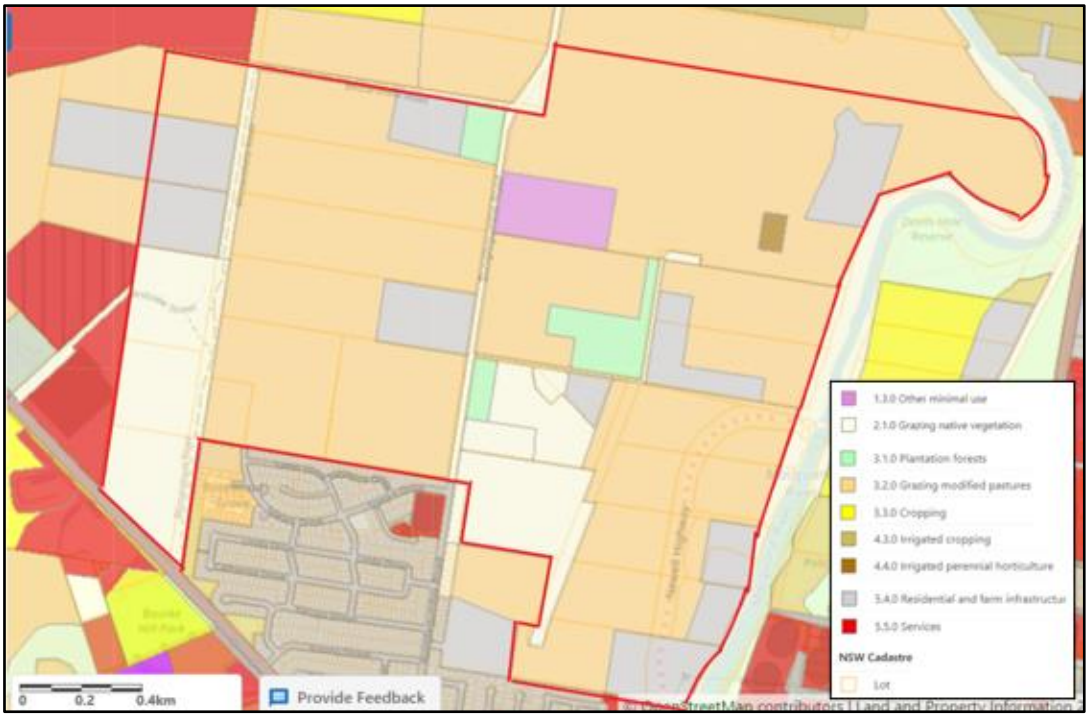

Figure 5: NSW Land use mapping informing the condition of site vegetation.

Matters of national environmental significance

The development is not a controlled action and does not need referral under the Environment Planning and Biodiversity Conservation (EPBC) Act 1999.

Information sources

Documentation and information sources for this assessment include the following.

- North-West Dubbo Precinct Plan, Urban Design Review NSW Department of Planning and Environment (DPE),
- Dubbo Regional Council Local Environmental Plan 2022 (pub. 24/05/2022),

- Hill PDA Consulting, NORTH-West Dubbo Urban Release Area Commercial Needs Assessment
- NSW Environment and Heritage, eSPADE v2.2 (nsw.gov.au),
- Department of Planning and Environment, Draft Development Control Plan DCP22-002 - North-West Urban Release Area,
- Department of Planning and Environment, BCS NW Branch Steps for Assessing Biodiversity in Planning Proposals,
- NSW Planning Portal (https://www.planningportal.nsw.gov.au/),
- NSW Government aerial imagery and other spatial data layers including contours, cadastre, etc. (www.maps.six.nsw.gov.au),
- BioNet databases (www.bionet.nsw.gov.au), including BioNet Atlas, threatened species profiles, species records, vegetation classification and the NSW DPE Threatened Biodiversity Data Collection (TBDC),
- The Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) for Matters of National Environmental Significance (MNES),
- Flora NSW Online (www.plantnet.rbgsyd.nsw.gov.au) and *Flora of New South Wales* (Vol 1-4, Harden 1991-2002).

Table 1: Cadastre details for proposed Development.

Lot	DP	Area (ha)	Ownership	Comments	Zoning	Critical Habitats	Conservation Areas	Flood Prone Land
1	1206861	88.08	Council	Earthen lagoon for sewage constructed 2002; area with olive grove; TEC inland grey box woodland (derived grassland) near western boundary of lot	R2 RE1	None	Terrestrial biodiversity - riparian zone	Yes
1	958250	11.75	Council	Old sewage plant; 3 redundant sewer mains exhumed 2005	R2 RE1	None	Terrestrial biodiversity - riparian zone	Yes
2	958250	11.88	Council	Old sewage plant	R2 RE1	None	Terrestrial biodiversity - riparian zone	Yes
3	217195	21.51	Council	Remnant native tree plantation, planted to utilise sewage treatment plant (STP) effluent	R2	None	None	No
1	217195	0.989	Council	Old sewage plant and access	R2	None	None	Yes
10	250606	1.955	Council	Storage-outdoor materials; Demolition of building in 2004	R2	None	None	No
2	802180	0.495	Council	Demolition of former animal shelter	R2	None	None	No
1	802180	11.49	Council	Paulownia and remnant native tree plantation associated with STP	R2	None	None	No
18	1285243	8.05	Council	3 redundant sewer mains exhumed 2005	R2 RE1	None	None	Yes
17	1285243	9.76	Council	3 redundant sewer mains exhumed 2005	R2 RE1	None	None	Yes
25	1285243	1.72	TfNSW	New bridge works	R2 RE1	None	None	Yes
26	1285243	2.64	TfNSW	New bridge works	R2 RE1	None	None	Yes

Lot	DP	Area (ha)	Ownership	Comments	Zoning	Critical Habitats	Conservation Areas	Flood Prone Land
87	753233	0.45		LCV grassland				
1	653795	0.27		LCV grassland				
24	1285243	1.44	TfNSW	New bridge works	R2	None	None	Yes
23	1285243	1.31	Middleton	New bridge works	R2	None	None	Yes
15	1285243	9.89	Middleton	3 redundant sewer mains exhumed 2005	R2 RE1	None	Terrestrial biodiversity - riparian zone	Yes
16	1285243	8.44	Hughes	3 redundant sewer mains exhumed 2005	R2 RE1	None	Terrestrial biodiversity - riparian zone	Yes
32	1219695	1.63	Hughes	Heritage items	R2 RE1	None	Terrestrial biodiversity - riparian zone	Yes
51	1282381	8.52	Bunglegumbie Partners P/L	Recently cropped	R2	None	None	Yes
52	1282381	3.88	TfNSW	3 redundant sewer mains exhumed 2005; LCV grassland	R2 RE1	None	Terrestrial biodiversity - riparian zone	Yes
7	250606	11.37	Middleton	LCV grassland	R2	None	None	No
62	753233	16.41	Smith	Currently under crop; House; **Native plantation (TS habitat search required before development)**	R2	None	None	No
2	1206861	16.2	Smith	Currently under crop	R2	None	None	No
60	753233	16.26	Smith	Currently under crop	R2	None	None	No
59	753233	16.15	Davis	LCV grassland	R2	None	None	No
581	595112	13.39	Fardell		R2	None	None	No
582	595112	16.25	Fardell	LCV grassland	R2	None	None	No

Lot	DP	Area (ha)	Ownership	Comments	Zoning	Critical Habitats	Conservation Areas	Flood Prone Land
14	242992	11.41	Robinson	Part lot; Further BAM work required	R5 E4	None	None	No
15	242992	12.33	Lew	Part lot; Further BAM work required	R5 E4	None	None	No
16	242992	11.79	Gould	Part lot; Further BAM work required	R5 E4	None	None	No
133	753233	8.13	Dubbo LALC	Further BAM work required	R5	None	None	No
8	753233	7.27	Dubbo LALC	Further BAM work required	R5	None	None	No
53	753233	8.13	Dubbo LALC	Further BAM work required	R5	None	None	No
			R2	Low density residential				
			RE1	Public Recreation				
			R5	Large Lot Residential				
			E4	General Industrial				

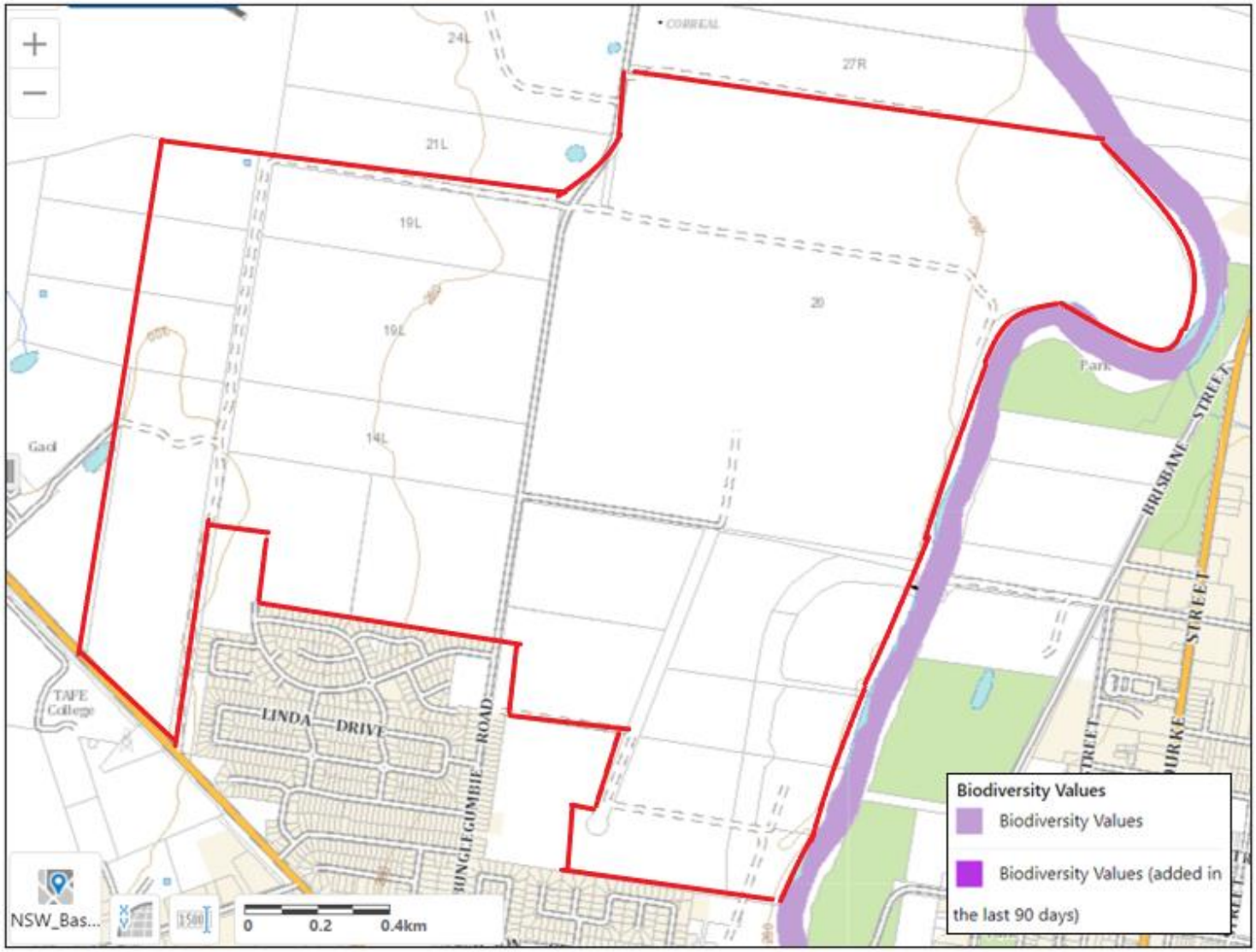

Figure 6: Biodiversity Values Map.

Figure 7: Dubbo Regional Local Council Terrestrial Biodiversity Map.

Consultation

The following consultation has been undertaken for this BDAR:

- Email correspondence, phone discussions and in person contact with the client representative regarding project details.

Overview of methods

A desktop review of available information including vegetation maps and BioNet Atlas data was undertaken to identify possible native vegetation types, threatened species and ecological communities relevant to the site. Predicted species that could be present, including those with suitable habitat at the site, were further assessed under the BAM process.

A site inspection was undertaken on 11-13/10/2023 and 23-24/11/2023, by Renae Hill (Accredited BOS Assessor No. 23003), Tony Moody and Cameron Rowling Scott of Access Environmental Planning to assess the condition of native vegetation and habitat characteristics found at areas that will be impacted by the development. The following tasks were completed during the site assessment:

- Collation of a flora / fauna species list.
- Identification of vegetation communities present at the Development Site.
- Search for predicted threatened species and potential habitat for predicted threatened fauna, such as rock outcrops, caves and hollow bearing trees (HBT).

This development has been assessed using the standard BAM assessment module.

Author qualifications

In field assessments and report preparation have been conducted by Ms Renae Hill (BAAS No. 23003), an Accredited Biodiversity Assessment Method (BAM) Assessor with oversight by Mr Christopher Botfield.

Mr Christopher Botfield - Principal Access Environment Planning

- Accredited Biodiversity Assessor for the Biodiversity Conservation Act 2016 - BAAS No 18023
- Certified Environmental Practitioner
- B. Environmental Management (B. App.Sc PRH) CSU

Experience in environmental resource and vegetation assessment, Indigenous land management, and landowner consultations. Over 30 years ecological practice and consulting experience in the Central Tablelands, Central West, Far West, North West Slopes and Sydney NSW regions.

Ms Renae Hill - Project Manager

- Accredited Biodiversity Assessor for the Biodiversity Conservation Act 2016 – BAAS No 23003
- Graduate Diploma Environmental Management 2022 CSU
- Bachelor of Agriculture 2006 UNE,
- Bachelor of Science (Hons) 1994 UoN

Ecological practice and consulting experience in the Central Tablelands, Central West, Far West, North West Slopes and Sydney NSW regions, for the past 5 years. Previously 10 years of field agronomy experience, both in the Central West and Hunter regions.

Limitations and assumptions

The following limitations and assumptions of this study are acknowledged.

Not all flora species will have been detected at the site and additional species other than those listed in this report will be present. Some ephemeral or cryptic flora species may have been dormant and not detected at the time of the survey.

Some of the Property could not be assessed because it had recently been burnt and vegetative matter was very limited.

Legislative context

Assessment of the Proposal was undertaken in accordance with and in consideration of the following Acts and Policies:

- Commonwealth:
  - Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).
  - Biosecurity Act 2015;
- State:
  - Biodiversity Conservation Act 2016 (NSW) (BC Act);
  - Biodiversity Conservation Regulation 2017 (NSW) (BC Regulation);
  - Environmental Planning and Assessment Act 1979 (EP&A Act);
  - Local Land Services Act 2013 (LLS Act);
  - Biodiversity Assessment Method (BAM) (DPE, 2020).
- Local:
  - Dubbo Regional Local Environmental Plan 2022 (DR LEP 2022),
  - Dubbo Regional Development Control Plan 2013 (DR DCP 2013)

EPBC Act 1999

Under the EPBC Act assessment, approval is required for actions that are likely to have a significant impact on matters of national environmental significance (MNES). An action includes a project, development, undertaking, activity, or series of activities. The Act identifies nine MNES:

1. World Heritage properties,
2. National heritage places,
3. Wetlands of international importance (Ramsar Convention),
4. Listed threatened species and communities,
5. Migratory species listed under international agreements,
6. Great Barrier Reef Marine Park,
7. Commonwealth marine areas,
8. Nuclear actions and
9. Water resources in respect to Coal Seam Gas and large coal mines.

While this BDAR is not required to address MNES, the proponent is required to address the EPBC Act as part of their development application. Items 4 and 5 are potentially relevant to this proposal.

EP&A Act 1979

The Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act), the Environmental Planning and Assessment Regulation 2021 (NSW) and associated environmental planning instruments (including State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs)) provide the framework for the assessment of the environmental impact of development proposals in NSW.

BC Act 2016

The BC Act sets out to conserve biodiversity at all levels consistent with the principles of ecologically sustainable development. It seeks to ensure a consistent, scientifically sound methodology for the assessment of biodiversity and to offset the impact of development through a Biodiversity Offset Scheme (BOS). The BC Act lists threatened species and communities, and determining authorities have a statutory obligation under the EP&A Act to consider whether a proposed activity is likely to significantly affect threatened species, populations or ecological communities or their habitats. A BDAR is required for developments if biodiversity values may be impacted.

Biodiversity Assessment Method 2020

The Proposal has been assessed under the BAM (DPE 2020). The Biodiversity Accredited Assessor System (BAAS) Case number for the project is 00044172, with associated BAM Calculator number of 00044172/BAAS23003/23/00044173 Revision 1. The BAM online calculator (BAM-C) version number is 61, updated 22/06/2023.

App last updated: 13/04/2023 10:00 (Version: 1.4.0.00)

BAM data last updated *: 22/06/2023 (Version: 61) * Disclaimer

LLS Act 2013

Legislation with provision for classification of rural land and subsequent treatment of native vegetation on such land. Even though the land in the study area is excluded from the provisions of the Local Land Services (LLS) Act 2013 due to land zoning, some zones satisfy the requirements for category 1 – exempt land and will be assessed for prescribed impacts only under the BAM.

Biosecurity Act 2015

Under the Biosecurity Act 2015 all plants are regulated with a general biosecurity duty "to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant and knows of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable."

2. Methods

Site context methods

Landscape features

Field surveys were conducted early in October and November involving vehicle and pedestrian survey. Transects and vegetation plots were assessed for characteristics regarding native plants. Observations of fauna encountered while performing this field work were made.

Groundwater flow on the eastern portion of the site is expected to flow in a northerly direction (like the river flow direction). Deeper groundwater, on a regional scale, would likely flow to the north-west (as the river does on a regional scale).

Native vegetation cover

Aerial imagery was examined before site visits (including historical imagery) to gather information about past land management practices and indicate potential differences in condition in vegetation types.

Detail field visit used to examine landscape features and confirm extent and condition of vegetation communities on the subject land.

Native vegetation, threatened ecological communities and vegetation integrity methods

Existing information

Existing state vegetation type mapping (SVTM) (available through the Sharing and Enabling Environmental Data (SEED) portal) lists non-native plants and seven other potential plant community types (PCTs) that could be present at the site (**Figure 8**). Vegetation mapping is not always accurate and has to be corroborated with field survey and corresponding data analysis. Vegetation information for the site was limited with areas listed as PCT 0 – not recognised as a native vegetation plant community, with adjacent sections of:

PCT 45: Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South west Slopes Bioregion – this PCT is not at the mapped location as the area is a cropped paddock and the other mapped areas are modified severely grazed pastures.

PCT 70: White Cypress Pine woodland on sandy loams in Central NSW wheatbelt – this area is currently a planted woodlot (site access was not permitted).

PCT 76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions.

PCT 78: River Red Gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion.

PCT 81: Western Grey Box-cypress pine shrub tall woodland – this PCT exists at the site but not as mapped in the SVTM. The area mapped on the SVTM is planted native vegetation comprised mainly of spotted gum (*Corymbia maculata*).

PCT 248: Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW.

PCT 511 Queensland Bluegrass - Redleg Grass - Rats Tail Grass - spear grass - panic grass derived grassland of the Nandewar Bioregion and Brigalow Belt South Bioregion. This PCT does not exist at the site as a portion of the SVTM mapped area is a cropped paddock and the remainder is planted native vegetation surrounding a residence.

Mapping native vegetation extent

Native vegetation at the Development Site was assessed in accordance with Section 4 of the BAM (DPE 2020).

Plot based vegetation survey

Sampling locations were selected by checking SVTM, aerial imagery and zones of disturbance like fences and roads. Existing State vegetation mapping was used to examine potential plant communities that may occur at the Property. Aerial imagery including historical changes were also examined to help identify modifications from land management and possible differences in vegetation condition.

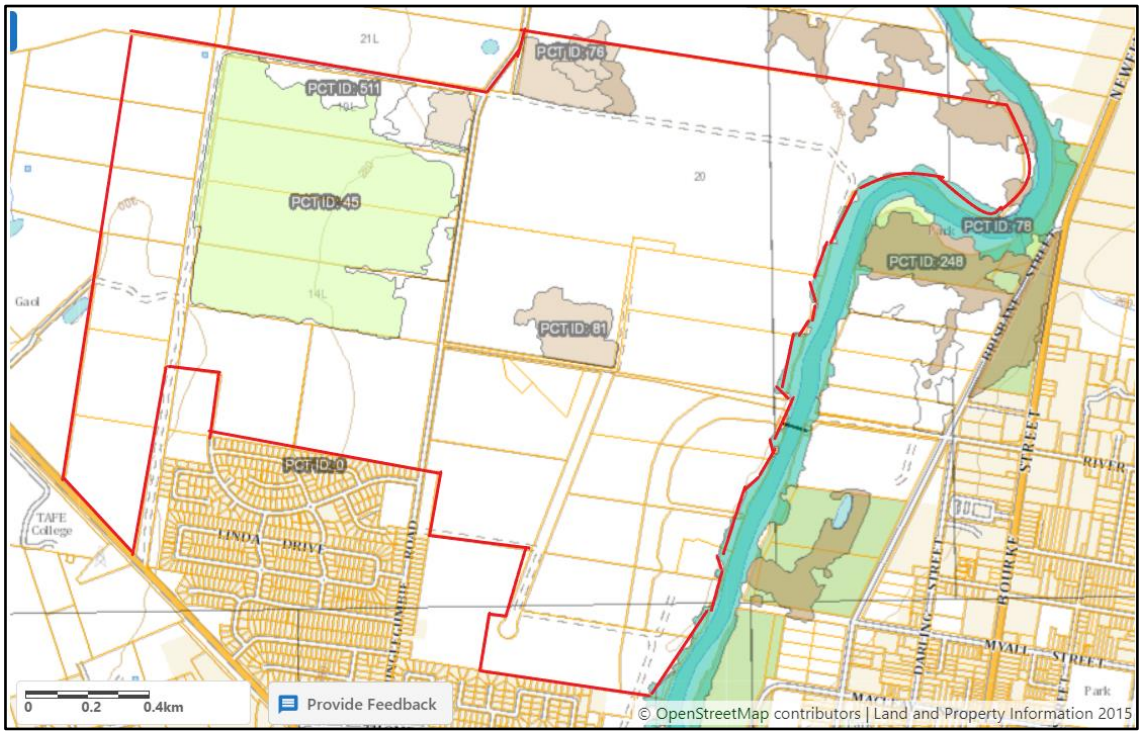

Figure 8: State vegetation type map (SVTM) of Development site.

Vegetation Mapping Surveys

Detailed vegetation survey was conducted across the Development Site and Property in October and November 2023, with 20 m x 20 m BAM vegetation plots labelled as Grassland, River, GW-01, GW-02, GW-03, GW-04, GW-05, GW-06, GW-07, GW-08, Grassland A, Grassland B (**Figure 15**). Ecological function and structure characteristics were measured based on 20 m x 50 m field plots.

Weather conditions

The ambient weather conditions present on days of site investigations are outlined in **Table 2**. Field conditions on all plots in October were fine and dry, while the ambient weather for the November visit was generally overcast. The Dubbo Airport weather station is the closest station to the lots on Bunglegumbie Rd, 2.5 km away.

Table 2: Weather observations at Dubbo airport (station 065070) (World Weather 2023).

Date	Rainfall (mm)	Temperature Min (°C)	Temperature Max (°C)	Relative Humidity 9am (%)	Relative Humidity 3pm (%)	Site conditions
11/10/2023	0	11.1	18.8	82	63	Fine, dry
12/10/2023	0	12.2	31.1	61	24	Fine, dry, windy afternoon
13/10/2023	0	8.8	18.8	80	36	Fine, dry
23/11/2023	5	17.2	21.7	65	85	Cool, cloudy, overnight rain
24/11/2023	4.8	17.9	21.2	92	89	Cool, cloudy and drizzly

Limitations

Not all flora species will have been detected at the site and additional species other than those listed in this report will be present. Some ephemeral or cryptic flora species may have been dormant and not detected at the time of the survey.

The site visit was also limited by access constraints on specific lots. Some of the land parcels in the west of the site owned by Dubbo Local Aboriginal Land Council (LALC) had been recently burned and in was not possible to perform any satisfactory vegetation survey. Another factor affecting the lots on the western side was lack of permission to access the property and vegetation in these lots (grassland) was under assessed, with regard to the recommended number of plots outlined in the BAM and will require further assessment in the future (lots affected - LALC land Lots 53, 8 and 133 DP 753233 and Lots 14, 15, 16 DP 242992). Access was also an issue for the planted native species woodlot (eastern end of Lot 62 DP 753233) and further survey for threatened species in this vegetation patch should be performed if there is to be any future development, although this vegetation is to be retained in current plans.

3. LANDSCAPE CONTEXT

Assessment area

The Dubbo North-West Urban Release Area (DNWURA) spans 372 hectares on the northwestern outskirts of Dubbo. It is located approximately 2 km from the Dubbo CBD and the Regional Airport is close to the western boundary of the site. The land currently supports cropping, grazing and other agricultural pursuits.

The Assessment area is the Development site (or subject land) and an additional 1500 m buffer area surrounding the Development (**Figure 10**).

The development site is mostly comprised of non-native grassland, with heavy exotic weed incursion. Much of the site is used for primary production and there is an old sewage treatment plant towards the middle of the Council owned land. The slope is minor and for the majority of the Property generally falls to the east towards the Macquarie River, which runs along the entire eastern boundary of the Property.

The Development Site in the Brigalow Belt South Interim Biogeographic Regionalisation of Australia (IBRA) bioregion, having a small section in the south eastern corner which is in the Talbragar Valley sub-region and the remainder in the Pilliga subregion. Residual rocky hills, undulating long slopes and wash plains, wide valley floors with sandy streams are typical of the landscape. Sub-region soils are typically thin stony loams and texture contrast soils, with deeper sands and brown earths on valley floors (DPE 2023). Geology of this sub-region consists of near horizontal Mesozoic quartz sandstone, conglomerates and shales with minor Tertiary basalt caps and extensive alluvial wash plains. Broadly, the vegetation of the sub-region consists of narrow-leaved ironbark, white cypress pine, white box on hills and slopes. Patches of black cypress pine, hill red gum, occasional kurrajong and scrubby acacia in rocky outcrops. Grey box, yellow box, rough-barked apple on valley floors. River red gum on larger streams and river oak on tributaries (DPE 2023).

Landscape features

Table 3: Landscape features of the Development Site and Assessment Area

Landscape Features	Development Site
General description	Topography – alluvial plains to undulating rises and low hills. Hydrology – all of the Property is identified as being in a vulnerable groundwater zone (Dubbo Regional LEP 2022) (**Figure 13**).

	Geology –The eastern section of the Property, closest to the Macquarie River, has quaternary alluvial deposits – mud, silt, sand and gravel. The western section of the Property has Jurassic sedimentary rocks predominately sandstone with small conglomerate and claystone patches. There is a small occurrence of Cenozoic, mafic volcanic rock, typically basalt, in the centre north of the Property. (Sharing and Enabling Environmental Data (SEED) portal (DPE 2021b)). Soils vary across the site with dermosols near the river, chromosols and ferrosols further west, also with a minor occurrence of tenosols. (SEED, Dubbo Soil Landscapes sheet 1:250 000 (Data NSW 2020).
Native vegetation cover	8 % extant native vegetation cover in Assessment Area (**Figure 12**). Urban development, general industry and primary production land surround the site, contained within the Assessment Area. Some native vegetation exists at the Property as planted woodlots.
IBRA bioregion	Brigalow Belt South (**Figure**)
IBRA subregion	Pilliga (site west)/Talbragar Valley (site east) (Property)
LGA	Dubbo Regional Council
Rivers and streams	The Macquarie River runs adjacent to the eastern boundary of the site (**Figure 11**). Troy Creek (Strahler stream order 3) runs through the north eastern portion of the Assessment area.
Wetlands	No wetlands occur within the Development Site, Property, assessment area (buffer zone) or adjacent lands.
Habitat connectivity	The Development Site lies within agricultural areas with habitat connectivity only maintained along the riparian zone (**Figure 11**).
Significant geological features	There are no significant areas of rock outcrop near the Development Site and Assessment Area. There are no other significant geological features like karst, caves, large crevices or cliffs in the Assessment Area.
Areas of outstanding biodiversity value	There are no areas of outstanding biodiversity value mapped within or adjacent to the Assessment Area.
NSW (Mitchell) landscapes	The site is divided with the Macquarie Alluvial Plains landscape in the east and Goonoo Slopes in the west.
Any additional features	The Macquarie River along the eastern boundary of the site.

Details of the landscape assessment for the Development Site, according to the BAM (DPE 2020) using site-based assessment methodology and Geographic Information System (GIS) capabilities, are reported below.

Native vegetation cover

The Assessment Area (1500 m site buffer) has an area of approximately 2275 ha which has extant native vegetation cover of 101 ha (4 %) (SEED). There is a likely additional 68 ha that is native grassland (in the western zone of the site and adjacent to the site boundary in that area), grassy woodlands in the eastern section of the site (the assessed PCTs) totalling 13.7 ha, and small blocks of planted native trees that currently occupy 6.2 ha, none of which are shown as extant native vegetation in the SEED mapping. Therefore the total native vegetation in the assessment area is 8 % with much of the surrounding land being urban or general industry with sparse remnant native vegetation.

Table 4: Native vegetation cover in the assessment area.

Assessment area (ha)	2275
Total area of native vegetation cover (ha)	188.9
Percentage of native vegetation cover (%)	8.3
Class (0-10, >10-30, >30-70 or >70 %	0-10

Geology and soils

The landscape consists of alluvial plains to undulating rises and low hills. The western side of the site features an underlying geological formation of extremely weathered orange sandstone. The site also has isolated pockets of basalt, predominately on rises, with other areas of silty clay beneath firm red to brown clay top soils. These soils have low to moderate natural fertility, with weakly structured surface soils and moderate to high erosion hazard. Soils of the site are a combination of chromosols, dermosols, tenosols and ferrosols, with strongly contrasting texture between structural horizons. Non-calcic brown soils occur on upper slopes and yellow podzolic soils (mostly acidic, erodible and poorly drained) on mid to lower slopes. (Dubbo Soil Landscapes sheet 1:250 000 (Data NSW 2020)).

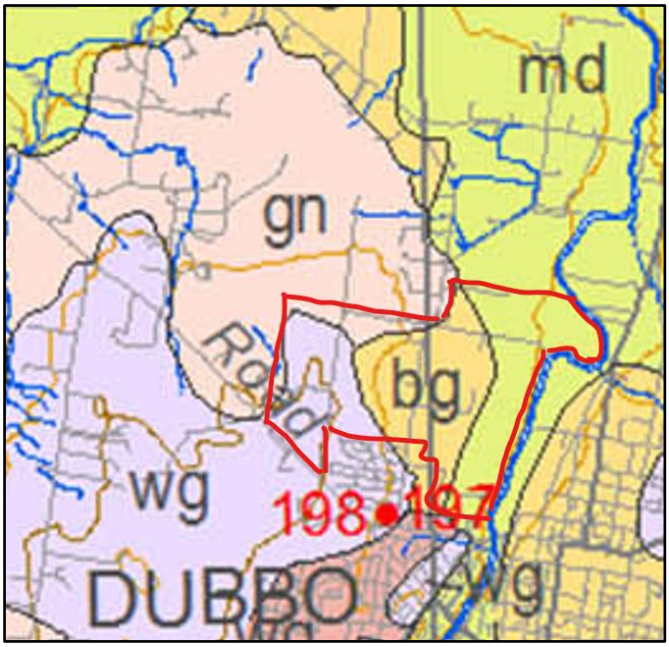

Figure 9: Soil Landscapes of the Dubbo 1:250 000 sheet (Data NSW, 2020).

Alluvial soils (md – Macquarie Dubbo) – alluvial plains and terraces of the Macquarie River, relief to 10 m with slopes of 0-3% alluvial sands with higher, older slopes tending to red and red-brown earths and yellow podzolic solodic soils. Moderate fertility some erosion hazard.

Higher terraces (bg – Bunglegumbie) – level to slightly undulating plains of the Macquarie River, relief to 10 m and slope less than 3 %. Typically red and yellow chromosols, red kandosols and black vertosols with poorly structured surface soils.

Gentle rises and low hills (wg – Wongarbon) – derived from basalt, relief of 20 – 60 m, slopes from 3 to 8 % composed of red dermosols, and red or brown vertosols (cracking clays). Inherent fertility and shrink swell characteristics are naturally moderate to high.

Undulating rises and low hills (gn – Goonoo) with sandstone, mudstone and shale, relief to 10 – 50 m and slopes 2 – 10 %; yellow and brown earthy sands and siliceous sands on mid and upper slopes, red podzolic soils on lower slopes and flats.

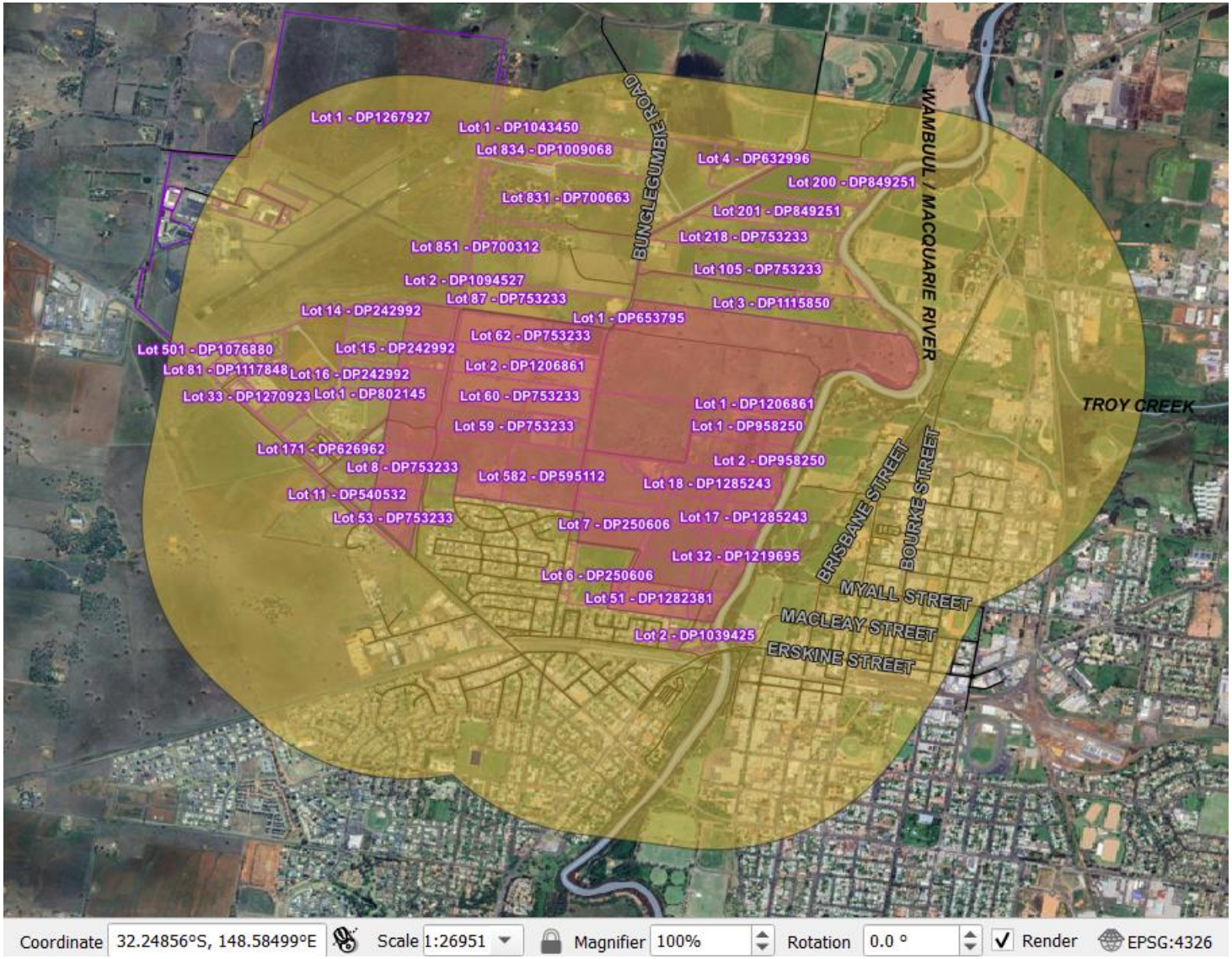

Figure 10: Property and assessment area (1500 m buffer).

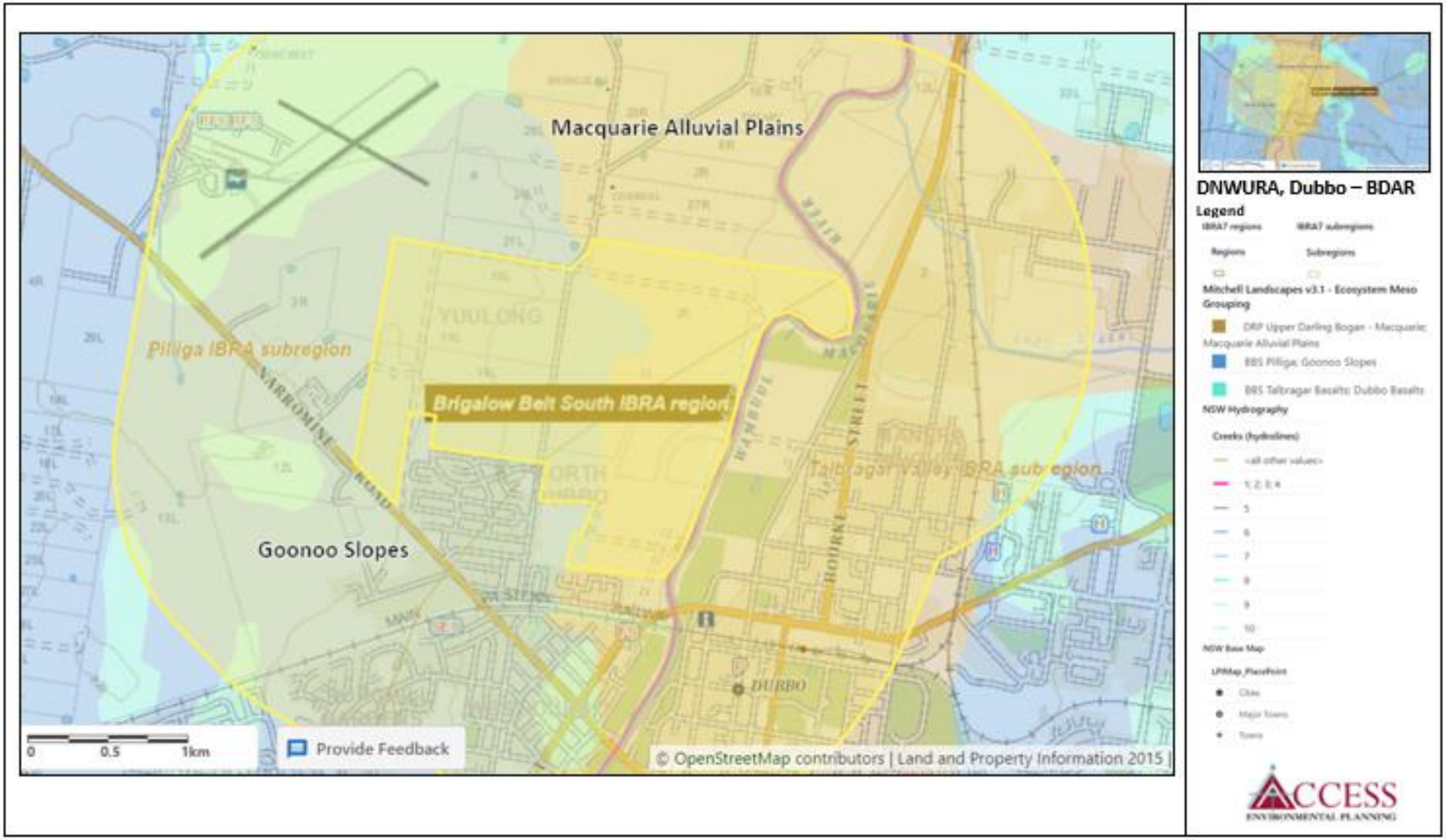

Figure 11: Overview of site landscape context.

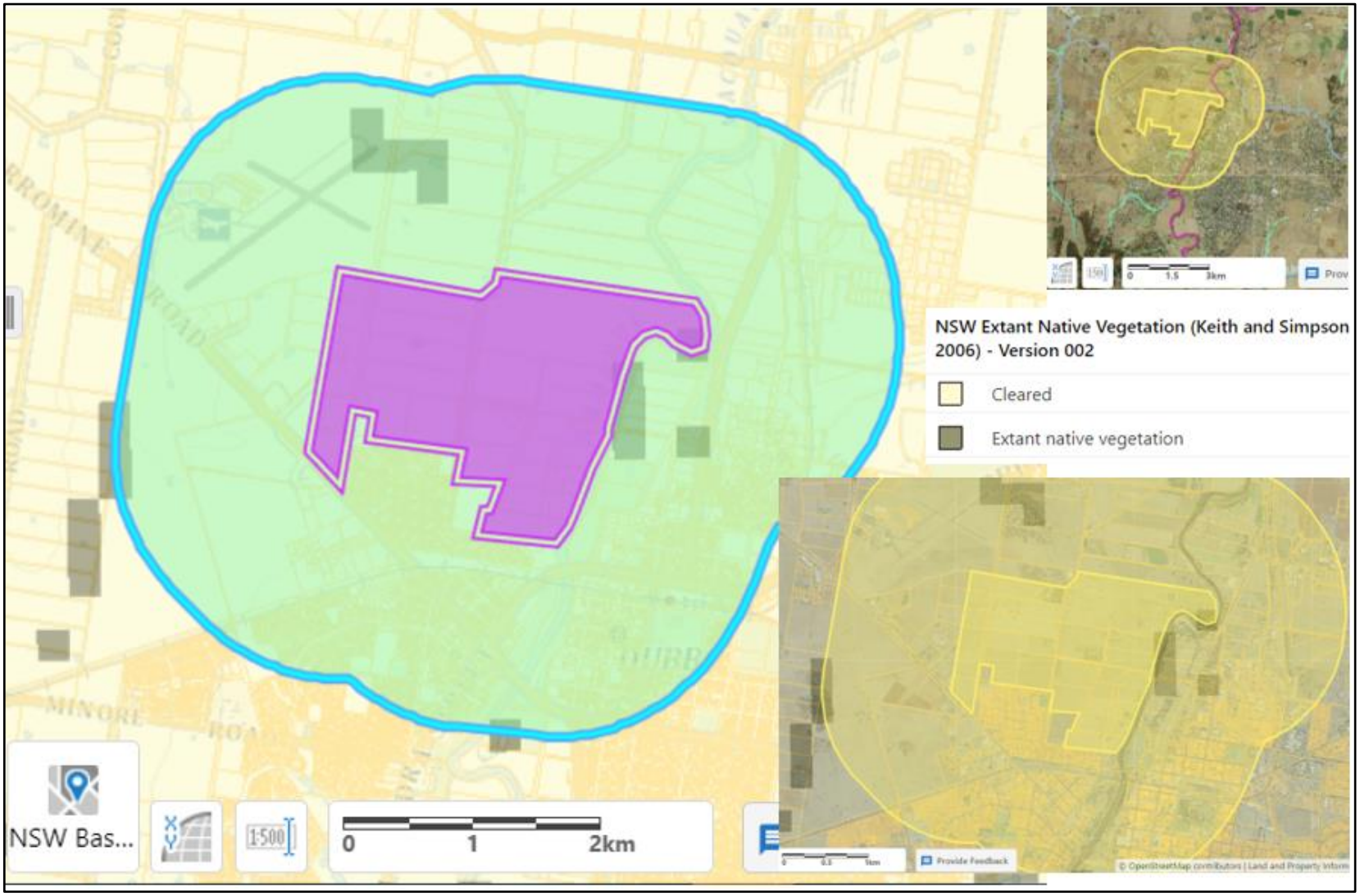

Figure 12: Extant native vegetation in assessment area.

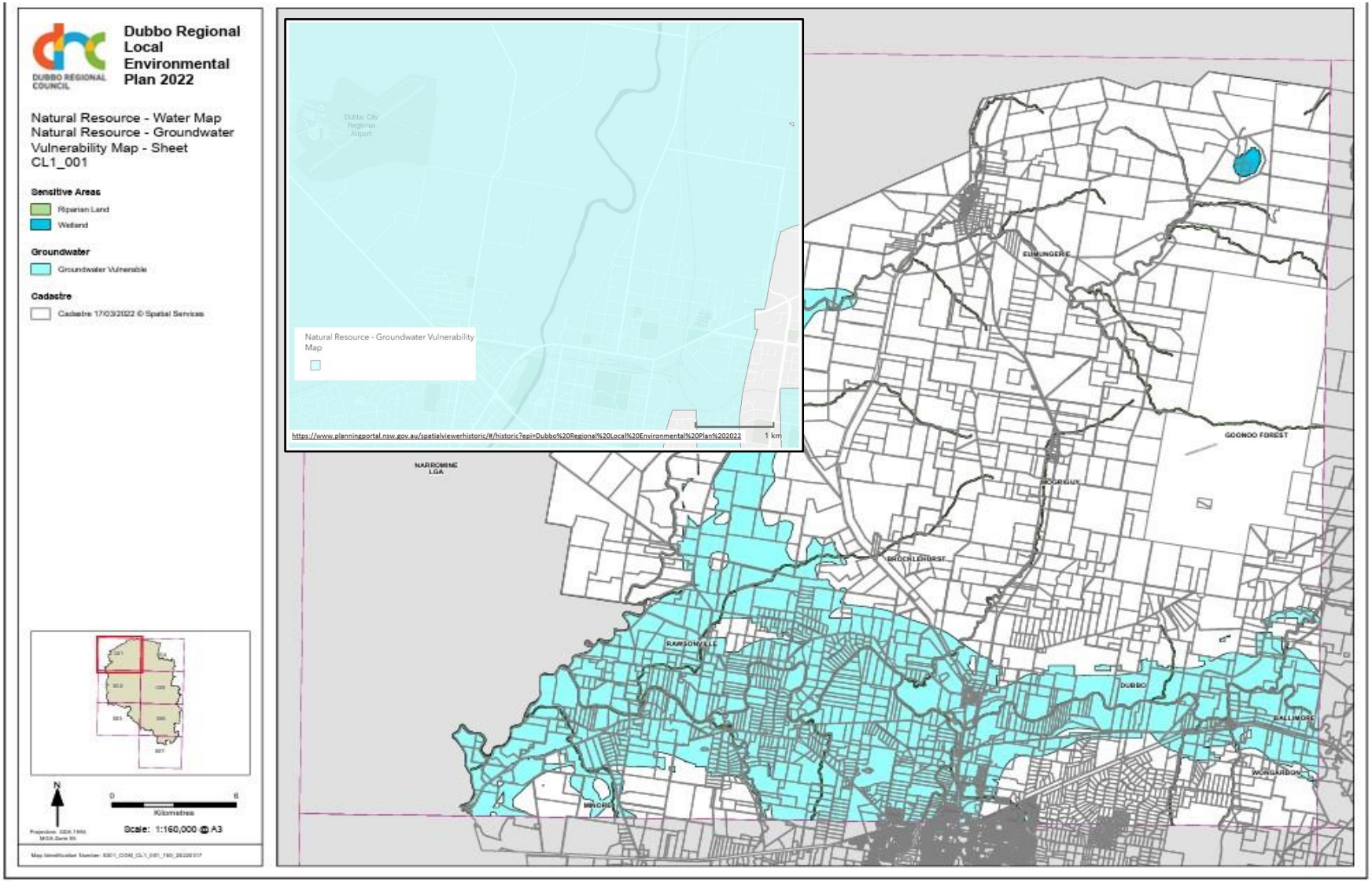

Figure 13: Groundwater vulnerability (DRC–LEP).

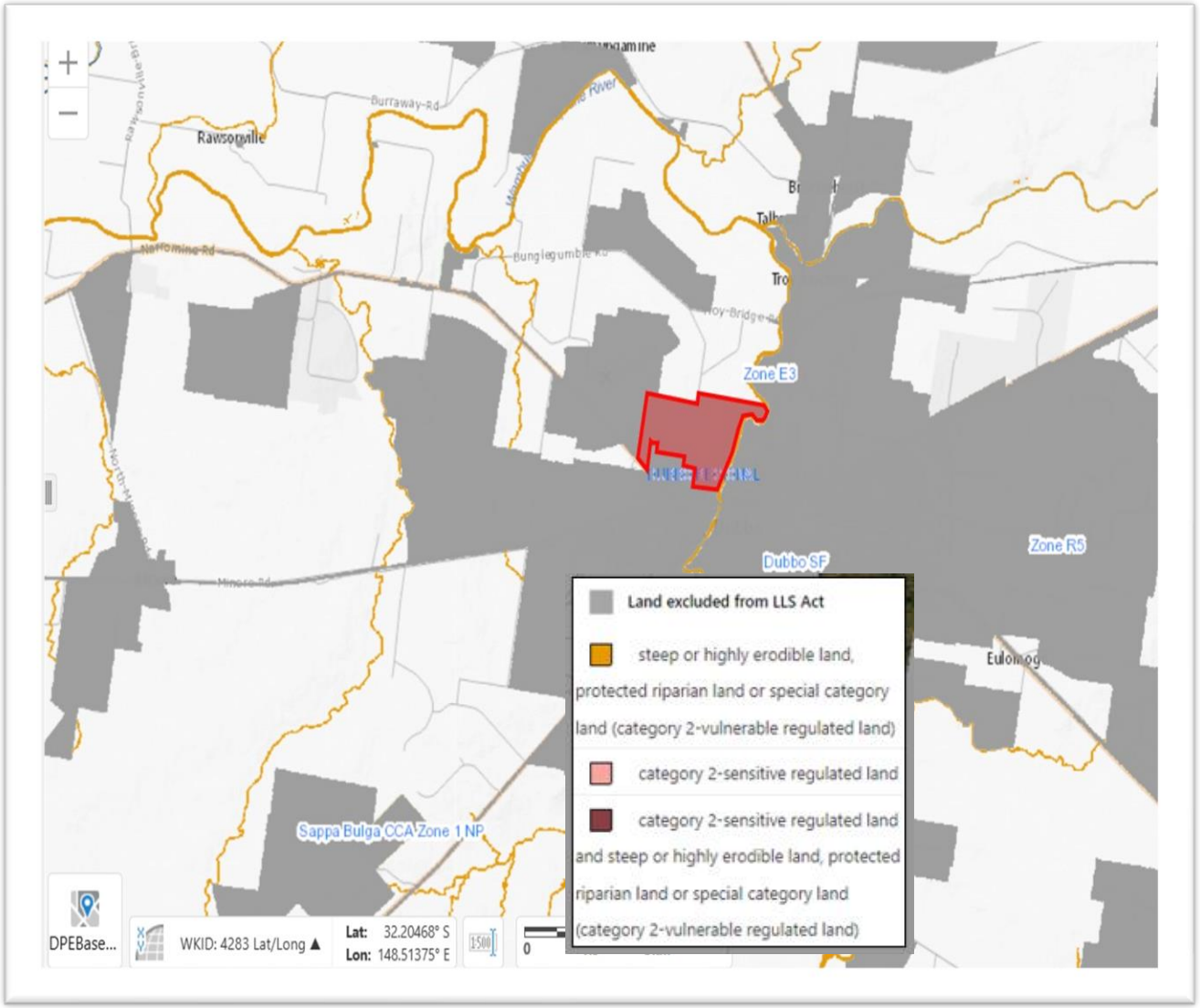

Figure 14: Native Vegetation Regulatory (NVR) Map.

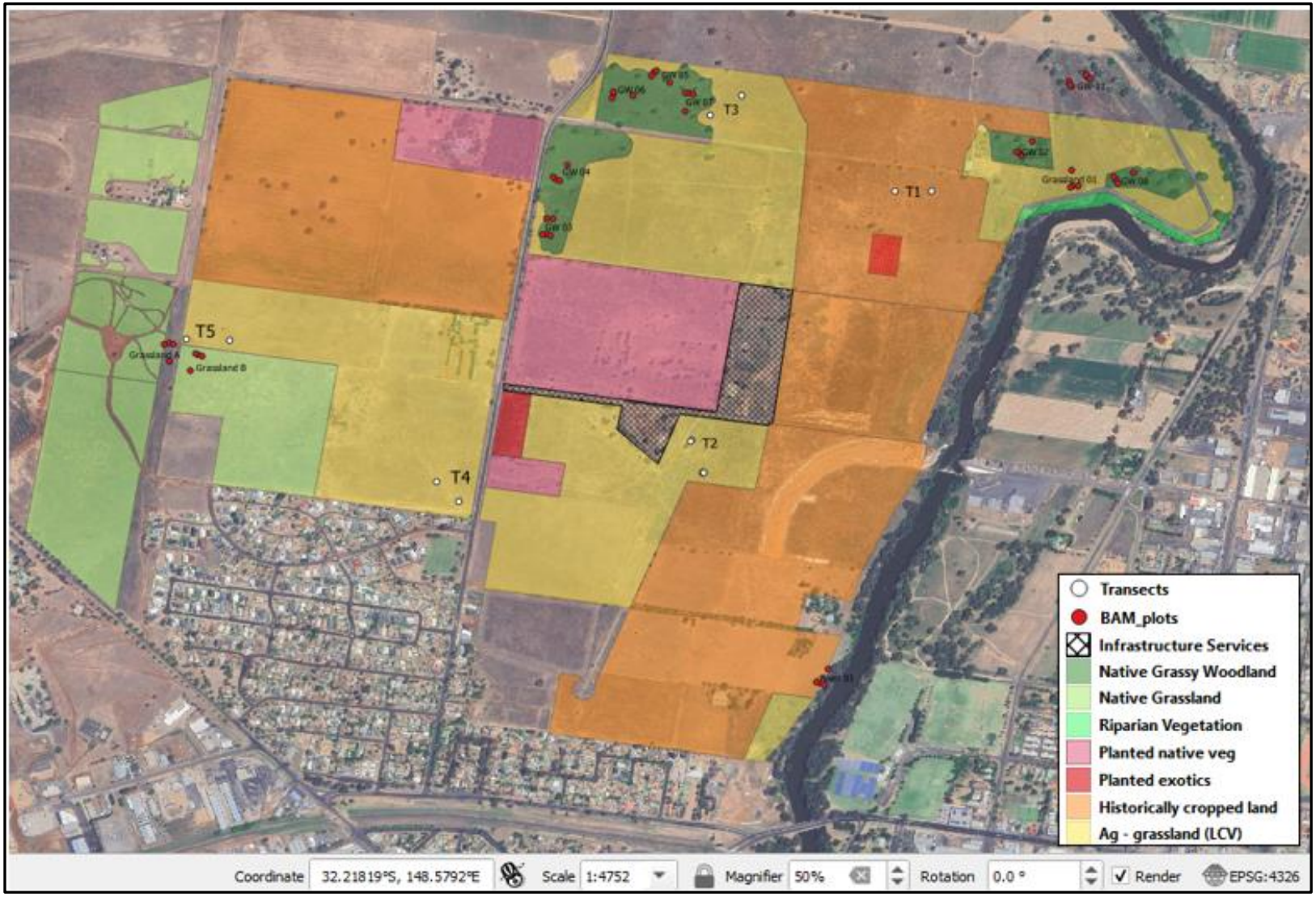

Figure 15: Transect and BAM vegetation plot locations and vegetation zones.

Figure 16: Significant trees with hollows and nests.

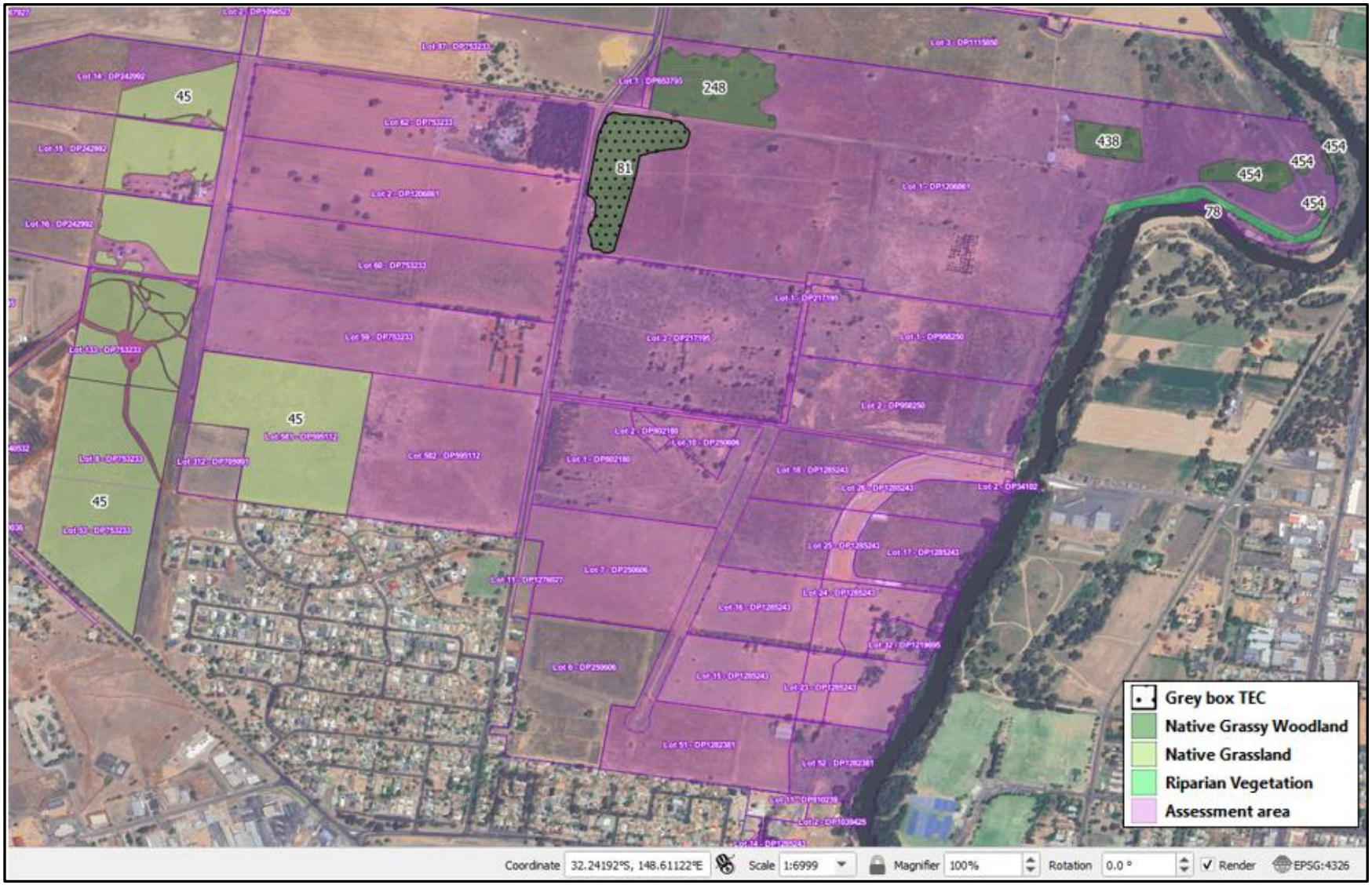

Figure 17: PCTs and grey box TEC located on the subject land.

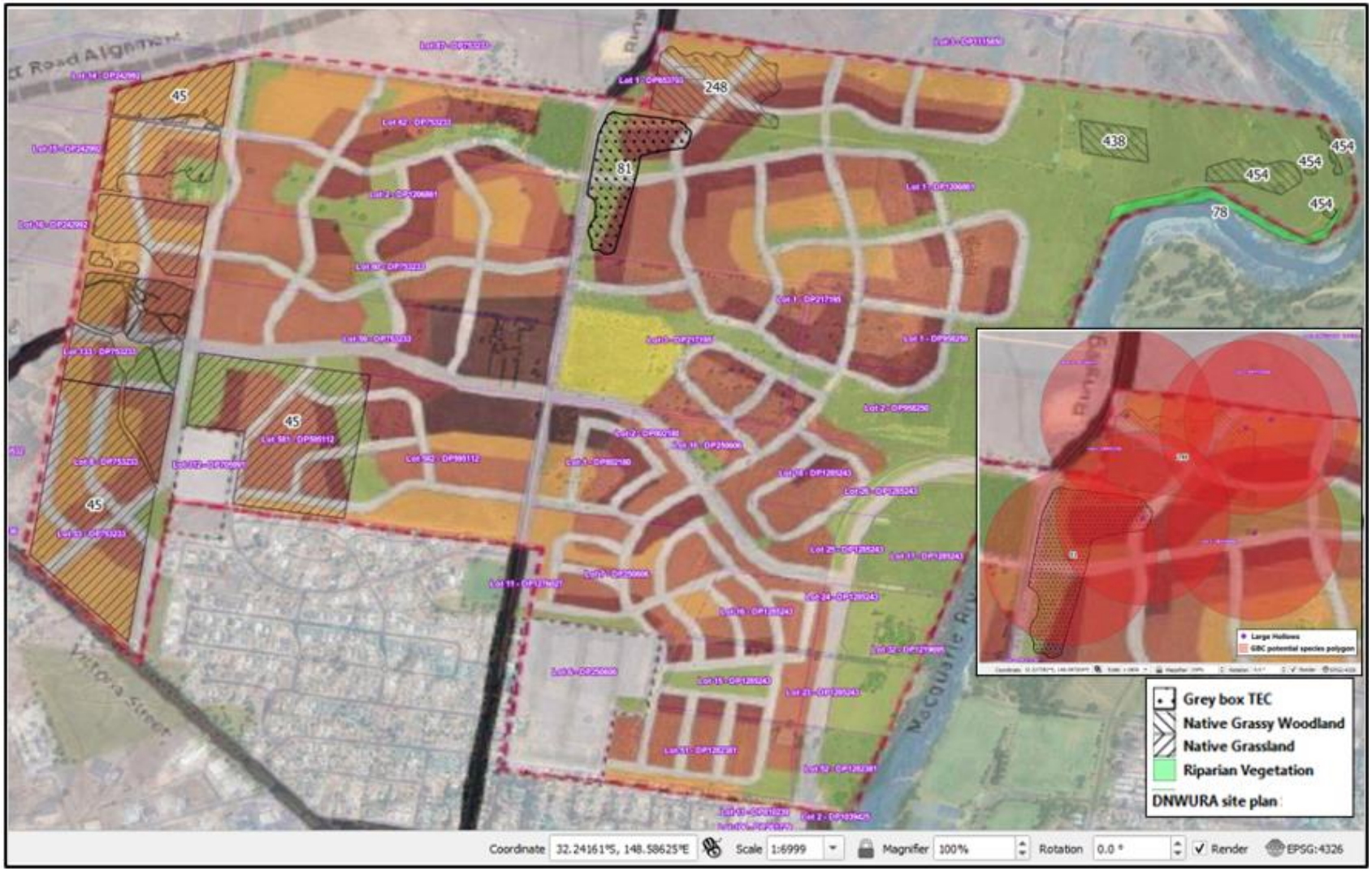

Figure 18: Site plan overlay showing open space consideration (inset - glossy black cockatoo (GBC) species polygons).

4. NATIVE VEGETATION

Native Vegetation extent

Areas that are not native vegetation

Areas are currently under crop and some have been cropped in the past and continue to be grazed with a high proportion of weedy exotic species. Even areas that have not been highly disturbed by an obvious crop rotation history have been continuously grazed by domestic stock and horses and have history of fertilizer application, cutting for hay and weed spraying (C. Middleton, personal communication, October 12, 2023). A number of transects were assessed to determine the native component of grassland areas (**Figure 15**). These transects showed few if any native species and almost exclusive annual exotic weed species.

Plant Community Types

The vegetation communities identified within the Development Site were assigned to the closest equivalent PCT from those listed in the BioNet Vegetation Classification database (DPE 2023). It was determined through a comparison of the floristic descriptions of PCTs in the database with the plot data collected from the site. In addition to floristic and structural similarity, the location, landscape position, soil type and other diagnostic features of the vegetation communities on the site were compared to the descriptions in the database to determine the most suitable PCT. Where transformation has occurred, for instance the tree layer removed or there has been weed incursion, the original parent PCT is identified. The PCTs identified as within the subject land are shown (**Table 5**) with descriptions following. Threatened ecological communities (TECs) as defined in NSW and ecological communities (ECs) under Commonwealth legislation were considered if present.

Table 5: PCTs identified within the subject land.

PCT ID	PCT Name	Subject land area (ha)
81	Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion	4.2
438	River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion	1.3
78	River red gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	1.5
248	Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW	5.0
454	River red gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion	1.7
45	Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	48.95

Native vegetation areas containing PCT 81, PCT 248 and the grassland areas - PCT 45 (including Dubbo LALC land) will be directly impacted by proposed development. Land that will be modified by built structures was allocated 100 % biodiversity loss, whereas land in designated open spaces was assumed to have only 10-20 % biodiversity loss. Zones containing PCT 78, 438 and 454 will not be directly impacted by the proposal as they are located in the planned open space area near the river.

PCT 81 Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion

Table 6: PCT 81 overview

PCT ID	81
PCT Name	Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
Vegetation Formation	Grassy Woodlands
Vegetation Class	Floodplain Transition Woodlands
PCT cleared value (%)	78
Extent within subject land (ha)	4.2

PCT scientific description - tall Western Grey Box (*Eucalyptus microcarpa*) woodland commonly 20 m high, often with scattered White Cypress Pine (*Callitris glaucophylla*), Buloak (*Allocasuarina luehmannii*) and Kurrajong (*Brachychiton populneus*). Other trees may include Black Cypress Pine (*Callitris endlicheri*), Narrow-leaved Ironbark (*Eucalyptus crebra*), Yellow Box (*Eucalyptus melliodora*) and Rough-barked Apple (*Angophora floribunda*). Usually contains a very sparse shrub layer composed of *Maireana microphylla* with wattle species such as *Acacia hakeoides*, *Acacia decora* and *Acacia deanei*. The mid-dense to dense ground cover is dominated by native grass species include *Austrostipa scabra*, *Austrostipa verticillata*, *Austrodanthonia fulva* and *Enteropogon acicularis*, with forbs including *Einadia nutans* subsp. *nutans*, *Dichondra repens*, *Calotis cuneifolia*, *Calotis lappulacea*, *Chrysocephalum apiculatum* and Oxalis *perennans*. Occurs on well drained alluvial brown sandy loam to loam soil derived from sedimentary and volcanic substrates in valley flats and drainage depressions on alluvial plains or rises. It is mainly confined to the Brigalow Belt South Bioregion and similar in structure to ID76 or ID80 in the south western slopes. Part of a NSW and Federally listed endangered ecological community.

Photo 1: PCT 81 - Western Grey Box - cypress pine shrub grass shrub tall woodland

Condition States

The PCT is present in the same condition state, a derived grassland form, albeit modified by some fire activity in the last few years.

Justification of PCT selection

The area identified as containing this PCT was not previously mapped as native vegetation. The area surveyed had a high level of species composition diversity. A short list of the possible PCTs, collated from comparison with criteria from site location and floral characteristics, was examined to determine the most representative PCT. For the plot (GW 03), PCT 81 was the third choice on the list, matching 8 out of 19 criteria (**Table 7**).

The species relied upon for identification was grey box and numerous grasses.

Table 7: Justification of PCT 81 selection.

PCT	Formation	Class	Common Name	Criteria matches	TEC Association	Comments
244	Grassy Woodlands	Floodplain Transition Woodlands	Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt).	9	Yes	× No poplar box trees in plot
70	Grassy Woodlands	Floodplain Transition Woodlands	White Cypress Pine (WCP) woodland on sandy loams in central NSW wheatbelt	8	No	× No WCP trees in plot
81	Grassy Woodlands	Floodplain Transition Woodlands	Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion	8	Yes	✓Species, location and soils match description
83	Semi-arid Woodlands (Grassy sub-formation)	Inland Floodplain Woodlands	Yellow Box woodland on sandy loam soils on alluvial plains mainly in the upper Darling Riverine Plain Bioregion	8	Yes	× No yellow box trees in plot
56	Grassy Woodlands	Floodplain Transition Woodlands	Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	7	Yes	× No poplar box or belah trees in plot
80	Grassy Woodlands	Floodplain Transition Woodlands	Western Grey Box - White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion	7	Yes	× No WCP trees in plot
82	Grassy Woodlands	Floodplain Transition Woodlands	Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion	7	Yes	× No poplar box trees in plot
237	Grassy Woodlands	Floodplain Transition Woodlands	Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone	7	Yes	× No river red gum or black box trees in plot

454	Semi-arid Woodlands (Grassy sub-formation)	Inland Floodplain Woodlands	River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion	7	No	× No river red gum trees in plot
248	Grassy Woodlands	Floodplain Transition Woodlands	Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW	6	Yes	× Fewer criteria matches
76	Grassy Woodlands	Floodplain Transition Woodlands	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	5	Yes	× Fewer criteria matches
251	Grassy Woodlands	Floodplain Transition Woodlands	Mixed Eucalypt woodlands of floodplains in the southern-eastern Cobar Peneplain Bioregion	5	No	× Fewer criteria matches and outside bioregion distribution

Alignment with TECs

It is associated with the BC Act threatened ecological community (TEC) Inland grey box woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions. The NSW Scientific Committee description supports the assessment of the TEC being present as there are relatively fertile soils, *Eucalyptus microcarpa* is the most characteristic tree species, average rainfall is 375 – 800 mm a year, shrubs are sparse or absent and there are many of the listed typical species.

Alignment with EPBC Act listed ECs

It can have associations with the EC Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia. The site is within the normal distribution, has grey box trees and native perennial species in the ground layer but condition thresholds relating to the amount of coverage of grey box trees do not satisfy the minimum requirements to be classified as the EPBC protected community.

PCT 438 River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion

Table 8: PCT 438 overview

PCT ID	438
PCT Name	River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion
Vegetation Formation	Semi-arid woodlands (grassy sub-formation)
Vegetation Class	Inland Floodplain Woodlands
PCT cleared value (%)	80
Extent within subject land (ha)	1.3

PCT scientific description - tall open woodland to woodland dominated by River Red Gum (*Eucalyptus camaldulensis* subsp. *camaldulensis*) sometimes with River Oak (*Casuarina cunninghamiana* subsp. *cunninghamiana*) or Yellow Box (*Eucalyptus melliodora*). Shrubs are absent with *Acacia salicina* rarely present. The ground cover is very dense and varies in composition depending on flooding regimes. Higher ground is often dominated by Couch Grass (*Cynodon dactylon*) often with Plains Grass (*Austrostipa aristiglumis*) or *Austrostipa verticillata*. Forb species include *Rumex brownii* and *Mentha satureioides*. Exotic weeds are abundant and often dominate the site. They include *Bromus catharticus*, *Silybum marianum*, *Medicago minima*, *Phalaris paradoxa*, *Phyla canescens*, *Salix babylonica* and *Vicia spp*. Occurs on black earth or humic alluvial soils on plains landscapes mainly confined to the Liverpool Plains IBRA sub-region in the Brigalow Belt South Bioregion.

Photo 2: PCT 438 - River Red Gum riparian tall woodland wetland on basaltic alluvial soils.

Condition States

The PCT is present in one condition state containing yellow box trees with adjacent river red gum trees, no shrubs and many exotic weeds.

Justification of PCT selection

The area identified as containing this PCT was not previously mapped as native vegetation. The PCT description mentions weed invasion and prevalent exotic plants often dominating a site and there were few native species in the vegetation plots. A short list of the possible PCTs, collated from floodplain and transition woodlands and comparison with criteria from site location and floral characteristics, was examined to determine the most representative PCT. For the plot GW 02, PCT 438 was down the list but was chosen over PCT 454 because it is described as containing yellow box trees (**Table 9**).

The species relied upon for identification was yellow box trees and river red gums.

Table 9: Justification of PCT 438 selection.

PCT	Formation	Class	Common Name	Criteria matches	TEC Association	Comment
454	Semi-arid Woodlands (Grassy sub-formation)	Inland Floodplain Woodlands	River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion	6	No	✕ Yellow box trees are not included in species list of PCT
244	Grassy Woodlands	Floodplain Transition Woodlands	Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt).	5	Yes	✕ No poplar box trees near plot
81	Grassy Woodlands	Floodplain Transition Woodlands	Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion	4	Yes	✕ No grey box or cypress trees near plot
251	Grassy Woodlands	Floodplain Transition Woodlands	Mixed Eucalypt woodlands of floodplains in the southern-eastern Cobar Peneplain Bioregion	4	No	✕ PCT not associated with river red gums or the IBRA bioregion
13	Semi-arid Woodlands (Grassy sub-formation)	Inland Floodplain Woodlands	Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	3	No	✕ No black box trees or lignum in plot
56	Grassy Woodlands	Floodplain Transition Woodlands	Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	3	Yes	✕ No poplar box trees in plot
70	Grassy Woodlands	Floodplain Transition Woodlands	White Cypress Pine woodland on sandy loams in central NSW wheatbelt	3	No	✕ No WCP trees in plot
248	Grassy Woodlands	Floodplain Transition Woodlands	Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW	3	Yes	✕ PCT not associated with river red gums and the IBRA bioregion

15	Semi-arid Woodlands (Grassy sub-formation)	Inland Floodplain Woodlands	Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	2	No	✗ No black box trees in plot
16	Semi-arid Woodlands (Grassy sub-formation)	Inland Floodplain Woodlands	Black Box grassy open woodland wetland of rarely flooded depressions in south western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	2	No	✗ No black box trees in plot
74	Grassy Woodlands	Floodplain Transition Woodlands	Yellow Box - River Red Gum tall grassy riverine woodland of NSW South Western Slopes Bioregion and Riverina Bioregion	2	Yes	✗ Typical forbs not present and PCT not associated with IBRA bioregion
76	Grassy Woodlands	Floodplain Transition Woodlands	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	2	Yes	✗ No grey box trees in plot
80	Grassy Woodlands	Floodplain Transition Woodlands	Western Grey Box - White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion	2	Yes	✗ No grey box or cypress trees in plot
83	Semi-arid Woodlands (Grassy sub-formation)	Inland Floodplain Woodlands	Yellow Box woodland on sandy loam soils on alluvial plains mainly in the upper Darling Riverine Plain Bioregion	2	Yes	✗ PCT not associated with the IBRA bioregion
237	Grassy Woodlands	Floodplain Transition Woodlands	Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone	2	Yes	✗ No grey box trees in plot
438	Semi-arid Woodlands (Grassy sub-formation)	Inland Floodplain Woodlands	River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion	2	No	✓ Species, location and soils match description

628	Grassy Woodlands	Floodplain Transition Woodlands	Carbeen +/- Coolabah grassy woodland on floodplain clay loam soil on north-western NSW floodplains, mainly Darling Riverine Plain Bioregion	2	Yes	✕ No carbeen and coolabah trees in plot

Alignment with TECs

No TECs are associated with this PCT (in the Bionet Vegetation Classification database). Even though yellow box trees occur it is not associated with the critically endangered white box, yellow box, Blakely's red gum woodland because the river red gum trees are the dominant overstorey species.

Alignment with EPBC Act listed ECs

Not associated with an EPBC protected EC.

PCT 78 River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

Table 10: PCT 78 Overview

PCT ID	78
PCT Name	River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
Vegetation Formation	Forested wetlands
Vegetation Class	Inland Riverine Forests
PCT cleared value (%)	60
Extent within subject land (ha)	1.5

Scientific description - Tall open forest or woodland to 30 m high composed of River Red Gum (*Eucalyptus camaldulensis*) often with Rough-barked Apple (*Angophora floribunda*), Yellow Box (*Eucalyptus melliodora*) or River Oak (*Casuarina cunninghamiana*). Blakelys Red Gum (*Eucalyptus blakelyi*) may intergrade with River Red Gum. Small trees may include *Melaleuca bracteate*, *Callistemon viminalis*, with shrubs sparse but potentially with *Callistemon sieberi*, wattles and tea tree species present. Forbs include and *Alternanthera denticulata*, *Commelina cyanea*, *Einadia hastata*, *Ajuga australis* and *Urtica incisa* and grass-like plants can include *Lomandra longifolia, Cynodon dactylon*, *Aristida vagans*, *Cymbopogon refractus* and *Paspalidium* species. Weeds are often abundant and include the willow (*Salix babylonica*), Pepper Tree (*Schinus areira*), African Boxthorn (*Lycium ferrosissimum*), Phalaris (*Phalaris paradoxa*) and ground weeds such as *Xanthium* spp. *Aster subulatus*, *Datura ferox, Cirsium vulgare* and Coolatai Grass (*Hyparrhenia hirta*). This community occurs on alluvial loamy soils, on the on banks or watercourses and on adjoining flats in undulating low hills or hill landscapes in the Nandewar and Brigalow Belt South Bioregion.

Photo 3: PCT 78 - River Red Gum riparian tall woodland / open forest wetland.

Condition States

The PCT is present in one condition state along the river.

Justification of PCT selection

Areas identified as containing this PCT were previously mapped as PCT 78 - *River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion*. The PCT description mentions weed invasion and prevalent exotic plants often dominating a site and there were few native species in the vegetation plots. Comparison of the possible PCTs with criteria from site location was assessed and the PCT determination concurred with the existing SVTM (**Table 11**).

The site was dominated by river red gum, couch and exotic weedy species.

Table 11: Justification of PCT 78 selection.

PCT	Formation	Class	Common Name	Criteria matched	TEC Association	Comment
42	Forested Wetlands	Eastern Riverine Forests	River Red Gum / River Oak riparian woodland wetland in the Hunter Valley	4	Yes	✗ River oak is not present and site is not in the Hunter Valley
53	Freshwater Wetlands	Inland Floodplain Swamps	Shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains	4	Yes	✗ The site is not dominated by spike rushes and ferns
78	Forested Wetlands	Inland Riverine Forests	River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	4	No	✓ Concurs with SVTM mapping (SEED), species, location and soils match PCT description

84	Forested Wetlands	Eastern Riverine Forests	River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	4	No	✕ River oak and rough barked apple are not present
241	Freshwater Wetlands	Inland Floodplain Shrublands	River Coobah swamp wetland on the floodplains of the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion	4	Yes	✕ River Cooba (*Acacia stenophylla*) not present
333	Dry Sclerophyll Forests (Shrubby sub-formation)	Western Slopes Dry Sclerophyll Forests	Bottlebrush riparian shrubland wetland of the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion	4	No	✕ The site is not dominated by *Callistemon sieberi*
454	Semi-arid Woodlands (Grassy sub-formation)	Inland Floodplain Woodlands	River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion	4	No	✕ This PCT is not found on the banks of watercourses

Alignment with TECs

There are no TECs associated with this PCT.

Alignment with EPBC Act listed ECs

There are no EPBC Act listed ECs associated with this community.

PCT 248 Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW

Table 12: PCT 248 Overview

PCT ID	248
PCT Name	Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
Vegetation Formation	Grassy woodlands
Vegetation Class	Floodplain Transition Woodlands
PCT cleared value (%)	80
Extent within subject land (ha)	5.0

PCT Scientific description - tall woodland averaging about 14 m high dominated by a number of box eucalypts including Western Grey Box (*Eucalyptus microcarpa*), Yellow Box (*Eucalyptus melliodora*) and Polar Box (*Eucalyptus populnea subsp. bimbil*) with Western Rosewood (*Alectryon oleifolius subsp.*

canescens) as a small tree. Shrubs are very sparse or absent. The ground cover is usually mid-dense and is dominated by grasses such as *Austrostipa scabra subsp. scabra*, *Enteropogon acicularis* and *Elymus scaber var. scaber* along with forbs such as *Calotis lappulacea*, *Sida corrugata*, *Vittadinia cuneata* and *Atriplex semibaccata*. Low shrubs such as *Maireana enchylaenoides* and *Sclerolaena diacantha* may be present. Occurs on sandy loam soils on low rises on alluvial and stagnant alluvial plains in central NSW of the Lachlan River alluvial plain. Mainly in the north-western section of the NSW South Western Slopes and eastern section of the Cobar Peneplain Bioregions. Most of this community has been cleared for grazing or cropping and remnants have been heavily grazed.

Condition States

The PCT is present in one condition state, a derived grassland form.

Justification of PCT selection

Areas identified as containing this PCT were previously mapped (SVTM) as PCT 76 – *Western Grey Box* and 248- *Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW*. Comparison of the possible PCTs with criteria from site location, including the plant community formation being grassy woodland and vegetation class as floodplain transition woodland, with the PCT determination concurring with parts of the existing SVTM (**Table 13**).

The site was dominated by yellow box trees, couch and a high proportion of non-grass exotic weed species.

Table 13: Justification of PCT 248 selection

PCT	Formation	Class	Common Name	Matched criteria	TEC Association	Comment
101	Grassy Woodlands	Floodplain Transition Woodlands	Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	10	Yes	✕ Not known in the Dubbo Regional LGA and poplar box, white cypress pine and silver leaved ironbark trees not occurring
56	Grassy Woodlands	Floodplain Transition Woodlands	Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	7	Yes	✕ Typical species like poplar box, belah, Bulloak and white cypress pine are not present
70	Grassy Woodlands	Floodplain Transition Woodlands	White Cypress Pine woodland on sandy loams in central NSW wheatbelt	7	No	✕ The dominant white cypress pine is not present
244	Grassy Woodlands	Floodplain Transition Woodlands	Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt).	7	Yes	✕ Poplar box, belah and white cypress pine not present

81	Grassy Woodlands	Floodplain Transition Woodlands	Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion	6	Yes	✗ Grey box is not the most common tree and white cypress pine, Bulloak and kurrajong are not present
76	Grassy Woodlands	Floodplain Transition Woodlands	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	5	Yes	✗ Not typically in the BBS bioregion and not distributed as far north as Dubbo
237	Grassy Woodlands	Floodplain Transition Woodlands	Riverine Western Grey Box grassy woodland of the semi-arid (warm) climate zone	5	Yes	✗ Not typically in the BBS bioregion and not containing river red gum or black box trees
248	Grassy Woodlands	Floodplain Transition Woodlands	Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW	5	Yes	✓ Concurs with SVTM mapping (SEED) for similar areas at the site, species, location and soils match PCT description
251	Grassy Woodlands	Floodplain Transition Woodlands	Mixed Eucalypt woodlands of floodplains in the southern-eastern Cobar Peneplain Bioregion	5	No	✗ Not typically in the BBS bioregion and not containing river red gum or black box trees
628	Grassy Woodlands	Floodplain Transition Woodlands	Carbeen +/- Coolabah grassy woodland on floodplain clay loam soil on north-western NSW floodplains, mainly Darling Riverine Plain Bioregion	5	Yes	✗ Carbeen, coolabah, river red gum and weeping myall not present

Alignment with TECs

It can be associated with the BC Act threatened ecological communities (TEC) Artesian Springs Ecological Community in the great Artesian Basin and Inland grey box woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions.

However, it is not an example of the Artesian Springs ecological community because the native plants are not dependent on water emanating from a great Artesian Basin ground spring. The subject area is

not even a seasonal wetland and does not have a high proportion of sedge type plants. The subject area is also not representative of the inland grey box woodland because grey box trees are not the most characteristic tree species with a higher proportion of yellow box trees.

Alignment with EPBC Act listed ECs

It can have associations with the EC Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia. This ecological community is not present because non-grass weedy species comprise 30 % of the ground layer plants, trees cover less than 10 % of the area and there is no evidence that grey box trees were once common in the patch.

PCT 454 River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion

Table 14: PCT 454 Overview

PCT ID	454
PCT Name	River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
Vegetation Formation	Semi-arid woodlands (grassy sub-formation)
Vegetation Class	Inland Floodplain Woodlands
PCT cleared value (%)	83
Extent within subject land (ha)	1.7

PCT scientific description - tall to mid-high open woodland or woodland dominated by River Red Gum (*Eucalyptus camaldulensis subsp. camaldulensis*). Shrubs are absent or very sparse and include short chenopods such as *Sclerolaena birchii*, *Enchylaena tomentosa*, *Atriplex leptocarpa*, *Vachellia* (Acacia) *farnesiana*, *Sclerolaena diacantha*, and *Atriplex semibaccata*. Ground cover varies from dense after rain to very sparse during drought. Grass species inlcude *Paspalidium jubiflorum*, *Lachnagrostis filiformis*, *Leptochloa digitata*, *Panicum decompositum*, *Paspalidium gracile* and *Paspalidium constrictum*. Various forbs can include *Einadia nutans subsp. nutans*, *Polygonum aviculare*, *Portulaca oleracea*, *Boerhavia dominii*, *Alternanthera denticulata*, *Rumex brownii* and *Solanum esuriale*. The PCT occurs on alluvial loams and clays on floodplains.

Condition States

The PCT is present in one condition state with river red gum trees and a very weedy understorey.

Justification of PCT selection

Areas identified as containing this PCT was not previously mapped as native vegetation or it was shown as PCT 248 - *Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW*. A short list of the possible PCTs, collated from comparison with criteria from site location and floral characteristics, was examined to determine the most representative PCT. For the plot GW01, PCT 454 was the first choice on the list, matching 5 out of 5 criteria (**Table 15**).

The species relied upon for identification were river red gum trees and *Paspalidium gracile*.

Photo 4: PCT 454 - River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil.

Table 15: Justification of PCT 454 selection.

PCT	Formation	Class	Common Name	Matched criteria	TEC Association	Comment
454	Semi-arid Woodlands (Grassy sub-formation)	Inland Floodplain Woodlands	River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion	5	No	✓ Species, location and soils match description
438	Semi-arid Woodlands (Grassy sub-formation)	Inland Floodplain Woodlands	River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion	3	No	✗ River red gum trees are the sole tree species
56	Grassy Woodlands	Floodplain Transition Woodlands	Poplar Box - Belah woodland on clay-loam soils on alluvial plains of north-central NSW	2	Yes	✗ No poplar box or belah trees in plot
70	Grassy Woodlands	Floodplain Transition Woodlands	White Cypress Pine woodland on sandy loams in central NSW wheatbelt	2	No	✗ No WCP trees in plot
81	Grassy Woodlands	Floodplain Transition Woodlands	Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion	2	Yes	✗ No grey box or cypress trees in plot

83	Semi-arid Woodlands (Grassy sub-formation)	Inland Floodplain Woodlands	Yellow Box woodland on sandy loam soils on alluvial plains mainly in the upper Darling Riverine Plain Bioregion	2	Yes	✕ No yellow box trees in plot and PCT associated with a different IBRA bioregion
244	Grassy Woodlands	Floodplain Transition Woodlands	Poplar Box grassy woodland on alluvial clay-loam soils mainly in the temperate (hot summer) climate zone of central NSW (wheatbelt).	2	Yes	✕ No poplar box trees in plot
628	Grassy Woodlands	Floodplain Transition Woodlands	Carbeen +/- Coolabah grassy woodland on floodplain clay loam soil on north-western NSW floodplains, mainly Darling Riverine Plain Bioregion	2	Yes	✕ No carbeen and coolabah trees in plot

Alignment with TECs

There are no TECs associated with this PCT.

Alignment with EPBC Act listed ECs

There are no EPBC Act listed ECs associated with this community.

PCT 45 Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion

Table 16: PCT 45 Overview

PCT ID	45
PCT Name	Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
Vegetation Formation	Grasslands
Vegetation Class	Riverine Plain Grasslands
PCT cleared value (%)	60
Extent within subject land (ha)	48.95

PCT Scientific description - tussock grassland dominated by the grass species Plains Grass (*Austrostipa aristiglumis*), *Walwhalleya proluta*, *Austrodanthonia duttoniana* and *Chloris truncata*. Queensland Bluegrass (*Dichanthium sericeum subsp. sericeum*) occurs in the north and *Austrodanthonia duttoniana* is more common in the south. Weed species are common and at some sites may be dominant. They include Cape Weed (*Arctotheca calendula*), *Hypochaeris glabra*, *Lolium rigidum*, *Trifolium arvense*, *Romulea rosea var. australis* and *Echium plantagineum*. Occurs on dark grey, self-mulching clays and clay loam soils in slightly low lying areas of the floodplains and alluvial plains of central NSW extending from the Riverina and Lower Slopes of the NSW SWS Bioregions to north of Warren in the north-central wheatbelt of NSW.

Photo 5: PCT 45 - Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion

Condition States

The PCT is likely to be present in more than one condition state but insufficient field assessment has been performed due to recent fire activity and lack of authority to attend the site – so it has been assumed as one condition state for the current analysis.

Justification of PCT selection

Areas identified as containing this PCT was not previously mapped as native vegetation (SVTM on SEED). Comparison of the possible PCTs with criteria from site location was assessed and also selected for only grassland communities (**Table 17**).

The site was dominated by Queensland blue grass, couch and plains grass.

Table 17: Justification of PCT 45 selection

PCT	Formation	Class	Common name	Matched criteria	TEC	Comment
3414	Grasslands	Temperate Montane Grasslands	Monaro Snowgrass-Kangaroo Grass Grassland	8	Yes	✕ Wrong location and no kangaroo grass
52	Grasslands	Semi-arid Floodplain Grasslands	Queensland Bluegrass +/- Mitchell Grass grassland on cracking clay floodplains and alluvial plains mainly the northern-eastern Darling Riverine Plains Bioregion	7	Yes	✕ Wrong location only known as far south as Warren which is north of the site

619	Grasslands	Western Slopes Grasslands	Derived Wire Grass grassland of the NSW Brigalow Belt South Bioregion and Nandewar Bioregion	7	Yes	✕ Not dominated by wiregrass (*Aristida*)
3415	Grasslands	Temperate Montane Grasslands	Southern Tableland Red Grass-Spear Grass Grassland	6	Yes	✕ Wrong location and no kangaroo grass
3408	Grasslands	Maritime Grasslands	Northern Headland Grassland	6	Yes	✕ Wrong location and no kangaroo grass
43	Grasslands	Semi-arid Floodplain Grasslands	Mitchell Grass grassland - chenopod low open shrubland on floodplains in the semi-arid (hot) and arid zones	5	Yes	✕ Occurs on cracking grey clays and does not have many typical PCT grasses
45	Grasslands	Riverine Plain Grasslands	Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	5	Yes	✓ Concurs with SVTM mapping (SEED) of adjacent area, species, location and soils match PCT description
50	Grasslands	Semi-arid Floodplain Grasslands	Couch Grass grassland wetland on river banks and floodplains of inland river systems	5	Yes	✕ Occurs on riverbanks and different species composition
102	Grasslands	Western Slopes Grasslands	Liverpool Plains grassland mainly on basaltic black earth soils, Brigalow Belt South Bioregion	5	Yes	✕ Occurs in different subregion
3409	Grasslands	Maritime Grasslands	Southern Headland Grassland	5	Yes	✕ Wrong location and no kangaroo grass

Alignment with TECs

It can be associated with the BC Act threatened ecological community (TEC) Artesian Springs Ecological Community in the Great Artesian Basin. However, the Artesian Springs ecological community is not present because the native plant community at the site is not dependent on water emanating from a great Artesian Basin ground spring and does not exhibit wetland characteristics.

Alignment with EPBC Act listed ECs

It can have associations with the EC Natural Grasslands of the Murray Valley Plains. This ecological community is not represented at the site because the location is not within the known range (southern parts of the Riverina bioregion and into the Murray-Darling depression and NSW south west slopes bioregions) and the typically principal grasses (*Rytidosperma spp. (wallaby grasses) Austrostipa spp.* (spear-grasses) and *Enteropogon ramosus* (curly windmill grass)), are not dominant.

Threatened Ecological Communities

The following TECs and ECs were identified within the subject land (**Table 18, Figure 17**).

Vegetation Zones

A vegetation zone is defined in the BAM (DPE 2020, Section 4) as a relatively homogenous area that is the same vegetation type and broad condition. The PCTs represented at the Development site were only present as one vegetation zone. The site has been uniformly disturbed over a long period and there are no differences in vegetation condition for each of the PCTs (however, this may not be the case for grassland areas (PCT 45) which have not yet been fully accessed) . The different zones were designated as:

- *81_Regrowth* – recent fire disturbance history, derived grassland.
- *438_Emelliodora* – river red gum and yellow box community.
- *78_Riparian* – river terrestrial transition zone.
- *248_Yellow* – majority yellow box trees, derived grassland.
- *454_RRG* – woodland near the river with river red gums as sole tree species.
- 45_Grassland – native grassland.

A patch is considered to be the area of continuous native vegetation, separated by less than 100 m for woody systems and less than 30 m for grasslands. The patch size was determined as 50 ha for the derived grassland / grassy woodland vegetation zones in the middle of the subject land, 76 ha (based mainly on riparian vegetation continuity) for those PCTs close to the river and 73 ha for the native grassland in the western section of the site.

Table 18: TECs within the subject land.

TEC Name	Profile ID (from TBDC)	BC Act status	EPBC Act status	Associated vegetation zones within the subject land	Area within subject land (ha)
Inland grey box woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	20072	Endangered	Not listed	81_Regrowth	4.2

Table 19: Vegetation zones and patch sizes.

Vegetation zone ID	PCT ID No. and name	Condition / other defining feature	Area (ha)	Patch size class (multiple if vegetation discontinuous)	No. vegetation integrity (VI) plots required	No. VI plots completed	No. VI plots used in assessment	Plot IDs of VI plots used in assessment
81_Regrowth	81 - Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion		4.2	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	2	2	2	GW03 GW04
438_Emelliodora	438 - River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion		1.3	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	1	1	1	GW02
78_Riparian	78 - River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion		1.5	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	1	1	1	River 1

248_Yellow	248 - Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW		5.0	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	3	3	3	GW05 GW06 GW07
454_RRG	454 - River red gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion		1.7	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	1	1	1	GW08 (GW01 not used)
45_Grassland	45 – Plains grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion		48.95	☐ <5 ha ☐ 5–24 ha ☒ 25–100 ha ☐ >100 ha	4	**2**	4	Grassland A Grassland B Insufficient plots completed plot data duplicated in BAM-C
	No PCT			☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☐ >100 ha			Not used	Grassland 1

Vegetation Integrity

Assessing Vegetation Integrity (Site Condition)

The vegetation plots undertaken at the Property to collect site condition data measures factors relating to the composition, structure and function attributes listed in **Table 20** in accordance with Section 4.3 of the BAM (DPE, 2020). The locations of the plots were randomly selected to provide representative samples across the site with vegetation characteristics noted from 20 x 20 m plots and function aspects from 20 x 50 m plots. The plot number undertaken at the site meets the minimum number required for each vegetation zone as detailed in Section 4.3.4, Table 3 of the BAM (DPE 2020), except for the grassland areas which need additional survey plots to be undertaken. The locations of the BAM plots undertaken on the Property are shown in **Figure 15**.

Table 20: Composition, structure and function components of vegetation integrity.

Growth form groups used to assess composition (species richness) and structure (% foliage cover)	Function attributes
Tree (TG) Shrub (SG) Grass and grass-like (GG) Forb (FG) Fern (EG) Other (OG)	Number of large trees Tree regeneration (presence/absence) Tree stem size class (presence/absence) Total length of fallen logs Litter cover High threat exotic vegetation cover (HTE) Hollow-bearing trees (HBT)

Assessment Results: VI scores within development site

The Development Site is highly disturbed with only small areas of remnant native vegetation

The existing native species, structure of the vegetation, soil type and landscape position were used to identify the vegetation types according to the NSW standard Plan Community Type (PCT) classification. The 'best-fit' PCTs at the Development Site were identified, with vegetation zone names:

- *81_Regrowth* – recent fire disturbance history.
- 438_Emelliodora – river red gum and yellow box community.
- 78_Riparian – river side transition zone.
- 248_Yellow – Dominant yellow box trees.
- *454_RRG* – woodland near the river with river red gums as sole tree species.
- *45_Grassland* – grassland areas in the western portion of the site.

Table 21: Vegetation integrity (VI) scores

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score	VI score	Hollow bearing trees present? (Y/N)
81_Regrowth	60.6	32.6	22.4	35.4	Y
438_Emelliodora	20.7	3.2	49.9	14.9	Y
78_Riparian	4.8	2.7	20.1	6.4	Y
248_Yellow	51.3	34.4	24.7	35.2	Y
454_RRG	39.5	33.4	72.8	45.8	Y
45_Grassland	81.2	13.8	-	33.5	N
Note – the function data is not applicable for grassland vegetation formations					

Benchmark data was as per BAM 2020. – no guidance has been published (DPE) on modifying relevant benchmarks.

The only other significant landscape feature that occurs near the Development Site is the Macquarie River. No structures relating to the Proposal will be built on land adjacent to the river and a buffer distance of over 150 m is planned to minimise impacts to river land.

Native vegetation types

Site species lists are provided in **Appendix 1**.

Weeds

Exotic weedy species were prevalent across the Development site and the 'high threat exotic' weed species blue heliotrope (*Heliotropium amplexicaule*), prickly pear (*Opuntia spp*.), great brome (*Bromus diandrus*), silver leaf nightshade (*Solanum elaeagnifolium*), Bathurst burr (*Xanthium spinosum*), khaki weed (*Alternanthera pungens*) and African boxthorn (*Lycium ferocissimum*) occur.

Aquatic habitat

Threatened aquatic species and ecological communities are listed under the *Fisheries Management Act 1995* if they face a very high risk of extinction in the near future as determined by the Fisheries Scientific Committee. The nearest named watercourse is Macquarie River, which is located immediately adjacent to the easterly section of the development site. Key fish habitat is mapped near the Development Site but there are no expected impacts to aquatic habitat or threatened aquatic species or ecosystems.

5. THREATENED SPECIES

Assessing Habitat Suitability

An assessment of suitable habitat for threatened species and populations within the Development Site was conducted to help assess the significance of proposed works. Preliminary information came from database searches of the NSW Department of Planning and Environment (DPE) BioNet Atlas and the Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST). Results are summarised in **Appendix 2** with the actual search results presented in **Appendix 3 and 4**.

Threatened flora

The BioNet Wildlife Atlas database contains records for five threatened plant species, *Calotis glandulosa* (Mauve burr daisy), *Indigofera efoliata* (Leafless indigo), *Commersonia procumbens, Homoranthus darwinioides* (Fairy bells) and *Diuris tricolor* (Pine Donkey Orchid) previously observed within a 10 km^2 range, centred around the Development Site (**Appendix 3**). There was no incidence of these species found at the Property. A short discussion for each species is provided below.

***Calotis glandulosa* (Mauve burr daisy):** is a sprawling, branched herb that is centred on the Monaro and Kosciuszko regions. Found in montane and subalpine grasslands in the Australian Alps. There are possible dubious records from near Oberon, the Dubbo area and Mount Imlay. It appears to be a coloniser of bare patches and often occurs on roadsides.

***Indigofera efoliata* (Leafless indigo):** This broom-like subshrub is very rare and was presumed extinct until it was rediscovered near Geurie in spring 2021. Dies back to a substantial underground rootstock in unfavourable seasons and it is possible that aerial parts do not appear at all unless there is significant rainfall.

Commersonia procumbens: Prostrate shrub with slender trailing stems, Endemic to NSW, mainly confined to the Dubbo-Mendooran-Gilgandra region. Grows in sandy sites, often along roadsides. The species is often found as a pioneer species of disturbed habitats.

***Homoranthus darwinioides* (Fairy bells)**: Slender hairless shrub, which is rare in the central tablelands and western slopes of NSW. Grows in in various woodland habitats with shrubby understoreys, usually in gravely sandy soils.

***Diuris tricolor* (Pine Donkey Orchid):** sporadically distributed on the western slopes of NSW, extending from south of Narrandera all the way to the north of NSW, can be recorded from disturbed habitats.

Vegetation assessments did not identify any threatened flora and many areas of the Development Site have been extensively disturbed.

Threatened fauna

The proposed Development Site contains areas of degraded fauna habitat but many isolated hollow-bearing trees still exist. Shrubs are very rare or completely absent across the proposed Development site.

A BioNet Atlas search has identified 28 threatened fauna species that have previously been recorded within 10 km^2 of the site (**Appendix 3**). Threatened species previously seen in the area are listed and discussed below:

***Rostratula australis* (Australian painted snipe):** most records are from the south east, particularly the Murray Darling Basin. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds.

***Circus assimilis* (spotted harrier):** typical habitat is grassy open woodland, including acacia and mallee remnants, inland riparian woodland, shrub steppe and most commonly grassland.

***Hieraaetus morphnoides* (little eagle):** open eucalypt forest, woodland, sheoak or acacia woodlands and riparian woodlands; builds large stick nests in tall living trees and preys on birds, reptiles and mammals.

***Falco subniger* (black falcon):** the black falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. Inhabits numerous vegetation classes including River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the western Brigalow Belt South Bioregion.

***Lophoictinia isura* (square-tailed kite):** found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland.

***Calyptorhynchus lathami* (glossy black cockatoo):** feeds almost exclusively on the seeds of forest oak and she-oak (*Casuarina* and *Allocasuarina* species). The few *Casuarina or Allocasuarina* feed trees present at the site are dead or dying and planted near the old sewage treatment plant area.

***Lophochroa leadbeateri* (Major Mitchell's cockatoo):** found in a wide range of treed and treeless inland habitats, within easy reach of water. Feeds mostly on the ground on the seeds of melons, saltbush, wattles and cypress pines.

***Glossopsitta pusilla* (little lorikeet):** could occasionally be present in the area, utilises forest habitat and flowering eucalypt trees when in season. Favoured feed trees are heavy-flowering eucalyptus.

***Polytelis swainsonii* (superb parrot):** inhabit box-gum, cypress pines and boree woodlands and river red gum forest, using hollows of large trees for nesting.

***Ninox connivens* (barking owl):** lives in woodland and open forest, requiring hollows of large, old trees, with living trees preferred.

***Ninox strenua* (powerful owl):** uses a range of vegetation types including woodland, open sclerophyll forest, open wet forest and rainforest, with very big hollows in large, old trees.

***Climacteris picumnus victoriae* (brown treecreeper (eastern subspecies)):** inhabits eucalypt woodlands and dry open forests of the inland slopes and plains; preferring stringybarks or other rough barked eucalypts, typically with grassy understorey rather than a dense shrub layer. They are sedentary and territorial but do require tree hollows for nesting.

***Anthochaera phrygia* (regent honeyeater)**: inhabit woodlands with an abundance of mistletoes and feeds mainly on nectars from the few eucalypts that produce high volumes (Mugga ironbark, yellow box, white box and swamp mahogany) and mistletoes.

***Pomatostomus temporalis temporalis* (grey-crowned babbler):** typically found in box-gum woodlands on the slopes, box-cypress pine and open box woodlands on alluvial plains and coastal woodlands.

***Petroica phoenicea* (flame robin):** The flame robin is endemic to south eastern Australia. In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. The ground layer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Birds forage from low perches.

***Epthianura albifrons* (white-fronted chat):** it typically lives in habitat near waterways in the western part of NSW. Gregarious species usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground.

***Anseranas semipalmata* (magpie goose):** Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes. This goose is most active on floodplains of rivers and large shallow wetlands formed by run-off.

***Phaethon rubricauda* (red-tailed tropicbird):** A marine species which breeds in coastal cliffs and under bushes in tropical Australia. However, vagrant birds occasionally occur inland, particularly after storm events.

***Tringa stagnatilis* (marsh sandpiper):** this species is a full migrant, travelling overland on a broad front between its breeding grounds in central Asia (Russia and Siberia), and its wintering grounds in southern Asia, Indonesia and Australia. These wintering grounds *typic*ally occur on the margins of inland freshwater and brackish wetlands such as rice paddy-fields, swamps, salt-pans, salt-marshes, sewage works and marshy lake-edges.

***Calidris acuminata* (sharp-tailed sandpiper):** Primarily an Asian species, breeding on tundra in Russia and wintering to Australia and New Zealand. Found in freshwater marshes and coastal mudflats, sometimes inland.

***Philomachus pugnax* (ruff): t**his highly gregarious sandpiper is migratory and sometimes forms huge flocks in its winter grounds, which includes southern Asia and Australia. When found inland, it typically inhabits grassland and wetlands.

***Phascolarctos cinereus* (koala):** A small number of koalas have been recorded in the area, with numerous trees listed on the Northwest Slopes Management Area Plan. The riparian zone running along the perimeter of the Macquarie River on the eastern side of the site, is lined with core koala habitat (*E. camaldulensis*) trees. However, this habitat will not be cleared/destroyed during the development process, as this will be incorporated into the development site's 'open space' area. Additionally, many of the remnant *Eucalyptus* trees used by the Koala on site will remain intact, in line with recommendations of this report to conserve as many mature and hollow trees as possible during the development. Hence, as the vast majority of core *E. camaldulensis* trees aligning the Macquarie River to remain untouched, the impact on any potential population of the Koala will be minor.

***Petrogale penicillata* (brush-tailed rock wallaby):** habitat consists of rocky escarpments, outcrops and cliffs ideally with fissures, caves and ledges.

***Pteropus poliocephalus* (grey-headed flying fox):** can use subtropical and temperate rainforests, tall sclerophyll forests and woodland, heaths and swamps.

***Saccolaimus flaviventris* (yellow-bellied sheathtail bat):** Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows.
When foraging for insects, flies high and fast over the forest canopy, but lower in more open country.

***Chalinolobus picatus* (little pied bat):** Occurs in dry open forest, open woodland, mulga woodlands, chenopod shrublands, cypress pine forest and mallee and Bimbil box woodlands. Roosts in caves, rock outcrops, mine shafts, tunnels, tree hollows and buildings.

***Nyctophilus corbeni* (Corben's long-eared bat):** Inhabits a variety of vegetation types, including mallee, bulloke *Allocasuarina luehmannii* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.

***Miniopterus orianae oceanensis* (large bent-winged bat):** Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Hunt in forested areas, catching moths and other flying insects above the tree tops.

The likely presence of these species was considered in relation to whether suitable habitat occurs at the site (**Appendix 2**). Species that depend on swamps or caves do not have suitable habitat at the Development Site. Also, areas of rock outcrop, important habitat for reptiles, does not exist at the proposed Development Site. Hollow-bearing trees necessary to provide shelter or nesting sites for hollow-dependant fauna were present on site.

Ecosystem credit species

Assessment of habitat suitability for ecosystem credit species has been conducted in accordance with Section 5.2 of the BAM. Ecosystem credits help represent threatened species that can be predicted to be present by the type and condition of vegetation at the Development Site and a habitat assessment has been completed to assess potentially significant impacts.

A list of predicted ecosystem credit species for the Development Site was reviewed in the BAM calculator (BAM-C). The potential for the identified ecosystem credit species to occur on the Development Site was assessed according to species specific location requirements and habitat

constraints as detailed in **Table 22**. Where habitat features were not present due to the altered condition of the site vegetation, ecosystem credit species were excluded from further consideration.

Table 22: Assessment of ecosystem credit species within the Development Site.

Species	Common name	Veg Zone - Confirmed predicted species	Retained for further assessment (Y) or reason for exclusion	Sensitivity to gain class	BC Act listing status	EPBC Act listing status.
Anthochaera phrygia	Regent Honeyeater (Foraging)	81_Regrowth 78_Riparian	Y	High	CE	CE
Artamus cyanopterus cyanopterus	Dusky Woodswallow	81_Regrowth 438_Emelliodora 78_Riparian 248_Yellow 454_RRG 45_Grassland	Y	Moderate	V	Not Listed
Calyptorhynchus lathami	Glossy Black-Cockatoo (Foraging)	81_Regrowth 438_Emelliodora 78_Riparian 454_RRG	There are no *Allocasuarina* and *Casuarina* species in the assessed vegetation zones	High	V	V
Chthonicola sagittata	Speckled Warbler	81_Regrowth 78_Riparian 248_Yellow	Y	High	V	Not Listed
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	81_Regrowth 78_Riparian 248_Yellow	Y	High	V	Not Listed
Dasyurus maculatus	Spotted-tailed Quoll	81_Regrowth 78_Riparian	Y	High	V	E
Ephippiorhynchus asiaticus	Black-necked Stork	78_Riparian	No swamps No shallow, open freshwater or saline wetlands or shallow edges of deeper wetlands within 300 m of these swamps. Waterbodies Shallow lakes, lake margins and estuaries within	Moderate	E	Not Listed

			300 m of these waterbodies			
Epthianura albifrons	White-fronted chat	45_Grassland	Y	Moderate	V	Not Listed
Falco hypoleucos	Grey Falcon	78_Riparian 248_Yellow 45_Grassland	Y	Moderate	V	V
Falco subniger	Black Falcon	78_Riparian 248_Yellow 454_RRG 45_Grassland	Y	Moderate	V	Not Listed
Glossopsitta pusilla	Little Lorikeet	81_Regrowth 78_Riparian	Y	High	V	Not Listed
Grus rubicunda	Brolga	78_Riparian 45_Grassland	Y	Moderate	V	Not Listed
Haliaeetus leucogaster	White-bellied Sea-Eagle (Foraging)	78_Riparian 454_RRG	Y	High	V	Not Listed
		81_Regrowth 248_Yellow 45_Grassland	Not within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines			
Hamirostra melanosternon	Black-breasted Buzzard (Foraging)	438_Emelliodora 78_Riparian 454_RRG	Y	Moderate	V	Not Listed
Hirundapus caudacutus	White-throated Needletail	81_Regrowth 438_Emelliodora 78_Riparian 248_Yellow 454_RRG 45_Grassland	Y	High	Not Listed	V
Lathamus discolor	Swift Parrot (Foraging)	81_Regrowth 438_Emelliodora 78_Riparian 248_Yellow 454_RRG	Y	Moderate	E	CE
Lophochroa leadbeateri	Major Mitchell's Cockatoo (Foraging)	81_Regrowth 438_Emelliodora 78_Riparian 248_Yellow 454_RRG	Y	Moderate	V	Not Listed

		45_Grassland				
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	81_Regrowth 438_Emelliodora 78_Riparian 248_Yellow 454_RRG	Y	Moderate	V	Not Listed
Miniopterus orianae oceanensis	Large Bent-winged Bat (Foraging)	81_Regrowth 78_Riparian	Y	High	V	Not Listed
Petroica boodang	Scarlet Robin	81_Regrowth 78_Riparian 248_Yellow	Y	Moderate	V	Not Listed
Petroica phoenicea	Flame Robin	248_Yellow	Y	Moderate	V	Not Listed
Polytelis swainsonii	Superb Parrot (Foraging)	81_Regrowth 438_Emelliodora 78_Riparian 248_Yellow 454_RRG 45_Grassland	Y	Moderate	V	Vulnerable
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	81_Regrowth 438_Emelliodora 78_Riparian 248_Yellow 454_RRG	Y	Moderate	V	Not Listed
Pteropus poliocephalus	Grey-headed Flying-fox (Foraging)	81_Regrowth 78_Riparian 454_RRG	Y	High	V	Vulnerable
Rostratula australis	Australian Painted Snipe	78_Riparian	Y	Moderate	E	E
Stagonopleura guttata	Diamond Firetail	81_Regrowth 438_Emelliodora 78_Riparian 248_Yellow 454_RRG 45_Grassland	Y	Moderate	V	Not Listed
Stictonetta naevosa	Freckled Duck	78_Riparian	Y	Moderate	V	Not Listed

From the listed potential ecosystem species three were removed from further considerations because of habitat constraints at the site in various vegetation zones. The glossy black cockatoo was removed (from PCT 81, 438, 78 and 454) due to a lack of *Casuarina* and *Allocasuarina* tree species in these areas. The black-necked stork was removed (from PCT 78) as there is a lack of swamps, wetlands, lake margins and estuaries. The white bellied sea eagle is not considered for certain PCTs (PCT 81, 248 and 45) as these vegetation zones are not within 1 km of the river or other major water body.
All credit determinations are derived from complex algorithms supporting the function of the online BAM calculator (BAM-C). Change in vegetation integrity, area of impact, connectivity in the landscape and adjacent vegetation features are all components of the calculation. A summary of ecosystem credits, from the BAM-C online tool is shown below:

Case
00044172/BAAS23003/23/00044173

App last updated: 13/04/2023 10:00 (Version: 1.4.0.00)
BAM data last updated *: 22/06/2023 (Version: 61) * Disclaimer

Zone	Vegetation zone name	Vegetation integrity loss	Area	Sensitivity to loss	Sensitivity to loss(Justification)	Species sensitivity to gain class	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW									
4	248_Yellow	34.4	5 hectares	High Sensitivity to Loss	PCT Cleared - 80%	High Sensitivity to Gain	2		86
									Subtotal: **86**
Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion									
6	45_Grassland	29.1	49 hectares	Moderate Sensitivity to Loss	PCT Cleared - 60%	High Sensitivity to Gain	1.75		623
									Subtotal: **623**
River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion									
5	454_RRG	0	1.7 hectares	High Sensitivity to Loss	PCT Cleared - 83%	High Sensitivity to Gain	2		1
River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion									
3	78_Riparian	0	1.5 hectares	Moderate Sensitivity to Loss	PCT Cleared - 60%	High Sensitivity to Gain	1.75		0
									Subtotal: **0**
River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion									
2	438_Emelliodora	0	1.3 hectares	High Sensitivity to Loss	PCT Cleared - 80%	High Sensitivity to Gain	2		0
									Subtotal: **0**
Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion									
1	81_Regrowth	23.2	4.2 hectares	High Sensitivity to Loss	Biodiversity Conservation Act listing status	High Sensitivity to Gain	2		49
									Subtotal: **49**
									Total: 759

Species credit species

Identify threatened species for assessment

A list of predicted species credit species for the Development Site was reviewed in the BAM-C. Species credits pertain to threatened species that cannot be predicted by the vegetation present and relates primarily to species for which breeding habitat is available.

Habitat constraints and vagrant species

The potential for identified species credit species to occur on the Development Site was assessed according to species particular habitat requirements, as detailed in **Tables 23 and 24**. Where habitat features were not present due to the condition of the site vegetation, species credit species were found not to be candidate species and no further assessment was required.

Table 23: Predicted flora species credit species

Species	Common name	Confirmed candidate species (Y) or reason for exclusion	Veg zone / PCT ID species retained within	Sensitivity to gain class	BC Act listing status	EPBC Act listing status.
Dichanthium setosum	Bluegrass	Y	All	High	V	V
Digitaria porrecta	Finger Panic Grass	Y	All	Moderate	E	Not Listed
Diuris tricolor	Pine Donkey Orchid	Y	All	Moderate	V	Not Listed
Indigofera efoliata	Leafless Indigo	Habitat degraded; shrubs are rare at the site	-	High	E	E
Lepidium aschersonii	Spiny Peppercress	Habitat degraded	-	High	V	V
Pomaderris queenslandica	Scant Pomaderris	Habitat degraded; shrubs are rare at the site	-	High	E	Not Listed
Prasophyllum sp. Wybong	Prasophyllum sp. Wybong	Habitat degraded, not known from around this location	-	Moderate	Not Listed	CE
Swainsona murrayana	Slender Darling Pea	Y	All	High	V	V
Swainsona sericea	Silky Swainson-pea	Y	All	High	V	Not Listed

Table 24: Predicted fauna species credit species.

Species	Common name	Habitat constraints	Confirmed candidate species (Y) or reason for exclusion	Veg zone / PCT ID species retained within	BC Act listing status	EPBC Act listing status.
Anthochaera phrygia	Regent Honeyeater (Breeding)	As per Important Habitat Map	Not on important areas map and habitat degraded	-	CE	CE
Ardeotis australis	Australian Bustard	--	Y	78 454	E	Not Listed
Calyptorhynchus lathami	Glossy Black-Cockatoo (Breeding)	Hollow bearing trees Living or dead tree with hollows greater than	Y	81 438 78 248 454	V	V

		15cm diameter and greater than 8m above ground				
Crinia sloanei	Sloane's Froglet	Semi-permanent/ephemeral wet areas Containing relatively shallow sections with submergent and emergent vegetation, or within 500 m of wet area Swamps Within 500 m of swamps, waterbodies Within 500 m of waterbody	Y	78 438 454	V	E
Haliaeetus leucogaster	White-bellied Sea-Eagle (Breeding)	Living or dead mature trees within suitable vegetation within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines	Y	78 438 454	V	Not Listed
Hamirostra melanosternon	Black-breasted Buzzard (Breeding)	Waterbodies Land within 40 m of riparian woodland on inland watercourses/waterholes containing dead or dying eucalypts	Y	78 454	V	Not Listed
Lathamus discolor	Swift Parrot (Breeding)	As per Important Habitat Map	Not on important areas map and habitat degraded		E	CE
Lophochroa leadbeateri	Major Mitchell's Cockatoo (Breeding)	Hollow bearing trees Living or dead tree with hollows greater than 10cm diameter	Y	81 438 78 248 454 45	V	Not Listed
Miniopterus orianae oceanensis	Large Bent-winged Bat (Breeding)	Caves Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records	Habitat features not at the Property	-	V	Not Listed

		with microhabitat code "IC - in cave " observation type code "E nest-roost " with numbers of individuals >500				
Petaurus norfolcensis	Squirrel Glider	--	Y	78 438 454	V	Not Listed
Phascolarctos cinereus	Koala	Other Presence of koala use trees - refer to Survey Comments field in TBDC	Y	81 438 78 248 454	E	E
Polytelis swainsonii	Superb Parrot	Hollow bearing trees	Y	81 438 78 248 454	V	V
	(Breeding)	Living or dead *E. blakelyi, E. melliodora, E. albens, E. camaldulensis, E. microcarpa, E. polyanthemos, E. mannifera, E. intertexta* with hollows greater than 5cm diameter greater than 4m above ground or trees with a DBH of greater than 30cm				
Pteropus poliocephalus	Grey-headed Flying-fox	Breeding camps	No breeding camps exist on subject land	-	V	V

Potential species credit species, the regent honeyeater, swift parrot, large bent-winged bat and grey headed flying fox were removed from further consideration as candidate species because required habitat features were not present at the site. Justification for their removal follows:

Regent honeyeater: no part of the Property or Assessment area is mapped on the Important Areas Map (**Figure 19**) (recognised as breeding habitat and critical for the survival of the species). Woodland breeding habitat and food resources are negligible for the regent honeyeater due to agricultural land use and lack of remnant woody native vegetation across the Development site.

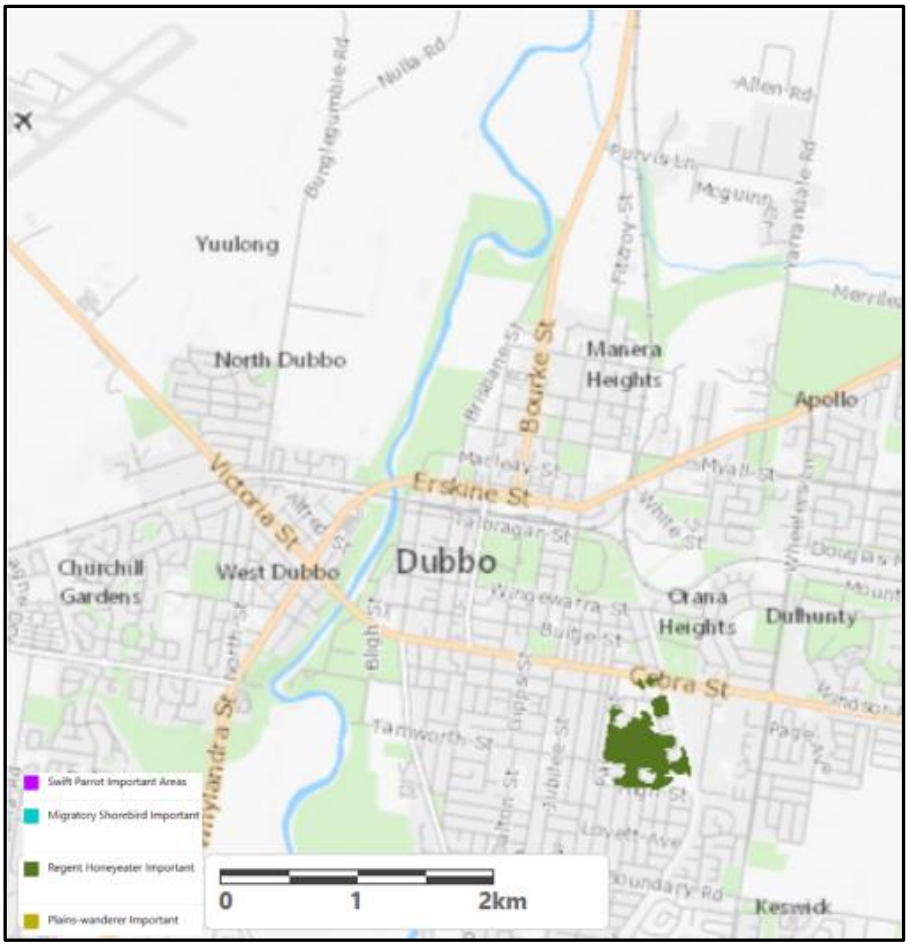

Figure 19: The Important Areas Map identifies critical habitat.

Swift parrot: no part of the Property or Assessment area is mapped on the Important Areas Map (**Figure 19**) (recognised as breeding habitat and critical for the survival of the species). Swift parrots breed in Tasmania during the September to April period and outside of the breeding season will move through box-ironbark forests on the Australian mainland. Habitat and food resources for the swift parrot are negligible across the Development site due to lack of remnant woody native vegetation.

Large bent-winged bat: there are no caves, tunnels, mines, culverts or other structures that could be used for breeding; no observed nest-roost and no individuals.

Grey-headed flying fox: No breeding camps were observed at the site.

Presence of Candidate Species

The remaining candidate threatened species were further assessed to determine presence or absence within the subject land based on:

- assumed presence within the subject land
- an important habitat map (for dual credit species)
- targeted threatened species survey, or
- an expert report.

Candidate Threatened Flora

The minimum suggested survey effort for targeted flora survey is two 20 m x 20 m quadrats for every 2 – 50 ha stratification unit (DEC 2004, p. 5-69). The twelve 20 x 20 m vegetation plots (conducted for site BAM assessment) were used as targeted surveys for the candidate floral species requiring further assessment. No incidence of these species was observed.

Table 25: Determining status of candidate flora species on subject land.

Species	Common name	Present? (Y/N)	Method used to determine presence	BC Act listing status	EPBC Act listing status.
Dichanthium setosum	Bluegrass	N	Survey	V	V
Diuris tricolor	Pine Donkey Orchid	N	Survey	V	Not Listed
Swainsona murrayana	Slender Darling Pea	N	Survey	V	V
Swainsona sericea	Silky Swainson-pea	N	Survey	V	Not Listed

*Further survey is required to confirm species is not in grassland zones (PCT 45)

Queensland blue grass (*Dichanthium sericeum*) was identified in the grassland area in the west of the site but this is a widespread species and not endangered. *Dichanthium setosum* was not recorded.

The specified survey months for *Digitaria porrecta* are January and February (outside the actual field survey times) but it is found in the north western slopes and north western plains botanical regions, whereas the site is in the central western slopes area.

The required survey timing for slender darling pea is September however field survey was conducted early October. It is found in grassland, herb land and open black box woodland, often in depressions and on heavy soils like dense grey or brown clay loam or red cracking clays, which are not typical at the site.

Candidate Threatened Fauna

For diurnal birds multiple timed area searches were conducted in the Development Site. This was in conjunction with opportunistic observations, including birds that were flying over the site and in or over adjacent areas. Birds were identified by sight and bird call vocalisations. Observations and surveys were conducted mid-morning, the weather during observation was mild with moderate ambient wind conditions.

Table 26: Determining status of candidate fauna species on subject land.

Species	Common name	Present? (Y/N)	Method used to determine presence	BC Act listing status	EPBC Act listing status.
Ardeotis australis	Australian Bustard	N	Survey	E	Not Listed
Calyptorhynchus lathami	Glossy Black-Cockatoo	Y	Assumed	V	V

	(Breeding)				
Crinia sloanei	Sloane's Froglet	Y	Assumed	V	E
Haliaeetus leucogaster	White-bellied Sea-Eagle (Breeding)	N	Survey	V	Not Listed
Hamirostra melanosternon	Black-breasted Buzzard (Breeding)	N	Survey	V	Not Listed
Lophochroa leadbeateri	Major Mitchell's Cockatoo (Breeding)	N	Survey	V	Not Listed
Petaurus norfolcensis	Squirrel Glider	N	Survey	V	Not Listed
Phascolarctos cinereus	Koala	N	Survey	E	E
Polytelis swainsonii	Superb Parrot (Breeding)	N	Survey	V	V

Threatened species surveys

The glossy black cockatoo presence has been assumed for species credits due to the presence of potential nest trees. To confirm the status of such species at the site these trees should be monitored (from April to August) to determine if such trees are actual nest trees. If confirmed a radial buffer of 200 m around each actual nest tree becomes the species polygon.

The presence of the Sloane's froglet has been assumed for PCTs within 500 m of wet zones (habitat constraint) and therefore it is not considered present in the PCTs 81, 248 and 45.

For diurnal birds four area searches of up to 1 hour each were performed. No threatened species were observed. The superb parrot requires hollows with diameter 6 cm at least 3.5 m above the ground, and no active nesting hollows or individual or bird pairs were observed.

Checking habitat for mammals consisted of searching for scats particularly around the base of trees and other signs including scratch marks on trees. Spotlighting (for arboreal and terrestrial mammals) was not performed because the prevailing weather conditions (storm, rain and wind - on the November site visit) reduce the reliability of this as a detection technique. The remnant native plantation trees near the old sewage treatment plant (Lot 3 DP 217195) site were assessed by looking for hollows, nests and scratches on tree trunks and no evidence of potential habitat was recorded.

Koalas are listed as candidate species in the online BAM case but no records of them exist on the subject land. No evidence of any koala activity was found. Riparian vegetation is continuous and could support koalas but there is no development planned near the river. Isolated paddock trees are more than 500 m west of the trees in the grassy woodland remnants near the river, meaning any provision for koala habitat is discontinuous and only represented by remaining paddock trees. Further survey techniques were scat detection (in the PCT 248 vegetation zone) and spot lighting (which was interrupted by stormy weather) (Koala BAM Survey Guide, DPE 2022). No evidence of koala activity was found.

For the squirrel glider survey year round is appropriate but sites with bipinnate acacia, autumn winter flowering trees and shrubs such as *Eucalyptus robusta* and *Banksia* species should be subject to a more retracted survey period of between March - August (from TBDC). They rely on large old trees with hollows for breeding and nesting. These trees are also critical for movement and typically need to be closely connected (i.e. no more than 50 m apart). However, across the site most hollow bearing trees were separated by much greater distances and there is also no flowering understorey with *Acacia* and *Banksia* trees.

6. Identifying prescribed impacts

Table 27: Prescribed impacts

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☐ Yes /☒ No	N/A	N/A
Human-made structures	☒ Yes /☐ No	There are existing human made buildings – houses and sheds that are inhabited by humans and constant human activity would negate use by threatened species	None
Non-native vegetation	☒ Yes /☐ No	Paulownia plantation Olive plantation These trees are not old, do not have hollows and do not have apparent nests There are areas of planted native vegetation, originally planted to consume effluent water from a sewage treatment plant – most of these trees are in poor condition and those	None

		remaining less than 30 years old with no hollows.	
Habitat connectivity	☒ Yes /☐ No	The only connected habitat is the riparian zone.	Potentially all There will be no change to existing use, conditions and indirect impacts. The riparian zone will not be encroached upon by construction with an open space buffer of 150 m minimum from the watercourse
Waterbodies, water quality and hydrological processes	☒ Yes /☐ No	The Macquarie River lies adjacent to the eastern boundary of the Property but it is separated from the subject land by minimum 150 m buffer. No change to water quality of the river is expected.	Sloane's froglet White bellied sea-eagle Black breasted buzzard
Wind turbine strikes (wind farm development only)	☐ Yes /☒ No	N/A	N/A
Vehicle strikes	☒ Yes /☐ No	Majority of the site is exotic grassland with limited habitat resources available for threatened species. A population of koalas away from riparian vegetation is unlikely.	Koala

7. Mitigating and Managing impacts on Biodiversity values

Construction works will be managed, implementing measures outlined in **Table 28**.

Table 28: Summary of direct, indirect and prescribed impacts of the Proposal

Impact	Action and Outcome	Responsibility	Timing
Direct			
Clearing of native vegetation / habitat	Mark out boundary of Development Site and proposed cleared areas to prevent unnecessary ground disturbance and protect vegetation in adjacent land Physically exclude area to remain green open space and vegetation near the river to ensure no disturbance to that zone	Site Manager	Prior to ground disturbance

Impact	Action and Outcome	Responsibility	Timing
	Ensure vehicle and equipment parking areas and unloading zones are designated and positioned to limit any new disturbance	Site Manager	Prior to construction
	Identify and communicate the location of environmentally sensitive areas and exclusion zones at the initial site visit for site personnel and contractors to protect important habitat features		
	If it is necessary to move any fallen limbs or timber, relocate it to another area of the Property (for example in the areas to be left as open space near the river) to reduce the impact from removing dead wood, which can be a fauna resource	Site Manager	Prior to and during construction
	Avoid and minimise clearing impacts by retaining large trees (greater than 30 cm diameter at breast height) in the proposed green open space areas and APZ, if possible		
Removal of hollow-bearing trees, habitat trees	Minimise the removal of hollow bearing habitat trees and install nest boxes	Site Manager	Site preparation
	Fauna specialist should be on-site whenever hollow bearing trees will be disturbed		
Indirect			
Transfer of weeds and pathogens to and from the site	Inspect vehicles to be used on site for soil and plant material residue as a biosecurity measure	Site Manager	Prior to first use on site
	Clean vehicles by brushing or blowing off any plant material prior to site entry to avoid transferring weed propagules or pathogens	Site Contractors	During site activities
	Inspect the site and control any new infestations of recognised priority weeds to remediate impact of weed incursion	Site Manager	After development
Erosion, sedimentation and contaminated runoff	Erosion and sedimentation controls as per Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book). https://www.environment.nsw.gov.au/research-and-publications/publications-search/managing-urban-stormwater-soils-and-construction-volume-1-4th-editon	Site Manager	Prior to and during disturbing activities
	Maintain vegetation especially downslope of disturbed areas to control water release from the site, improve water quality and reduce pollution risks		

Impact	Action and Outcome	Responsibility	Timing
	Spill kit kept on site to control accidental fuel spills		
Accidental incursions	Ensure deliveries to site are unloaded in already disturbed areas Create a buffer zone protecting vegetation Ensure all work is done by licenced and experienced professionals	Site Manager	Prior to and during disturbing activities
Edge effects	Create a buffer and install exclusion fencing / signage, protecting vegetation adjacent to the Development Site	Site Manager	Prior to and during disturbing activities
Noise, vibration, lighting, waste and air pollution impacts to adjacent habitat	Restrict human traffic to the Development Site, to avoid disturbance in adjacent habitat areas Noise and vibration impacts minimised by using appropriate and well maintained equipment and coordinating disruptive activities where possible No night works requiring lighting and any permanent lighting restricted to the immediate development zone to minimise light spill and possible changes to animal behaviour Any waste materials produced from on-site activities to be recycled or removed to appropriately licenced waste facility To reduce dust generation any loads of bulk material will be covered in transit and work will cease in high wind conditions if required	Site Manager	During disturbing activities
Increased risk of starvation or exposure and loss of shade and shelter	Any disturbance near woody vegetated areas should be initiated well before the spring breeding season. Stage construction works and gradually progress to peak site activity to allow animals the opportunity to move away. Minimise disturbance to the other areas of the property.	Site Manger	Prior to and during, vegetation clearing and construction
Loss of breeding habitat	Minimise clearing of large trees where possible	Site Owner	Prior to vegetation clearing
Inhibition of nitrogen fixation and	Maintain natural water movement across the landscape	Site Manager and Residents	Prior to vegetation clearing

Impact	Action and Outcome	Responsibility	Timing
increased soil salinity			During occupation future dwellings
Fertiliser drift	Apply fertiliser if required only to managed landscape areas Minimise off target exposure to adjacent natural areas Use fertiliser suitable for native plants	Residents	During future occupation
Removal and disturbance of rocks	Minimal bush rock exists	N/A	N/A
Increase in predators and pest populations	Routine domestic care and maintenance will help prevent pests encroaching near the residential houses Removal of rubbish before it accumulates will avoid predators and pests gaining competitive advantage by utilising foreign materials.	Residents	During future occupation
Disturbance to specialist breeding and foraging habitat	Avoid any disturbance of hollow bearing trees.	Residents	During future occupation
Increased fire risk	Provision of APZ for a defendable space around the subdivision / building envelopes. Provision of access for fire fighting vehicles. Provision of water reserves for fire- fighting.	Site Owner	During future construction and occupation
Increased rubbish	Remove rubbish before it accumulates to reduce fire hazard and avoid scavenging animal behaviour.	Site Manager, all site visitors and residents	During future construction and occupation
Prescribed			
Geological features, fabricated structures and non-native vegetation	Minimise the duration of disturbing activities.	Site Manager	During future construction
Connectivity through the landscape	Establish and maintain plantings of endemic species in connected green species for some provision of habitat resources.	Council Residents	During future occupation

Impact	Action and Outcome	Responsibility	Timing
Impacts to surface and groundwater quality	Standard erosion control measures like sediment fences, maintaining vegetation and mulching, where appropriate.	Site Manager	During future construction
	A spill management procedure to be developed in case of accidental spill or fuel leak		Prior to construction
Vehicle collision with fauna	Low on site vehicle speed to accommodate uneven ground and to reduce accident potential	Site Owner	During disturbing activities

8. IMPACT SUMMARY

The following is an assessment of the impacts requiring offsetting in accordance with Section 9 of the BAM (DPE 2020) and includes impacts:

- on biodiversity values at risk of serious and irreversible impact
- for which offset requirements need to be determined
- for which offset requirements do not need to be determined
- that do not require further assessment

Serious and irreversible impacts

Serious and Irreversible Impacts (SAII) are not expected to occur at the Development Site due to lack of existing foraging and breeding resources. The Development site is not identified on the Important Areas Map for the regent honeyeater or swift parrot.

Identification of impacts requiring offsets

Impacts on Native vegetation

A summary of the impacts on native vegetation and the required ecosystem credits is provided in **Table 29**. PCT 81 identified at the development site is representative of an endangered ecological community.

Table 29: Summary of required ecosystem credits.

Veg Zone	Veg Zone Name	Management Zone	Area (ha)	Current Vegetation Integrity Score	Future Vegetation Integrity Score	Change in VI Score	Credits Required	BAM Case No.
1	81_Regrowth	Housing OpenSpace	2.5 1.7	35.4 35.4	0 30.2	-35.4 -5.2	49 -	00044172
2	438_Emelliodora	None	1.3	14.9	14.9	0	0	00044172
3	78_Riparian	None	1.5	6.4	6.4	0	0	00044172
4	248_Yellow	Housing OpenSpace	4.86 0.14	35.2 35.2	0 28.8	-35.2 -6.4	86 -	00044172
5	*454_RRG*	None	1.7	45.8	45.8	0	1	00044172
6	45_Grassland	Housing OpenSpace	41.48 7.47	33.5 33.5	0 28.7	-33.5 -4.8	623 -	00044172
	Total Credits Required						**759**	**00044172**

The 'like – for like' Credit Report is provided in **Appendix 5**.

Impacts on Species credit species

Species credits for the glossy black cockatoo will require offsetting unless future biodiversity assessment work for the Development site can undertake survey during the required survey months (**Appendix 5**).

Impacts not requiring offsets

Impacts on species identified outside the Development Site do not require offsets to be determined. No impacts on threatened species outside the Development Site were identified.

Impacts that do not need further assessment

Large areas of the subject land are cropped or contain low conservation value grasslands and are therefore regarded as non-native vegetation. These areas do not need to be assessed for ecosystem credits. Established non-native woody vegetation consisted of plantation areas (small olive grove and Paulownia planting) and exotic trees around the buildings. It is only when threatened species may be using non-native vegetation that further assessment may be warranted. The olive grove (located on Lot 1 DP 1206861) was likely established around 1980 (historical imagery, **Appendix 6**) covers 0.7 ha and is no longer irrigated or maintained. This area was examined by searching around the perimeter and through some of the rows. No nests, hollows or threatened species were observed. The Paulownia patch (located on Lot 1 DP 802180) was established in the late 1990s, covers 1.3 ha and has only sparse canopy development. As these trees are young and exotic, habitat for native animals is unlikely to be present and there was no evidence of threatened species utilising this area. Due to the location of the other ornamental plants near the frequently trafficked houses, sheds and utility areas, threatened species are unlikely to use this vegetation, however no threatened species survey were conducted near the existing buildings to confirm this assumption.

The majority of the isolated paddock trees (amongst cropped paddocks) on Lots 60 and 62 DP 753233 and Lot 2 DP 1206861 are to be retained in open space areas and therefore have not been considered further. The woodlot containing native species towards the eastern end of Lot 62 DP 753233 is also to be reserved and was not assessed.

CONCLUSION AND RECOMMENDATIONS

Plant and animal species recorded during the site assessment, are listed in **Appendix 1**.

The vegetation types at the Property were confirmed as:

81	Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion	4.2 ha
438	River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion	1.3 ha
78	River red gum riparian tall woodland/open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	1.5 ha
248	Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW	5.0 ha
454	River red gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion	1.7 ha
45	Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion Grassland (Dubbo LALC) and other lots	48.95 ha

The current design of the residential subdivision, with provision for open space near the river, means that only PCT 81, 248 and 45 will be directly impacted by works. This will result in clearing or modification to approximately 58 ha of native vegetation. The areas marked on the Biodiversity Values Map (riparian zone) will not be impacted by the development. There are no areas on the Important Areas Map for the regent honeyeater or swift parrot that occur in the subject land.

BAM assessment has confirmed there is one threatened ecological community (TEC) at the Development Site. In the western grey box – cypress pine shrub grass tall woodland (PCT 81) (north western section of Lot 1 DP 1206861) the endangered ecological community 'Inland grey box woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions' is present. Part of this area is to be retained as a green space in the planning layout of the residential subdivision. Ideally, it would be maintained as a natural space with future management aiming to enhance the biodiversity values of the TEC for the long term.

At this stage a total of **759 ecosystem credits** are required to be offset for the planned disturbance to vegetation at the proposed subdivision site. Where there is a direct impact to the identified PCTs it has been assumed that there is a complete loss of vegetation integrity for the developed areas (buildings and roads), with planned open space areas only suffering a biodiversity loss of 10-20%.

The BAM process has determined **113 species credits** are required for the glossy black cockatoo (*Calyptorhynchus lathami*) (assumed present), although this may be revised after additional species survey between Apil and August. While Sloane's froglet (*Crinia sloanei*) has been assumed present, no species credits are required because none of the vegetation zones that it may inhabit will be impacted by the proposed development.

This is an initial evaluation of potential biodiversity credit obligation. Limitations including lack of access to grassland areas and assumptions about vegetation condition adds uncertainty to the stated credit obligation in these zones. This area was not fully sampled and supplementary BAM vegetation plots and threatened species searches are required to satisfy the assessment requirements for the western section of the subject land. Further refinement of the subdivision plans may also reduce biodiversity impacts in the future. Of the threatened fauna species that have been recorded locally, some have suitable foraging habitat at the Property and may occur there from time to time. Potential breeding resources are limited at the Development Site due to existing vegetation condition. There are no specialised habitat features such as rock outcrops, cliffs or caves in the Development Site.

9. ASSESSMENT OF OTHER BIODIVERSITY LEGISLATION

EPBC Act

Proposal was not considered likely to have significant impact on MNES:

Table 30: Matters of national environmental significance checklist.

Factor	Impact
a. Any impact on a World Heritage property?	*Nil*
b. Any impact on a National Heritage place?	*Nil*
c. Any impact on a wetland of international importance?	*Nil*
d. Any impact on a listed threatened species or communities?	*Unlikely*
e. Any impacts on listed migratory species?	*Nil*
f. Any impact on a Commonwealth marine area?	*Nil*
g. Does the proposal involve a nuclear action (including uranium mining)?	*Nil*
Additionally, any impact (direct or indirect) on Commonwealth land?	*Nil*

Biosecurity Act

The priority weeds prickly pear (*Opuntia sp*.) African boxthorn (*Lycium ferocissimum*) and silver leaf nightshade (*Solanum elaeagnifolium*) occur at isolated locations in the eastern section of the Property. Biosecurity obligations mean these plants should not be moved or released into the environment and land managers should mitigate the spread of the plant.

Declaration

I declare that this BDAR has been prepared in accordance with the requirements of the BAM and relevant legislation. It contains all available information that is relevant to the environmental assessment of the development to which the statement relates. The site of the proposal has been inspected by Access EP staff to gather the site-specific physical data presented in this report.

Certification under clause 6.15 Biodiversity Conservation Act 2016

I certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the *Biodiversity Conservation Act 2016* (BC Act).

Signature: 

____ _____

Date: _____14/03/2024_____

BAM Assessor Accreditation no: _____23003_____

This BDAR has been prepared to meet the requirements of BAM 2020. The report has been prepared on the basis of the requirements of, and information provided under the BAM as at a 17/01/2024, within 14 days of the date the report is submitted to the decision-maker.

The BAM Calculator (BAM-C) has been finalised and submitted within the Biodiversity Offsets and Agreement Management System (BOAMS) to be considered valid (within 14 days of the finalisation of the BAM-C).

To the best of my knowledge, the information contained in this BDAR is neither false nor misleading.

Christopher Botfield

10. References

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Appendix 1: Flora and Fauna Species Lists

Fauna

Common name	**Scientific name**
White faced heron	*Egretta novaehollandiae*
Crested dove	*Ocyphaps lophotes*
Noisy miner	*Manorina melanocephala*
Magpie lark	*Grallina cyanoleuca*
Galah	*Eolophus roseicapilla*
Sulphur crested cockatoo	*Cacatua galerita*
Eastern rosella	*Platycercus eximius*
Sacred kingfisher	*Todiramphus sanctus*
Willy wagtail	*Rhipidura leucophrys*
Whistling kite	*Haliastur sphenurus*
Australian raven	*Corvus coronoides*
Rainbow lorikeet	*Trichoglossus moluccanu*
Common starling	*Sturnus vulgaris*
Australian magpie	*Cracticus tibicen*
Little corella	*Cacatua sanguinea*
Superb fairy wren	*Malurus cyaneus*
White winged chough	*Corcorax melanorhamphos*
Grey butcher bird	*Cracticus torquatus*
Wedge tailed eagle	*Aquila audax*
Tree martin	*Petrochelidon nigricans*
Laughing kookaburra	*Dacelo novaeguineae*
Blue faced honeyeater	*Entomyzon cyanotis*
Brown songlark	*Cincloramphus cruralis*
Australian wood duck	*Chenonetta jubata*
Australian white ibis	*Threskiornis molucca*

Flora: Native

Common name	**Scientific name**
River red gum	*Eucalyptus camaldulensis*
Yellow box	*Eucalyptus melliodora*
Kurrajong	*Brachychiton populneus*
White cedar	*Melia azedarach*
Ribbon gum	*Eucalyptus viminalis*
Box leaf wattle	*Acacia buxifolia*
Grey box	*Eucalyptus microcarpa*
Mt Morgan wattle	*Acacia podalyriifolia*
Couch	*Cynodon dactylon*
Slender panic	*Paspalidium gracile*
Wallaby grass	*Rytidosperma monticola*
Wallaby grass	*Austrodanthonia richardsonii*
Windmill grass	*Chloris truncata*
Summer grass	*Digitaria sanguinalis*

Tussock grass	*Poa labillardierei*
Slender chloris	*Chloris divaricata*
-	*Paspalidium distans*
Queensland blue grass	*Dichanthium sericeum*
Plains grass	*Austrostipa aristiglumis*
Spear grass	*Austrostipa drummondii*
Jericho wiregrass	*Aristida jeriochoensis*
Rough spear grass	*Austrostipa scabra*
Bluebell	*Wahlenbergia victoriensis*
Annual bluebell	*Wahlenbergia gracilenta*
-	*Isolepsis inundata*
Common reed	*Juncus usitatus*
-	*Cyperus sanguinolentus*
Creeping knotweed	*Persicaria prostata*
Climbing saltbush	*Rhagodia nutans*
Small crumbweed	*Dysphania pumilio*
Small knotweed	*Polygonum plebeium*
Ridged sida	*Sida cunninghamii*
Creeping saltbush	*Atriplex semibaccata*
Pigweed	*Portulaca oleracea*
Swamp dock	*Rumex brownii*
Quena	*Solanum esuriale*
Yellow daisy burr	*Calotis lappulacea*
Small blue bush	*Maireana enchylaenoindes*
Oxalis	*Oxalis exilis*
Sedge	*Carex inversa*
Peppercress	*Lepidium pseudohyssopifolium*
Fuzzweed	*Vittadinia cuneata*
Black crumbweed	*Dysphania melanocarpa*
Oxalis	*Oxalis thompsoniae*
Berry saltbush	*Einadia hastata*
Ruby saltbush	*Enchylaena tomentosa*
Dissected New Holland Daisy	*Vittadinia dissecta*
Galvanised burr	*Sclerolaena birchii*
-	*Lepidium hypenantion*
Old man saltbush	*Atriplex nummularia*
Tar vine	*Boerhavia dominus*
Lesser joyweed	*Alternanthera denticulata*
Streaked poverty bush	*Bassia tricuspis*
Spiny-fruit saltbush	*Atriplex spinibractea*
Garland lily	*Calostemma prupureum*
Hogweed	*Zaleya galericulata*
Oxalis	*Oxalis perennans*
Corrugated sida	*Sida corrugata*
Smooth senna	*Senna barclayana*
Caustic weed	*Euphorbia drumondii*
Kidney weed	*Dichondra repens*
Glycine	*Glycine clandestina*

Small verbena	*Verbena gaudichaudii*

Flora: Non-native

Common name	**Scientific name**
Prairie grass	*Bromus cartharticus*
Barley grass	*Hordeum leporinum*
Rye grass	*Lolium spp.*
Great brome	*Bromus diandrus*
Annual beard grass	*Polypogon monspeliensis*
Browntop bent grass	*Agrostis capillaris*
Sweet vernal grass	*Anthoxanthum odoratum*
Phalaris	*Phalaris aquatica*
Paspalum	*Paspalum dilatatum*
Blackberry nightshade	*Solanum nigrum*
Blue heliotrope	*Heliotropium amplexicaule*
New Zealand spinach	*Tetragonia tetragonioides*
Volunteer oats	*Avena spp.*
Radish	*Raphanis raphanistrum*
Wild turnip	*Brassica rapa*
Horehound	*Marrubium vulgare*
Broadleaf dock	*Rumex obtusifolius*
Purple top	*Verbena bonariensis*
Flatweed	*Hypochaeris radicata*
Paterson's curse	*Echium plantagineum*
Creeping woodsorrel	*Oxalis corniculata*
Small flowered mallow	*Malva parviflora*
Variegated thistle	*Silybum marianum*
Turnip weed	*Hirschfeldia incana*
Prickly lettuce	*Lactuca serriola*
Medic	*Medicago spp.*
Onion weed	*Nothoscordum gracile*
Peppercress	*Lepidium africanum*
Prickly paddy melon	*Cucumis myriocarpus*
Peppercorn tree	*Schinus molle*
African boxthorn	*Lycium ferocissimum*
Honey locust	*Gleditsia triacanthos*
Fat hen	*Chenopodium alben*
Cleaver	*Galium aparine*
Creeping speedwell	*Veronica persica*
Lucerne	*Medicago sativa*
Clustered dock	*Rumex conglomeratus*
Haresfoot clover	*Trifolium arvense*
Gomphrena weed	*Gomphrena celosioides*
Skeleton weed	*Chondrilla juncea*
Sheep sorrel	*Rumex acetosella*
-	*Petrorhagia nanteuilii*

-	*Oenothera glazioviana*
Ox eye daisy	*Leucanthemum vulgare*
Common heliotrope	*Heliotropium europium*
Peppercress	*Lepidium bonariense*
Slim amaranth	*Amaranthus hybridus*
Milk thistle	*Sonchus oleraceous*
Silver leaf nightshade	*Solanum elaeagnifolium*
Khaki weed	*Alternanthera pungens*
Fumitory	*Fumaria officinalis*
Dandelion	*Taraxacum officinale*
Salsify	*Tragopogon porrifolius*
Cobbler's pegs	*Bidens pilosa*
Bathurst burr	*Xanthium spinosum*
Deadnettle	*Lamium purpureum*
Fleabane	*Conyza bonariense*
Spear thistle	*Cirsium vulgare*
Vetch	*Vicia villosa*
Narrow leaf clover	*Trifolium angustifolium*
Myane's pest	*Glandularia aristigera*

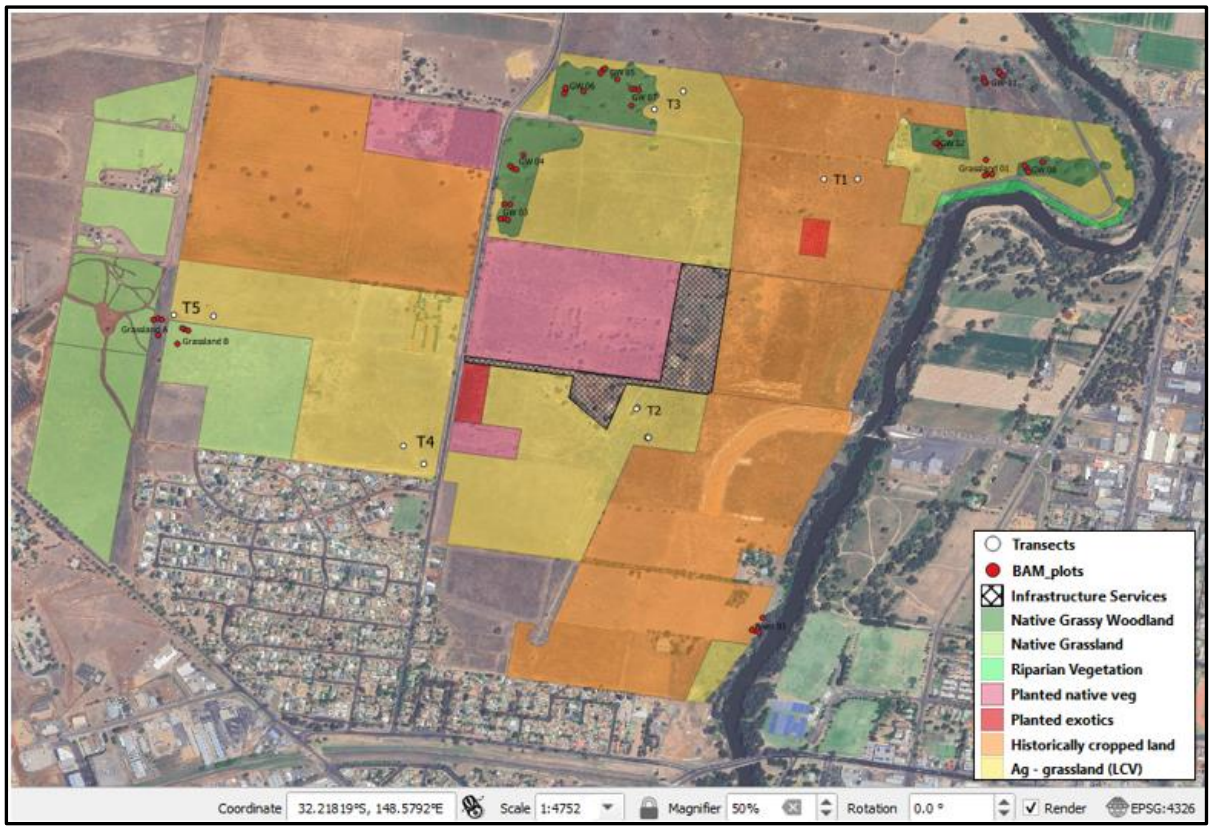
Transect Data

The area that is similar condition modified grassland is approximately 92 ha, with a minimum number of 5 transects recommended (>50 – 100 ha => 5 transects).

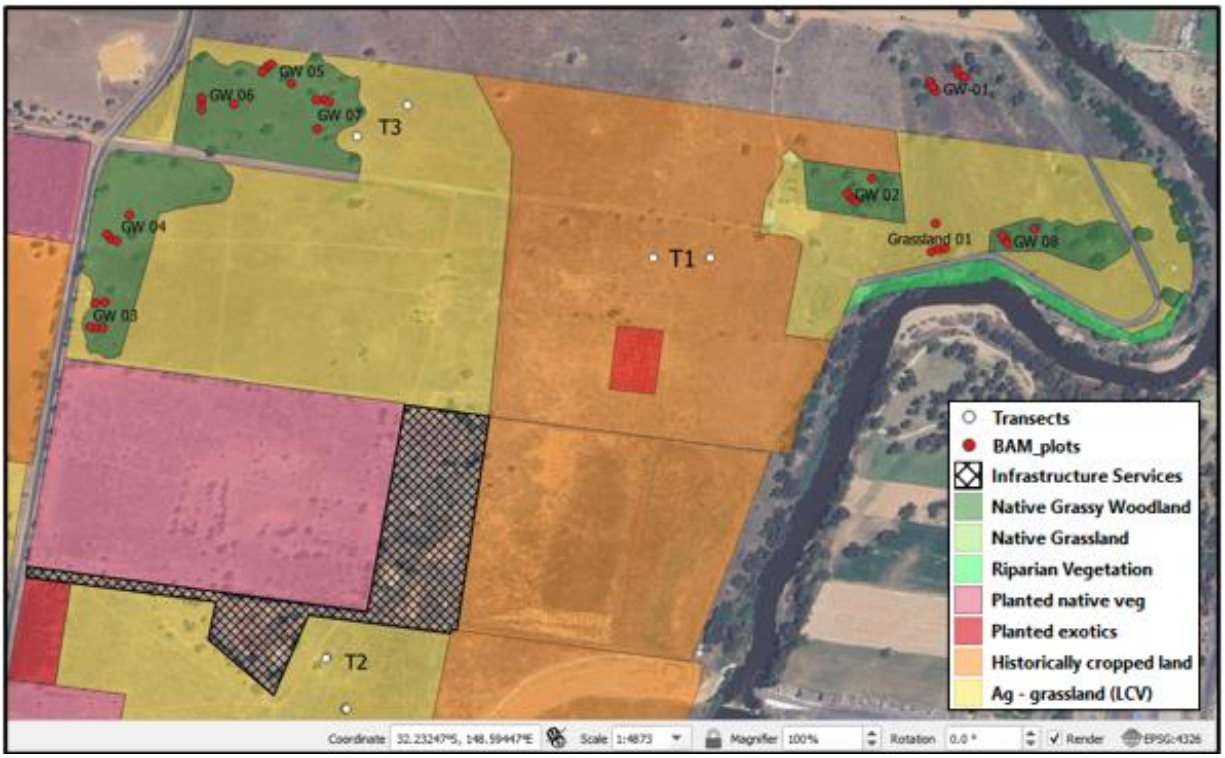
Transect	Native groundcover	Exotic perennials	Non-vegetation (e.g. bare ground, rock, litter etc)
1	0	4	0
2	0	5	2
3	2	2	6
4	2	6	3
5	6	19	8
Average	**2**	**7**	-

The average number of exotic perennials is greater than the average number of native plants found which means the vegetation zone is regarded as non-native and is classified as low conservation value.

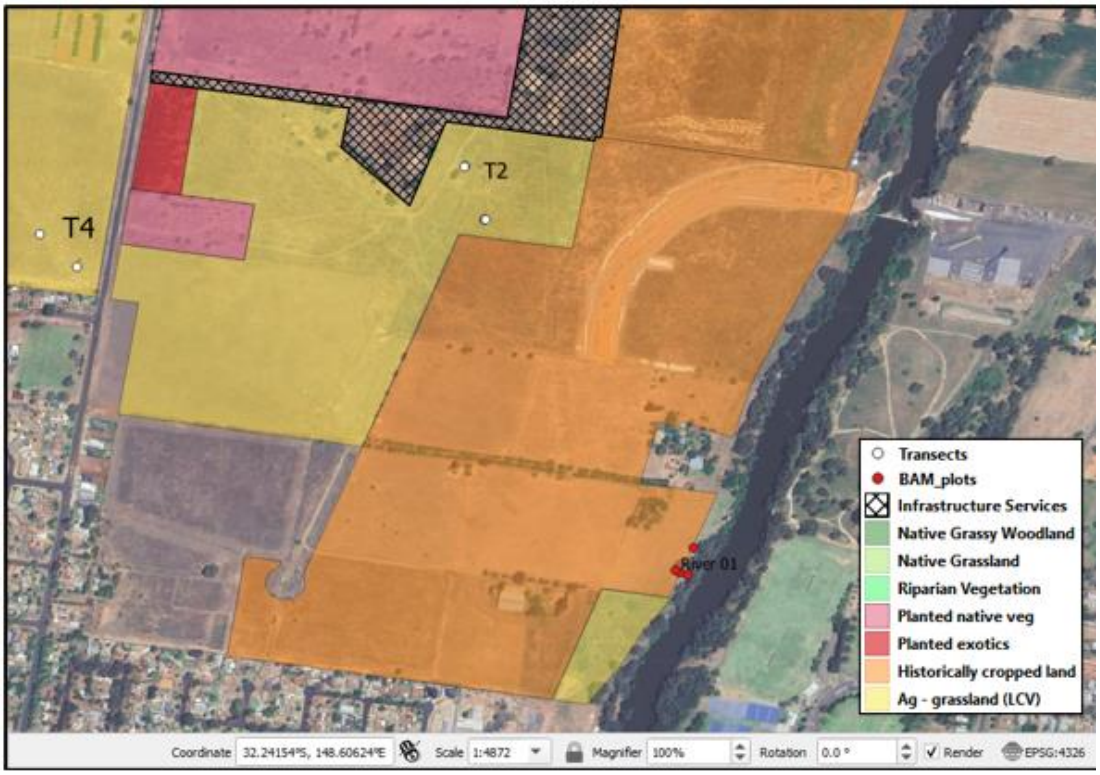
Overall site plan:



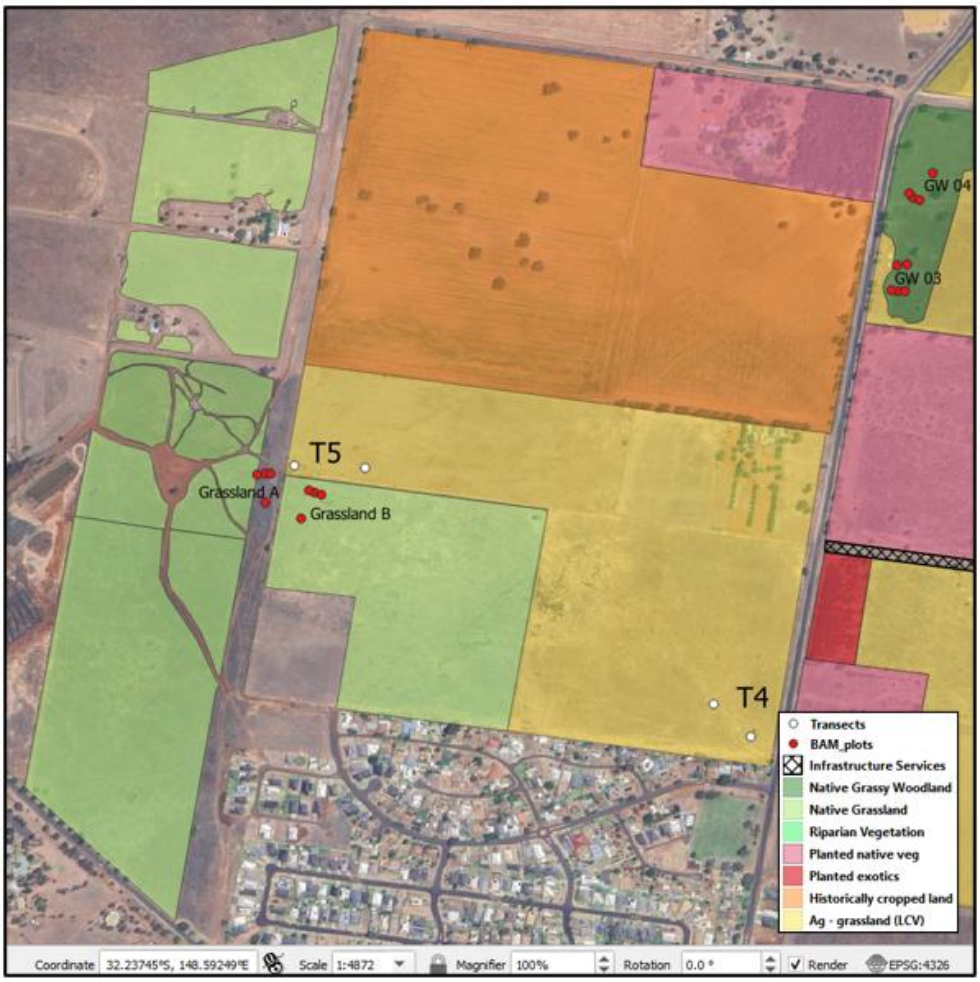
Plot locations site north:



Plot locations site south:



Plot locations site west:



Appendix 2: Threatened Species Database Search

A list of threatened species, populations and ecological communities that have been reported or modelled to occur from within a specific radius of the Study Area was obtained from the following databases:

NSW Department of Planning and Environment (DPE) Bionet Atlas (10 km^2 search area); and

Department Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters search tool (PMST) (1 km buffer).

Assessments were then made of the likelihood of the threatened species, populations and ecological communities reported or modelled to have occurred in the locality or using habitat within the Study Area as an essential part of a foraging range.

The following table summarises the likelihood of these threatened species and EPBC Act listed migratory species occurring within the Study Area based on the habitat requirements of each species. The likelihood of occurrence was designated according to specified criteria:

Known – species identified within the site during surveys

High – species previously recorded in the area or suitable habitat (such as roosting or foraging resources) present at the site

Moderate – species may be known from the area, potential habitat resources are available within the site

Low – species not known from the area and / or only marginal habitat is available at the site

Nil – habitat requirements not met within the site

P – Protected, V – Vulnerable, E – Endangered, CE – Critically Endangered

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
	Flora								
	Prasophyllum sp. Wybong (C.Phelps ORG 5269)	a leek-orchid	-	CE	-	PMST	A perennial orchid, appearing as a single leaf over winter and spring. Flowers in spring and dies back to a dormant tuber over summer and autumn. Known to occur in open eucalypt woodland and grassland. Most populations are small, although the Wybong population contains by far the largest number of individuals. **Not recorded at site inspection.**	Low	No
	Lepidium monoplocoides	Winged Pepper-cress	-	E	-	PMST	Occurs on seasonally moist to waterlogged sites in heavy fertile soils, with predominant vegetation usually an open woodland dominated by *Allocasuarina luehmannii* (Bulloak) and/or eucalypts, particularly *Eucalyptus largiflorens* (Black Box) or *Eucalyptus populnea* (Poplar Box). Recorded in a wetland-grassland community comprising *Eragrostis* australasicus, Agrostis avenacea, Austrodanthonia duttoniana, Homopholis proluta, Myriophyllum crispatum, Utricularia dichotoma and Pycnosorus globosus, on waterlogged grey-brown clay. **Not recorded at site inspection and favoured soil type not typical of site.**	Low	No
	Lepidium aschersonii	Spiny Pepper-cress	-	V	-	PMST	Indicative distribution does not occur within the site. Found on ridges of gilgai clays dominated by Brigalow, Belah, Buloke and Grey Box. **Not recorded at site inspection and no gilgai clays found on site.**	Low	No
	Swainsona recta	Small purple-pea	E	E	687	PMST, Bionet	Often in association with box-gum woodland, with understorey dominants including kangaroo grass (*Themeda australis*), poa tussocks (*Poa* spp.) and spear-grasses (*Austrostipa* spp.). **No *T. australis* was**	Low	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
							observed on site, and additionally, field survey did not detect the species.		
	Swainsona murrayana	Slender Darling-pea, Slender Swainson, Murray Swainson-pea	-	V	-		The species has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with *Maireana* species. **Field survey did not detect the species.**	Low	No
	Austrostipa wakoolica	null	-	E	-	PMST	Confined to the floodplains of the Murray River tributaries of central-western and south-western NSW. Habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat. **This species was not observed on site.**	Low	No
	Vincetoxicum forsteri	null	-	E	-	PMST	Grows in dry scrub and open forest. Recorded from low-altitude sedimentary flats in dry woodlands of *Eucalyptus fibrosa, Eucalyptus sideroxylon, Eucalyptus albens, Callitris endlicheri, Callitris glaucophylla* and *Allocasuarina luehmannii.* Also grows in association with *Acacia hakeoides, Acacia lineata, Melaleuca uncinata, Myoporum* species and *Casuarina* species. **Field survey did not detect the species.**	Low	No
	Androcalva sp.	Null	-	V	-	PMST	***Androcalva*** is a genus of 33 species of flowering plants in the family Malvaceae and is endemic to continental Australia. **Field survey did not detect the species.**		
	Commersonia procumbens	Mauve Burr-daisy	V	V	2	PMST, Bionet	Typically found in montane and subalpine grasslands in the Australian Alps; montane or natural temperate grassland dominated by Kangaroo Grass (*Themeda australis*) and	Low	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
							Snow Gum (*Eucalyptus pauciflora*) Woodlands on the Monaro and Shoalhaven area. Appears to be a coloniser of bare patches, which explains why it often occurs on roadsides. **Not observed on site.**		
	^^*Indigofera efoliata*	Leafless Indigo	E1,3	E	8	PMST, Bionet	Very rare species. Associated species include *Allocasuarina luehmannii, Exocarpos cupressiformis, Alectryon oleifolius, Geijera parviflora, Eucalyptus melliodora, Acacia deanei, Acacia buxifolia, Acacia hakeoides, Acacia spectabilis, Acacia lineata, Acacia oswaldii, Eremophila mitchellii, Myoporum platycarpum.* Recorded in Goonoo State Forest in *Eucalyptus crebra* and *Callitris glaucophylla* dry sclerophyll forest, and in *Eucalyptus microcarpa* and *Callitris glaucophylla* tall woodland. **Field survey of the site found no evidence of this species.**	Low	No
	Commersonia procumbens		V	V	3	PMST, Bionet	Endemic to NSW. Grows in sandy sites, often along roadsides. Recorded in *Eucalyptus dealbata* and *Eucalyptus sideroxylon* communities, *Melaleuca uncinata* scrub, under mallee eucalypts with a *Calytrix tetragona* understorey, and in a recently burnt Ironbark and *Callitris* area. **No records of this species have been recorded at the site and favoured soil type not found on site.**	Low	No
	Homoranthus darwinioides	Fairy Bells	V	V	1	PMST, Bionet	Grows in in various woodland habitats with shrubby understoreys, usually in gravely sandy soils. Associated species include *Callitris endlicheri, Eucalyptus crebra, E. fibrosa, C. trachyphloia, E. beyeri* subsp. *illaquens, E. dwyeri, E. rossii, Leptospermum divaricatum, Melaleuca uncinata, Calytrix tetragona, Allocasuarina* spp. and *Micromyrtus* spp. **Gravely soil type not observed on site.**	Low	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
	^Diuris tricolor	Pine Donkey Orchid	V,P,2	-	3	Bionet	Usually recorded from disturbed habitats. Associated species include *Callitris glaucophylla, Eucalyptus populnea, Eucalyptus intertexta*, Ironbark and *Acacia* shrubland. The understorey is often grassy with herbaceous plants such as *Bulbine* species. It is found in sandy soils, either on flats or small rises. N**ot found on site.**	Low	No
	Endangered Ecological Communities								
	White box-yellow box-Blakely's red gum grassy woodland and derived native grassland			CE	-	PMST	Characterised by the presence or prior occurrence of white box, yellow box or Blakely's red gum on moderately to highly fertile soils. Community is mainly grassy with sparse shrubs. **This Critically endangered ecological community is not located on site.**	Moderate	No
	Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales.			CE	-	PMST	This ecological community occurs in a climatic zone with a wet summer and low winter rainfall pattern. Temperate grasslands are typically dominated by tussock grasses in the genera *Austrodanthonia, Austrostipa, Bothriochloa, Chloris, Enteropogon, or Themeda* (Carter et al. 2003). **The *basalt and fine-textured alluvial plains typical of this community are not present on site.***	Low	No
	Coolibah-Black Box Woodland in the Darling Riverine Plains, Brigalow Belt South.			E	-	PMST	The structure of the community may vary from tall riparian woodlands to very open 'savanna like' grassy woodlands with a sparse midstorey of shrubs and saplings. Typically, these woodlands form mosaics with grasslands and wetlands, and are characterised by Coolibah (*Eucalyptus coolabah*) and, in some areas, Black Box (*E. largiflorens*). Other tree species may be present including River Cooba (*Acacia stenophylla*), Cooba (*A. salicina*). Typically	Low	No

No.	Species	BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
						occurs on grey self-mulching clays of periodically waterlogged floodplains, swamp margins, ephemeral wetlands and stream levees. **No *Coolibah-Black Box trees were observed on site.***		
	Fuzzy box woodland on alluvial soils		E		BioNet	Tall woodland or open forest dominated by Fuzzy Box *Eucalyptus conica*, often with Grey Box *Eucalyptus microcarpa*, Yellow Box *Eucalyptus melliodora*, or Kurrajong *Brachychiton populneus*. Buloke *Allocasuarina luehmannii* is common in places. Shrubs are generally sparse, and the groundcover moderately dense, although this will vary with season. Community occurs on brown loam or clay, alluvial or colluvial soils on prior streams and abandoned channels or slight depressions on undulating plains or flats of the western slopes. **No fuzzy box woodland was observed on site.**	Moderate	-
	White box – yellow box – Blakely's red gum grassy woodland and derived native grassland (box-gum woodland).		CE		BioNet	It is an open woodland community (sometimes occurring as a forest formation). Characterised by the presence or prior occurrence of White Box, Yellow Box and/or Blakely's Red Gum and a generally grassy understorey. Commonly co-occurring eucalypts include Apple Box (*E. bridgesiana*), Red Box (*E. polyanthemos*), E. macrorhyncha), Candlebark (*E. rubida*), Bundy (*E. goniocalyx*). The understorey in intact sites is characterised by native grasses and a high diversity of herbs; the most commonly encountered include Kangaroo Grass (*Themeda australis*), Poa Tussock (*Poa sieberiana*), wallaby grasses (*Rytidosperma* spp.). **Not on site.**	Moderate	-
	Inland grey box woodland in the Riverina, NSW South Western slopes, Cobar Peneplain, Nandewar and Brigalow Belt South bioregions		E		BioNet	Inland Grey Box Woodland includes those woodlands in which the most characteristic tree species, *Eucalyptus microcarpa* (inland	High	-

No.	Species	BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
						grey box), is often found in association with *E. populnea* subsp. *bimbil* (bimble or poplar Box), *Callitris glaucophylla* (white cypress pine), *Brachychiton populneus* (kurrajong), *Allocasuarina luehmannii* (Bulloak) or *E. melliodora* (yellow box), and sometimes with *E. albens* (white box). Shrubs are typically sparse or absent, although this component can be diverse and may be locally common, especially in drier western portions of the community. A variable ground layer of grass and herbaceous species is present at most sites. At severely disturbed sites the ground layer may be absent. **EEC present on site.**		
	Grey box (Eucalyptus microcarpa) grassy woodlands and derived native grasslands		E	-	PMST	Community with tree canopy dominated by grey box (*Eucalyptus microcarpa*), with other associated species including *Allocasuarina luehmannii, Brachychiton populneus, Callitris glaucophylla, Eucalyptus albens, E. camaldulensis, E. conica, E. largiflorens, E. melliodora and E. populnea*. **Condition thresholds not satisfied.**	High	No
	Poplar Box Grassy Woodland on Alluvial Plains		E	-	PMST	Characterised by a grassy woodland or occasionally open grassy forest, with a canopy dominated by *Eucalyptus populnea* and an understorey mostly of grasses and other forbs. Other sub-dominant tree species may include *Callitris glaucophylla, Casuarina cristata, Eucalyptus coolabah, E. largiflorens and E. melanophloia.* ***A significant area of Poplar Box canopy does not exist on site.***	Low	No
	Weeping Myall Woodland		E	-	PMST	Weeping Myall trees often occur in monotypic stands, however other vegetation may also occur in the ecological community, though not as dominant species. These include: Western Rosewood (*Alectryon*	Moderate	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
							oleifolius subsp. elongatus); Poplar Box (*Eucalyptus populnea*); or Black Box (*Eucalyptus largiflorens*) (NSW Scientific Committee 2005; Keith 2004). **Isolated, planted weeping Myall trees will be impacted by the development but the EEC is not present.**		
	Birds								
	Anthochaera phrygia	Regent honeyeater	CE	CE	6	PMST, BioNet	Temperate woodlands, open forests feeds on eucalypt nectar (Mugga ironbark, yellow box, white box). **Potential habitat degraded. No zone on the Important Areas map for the regent honeyeater is on the subject land.**	Moderate	No
	Aphelocephala leucopsis	Southern whiteface	-	V	-	PMST	Dry open forests and woodland and inland scrubs of mallee, mulga and saltbush are the preferred habitat, especially areas with fallen timber or dead trees and stumps. **Very little open forest and woodlands/inland mallee scrub located on the property.**	Low	No
	Pedionomus torquatus	Plains wanderer		CE		PMST	Plains-wanderers live in semi-arid, lowland native grasslands that typically occur on hard red-brown soils. These grasslands support a high diversity of plant species. Preferred habitat of the Plains-wanderer typically comprises 50% bare ground, 10% fallen litter, and 40% herbs, forbs and grasses. Most of the grassland habitat of the Plains-wanderer is <5 cm high, but some vegetation up to a maximum of 30 cm is important for concealment, as long as grass tussocks are spaced 10-20 cm apart. **Hard red-brown soils do not occur on site.**	Low	No
	Botaurus poiciloptilus	Australasian bittern		E		PMST	Found near fresh water wetlands with tall, dense vegetation like bullrushes (*Typha spp.*). **Habitat does not occur at the site.**	Low	No
	Calidris ferruginea	Curlew sandpiper	-	CE	-	PMST	Occupies littoral and estuarine habitats, foraging in shallow water and roosting on	Low	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
							shingle, shell or sand beaches. **Site does not have adequate habitat features.**		
	^Calyptorhynchus lathami	SE Glossy Black-Cockatoo	V, P	V	5	PMST, BioNet	Open inland woodlands where *Casuarinas* and *Allocasuarinas* are common. **No preferred tree species present at the site.**	Moderate	No
	Climacteris picumnus victoriae	Brown treecreeper (eastern subspecies)	V, P	V	5	PMST, BioNet	Inhabits eucalypt woodland and dry open forest, mainly with rough barked tree species like stringybarks or ironbarks, often with a grassy open understorey**. No stringybarks or ironbarks occur, potential habitat degraded.**	Moderate	No
	Falco hypoleucos	Grey falcon	-	V	-	PMST	Shrubland, grassland and wooded watercourses in arid and semi-arid regions and wetlands. Feeds on birds, reptiles and mammals. **Degraded habitat features.**	Low	No
	Grantiella picta	Painted Honeyeater	V, P	V		PMST	Inhabits Boree/Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*), Box-Gum woodland and Box-Ironbark forests. Feeds on fruits of mistletoes, eucalypts and acacias. **This habitat is not on site.**	Low	No
	Lathamus discolor	Swift Parrot	E	CE	-	PMST	Dry sclerophyll forest & woodland, flowering Eucalypts or lerp infested trees. Favoured feed trees are not present and will not be disturbed. **Inadequate features on site.**	Low	No
	Leipoa ocellata	Mallee fowl	-	V	-	PMST	Predominantly in mallee communities with spinifex understorey; prefers light sandy soils and diverse shrub/herb vegetation with a with a dense but discontinuous canopy. **Inadequate site features.**	Nil	No
	Lophochroa leadbeateri	Major Mitchell's cockatoo	V, P		1	BioNet PMST	Found in a wide range of treed and treeless habitats within easy reach of water. Feeds mostly on the ground on the seeds of melons, saltbush, wattles and cypress pines. **Habitat common on site, however, this species was not observed during fauna surveying and historically has only been recorded in the area on one previous occasion.**	Moderate	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
	Rostratula australis	Australian Painted Snipe	-	E	-	PMST	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. The nest consists of a scrape in the ground, lined with grasses and leaves. **Inadequate site features.**	Low	No
	Melanodryas cucullata cucullata	South-eastern Hooded Robin	-	E	-	PMST	Open eucalypt woodland, acacia scrub and mallee, often in open areas. Also requires structural diversity. **Site is disturbed and not structurally diverse.**	Low	No
	Ninox connivens	Barking owl	V, P	-	1	BioNet	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats. Roost in shaded portions of tree canopies including *Acacia* and *Casuarina* species. Habitat common on site. Was	High	-
	Ninox strenua	Powerful owl	V, P		2	BioNet	Found in woodland, open sclerophyll forest, tall open wet forest and rainforest and requires large hollows for nesting. **Habitat features at the site very limited. This species was not observed during surveys and has only been recorded on one occasion historically.**	Low	-
	Neophema chrysostoma	Blue winged parrot		V	-	PMST	Favours grasslands and grassy woodlands often near wetlands. There is very little woodland on site but some native grasses. **Not observed on site survey.**	Moderate	No
	Petroica boodang	Scarlet robin	V, P	-	3	BioNet	Dry eucalypt forests and woodlands with an open grassy understorey, usually with abundant logs and fallen timber. In autumn and winter they may live in open grassy woodlands and grasslands or grazed paddocks with scattered trees. **This Robin's habitat exists along the riparian zone of the Macquarie River which borders the eastern**	Moderate	-

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
							portion of the Property. However, this vegetation type will not be cleared.		
	Polytellis swainsonii	Superb parrot	V, P	V	1	PMST, BioNet	Found in box-gum, box-cypress pine, boree woodlands and river red gum forest; nest in hollows of large trees mainly in tall riparian forest or woodland; feeds on grass seeds, herbaceous plants, fruits, nectar, insects and grain. May forage up to 10 km from nesting sites primarily in grassy box woodland. **Not observed on site visit.**	Moderate	No
	Pomatostomus temporalis temporalis	Grey-crowned babbler (eastern subspecies)	V, P		1	BioNet	Occur in box-gum woodlands, box-cypress pine and open box woodlands on alluvial plains. Nests are built in shrubs or sapling eucalypts. **No evidence of nests or species occurrence at the site.**	Low	-
	Rostratula australis	Australian painted snipe	-	E	-	PMST	Prefers swamp edge, dams, marshes where there is grass cover and low scrub or open timber; forages in shallow water. **No wetlands or swamps on site.**	Nil	No
	Stagonopleura guttata	Diamond firetail	V,P	V	1	PMST, BioNet	Eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitat. **Site habitat features limited.**	Moderate	No
	Fish								
	Galaxis rostratus	Flathead galaxias	-	CE	-	PMST	Found in still or slow moving water bodies like wetlands and lowland streams	Nil	No
	Bidyanus bidyanus	Silver Perch, Bidyan	-	CE	-	PMST	Only one remaining secure and self-sustaining population occurs in NSW in the central Murray River downstream of Yarrawonga weir.	Nil	No
	Maccullochella macquariensis	Trout Cod	-	E	-	PMST	The trout cod's main habitats were the larger upland rivers and creeks, which they usually co-inhabited with Macquarie perch.	Nil	No
	Macquaria australasica	Macquarie perch	-	E	-	PMST	Found in waters with lots of cover from aquatic vegetation, snags and overhanging branches	Nil	No
	Maccullochella peelii	Murray Cod	-	V	-	PMST	Widespread throughout the Murray-Darling system originally being found in virtually all	Nil	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
							waterways of that system, including some surprisingly small streams.		
	Mammals								
	Chalinolobus dwyeri	Large-eared pied bat	V, P	V	-	PMST	Roosts in caves and cliff crevices, frequenting dry open forest and woodland near these features. **Unsuitable habitat features on site.**	Low	No
	Dasyurus maculatus maculatus	Spotted-tailed quoll	-	E	3	PMST, BioNet	Prefers mature wet forests and need den sites such as hollows, rock outcrops or caves. **No mature wet forest habitat at the site.**	Low	No
	Nyctophilus corbeni	Corben's long-eared bat	V,P	V	1	PMST, Bionet	Box/ironbark/cypress pine vegetation, roosts in tree hollows, crevices & under loose bark, hunts in understorey & on ground. **Negligible potential habitat.**	Low	No
	Phascolarctos cinereus	Koala	V, P	E	7	PMST, BioNet	There are many remnant *Eucalyptus camaldulensis* trees present on site, of which represent the primary food source of Koalas. Also, there is a particularly dense population of *E. camaldulensis habitat* aligning the riparian zone of the Macquarie River on the eastern boundary of the site. However, this habitat will not be cleared during the development, as this will be part of Councils Open Space area of the development. A very low number of Koalas have been previously recorded in the area; however, **no koalas were observed during the site inspection.**	Moderate	No
	Pteropus poliocephalus	Grey-headed flying-fox	V, P	V	12	PMST, Bionet	Mostly within 200 km of the east coast; in rainforests, tall sclerophyll forests and woodlands with roosting camps located near gullies, close to water in vegetation with a dense canopy. **Very little suitable habitat on site.**	Low	No
	Amphibians								
	Crinia sloanei	Sloane's Froglet	-	E	-	PMST	The majority of records for this species occurs in Darling Riverine Plains, NSW Southwestern Slopes and Riverina bioregions	Low	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
							in New South Wales. Records suggest that a moderately low number of mature individuals persist in NSW. It is typically associated with periodically inundated areas in grassland, woodland and disturbed habitats. **Unlikely that potential habitat would be affected because of open space provision near the river.**		
	Reptiles								
	Aprasia parapulchella	Pink-tailed worm-lizard	-	V	-	PMST	Sloping open woodland with native grassy ground layers, particularly kangaroo grass (*Themeda australis*) and rocky outcrops or partially buried rocks. **Development site soils are loamy sands, with minimal habitat features.**	Low	No
	Hemiaspis damelii	Grey Snake	-	E	-	PMST	In NSW, the Grey Snake's habitat includes the margins of ephemeral wetlands within River Red Gum (*Eucalyptus camaldulensis*) and Black Box (*E. largiflorens*) vegetation communities and Tangled Lignum (*Duma florulenta*) swamps. **No suitable habitat found on site.**	Low	No
	Anomalopus mackayi	Five-clawed Worm-skink, Long-legged Worm-skink	-	V	-	PMST	Close to or on the lower slopes of slight rises in grassy White Box woodland on moist black soils, and River Red Gum-Coolibah-Bimble Box woodland on deep cracking loose clay soils. May also occur in grassland areas and open paddocks with scattered trees. Live in permanent deep tunnel-like burrows and deep soil cracks, coming close to the surface under fallen timber and litter, especially partially buried logs. **Negligible habitat.**	Low	No
	Marine								
	Haliaeetus leucogaster	White-bellied Sea-Eagle	P	P	-	PMST	The White-bellied Sea-eagle's habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. It also occurs in	Medium	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
							the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. **Habitat exists close to the river – not observed on site survey.**		
	Migratory species								
	Apus pacificus	Fork-tailed swift	P		1	PMST, BioNet	Occur over inland plains, foothills or in coastal areas, usually from October-March. They eat insects and can fly as low as 1 m above open areas or water.	Low	No
	Hirundapus caudacutus	White-throated needletail	V	V	2	PMST, BioNet	Largely aerial and more often seen near the coast, they are more likely to be seen above wooded areas, including open forest and rainforest	Low	No
	Motacilla flava	Yellow wagtail	-		-	PMST	Mainly coastal distribution	Nil	No
	Myiagra cyanoleuca	Satin flycatcher	-		-	PMST	Tall forests, wetter habitats, coastal distribution	Nil	No
	Rhipidura rufifrons	Rufous fantail	-		-	PMST	Wet sclerophyll forests, coastal distribution	Nil	No
	Actitis hypoleucos	Common sandpiper	-		-	PMST	Utilise inland floodplain areas in wet years and the grassy edges of wetlands, foraging in shallow water	Nil	No
	Calidris acuminata	Sharp-tailed sandpiper	-		-	PMST	Occupies littoral and estuarine habitats, foraging in shallow water and roosting on shingle, shell or sand beaches.	Nil	No
	Calidris ferruginea	Curlew sandpiper	-	CE	-	PMST	Inhabits muddy marshes and wet grassy zones	Nil	No
	Calidris melanotos	Pectoral sandpiper	-		-	PMST	Can be in freshwater wetlands on or near the coast, generally among dense vegetation cover including sedges, grasses, lignum, reeds and rushes	Nil	No
	Gallinago hardwickii	Latham's snipe	-		-	PMST	Entire population migrates from Asia to Australia in the non-breeding period, with habitat in Australia typically shallow	Low	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
							freshwater wetlands of various kinds, with bare mud or shallow water for feeding and nearby vegetation cover for shelter.		
	Tringa stagnatilis	Marsh Sandpiper, Little Greenshank	-		-	PMST	Coastal distribution	Nil	No
	Numenius minutus	Little Curlew, Little Whimbrel	-		-	PMST	Coastal distribution	Nil	No
	Calidris ruficollis	Red-necked Stint	-		-	PMST	Coastal distribution	Nil	No
	Philomachus pugnax	Ruff (Reeve)	-		-	PMST	Coastal distribution	Nil	No

Appendix 3A: BioNet Atlas of NSW fauna search results

Threatened species sightings:

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Threatened (listed on BC Act 2016) ,CAMBA listed ,JAMBA listed or ROKAMBA listed Animals in selected area [North: -32.18 West: 148.54 East: 148.64 South: -32.28] returned a total of 117 records of 28 species.

Report generated on 12/10/2023 12:19am

Class	Species Code	Scientific Name	Common Name	NSW status	Comm. status	Records
Aves	0199	Anseranas semipalmata	Magpie Goose	V,P		3
Aves	0107	Phaethon rubricauda	Red-tailed Tropicbird	V,P	C,J	1
Aves	0218	Circus assimilis	Spotted Harrier	V,P		13
Aves	0225	Hieraaetus morphnoides	Little Eagle	V,P		3
Aves	0230	^^Lophoictinia isura	Square-tailed Kite	V,P,3		1
Aves	0238	Falco subniger	Black Falcon	V,P		4
Aves	0170	Rostratula australis	Australian Painted Snipe	E1,P	E	2
Aves	0163	Calidris acuminata	Sharp-tailed Sandpiper	P	C,J,K	2
Aves	0934	Philomachus pugnax	Ruff	P	C,J,K	1
Aves	0159	Tringa stagnatilis	Marsh Sandpiper	P	C,J,K	1
Aves	8862	^Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V,P,2	V	2
Aves	0270	^Lophochroa leadbeateri	Major Mitchell's Cockatoo	V,P,2		2

Aves	0260	Glossopsitta pusilla	Little Lorikeet	V,P		2
Aves	0277	^^Polytelis swainsonii	Superb Parrot	V,P,3	V	11
Aves	0246	^^Ninox connivens	Barking Owl	V,P,3		6
Aves	0248	^^Ninox strenua	Powerful Owl	V,P,3		1
Aves	8127	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V,P		1
Aves	0603	^Anthochaera phrygia	Regent Honeyeater	E4A,P,2	CE	11
Aves	0448	Epthianura albifrons	White-fronted Chat	V,P		1
Aves	8388	Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V,P		21
Aves	0382	Petroica phoenicea	Flame Robin	V,P		2
Aves	0652	Stagonopleura guttata	Diamond Firetail	V,P		1
Mammalia	1162	Phascolarctos cinereus	Koala	E1,P	E	6
Mammalia	1280	Pteropus poliocephalus	Grey-headed Flying-fox	V,P	V	12
Mammalia	1321	Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V,P		2
Mammalia	1352	Chalinolobus picatus	Little Pied Bat	V,P		1
Mammalia	T315	Nyctophilus corbeni	Corben's Long-eared Bat	V,P	V	1
Mammalia	3330	Miniopterus orianae oceanensis	Large Bent-winged Bat	V,P		3

Appendix 3B: BioNet Atlas of NSW Flora search results

Threatened species sightings:

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Threatened (listed on BC Act 2016) ,CAMBA listed ,JAMBA listed or ROKAMBA listed Animals in selected area [North: -32.18 West: 148.54 East: 148.64 South: -32.28] returned a total of 17 records of 5 species.

Report generated on 12/10/2023 12:23am

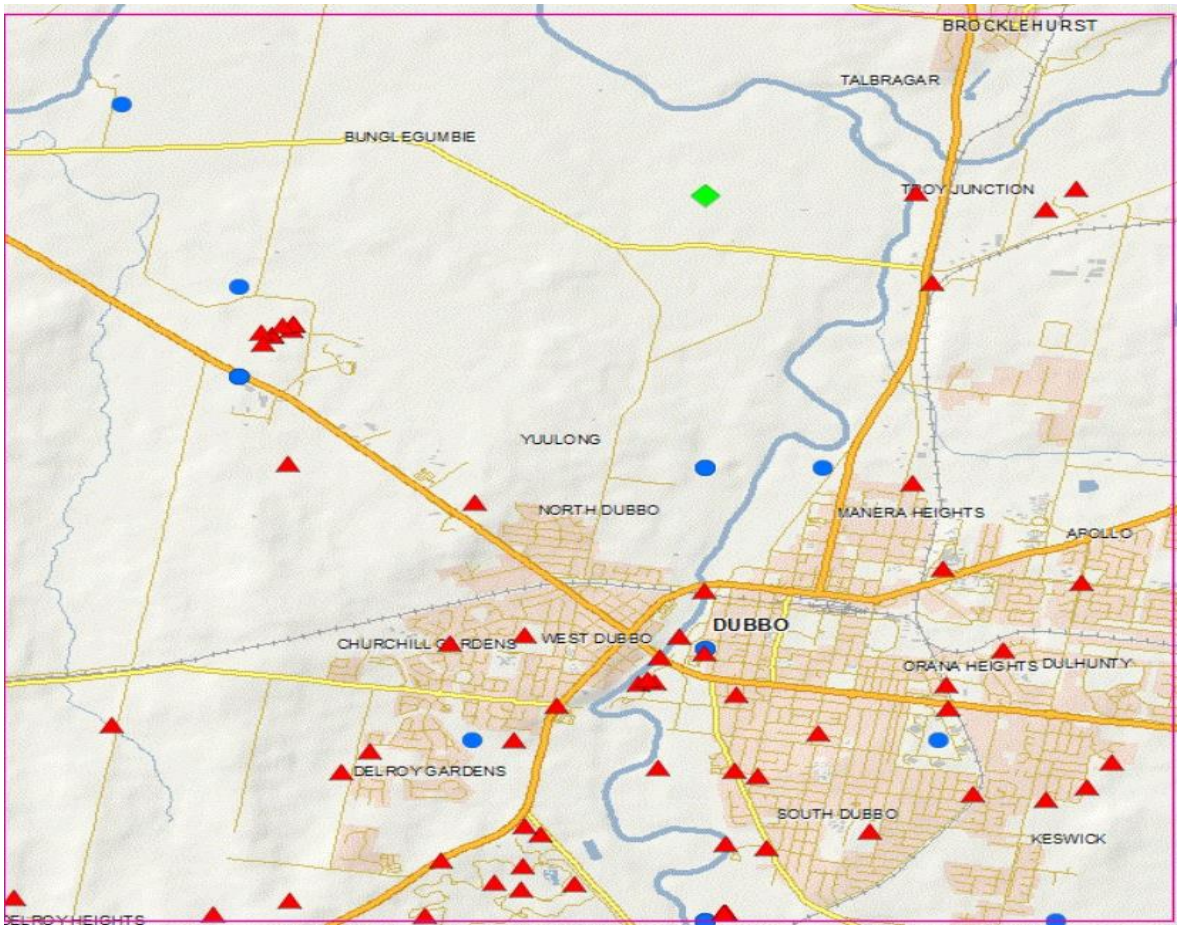
Class	Species Code	Scientific Name	Common Name	NSW status	Comm. status	Records
Flora	1341	*Commersonia procumbens*	Mauve Burr-daisy	V	V	2
Flora	2886	*^^Indigofera efoliata*	Leafless Indigo	E1,3	E	8
Flora	14617	*Commersonia procumbens*		V	V	3
Flora	4201	*Homoranthus darwinioides*	Fairy Bells	V	V	1
Flora	4457	*^Diuris tricolor*	Pine Donkey Orchid	V,P,2		3

NSW status

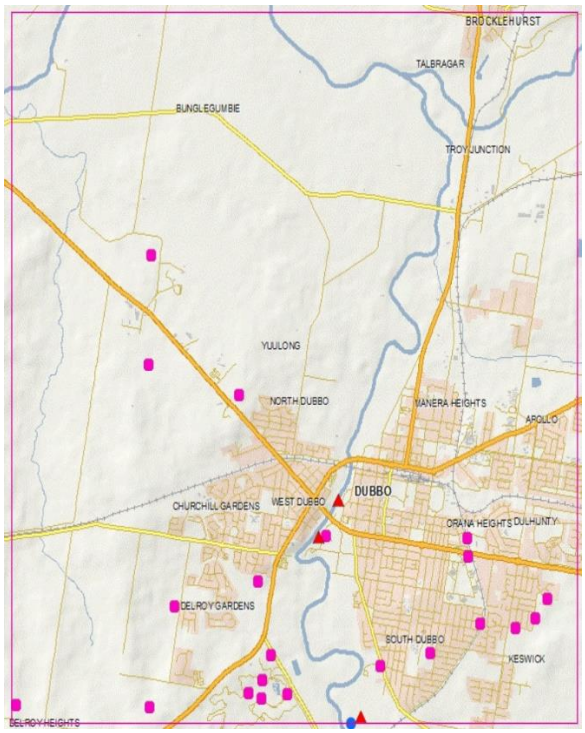
1	Sensitivity Class 1 (Sensitive Species Data Policy)
2	Sensitivity Class 2 (Sensitive Species Data Policy)
3	Sensitivity Class 3 (Sensitive Species Data Policy)
CH	Critical Habitat (Threatened Species Conservation Act 1995)
E1	Endangered (Threatened Species Conservation Act 1995)
E2	Endangered Population (Threatened Species Conservation Act 1995)
E3	Endangered Ecological Community (Threatened Species Conservation Act 1995)
E4	Presumed Extinct (Threatened Species Conservation Act 1995)
E4A	Critically Endangered (Threatened Species Conservation Act 1995)
E4B	Critically Endangered Ecological Community (Threatened Species Conservation Act 1995)
FCE	Critically Endangered Fish (Fisheries Management Act 1994)
FE	Endangered Fish (Fisheries Management Act 1994)
FEC	Endangered Ecological Community of Fish (Fisheries Management Act 1994)
FEP	Endangered Population of Fish (Fisheries Management Act 1994)
FKTP	Key Threatening Process of Fish (Fisheries Management Act 1994)
FP	Protected Fish (Fisheries Management Act 1994)
FV	Vulnerable Fish (Fisheries Management Act 1994)
FX	Extinct Fish (Fisheries Management Act 1994)
KTP	Key Threatening Process (Threatened Species Conservation Act 1995)
P	Protected (National Parks & Wildlife Act 1974)
V	Vulnerable (Threatened Species Conservation Act 1995)
V2	Vulnerable Ecological Community (Threatened Species Conservation Act 1995)

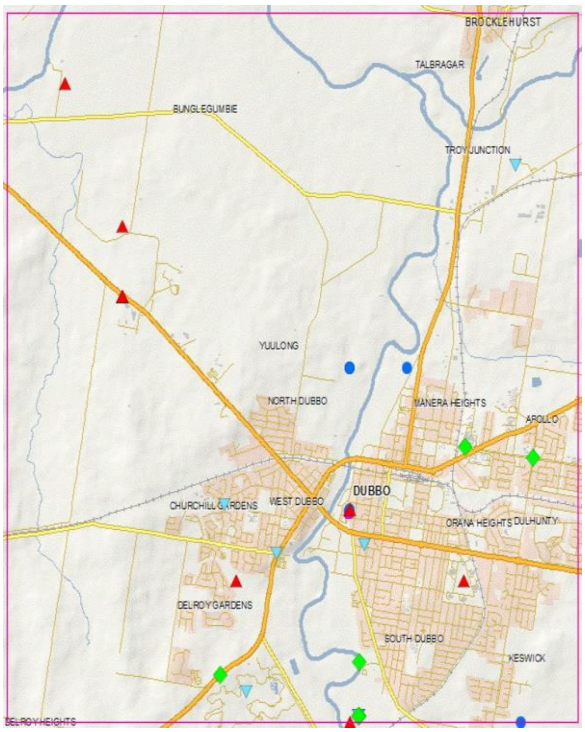
Commonwealth status

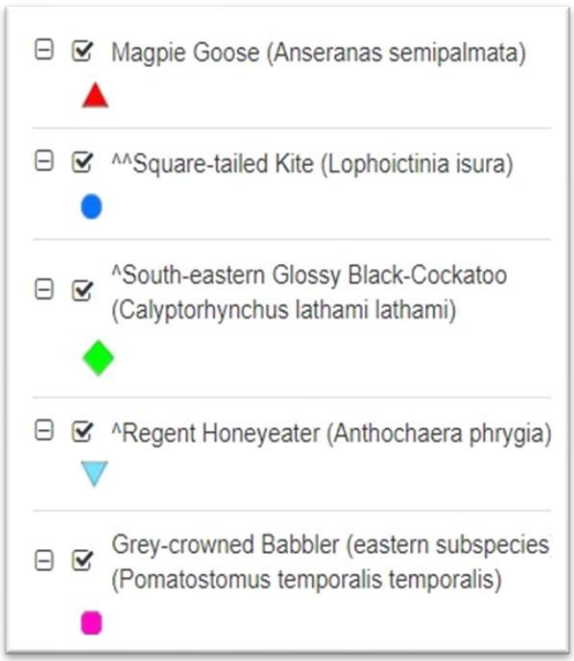
C	Listed on China Australia Migratory Bird Agreement
CD	Conservation Dependent (Commonwealth EPBC Act 1999)
CE	Critically Endangered (Commonwealth EPBC Act 1999)
E	Endangered (Commonwealth EPBC Act 1999)
J	Listed on Japan Australia Migratory Bird Agreement
K	Listed on Republic of Korea Australia Migratory Bird Agreement
KTP	Key Threatening Process (Commonwealth EPBC Act 1999)
V	Vulnerable (Commonwealth EPBC Act 1999)
X	Extinct (Commonwealth EPBC Act 1999)
XW	Extinct in the Wild (Commonwealth EPBC Act 1999)

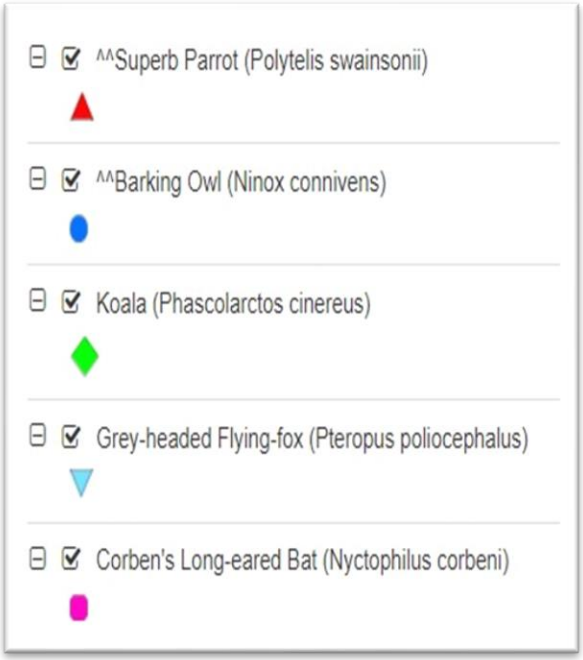


Location of threatened fauna and flora species historically recorded on site from the NSW Bionet Atlas search result.

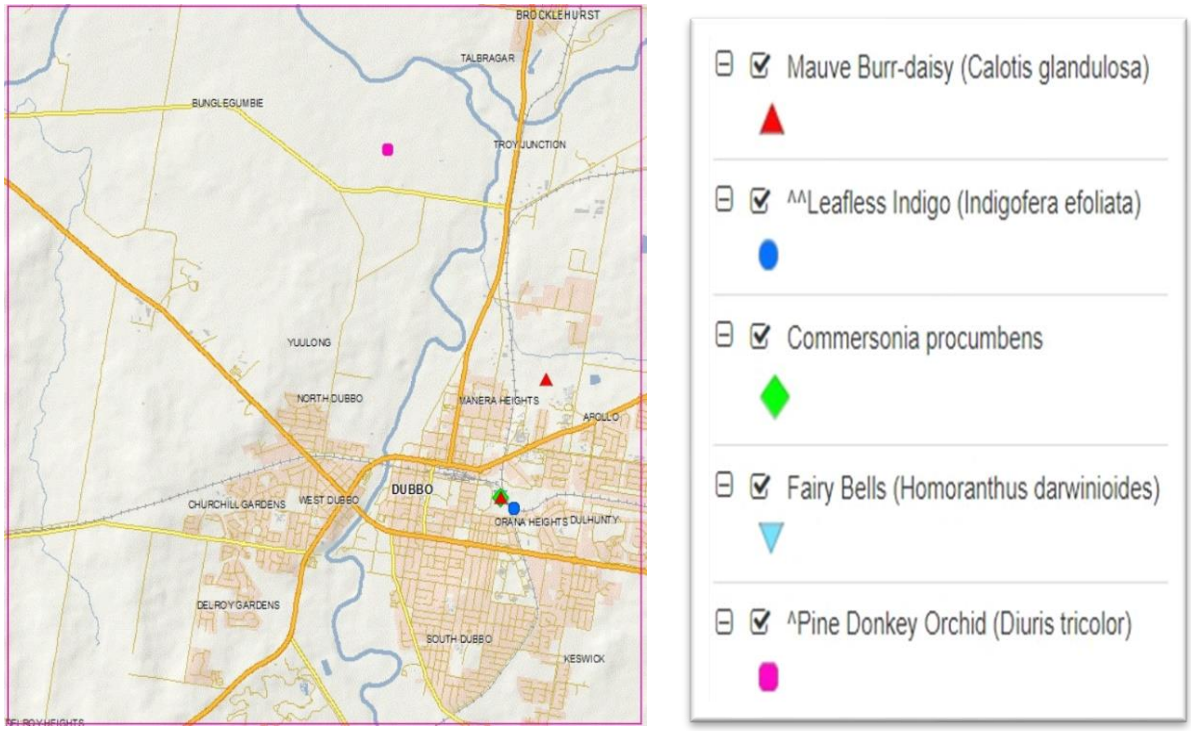








Location of the various threatened flora species historically recorded on site from the NSW Bionet Atlas search result.



Location of the five threatened flora species historically recorded on site from the NSW Bionet Atlas Search result.

Appendix 4: Protected Matters Report Summary

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: 30-Oct-2023

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:	40
Listed Migratory Species:	13

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	22
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

Matters of National Environmental Significance

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

Ramsar Site Name	Proximity
Banrock station wetland complex	700 - 800km upstream from Ramsar site
Riverland	700 - 800km upstream from Ramsar site
The coorong, and lakes alexandrina and albert wetland	900 - 1000km upstream from Ramsar site
The macquarie marshes	150 - 200km upstream from Ramsar site

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
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within 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
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species

Species ID	Scientific Name	Common Name	Class	Presence Text	Threatened Category	Buffer Status
81964	*Prasophyllum sp.*	A leek-orchid	Plant	Species or species habitat may occur within area	Critically Endangered	In feature area
906	*Pedionomus torquatus*	Plains-wanderer	Bird	Species or species habitat likely to occur within area	Critically Endangered	In feature area

84745	*Galaxias rostratus*	Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow	Fish	Species or species habitat may occur within area	Critically Endangered	In feature area
744	*Lathamus discolor*	Swift Parrot	Bird	Species or species habitat may occur within area	Critically Endangered	In feature area
856	*Calidris ferruginea*	Curlew Sandpiper	Bird	Species or species habitat may occur within area	Critically Endangered	In feature area
82338	*Anthochaera phrygia*	*Regent Honeyeater*	Bird	Species or species habitat known to occur within area	Critically Endangered	In feature area
76155	*Bidyanus bidyanus*	*Silver Perch*	Fish	Species or species habitat known to occur within area	Critically Endangered	In feature area
75184	*Dasyurus maculatus*	*Spotted-tailed Quoll*	Mammal	Species or species habitat may occur within area	Endangered	In feature area
1179	*Hemiaspis damelii*	Grey Snake	Reptile	Species or species habitat may occur within area	Endangered	In feature area
85104	*Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)*	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	Mammal	Species or species habitat may occur within area	Endangered	In feature area
66623	*Austrostipa wakoolica*	null	Plant	Species or species habitat may occur within area	Endangered	In feature area
26171	*Maccullochella macquariensis*	Trout Cod	Fish	Species or species habitat known to occur within area	Endangered	In feature area
7580	*Swainsona recta*	Small Purple-Pea	Plant	Species or species habitat may occur within area	Endangered	In feature area
92384	Vincetoxicum fosteri	null	Plant	Species or species habitat may occur within area	Endangered	In feature area
59151	*Crinia sloanei*	Sloane's Froglet	Frog	Species or species habitat may occur within area	Endangered	In feature area
1001	*Botaurus poiciloptilus*	Australasian Bittern	Bird	Species or species habitat likely to occur within area	Endangered	In feature area
82926	*Lophochroa leadbeateri leadbeateri*	Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo	Bird	Species or species habitat likely to occur within area	Endangered	In feature area
9190	*Lepidium monoplocoides*	Winged Pepper-cress	Plant	Species or species habitat likely to occur within area	Endangered	In feature area
77037	*Rostratula australis*	Australian Painted Snipe	Bird	Species or species habitat likely to occur within area	Endangered	In feature area
67093	*Melanodryas cucullata cucullata*	South-eastern Hooded Robin, Hooded Robin (south-eastern)	Bird	Species or species habitat may occur within area	Endangered	In feature area

66632	*Macquaria australasica*	Macquarie Perch	Fish	Species or species habitat may occur within area	Endangered	In feature area
183	*Chalinolobus dwyeri*	Large-eared Pied bat	Mammal	Species or species habitat may occur within area	Vulnerable	In feature area
10976	*Lepidium aschersonii*	Spiny Peppercress	Plant	Species or species habitat may occur within area	Vulnerable	In feature area
6765	*Swainsona murrayana*	Slender Darling Pea	Plant	Species or species habitat may occur within area	Vulnerable	In feature area
87153	*Androcalva sp.*	null	Plant	Species or species habitat likely to occur within area	Vulnerable	In feature area
67036	*Calyptorhynchus lathami lathami*	South-eastern Glossy Black Cockatoo	Bird	Species or species habitat likely to occur within area	Vulnerable	In feature area
682	*Hirundapus caudacutus*	White-throated Needle-tail	Bird	Species or species habitat known to occur within area	Vulnerable	In feature area
182	*Pteropus poliocephalus*	Grey-headed Flying fox	Mammal	Species or species habitat likely to occur within area	Vulnerable	In feature area
470	*Grantiella picta*	Painted Honeyeater	Bird	Species or species habitat known to occur within area	Vulnerable	In feature area
529	*Aphelocephala leucopsis*	Southern Whiteface	Bird	Species or species habitat likely to occur within area	Vulnerable	In feature area
934	*Leipoa ocellata*	Malleefowl	Bird	Species or species habitat may occur within area	Vulnerable	In feature area
738	*Polytelis swainsonii*	Superb Parrot	Bird	Species or species habitat known to occur within area	Vulnerable	In feature area
59398	*Stagonopleura guttata*	Diamond Firetail	Bird	Species or species habitat likely to occur within area	Vulnerable	In feature area
66633	*Maccullochella peelii*	Murray Cod	Fish	Species or species habitat known to occur within area	Vulnerable	In feature area
25934	Anomalopus mackayi	Five-clawed worm Skink	Reptile	Species or species habitat may occur within area	Vulnerable	In feature area
1665	*Aprasia parapulchella*	Pink-tailed Worm Lizard	Reptile	Species or species habitat likely to occur within area	Vulnerable	In feature area
83395	*Nyctophilus corbeni*	Corben's Long-eared Bat, South-eastern Long-eared Bat	Mammal	Species or species habitat may occur within area	Vulnerable	In feature area
67062	*Climacteris picumnus victoriae*	Brown Treecreeper (south-eastern)	Bird	Species or species habitat may occur within area	Vulnerable	In feature area
929	*Falco hypoleucos*	Grey Falcon	Bird	Species or species habitat likely to occur within area	Vulnerable	In feature area
726	*Neophema chrysostoma*	Blue-winged Parrot	Bird	Species or species habitat likely to occur within area	Vulnerable	In feature area

Listed Migratory Species

Species ID	Scientific Name	Common Name	Class	Simple Presence	Threatened Category	Migratory Category
612	*Myiagra cyanoleuca*	Satin Flycatcher	Bird	May		Migratory Terrestrial Species
644	*Motacilla flava*	Yellow Wagtail	Bird	May		Migratory Terrestrial Species
678	*Apus pacificus*	Fork-tailed Swift	Bird	Likely		Migratory Marine Birds
682	*Hirundapus caudacutus*	White-throated Needletail	Bird	Known	Vulnerable	Migratory Terrestrial Species
592	*Rhipidura rufifrons*	Rufous Fantail	Bird	Known		Migratory Terrestrial Species
848	*Numenius minutus*	Little curlew	Bird	Known		Migratory Wetlands Species
860	*Calidris melanotus*	Red-necked Stint	Bird	Known		Migratory Wetlands Species
863	*Gallinago hardwickii*	Latham's Snipe, Japanese Snipe	Bird	May		Migratory Wetlands Species
858	*Calidris melanotos*	Pectoral Sandpiper	Bird	May		Migratory Wetlands Species
850	*Philomachus pugnax*	Ruff (Reeve)	Bird	Known		Migratory Wetlands Species
59309	*Actitis hypoleucos*	Common Sandpiper	Bird	May		Migratory Wetlands Species
856	*Calidris ferruginea*	Curlew Sandpiper	Bird	May	Critically Endangered	Migratory Wetlands Species
833	Tringa stagnatilis	Marsh sandpiper	Bird	Known		Migratory Wetlands Species
874	*Calidris acuminata*	Sharp-tailed Sandpiper	Bird	May		Migratory Wetlands Species

Listed Marine Species

Species ID	Scientific Name	Common Name	Class	Simple Presence	Threatened Category	Migratory Category
612	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	Bird	Likely		Listed

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
Transport and Regional Services - Airservices Australia	
Commonwealth Land - Airservices Australia [13245]	NSW

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
2679.01 - Dubbo - BDAR - Proposed Residential and Industrial Subdivision	2022/09411		Completed
Controlled action			
Dubbo Zirconia Project	2012/6625	Controlled Action	Post-Approval
Not controlled action			
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed

Bioregional Assessments		
SubRegion	BioRegion	Website
Central West	Northern Inland Catchments	BA website

Appendix 5: Biodiversity Credit Reports

NSW GOVERNMENT

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00044172/BAAS23003/23/00044173	Dubbo NWURA	22/06/2023
Assessor Name	Report Created	BAM Data version *
Renae L Hill	13/03/2024	61
Assessor Number	BAM Case Status	Date Finalised
BAAS23003	Open	To be finalised
Assessment Revision	Assessment Type	BOS entry trigger
1	Part 4 Developments (General)	BOS Threshold: Area clearing threshold

* 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 SAII	Ecosystem credits
Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW												
4	248_Yellow	Not a TEC	35.2	34.4	5	PCT Cleared - 80%	High Sensitivity to Gain			2.00		86
											Subtotal	**86**

NSW GOVERNMENT

BAM Credit Summary Report

Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion											
6	45_Grassland	Not a TEC	33.5	29.1	49	PCT Cleared - 60%	High Sensitivity to Gain			1.75	623
										Subtotal	**623**
River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion											
5	454_RRG	Not a TEC	45.8	0.0	1.7	PCT Cleared - 83%	High Sensitivity to Gain			2.00	1
										Subtotal	**1**
River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion											
3	78_Riparian	Not a TEC	6.4	0.0	1.5	PCT Cleared - 60%	High Sensitivity to Gain			1.75	0
										Subtotal	**0**
River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion											
2	438_Emelli odora	Not a TEC	14.9	0.0	1.3	PCT Cleared - 80%	High Sensitivity to Gain			2.00	0
										Subtotal	**0**

NSW GOVERNMENT

BAM Credit Summary Report

Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion											
1	81_Regrowth	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	35.4	23.2	4.2	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00	49
										Subtotal	**49**
										Total	**759**

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 SAII	Species credits
Calyptorhynchus lathami / Glossy Black-Cockatoo (Fauna)									
81_Regrowth	23.2	23.2	2.5	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	29
438_Emelliodora	0.0	0.0	1.3	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	0

NSW GOVERNMENT

BAM Credit Summary Report

78_Riparian	0.0	0.0	1.5	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	0
248_Yellow	34.4	34.4	4.9	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	84
454_RRG	0.0	0.0	1.7	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	0
								Subtotal	**113**
Crinia sloanei / Sloane's Froglet (Fauna)									
438_Emelliodora	0.0	0.0	1.3	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Endangered	False	0
78_Riparian	0.0	0.0	1.5	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Endangered	False	0
454_RRG	0.0	0.0	1.7	Biodiversity Conservation Act listing status	Ability to colonise improved habitat	Vulnerable	Endangered	False	0
								Subtotal	**0**

NSW GOVERNMENT

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00044172/BAAS23003/23/00044173

Proposal Name
Dubbo NWURA

BAM data last updated *
22/06/2023

Assessor Name
Renae L Hill

Assessor Number
BAAS23003

BAM Data version *
61

Proponent Names

Report Created
13/03/2024

BAM Case Status
Open

Assessment Revision
1

Assessment Type
Part 4 Developments (General)

Date Finalised
To be finalised

BOS entry trigger
BOS Threshold: Area clearing threshold

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

NSW GOVERNMENT

BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added

PCT
248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Ephippiorhynchus asiaticus / Black-necked Stork
Calyptorhynchus lathami / Glossy Black-Cockatoo

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

NSW GOVERNMENT

BAM Biodiversity Credit Report (Like for like)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	4.2	49	0	49
438-River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion	Not a TEC	1.3	0	0	0
78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	Not a TEC	1.5	0	0	0
248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW	Not a TEC	5.0	86	0	86
454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion	Not a TEC	1.7	1	0	1
45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	Not a TEC	49.0	0	623	623

NSW GOVERNMENT

BAM Biodiversity Credit Report (Like for like)

45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Riverine Plain Grasslands This includes PCT's: 44, 45	Riverine Plain Grasslands >=50% and <70%	45_Grassland	No	623	Pilliga, Bogan-Macquarie, Castlereagh-Barwon, Inland Slopes, Kerrabee, Liverpool Plains, Liverpool Range, Pilliga Outwash and Talbragar Valley. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region

NSW GOVERNMENT

BAM Biodiversity Credit Report (Like for like)

	Inland Riverine Forests This includes PCT's: 9, 36, 78, 79, 112, 249, 356, 362, 4088, 4089	Inland Riverine Forests >=50% and <70%	78_Riparian	Yes	0	Pilliga, Bogan-Macquarie, Castlereagh-Barwon, Inland Slopes, Kerrabee, Liverpool Plains, Liverpool Range, Pilliga Outwash and Talbragar Valley. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion	**Like-for-like credit retirement options**					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248, 3405	-	81_Regrowth	Yes	49	Pilliga, Bogan-Macquarie, Castlereagh-Barwon, Inland Slopes, Kerrabee, Liverpool Plains, Liverpool Range, Pilliga Outwash and Talbragar Valley. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

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BAM Biodiversity Credit Report (Like for like)

81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion

248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Floodplain Transition Woodlands This includes PCT's: 56, 74, 76, 80, 81, 82, 237, 244, 248, 251, 628	Floodplain Transition Woodlands >=70% and <90%	248_Yellow	Yes	86	Pilliga, Bogan-Macquarie, Castlereagh-Barwon, Inland Slopes, Kerrabee, Liverpool Plains, Liverpool Range, Pilliga Outwash and Talbragar Valley. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

438-River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region

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BAM Biodiversity Credit Report (Like for like)

	Inland Floodplain Woodlands This includes PCT's: 83, 438, 454	Inland Floodplain Woodlands >=70% and <90%	438_Emelliodora	Yes	0	Pilliga, Bogan-Macquarie, Castlereagh-Barwon, Inland Slopes, Kerrabee, Liverpool Plains, Liverpool Range, Pilliga Outwash and Talbragar Valley. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Inland Floodplain Woodlands This includes PCT's: 83, 438, 454	Inland Floodplain Woodlands >=70% and <90%	454_RRG	Yes	1	Pilliga, Bogan-Macquarie, Castlereagh-Barwon, Inland Slopes, Kerrabee, Liverpool Plains, Liverpool Range, Pilliga Outwash and Talbragar Valley. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Calyptorhynchus lathami / Glossy Black-Cockatoo	**81_Regrowth, 438_Emelliodora, 78_Riparian, 248_Yellow, 454_RRG**	11.9	113.00
Crinia sloanei / Sloane's Froglet	**438_Emelliodora, 78_Riparian, 454_RRG**	4.5	0.00

Credit Retirement Options

Like-for-like credit retirement options

Calyptorhynchus lathami / Glossy Black-Cockatoo	Spp	IBRA subregion
	Calyptorhynchus lathami / Glossy Black-Cockatoo	Any in NSW
Crinia sloanei / Sloane's Froglet	Spp	IBRA subregion
	Crinia sloanei / Sloane's Froglet	Any in NSW

NSW GOVERNMENT

BAM Vegetation Zones Report

Proposal Details

Assessment Id	Assessment name	BAM data last updated *
00044172/BAAS23003/23/00044173	Dubbo NWURA	22/06/2023
Assessor Name	Report Created	BAM Data version *
Renae L Hill	13/03/2024	61
Assessor Number	Assessment Type	BAM Case Status
BAAS23003	Part 4 Developments (General)	Open
Assessment Revision	Date Finalised	BOS entry trigger
1	To be finalised	BOS Threshold: Area clearing threshold

* 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.

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones

NSW GOVERNMENT

BAM Vegetation Zones Report

1	81_Regrowth	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion	Regrowth	4.2	2	Housing (2.5 ha) OpenSpace (1.7 ha)
2	438_Emelliodora	438-River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion	Emelliodora	1.3	1	Notcleared (1.3 ha)
3	78_Riparian	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion	Riparian	1.5	1	
4	248_Yellow	248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW	Yellow	5	3	Housing (4.86 ha) OpenSpace (0.14 ha)
5	454_RRG	454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion	RRG	1.7	1	OpenSpace (1.7 ha)
6	45_Grassland	45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	Grassland	48.95	4	Housing (41.48 ha) OpenSpace (7.47 ha)

NSW GOVERNMENT

BAM Candidate Species Report

Proposal Details

Assessment Id 00044172/BAAS23003/23/00044173	Proposal Name Dubbo NWURA	BAM data last updated * 22/06/2023
Assessor Name Renae L Hill	Report Created 13/03/2024	BAM Data version * 61
Assessor Number BAAS23003	Assessment Type Part 4 Developments (General)	BAM Case Status Open
Assessment Revision 1	Date Finalised To be finalised	BOS entry trigger BOS Threshold: Area clearing threshold

* 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.

List of Species Requiring Survey

Name	Presence	Survey Months
Ardeotis australis Australian Bustard	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Calyptorhynchus lathami Glossy Black-Cockatoo	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Crinia sloanei Sloane's Froglet	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

NSW GOVERNMENT

BAM Candidate Species Report

Dichanthium setosum Bluegrass	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Digitaria porrecta Finger Panic Grass	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☑ Nov ☐ Dec ☑ Survey month outside the specified months?
Diuris tricolor Pine Donkey Orchid	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Haliaeetus leucogaster White-bellied Sea-Eagle	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Hamirostra melanosternon Black-breasted Buzzard	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Indigofera efoliata Leafless Indigo	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

NSW GOVERNMENT

BAM Candidate Species Report

Lepidium aschersonii Spiny Peppercress	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Lophochroa leadbeateri Major Mitchell's Cockatoo	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Petaurus norfolcensis Squirrel Glider	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Phascolarctos cinereus Koala	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Polytelis swainsonii Superb Parrot	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Pomaderris queenslandica Scant Pomaderris	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?

NSW GOVERNMENT

BAM Candidate Species Report

Prasophyllum sp. Wybong Prasophyllum sp. Wybong	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona murrayana Slender Darling Pea	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☐ Nov ☐ Dec ☑ Survey month outside the specified months?
Swainsona sericea Silky Swainson-pea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Grey-headed Flying-fox	Pteropus poliocephalus	Habitat constraints
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat constraints
Regent Honeyeater	Anthochaera phrygia	Habitat degraded Habitat constraints
Swift Parrot	Lathamus discolor	Habitat degraded Habitat constraints

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Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00044172/BAAS23003/23/00044173	Dubbo NWURA	22/06/2023
Assessor Name	Report Created	BAM Data version *
Renae L Hill	13/03/2024	61
Assessor Number	Assessment Type	BAM Case Status
BAAS23003	Part 4 Developments (General)	Open
Assessment Revision	BOS entry trigger	Date Finalised
1	BOS Threshold: Area clearing threshold	To be finalised

* 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.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Australian Painted Snipe	Rostratula australis	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
Black Falcon	Falco subniger	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
		454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
Black-breasted Buzzard	Hamirostra melanosternon	438-River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

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Black-breasted Buzzard	Hamirostra melanosternon	454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
Brolga	Grus rubicunda	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
Diamond Firetail	Stagonopleura guttata	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		438-River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
		454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		438-River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW

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Dusky Woodswallow	Artamus cyanopterus cyanopterus	454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
Flame Robin	Petroica phoenicea	248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
Freckled Duck	Stictonetta naevosa	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
Grey Falcon	Falco hypoleucos	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		438-River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
		454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
Grey-headed Flying-fox	Pteropus poliocephalus	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion

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Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	438-River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
		454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
Large Bent-winged Bat	Miniopterus orianae oceanensis	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
Little Lorikeet	Glossopsitta pusilla	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
Major Mitchell's Cockatoo	Lophochroa leadbeateri	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		438-River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
		454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
Regent Honeyeater	Anthochaera phrygia	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

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Scarlet Robin	Petroica boodang	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
Speckled Warbler	Chthonicola sagittata	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
Spotted-tailed Quoll	Dasyurus maculatus	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
Superb Parrot	Polytelis swainsonii	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		438-River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
		454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
Swift Parrot	Lathamus discolor	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		438-River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion

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Swift Parrot	Lathamus discolor	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
		454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
White-bellied Sea-Eagle	Haliaeetus leucogaster	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
White-fronted Chat	Epthianura albifrons	45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
White-throated Needletail	Hirundapus caudacutus	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		438-River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
		454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
Black-necked Stork	Ephippiorhynchus asiaticus	78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion

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Glossy Black-Cockatoo	Calyptorhynchus lathami	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		438-River Red Gum riparian tall woodland wetland on basaltic alluvial soils mainly in the Liverpool Plains sub-region, Brigalow Belt South Bioregion
		78-River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
		454-River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion
White-bellied Sea-Eagle	Haliaeetus leucogaster	81-Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion
		248-Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW
		45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion

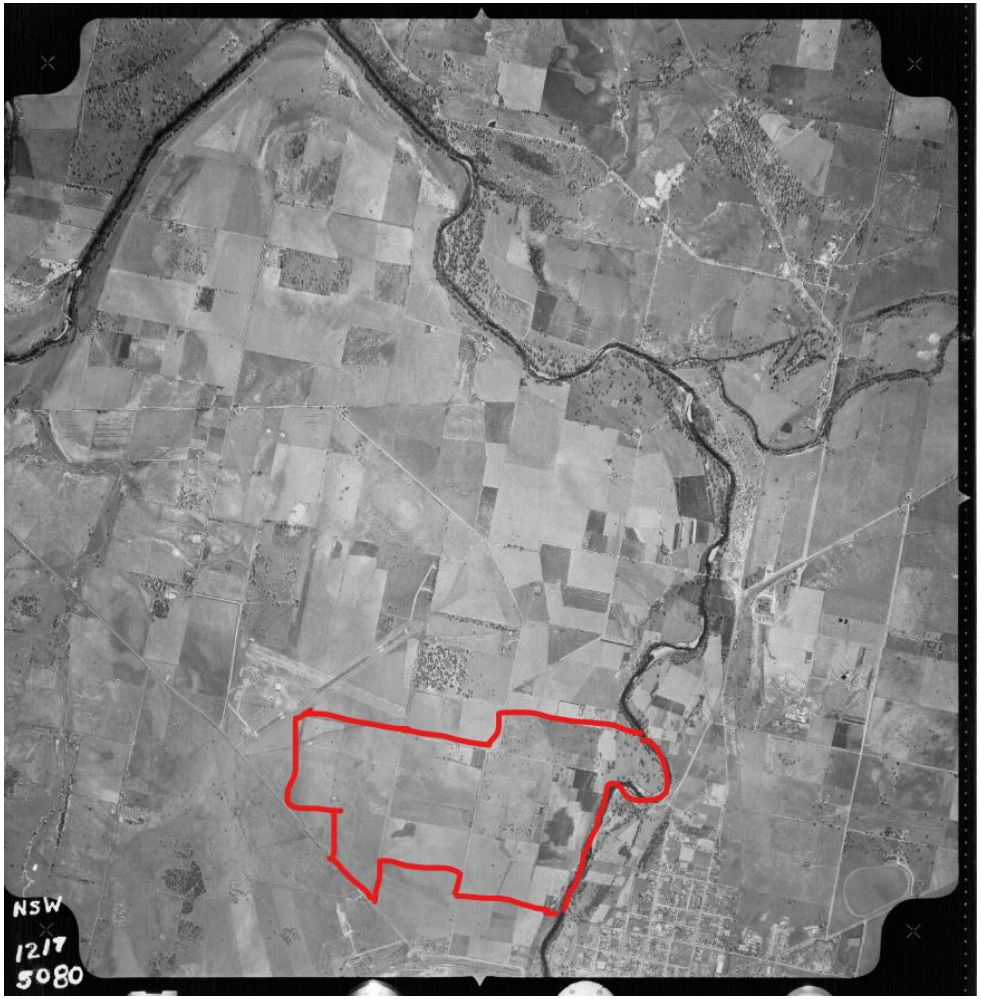
Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
Black-necked Stork	Ephippiorhynchus asiaticus	Habitat constraints
Glossy Black-Cockatoo	Calyptorhynchus lathami	Refer to BAR

Appendix 6: Historical Images

https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f7c215b873864d44bccddda8075238cb



Historic Aerial Photos: DUBBO

date	25/05/1964 0:00
sheetnum	8633
sheetname	DUBBO
film	1217
run	R4
frame	5080
key_diagra	86331964
scale	1:51000
ahdz	6248
camera	RC5A
filmscan	IRS
year	1963
image_name	1217_04_080

1964 - Site north east

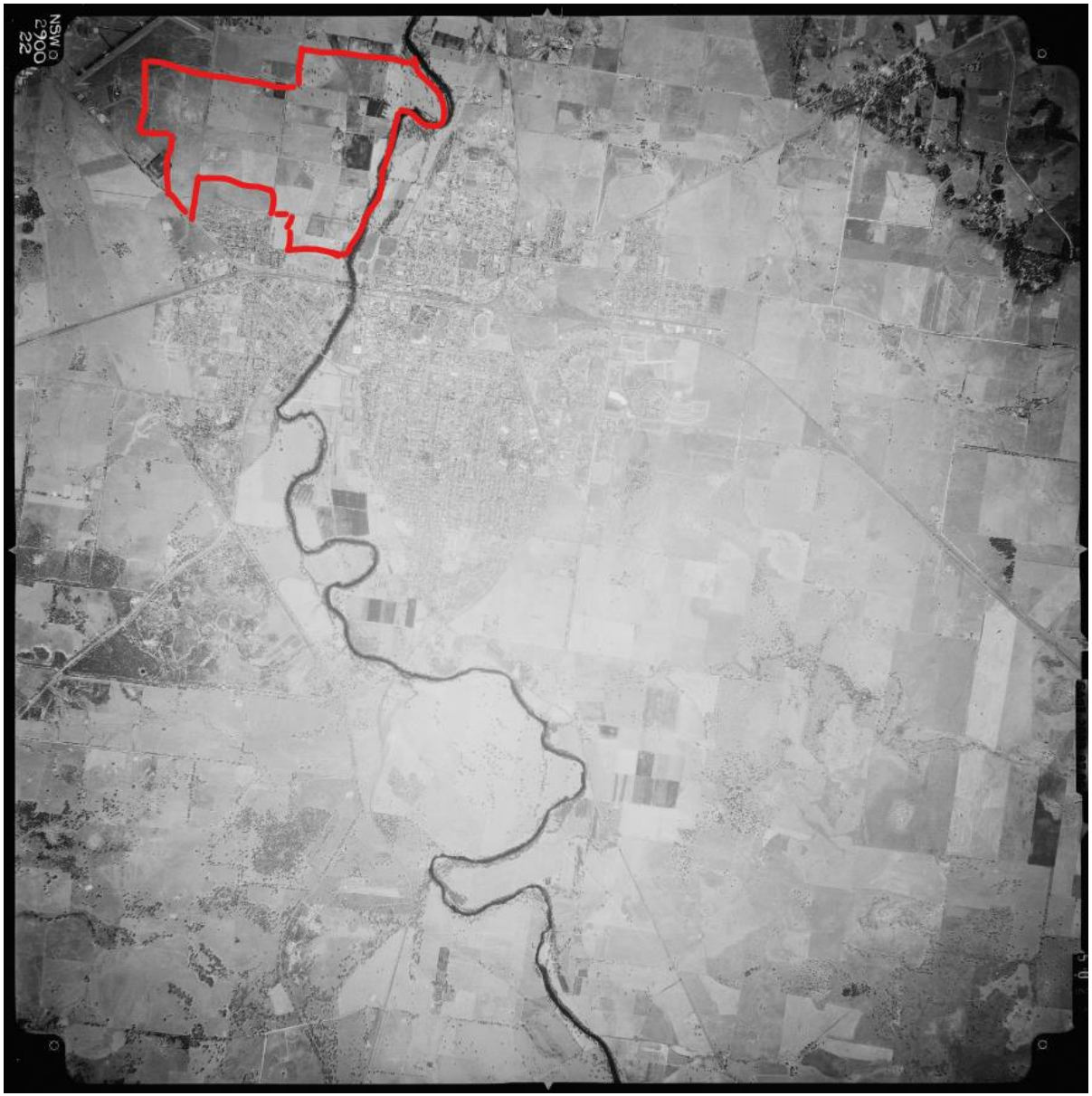
1964 - Site west

1964 - Site south east

date	17/08/1971 0:00
sheetnum	8633
sheetname	DUBBO
film	1968
run	R3
frame	5022
key_diagra	86331971
scale	1:72500
ahdz	7620
camera	RC10
filmscan	IRS
year	1970
image_name	1968_03_022

1971 – Site north east and west

1971 – Site south



Historic Aerial Photos: DUBBO

date	4/11/1980 0:00
sheetnum	8633
sheetname	DUBBO
film	2900
run	R4
frame	22
key_diagra	86331980
scale	1:50000
ahdz	5029
camera	RC10
filmscan	IRS
year	12/31/1979, 3:00 PM
image_name	2900_04_022

1980 – Site north east

1980 – Site west

1980 – Site south

Historic Aerial Photos: DUBBO

date	13/12/1995 0:00
sheetnum	8633
sheetname	DUBBO
film	4290
run	R4
frame	72
key_diagra	86331995
scale	1:50000
ahdz	8350
camera	RC30
filmscan	IRS
year	1994
image_name	4290_04_072

1995 – Site north east

1995 – Site west

1995 – Site south


Dubbo Regional Airport
A39
A32
Macquarie River
Image © 2023 Maxar Technologies
874 m
1985
Imagery Date: 4/27/2006 32°14'18.52" S 148°34'35.50" E elev 312 m eye alt 4
Google

2006


Blizzard field Rd
Narromine Rd
Salter Dr
Spears Dr
Spears Dr
Linda Dr
Catherine Dr
Yaruga St
Yulong St
Spence St
Wilkins St
Jannali Rd
692 m
Thompson St
A32
A39
A39
Brisbane St
Darling St
Evans St
Brisbane St
MacLeay St
Macquarie River
Image © 2023 Maxar Technologies
1985
Imagery Date: 2/17/2016
32°13'02.42" S 148°35'51.47" E elev

2016


Blizzard Field Rd
Salter Dr
Spears Dr
Spears Dr
Linda Dr
Catherine Dr
Yaruga St
Yulong St
Spence St
Wilkins St
692 m
Jannali Rd
A32
Thompson St
Macquarie River
MacLeay St
Brisbane St
Brisbane St
Darling St
Evans St
1985
Imagery Date: 11/28/2022 32°13'04.02" S 148°35'44.3

2022

Appendix 7: Staff Contributions

The following staff were involved in the compilation of this report:

Name	Relevant Qualifications	Title/Experience	Contribution
Christopher Botfield BAAS No. 18023	*B Env Management CSU 1999*	Principal Ecologist	BAM Calculator Report review
Renae Hill BAAS No. 23003	*Grad. Dip. Env Management CSU 2022* *BAgr UNE 2006* *BSc(Hons) UoN 1994*	Project Manager	Flora surveys Fauna surveys PCT allocation BAM Calculator Report writing
Cameron Rowling-Scott	*B App Sci (CSU 2004)* *Grad. Dip. Science (Biodiversity 2020).*	Project Officer	Flora surveys Fauna surveys Report writing
Kim Bennett	*B Env Sc (Hons)* *B A Computer Sc Legal Studies*	GIS Specialist	GIS data management
Tony Moody	*B App Sci, CSU, 1996*	Project Officer	Flora surveys Fauna surveys Report review
Liz Mansfield			Report review

Tasks performed may include:

- Report preparation
- Document review
- BAM-C data entry and analysis
- Figure preparation
- BAM plot surveys
- Targeted threatened flora surveys
- Targeted threatened fauna surveys