Dubbo Regional Rail Maintenance Facility

Ecological Assessment

Dubbo Regional Local Government Area, NSW

Prepared for Jacobs, on behalf of Transport for NSW

July 2018

OzArk Environmental & Heritage Management Pty Limited

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EXECUTIVE SUMMARY

Transport for NSW (TfNSW, the proponent) proposes to construct a Regional Rail maintenance facility in Dubbo, NSW (the Proposal). The proponent is a public authority under the NSW *Transport Administration Act 1988*, with the principal function of developing major transport infrastructure projects. The Proposal Site is located in the centre of Dubbo within the existing rail precinct along the Main Western Line at Lot 1 DP1185204, Lot 1 DP1006357 Lot 100 DP710487, and Lots 1-5 DP1006357. Jacobs has been engaged by TfNSW to prepare a Review of Environmental Factors (REF) for the Proposal under Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). OzArk Environmental & Heritage Management Pty Ltd (OzArk) has been engaged to complete the ecological assessment for the Proposal and to inform the REF.

The objectives of the ecological assessment are as follows:

- Assess impacts of the Proposal on native vegetation at the site and any identified or potential threatened species, populations and ecological communities and their habitat.
- Identify the requirements relevant to the Proposal under the following legislation:
    - Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
    - NSW *Biodiversity Conservation Act 2016* (BC Act).
    - NSW *Fisheries Management Act 1994* (FM Act).
    - NSW *Biosecurity Act 2015*.
- Provide recommendations to avoid, minimise and/or mitigate impacts of the Proposal on biodiversity.

The main components of the study comprise a desktop study and database searches, field survey, followed by habitat and data review for purposes of the impact assessment. A range of databases and information sources were reviewed to identify the predicted flora and fauna and vegetation communities at the site and to inform the field assessment and targeted searches for threatened species and ecological communities. The field assessment focussed on identifying native vegetation, exotic vegetation (weeds), and targeted searches for threatened species. Due to the time limitations on site, formalised plots were not completed, however the site was fully traversed and vegetation communities identified and mapped for purposes of the impact assessment.

The study area is situated in the Talbragar Valley subregion of the Brigalow Belt South Interim Biogeographic Regionalisation of Australia. The Proposal Site is situated close to the historic Wingewarra Swamp in the Victoria Park precinct, which once supported ephemeral woodland wetland. The swamp was cleared in the late 1800s as part of the development of Dubbo. The Proposal Site has been substantially disturbed over a long period, however large areas within the site retain the original soil profile and remnant native vegetation.

The Proposal Site is surrounded by the urban areas of Dubbo, and has very limited habitat connectivity to other areas of native vegetation.

An initial field assessment was completed in spring 2017 (Wednesday 11 October 2017 and Tuesday 13 November 2017) followed by a more-detailed assessment in late summer 2018 (Tuesday 13 February 2018). The combined field surveys identified a total of 62 flora species at the site during the two survey efforts, comprising 38 native species and 24 exotic species (**Appendix B**).

Direct impacts to native vegetation across the site are summarised below:

- **Plant Community Type (PCT) 796 *Derived grassland of the NSW south western slopes*.** The Proposal would affect approximately 9.2 hectares of derived native grassland. At the Proposal Site, the derived grassland is mostly likely a derived form of Fuzzy Box woodland, where trees have been cleared in the past.
- **PCT 201 *Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion*.** Based on the current design, the Proposal would avoid direct impacts to 1.88 hectares of PCT 201 which is part of the *Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions* endangered ecological community (EEC).

A review of habitat requirements and database records for threatened species, populations and ecological communities predicted to occur in the study area, in conjunction with the findings of the field survey, has concluded the following threatened entities could be impacted by the Proposal:

- *Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions* EEC.
- Pine Donkey Orchid (*Diuris tricolor*).
- Little Pied Bat (*Chalinolobus picatus*), Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) and Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*).

The following conclusions and recommendations to avoid, minimise and mitigate the potential impacts of the Proposal to biodiversity have been provided:

- PCT 201 community is associated with the *Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions* EEC. Given the vegetation classification as Fuzzy Box woodland and the lack of evidence of other overstorey trees, the native vegetation on the site is not considered to be part of any other endangered ecological community (EEC).
- The Proposal would remove 9.2 hectares of the derived grassland, but would retain 1.88 hectares of the identified Fuzzy Box woodland EEC in the area where occasional overstorey trees are present. The impact to Fuzzy Box woodland EEC has been assessed on a regional and local scale and it is concluded that the Proposal would not cause a significant impact to this community due to the small extent of the disturbance and the proposed restoration of a representative proportion of the community on the Proposal Site.
- There are no expected significant impacts to threatened species or populations. This is concluded on the basis that suitable habitat for most of the predicted species is not

present on the site, or they were not detected on site during the targeted searches on the day of the field assessment.

- There is a residual risk that threatened bats could be using the man-made structures as roosting or breeding habitat. The field survey did not include targeted survey for three predicted bat species, which are known to occur in the region, and a precautionary approach is therefore required, which assumes they could be present. Mitigation measures are proposed to ensure animals are not present and/or injured during the removal of existing structures.

A vegetation management plan is recommended to guide the appropriate restoration of the retained Fuzzy Box woodland based on methods and actions that are consistent with Office of Environment and Heritage (OEH) guidelines.

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1. Introduction

Transport for NSW (TfNSW) (the proponent) proposes to construct a Regional Rail maintenance facility (the Proposal) in Dubbo, NSW. The proponent is a public authority under the NSW *Transport Administration Act 1988*, with the principal function of developing major transport infrastructure projects. Jacobs has been engaged by TfNSW to prepare a Review of Environmental Factors (REF) for the Proposal. The REF is required to consider the significance of potential environmental and community impacts of the Proposal, as required for proposals being assessed under Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

OzArk Environmental & Heritage Management Pty Ltd (OzArk) was commissioned by Jacobs to complete the ecological assessment for the Proposal. The ecological assessment is one of a number of specialist studies being prepared to support the REF and project planning.

1.1 Objectives

The objectives of the ecological assessment are as follows:

- Assess impacts of the Proposal on native vegetation at the site and any identified or potential threatened species, populations and ecological communities and their habitat.
- Identify the requirements relevant to the Proposal under the following legislation:
    - Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
    - NSW *Biodiversity Conservation Act 2016* (BC Act).
    - NSW *Fisheries Management Act 1994* (FM Act).
    - NSW *Biosecurity Act 2015*.
- Provide recommendations to avoid, minimise and/or mitigate impacts of the Proposal on biodiversity.

1.2 The Proposal

The Proposal facility would comprise six tracks each capable of stabling 200 metre trains, with three of these roads being partly covered by the maintenance building. The Proposal Site would cover an area of approximately 220,000 square metres and would be bounded by a perimeter fence.

The key features of the proposed maintenance facility are shown in **Figure 1-1** and would comprise the following:

- Maintenance facility elements:
    - Fleet maintenance building would include three tracks to undertake maintenance activities partly housed within a single covered enclosure. The size of the building would be approximately 220 metres by 30 metres.
    - Wheel lathe– a separate building allowing for train wheels to be periodically machined using an underfloor wheel lathe.

    - Train wash– an enclosed structure comprising automated wash equipment for train sets with nearby waste water treatment plant.
- Administration building – a building comprising office facilities, kitchen, dining area and amenities.
- Security building.
- Storage area, loading dock and fuel delivery area – used for the delivery and storage of plant, equipment and diesel fuel.
- Rail infrastructure works:
    - Realignment of the Main Western Line through the site
    - Six maintenance rail tracks (three tracks within the maintenance facility building and three external).
    - A connection to the Main Western Line on the western side of the site.
    - Decanting and provisioning infrastructure.
- Road vehicle infrastructure:
    - Access roads throughout the site.
    - Staff car park.
- Power supply including a substation, and utility adjustments.
- Relocated detention basins.
- Earthworks.

Subject to planning approval, construction is expected to commence in 2019 and take around 30 months to complete.

1.3 Site identification

The Proposal is located within the Dubbo Regional Local Government Area in Central West NSW (**Figure 1-2**).

The Proposal Site covers the entirety of Lot 1 DP1185204, Lot 100 DP1006357, Lot 100 DP710487, Lots 1-5 DP1006357 and part of the railway corridor of the Main Western Line at Dubbo (**Figure 1-3, Figure 1-4**).

The ‘study area’ is the surrounding landscape which has been used to contextualise this study including as part of the impact assessment.

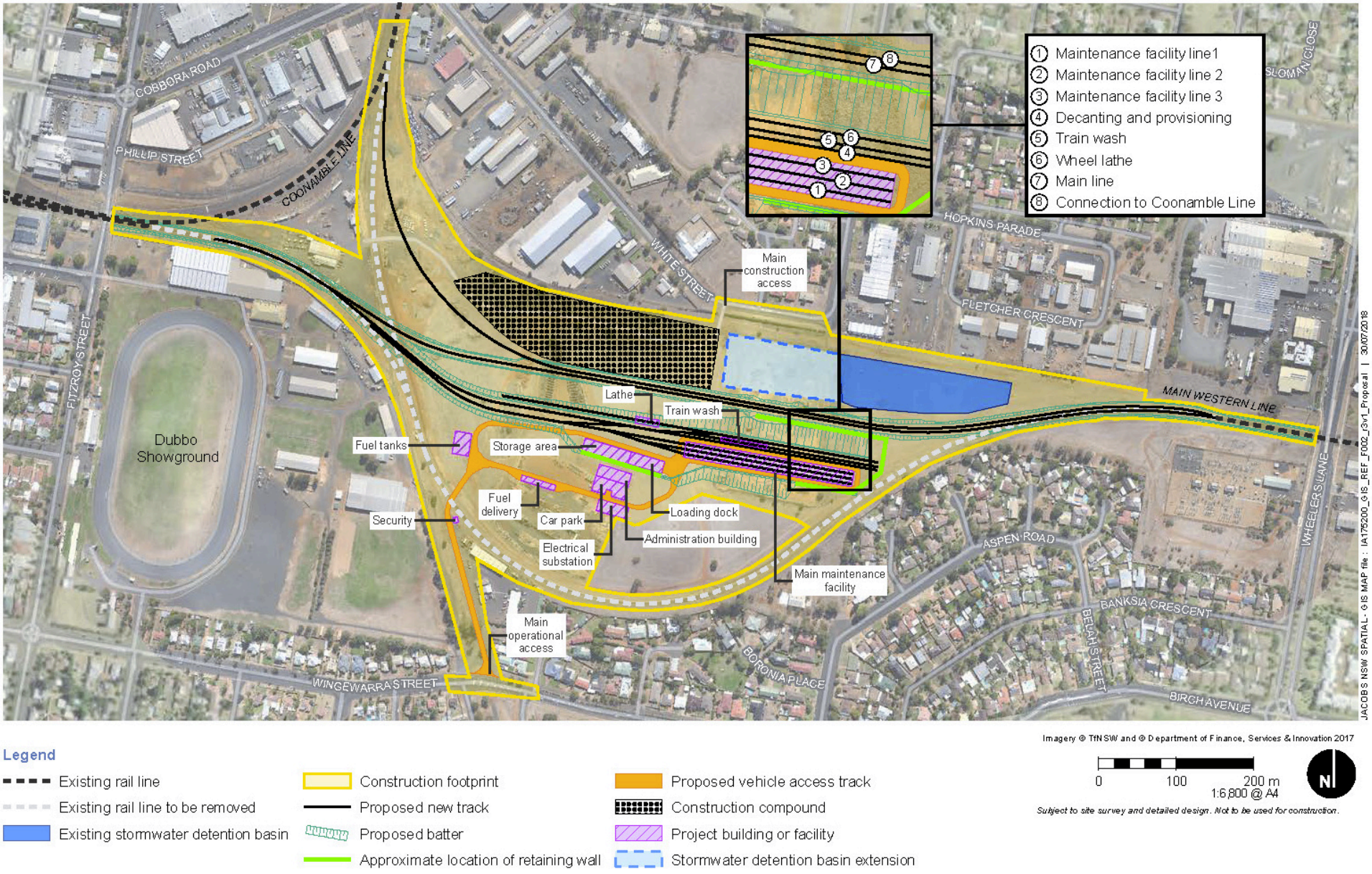

Figure 1-1: The Proposal

Figure 1-2: Location of the Dubbo Regional Local Government Area

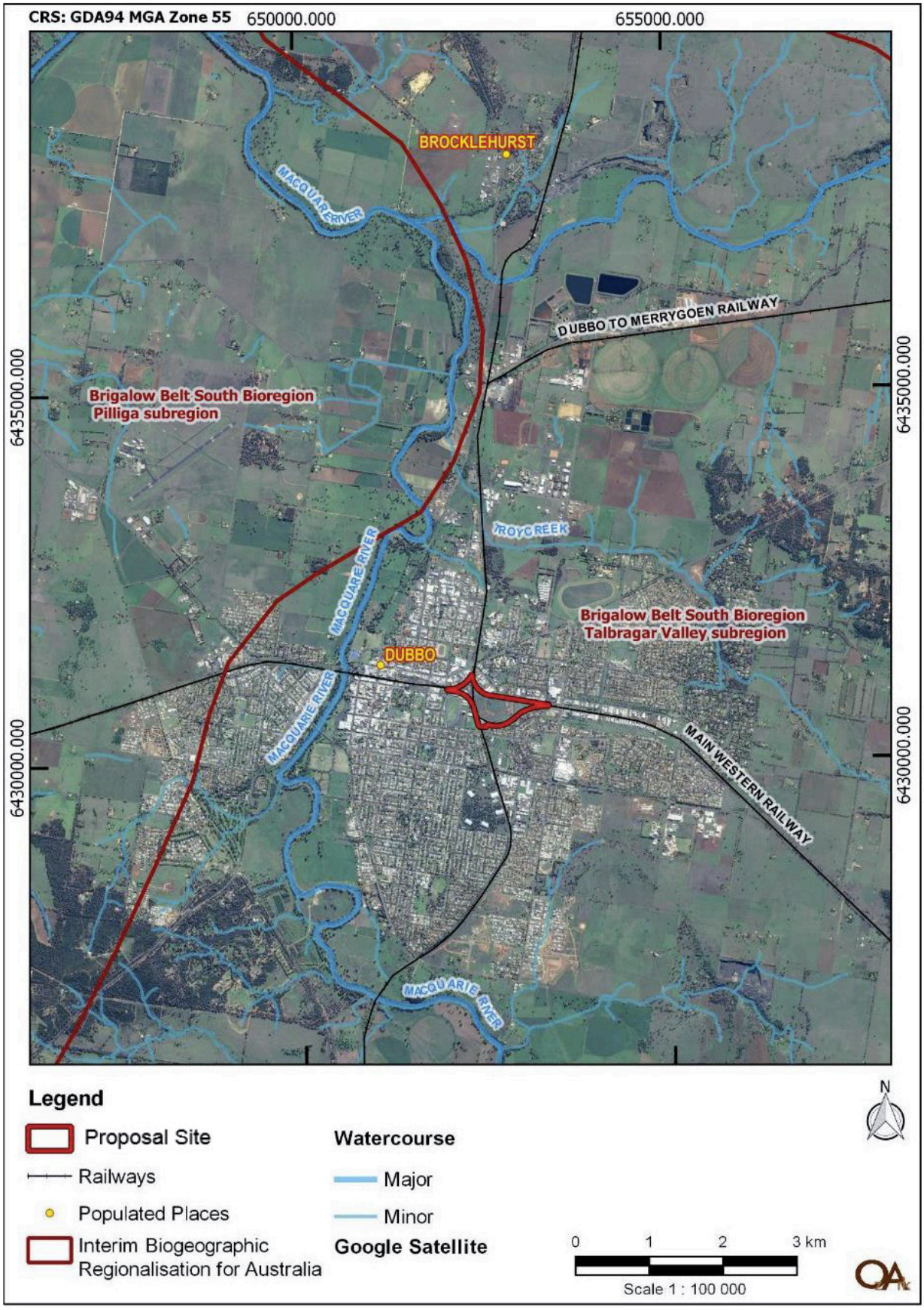

Figure 1-3: Regional context of the study area

2. Methods

The ecological assessment was carried out in three stages:

1. Desktop searches and review of ecological databases and information to identify threatened species, populations or ecological communities listed in the NSW *Biodiversity Conservation Act 2016*, *Fisheries Management Act 1994* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* that have the potential to occur in the study area.
2. Field survey of the subject site, to collate species lists for the purposes of identifying the vegetation communities present, and targeting predicted threatened species and ecological communities. Where a threatened species or community or habitat feature is identified, document the nature and extent of the protected matter and describe its 'viable local population' or occurrence.
3. Preparation of a written ecological assessment report that describes the impacts of the proposed activity on native vegetation and threatened species, populations and ecological communities, and provides recommendations to avoid, minimise and mitigate these impact, where possible.

2.1 Personnel

OzArk operates under NSW Scientific Research License 101908, and NSW Department of Primary Industries (DPI) Accreditation of a corporation as an animal research establishment Ref No. AW2017/012.

Field assessment and reporting components were completed by Senior Ecologist Kate Hammill, Ecologist Rowan Murphy and Environmental Scientist Nikki Allen. Key details of personnel are provided in **Table 2-1**.

Table 2-1: Summary of OzArk personnel qualifications

Name	Position	CV Details
Dr Kate Hammill	Senior Ecologist	• Biodiversity Assessment Method (BAM) accredited assessor, (Certification No.: BAAS18022; Valid from: 9/02/2018 to 8/02/2020). • Bushfire Planning and Design (BPAD) NSW Level 2 Accredited Practitioner. • Practicing member of the NSW Ecological Consulting Association. • PhD Revegetation of landfill sites (University of Sydney). • Bachelor of Science majoring in Botany / Zoology / Microbiology (University of Sydney). • Graduate Diploma in Bushfire Protection (University of Western Sydney).
Rowan Murphy	Ecologist	• Bachelor of Environmental Science (University of New England). • Bachelor of Laws (University of New England). • Practicing member of the NSW Ecological Consulting Association. • Practicing member of the Environment Institute of Australia and New Zealand (EIANZ). • National Railtrack Safety Induction (ARTC). • WHS White Card: 1652972. • Apply First Aid (Parasol) ID: 6007220.

Name	Position	CV Details
Nikki Allen	Environmental Scientist	• BSc. Major in Chemistry and Geography (University of New South Wales at the Australian Defence Force Academy). • Grad. Dip. In Environmental Health (Queensland University of Technology). • Apply First Aid (ABC First Aid) ID: 34795. • CPCCOHS1001A Work Safely in the Construction Industry (White Card). • Roads and Maritime Worker on Foot Training.

2.2 Information sources

Preliminary assessments drew on local experience, previous reporting and information held on government databases and archives. Data was used to assist in identifying distributions, suitable habitats and known records of threatened species to increase the effectiveness of field investigations. Information sources reviewed included the following.

- Preliminary site plans provided by TfNSW.
- Preliminary Ecological Assessment, completed by OzArk, November 2017.
- NSW Government online aerial imagery (www.maps.six.nsw.gov.au).
- NSW Government Biodiversity Values Map which identifies land with high biodiversity value, as defined by the Biodiversity Conservation Regulation 2017 (https://www.lmbc.nsw.gov.au).
- Flora and fauna records and profiles contained in the NSW Threatened Species Database, EPBC Protected Matters Search Tool and DPI threatened fish distribution maps.
- BioNet (www.bionet.nsw.gov.au) Wildlife Atlas and Plant Community Type (VIS) databases.
- Flora of NSW (Harden 1991-2002) and Flora NSW Online (www.plantnet.rbgsyd.nsw.gov.au).

2.3 Desktop review

The information sources and databases listed above were reviewed to identify the predicted flora and fauna values at the site and to inform the field assessment and targeted searches for threatened species and ecological communities. Databases were searched on the basis of geographic location and vegetation (habitat) type, as relevant to the Proposal Site.

Database searches were undertaken before the field assessment to determine the predicted species and also those previously recorded in the vicinity of the Proposal. The results of these searches led to the identification of key species for field survey effort and targeted searches. Results of the database searches are provided in **Appendix A**.

2.4 Field survey effort

The objectives of the field assessment were to:

- Identify native species and vegetation communities present.
- Describe the quality and value of the vegetation and the flora and fauna habitat at the Proposal Site.
- Complete targeted species and habitat searches, to determine if threatened species, populations or ecological communities listed are/may be present and would be likely to be affected by the development.

An initial field assessment was completed in spring 2017, comprising two site inspections on Wednesday 11 October 2017 and Tuesday 13 November 2017. A more-detailed assessment was completed subsequently in late summer 2018, on Tuesday 13 February 2018.

Weather conditions during each survey effort were fine and mild to warm. The spring 2017 survey effort occurred during a period of active growth and flowering of many exotic annual species, and also during the flowering period for some of the predicted threatened flora species. The summer 2018 survey occurred four months after the initial assessment, following an extremely dry summer. Because of these conditions, weeds and annuals had died back and native perennial cover was more prominent. Seasonal differences influenced the relative abundance of exotic and native species present detected on site. The summer 2018 survey effort was undertaken for the purposes of identifying the more representative suite of native species present, and thereby the conservation significance of the native grassy woodland and derived grassland vegetation communities present.

The field assessment focussed on identifying areas of predominantly native vegetation versus areas dominated by exotic vegetation (weeds), to determine the value and conservation significance of the native vegetation at the site. Due to the time limitations on site, formalised plots were not completed, however the site was fully traversed, vegetation communities identified and mapped, and diagnostic species identified for purposes of the impact assessment.

Special consideration was given to locating rare or threatened plants identified in database searches as having potential to occur. The conservation significance of flora was determined by referencing the schedules associated with the BC Act and the EPBC Act. The site was searched by pedestrian traverses across areas with a higher proportion of native species, targeting predicted threatened flora species. The principles and methods outlined in the OEH *Guide to Surveying Threatened Plants* (2016) were followed as far as practical.

The limitations of the field survey are acknowledged in Section 2.8. The pedestrian traverses completed during the spring 2017 and the summer 2018 survey efforts are mapped in **Figure 2-1**.

Figure 2-1: Survey effort and photo points

2.5 Native vegetation

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

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

- Central West Lachlan State Vegetation Map VIS ID 4468, which provides predictive mapping of PCTs in and around the Proposal Site. This mapping is indicative only, in terms of the extent of native vegetation mapped and the PCT identification, and is not necessarily accurate at a fine scale for the purposes of the current study.
- Ecological knowledge about locally-occurring vegetation types and landscape, soil and topographic patterns, including transitions from one community to another and potential for intergrades between plant communities.
- Field assessment to confirm the flora species present, vegetation structure, landscape position and soil type at a site and the extent and condition of native vegetation.
- The BioNet Vegetation Classification database was used to identify the candidate vegetation communities likely to be present based on the site conditions (flora species present, vegetation structure, bioregion, and landscape position and soil type) and the relevant published PCT descriptions.

Identification was difficult for some species due to the lack of flowering material and the dry conditions leading into the February 2018 survey. Despite these conditions, an adequate representative list of native species was collated and used to identify the PCTs and EECs present.

If any of the PCTs were identified as having potential to be part of a EEC, the relevant identification guidelines (NSW Scientific Committee listing criteria and Commonwealth identification guides) were consulted to determine the status of the vegetation community present on the site. These guidelines provide the identification criteria used to positively identify the community as being part of the EEC. The criteria include location, species present, overstorey species, weed cover, number and type of native species including whether certain ‘important’ native species are present. The EEC decision process is documented in the results section of this report.

Plant identification followed nomenclature in on the Royal Botanic Gardens PlantNet online database (Royal Botantic Gardens and Domain Trust, 2018).

2.6 Threatened species

The Proposal Site was assessed for its potential to provide habitat for threatened fauna known or predicted to occur in the study area. Habitat requirements of species were reviewed using a combination of ecological knowledge and the online threatened species profiles published by the NSW Office of Environment and Heritage (OEH), Department of Primary Industries (DPI)

Fisheries, and the Australian Government Department of Environment and Energy (DoEE). Features such as rocky outcrops, overhangs and caves, waterbodies, dense understorey vegetation and habitat trees were recorded, if present.

Any evidence of fauna i.e. scats, tracks, calls, fur, feathers, sloughed skins etc. was recorded, if observed. Attention was given to identifying tree hollows with signs of breeding activity or the presence of nests which may indicate use of the site by threatened fauna species. Opportunistic sightings of birds were recorded during the field assessment.

Each mature tree in the subject site was inspected for hollows, other shelter value (such as decorticating bark) and forage value such as flowering and mistletoe. Any evidence of use by fauna, such as nests or droppings was also recorded. Where a tree with hollows was observed it was given a score reflecting its habitat value in accordance with **Table 2-2**.

Table 2-2: Habitat value classification for trees

Habitat value	Description
HV3	High habitat value and highest level of constraint. The tree is a threatened species, provides known breeding/roosting habitat for a threatened species or possesses unique or rare habitat values within the landscape (such as one or more large hollows suitable for forest owls).
HV2	Moderate habitat value and medium level of constraint. The tree could provide feeding, breeding or roosting habitat for a threatened species, and possesses habitat values in the form of medium-sized hollows, large volumes of decorating bark or known feed resources, that may be limited in the local environment.
HV1	Low habitat value and low level of constraint. The tree is unlikely to provide breeding or roosting sites for threatened species and it possesses common habitat elements for the environment, is lacking in hollows and is not an identified feed tree species.

2.7 Habitat assessment

The results of the desktop review and the field assessment were collated and reviewed in the context of local ecological knowledge to determine the likelihood of occurrence of threatened species and ecological communities, and potential impacts of the Proposal (**Appendix D**). For instance, some threatened species may be predicted to occur locally but, on assessment of the site, key habitat elements or conditions are not present, in which case the species is assessed as not being present or impacted.

The likelihood of occurrence of threatened species, populations or ecological communities was categorised as follows:

- ‘Yes’ – the species was observed or has been previously recorded on the site.
- ‘Likely’ – a medium to high probability that a species uses the site, based on nearby records and suitable habitat being present.
- ‘Potential’ – suitable habitat for a species occurs on the site, but the species has not been observed or previously recorded at the site.
- ‘Unlikely’ – a very low likelihood that the species uses the site, based on lack of the preferred type and size of habitat.
- ‘No’ – habitat on-site and in the vicinity is unsuitable for the species.

The species confirmed to be present, or considered likely or with potential to be present at the site, were then considered as to whether the extent and type of development would be likely to impact on them.

Tests of significance were then completed for these species and ecological communities in accordance with the BC Act and/or the assessment of significance under the EPBC Act, and the relevant guidelines for these assessments.

2.8 Limitations

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

- The preliminary survey was completed during short site inspections in spring of 2017. The time available on site was limited to two short visits due to the requirement for a site safety officer to be present and site access restrictions.
- The detailed assessment and targeted searches for threatened flora species were completed in late summer 2018, following an exceptionally hot, dry period. This timing was suitable to detect additional native species, after the weeds had died back and native grasses were in flower. Some ephemeral or cryptic flora species may have been dormant at the time, depending on the life history traits and growth patterns, and not able to be detected during this survey effort.
- Fauna trapping, targeted fauna survey and nocturnal spotlighting were not undertaken for the current assessment.
- Microbat ultrasonic call capture and analysis was not undertaken due to access limitations at the site.

To overcome some of these limitations, a ‘precautionary approach’ for species presence has been adopted where required. If suitable habitat for a particular threatened species is present on the site or known to occur in the study area, then the species is assumed to also be present and the impact assessment is completed on that basis. The above-mentioned constraints were also considered when preparing the recommendations of avoiding, minimising and mitigating potential impacts.

3. Results

3.1 Landscape context

3.1.1 Bioregion

The study area is situated in the Talbragar Valley subregion of the Brigalow Belt South bioregion as per the Interim Biogeographic Regionalisation of Australia (IBRA) (Thackway & Cresswell, 1995) (**Figure 1-2**). This bioregion consists of landscapes derived from both extensive basalt flows and quartz sandstones, and consequently has highly variable soils and vegetation depending on the local rock type or sediment source (NSW Office of Environment & Heritage, 2016).

3.1.2 Climate

Dubbo is located at the far south-eastern area of the Brigalow Belt South bioregion and falls within the temperate climate zone. Rainfall distribution across the year is relatively even between an average of 42.7 millimetres per month in September and 60.7 millimetres per month in January. Mean daily maximum temperatures range from 15.2 degrees Celsius in July to 33 degrees Celsius in January. Summer temperatures can regularly approach, or exceed, 40 degrees Celsius. Mean daily minimum temperatures range from 2.6 degrees Celsius in July to 17.9 degrees Celsius in January (Australian Bureau of Meteorology, 2017).

3.1.3 Topography, geology, soils

The study area has minimal topography relief with an elevation range from about 265 metres to 285 metres AHD (**Figure 3-1**). The Proposal Site has a gentle slope from east to west. The Proposal Site is situated near the junction of two Mitchell landscapes; Goonoo Slopes and the Macquarie Alluvial Plains (Mitchell, 2002) (**Figure 3-2**). These are characterised in general terms as follows:

- The Goonoo Slopes landscape is comprised of extensive undulating to stepped low hills with long slopes on sub-horizontal Triassic / Jurassic quartz sandstone, conglomerates, siltstone, shale and some coal. The general elevation of this landscape is from 300 metres to 500 metres AHD with local relief to 30 metres. It has an overall westerly slope and a poorly defined drainage network. Soils are typically stony yellow earths with sandstone outcrops on ridgelines to yellow harsh texture-contrast soils in shallow valleys (Mitchell, 2002, p. 13).
- The Macquarie Alluvial Plains landscape is comprised of Holocene fluvial sediments of backplain facies of the Marra Creek Formation associated with the Macquarie River main alluvial fan and distributary stream system. It has a local relief of one to three metres. Dark yellow-brown silty clay with patches of sand and carbonate nodules deposited from suspended sediments in floodwater, often with gilgai. Slightly elevated areas with red-brown texture-contrast soils.

The Proposal Site location is more aligned to the Macquarie Alluvial Plains landscape, being at lower elevation and on the gentle slope near an historic woodland swamp landscape with fine-grained brown soils.

The area of Dubbo lies predominantly on the Napperby geological formation, which was laid down during the Mesozoic era. The Napperby formation is comprised of siltstone thinly interbedded with fine to medium grained lithic quartz sandstone, minor conglomerate with burrows and bioturbation. Quaternary alluviums are associated with river and creek systems such as the Macquarie River in the area. These alluviums are comprised of alluvial silt, sand and clay, and have variable humic contents sporadic to cobble sized unconsolidated conglomerate lenses. Soils consist of mantled slopes (brown) which grade into the red soiled terrace (red) that extend close to the Macquarie River within this area.

3.1.4 Land use

Review of the past and present land use patterns within the study area demonstrates that the Proposal Site has undergone significant biophysical modification as a result of drainage of the Wingewarra Swamp, the construction and use of the Dubbo Railway Station and railway line, and current land uses for stockpiling and public works.

The Proposal Site is situated on the low slopes to the northeast of the pre-existing Wingewarra Swamp. This swamp was once an ephemeral woodland wetland, covering the broader area around Victoria Park precinct and the sporting ovals to the west. The swamp was cleared in the late 1800s as part of the development of Dubbo township. The site retains some of the original slope and soil profile, between the areas that are modified for the rail line, detention basin, materials stockpiles, and works compounds. It could therefore be expected to retain elements of the original vegetation that once occurred across the transition from the wetland to slopes woodlands.

The site is surrounded by the urban development of Dubbo. Any native vegetation and fauna habitat on the site is relatively isolated by the surrounding urban development, and has limited connectivity to other areas of potential habitat.

The land is currently designated to the following zones under the *Dubbo Local Environmental Plan 2011* (**Figure 3-3**):

- Light Industrial
- Infrastructure
- Private Recreation
- Public Recreation

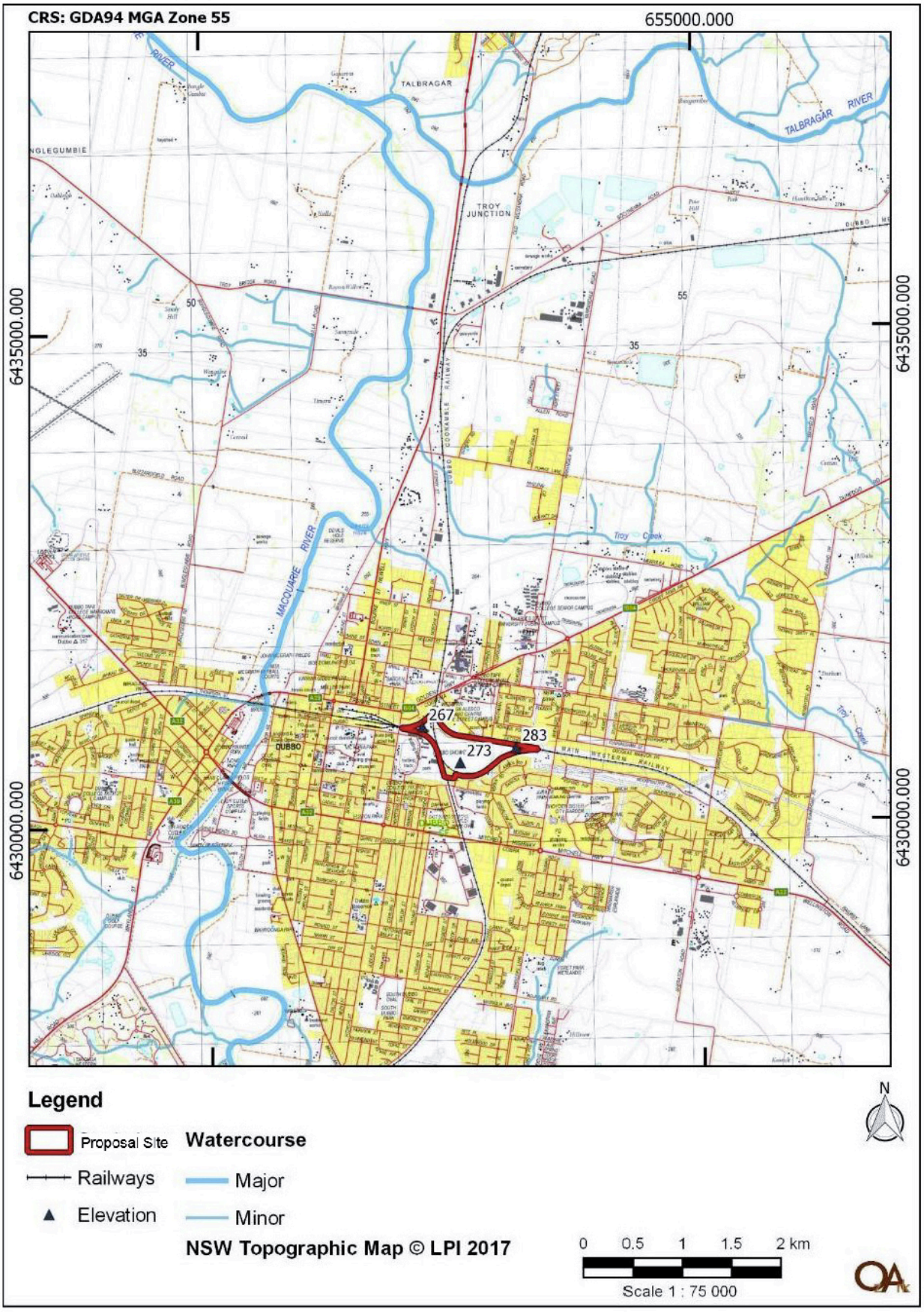

Figure 3-1: Topographic context of the study area

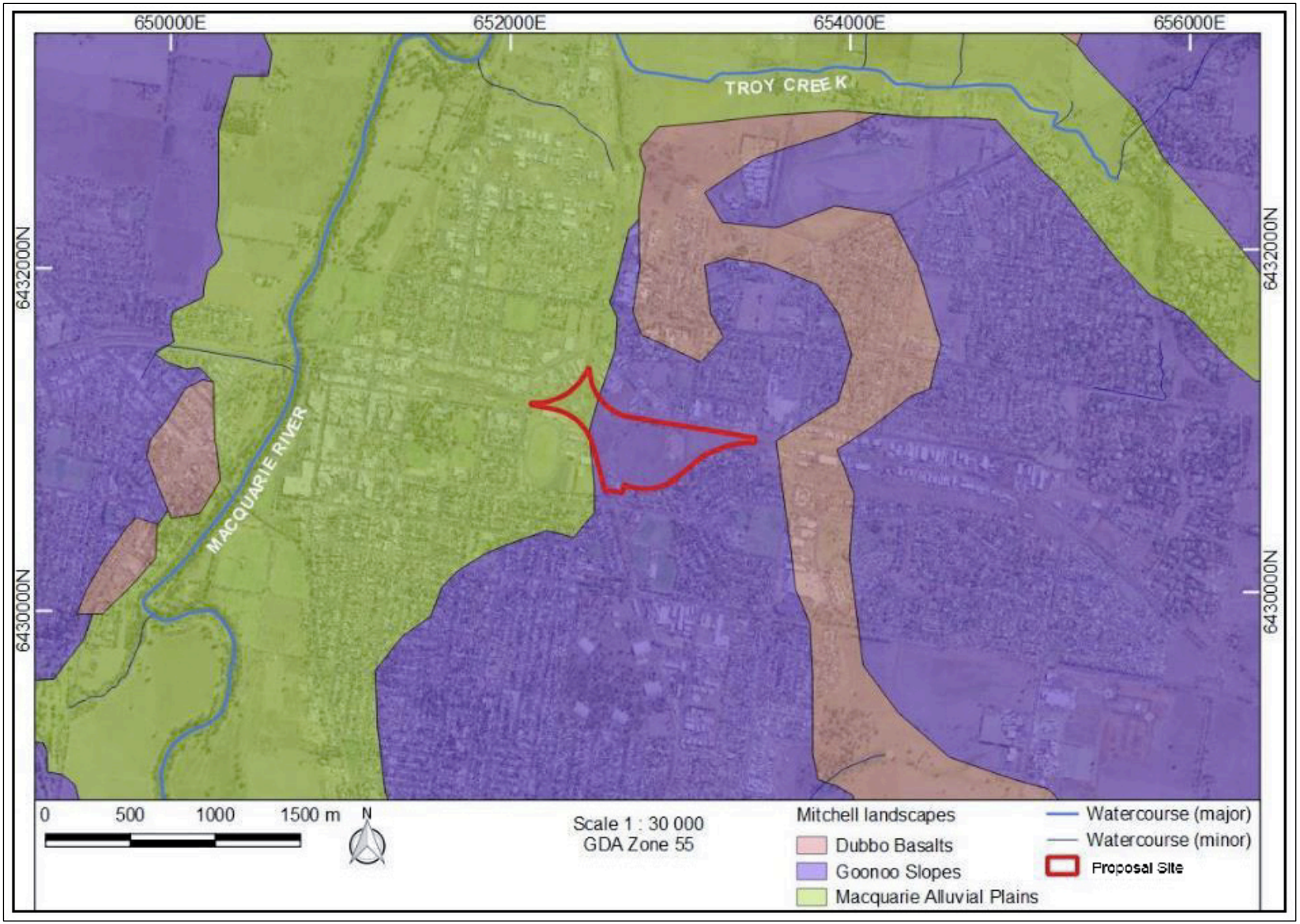

Figure 3-2: Mitchell landscapes of the study area

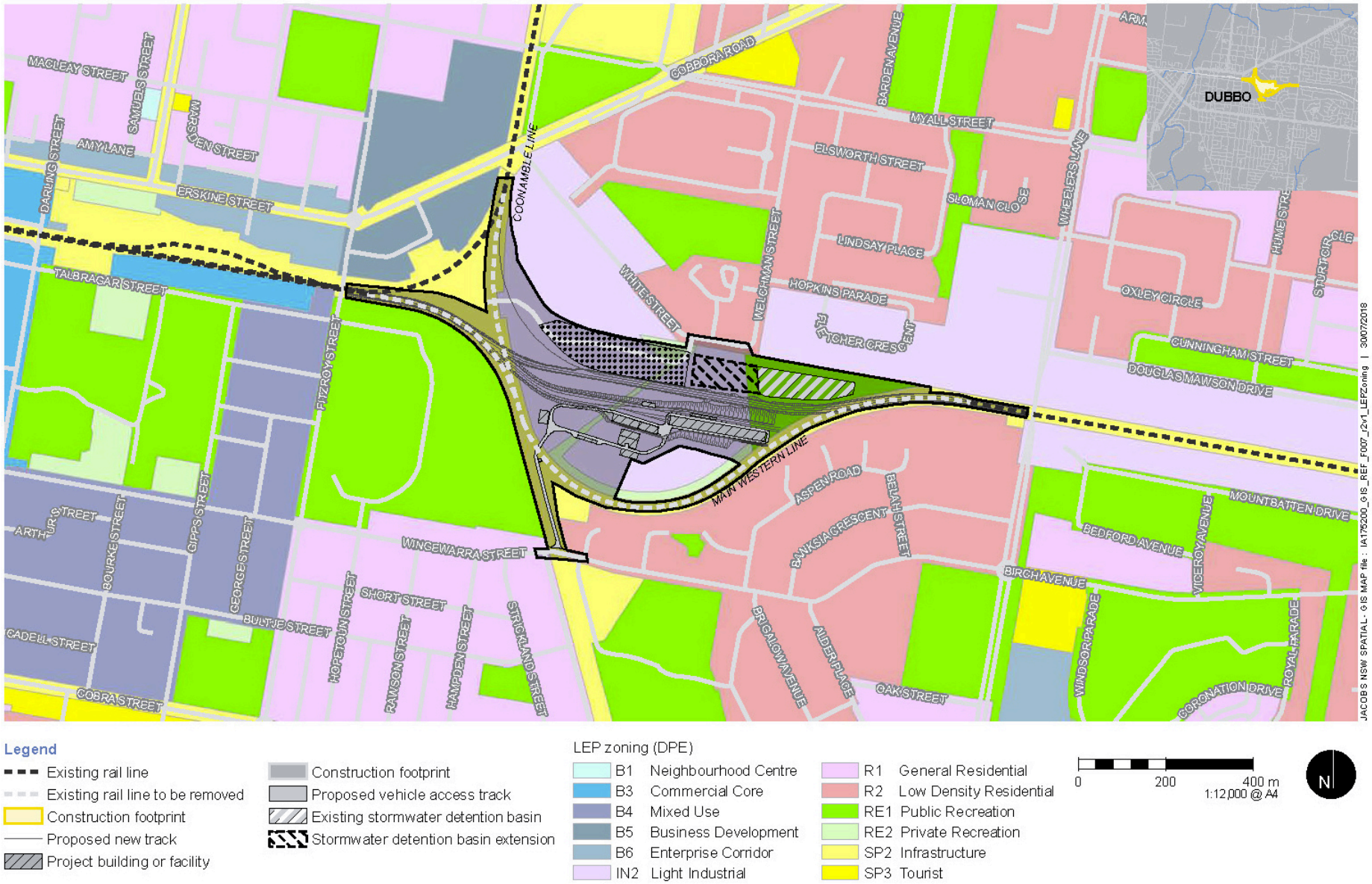

Figure 3-3: Land zones of the study area

3.1.5 Environmentally sensitive areas

The presence and/or proximity of environmentally sensitive areas relative to the Proposal Site is summarised in **Table 3-1**. No environmentally sensitive areas occur within the Proposal Site.

The major riparian corridor of the Macquarie River is approximately 2 kilometres to the west, separated from the site by the central business district of Dubbo. Much of the adjoining rural landscape of Dubbo, beyond the urban areas, is cleared or semi-cleared for agriculture. The nearest conservation reserves are situated 11 kilometres to the east (Beni State Conservation Area) and 13 kilometres to the southwest (Sappa Bulga National Park).

Table 3-1: Presence and/or proximity of environmentally sensitive areas.

Environmental Considerations	In the study area?
Land identified on the Biodiversity Values Map under the *NSW BC Act 2016*	No. Nearest land mapped on the Biodiversity Values Map is the Macquarie River corridor.
Area of Outstanding Biodiversity Value (AOBV) under the *NSW BC Act 2016*	No
Critical habitat nationally?	No
An area reserved or dedicated under the *National Parks and Wildlife Act 1974*?	No
Is the proposal located within land reserved or dedicated within the meaning of the *Crown Lands Act 1989* for preservation of other environmental protection purposes?	No
A World Heritage Area?	No
Environmental Protection Zones in environmental planning instruments?	No
Lands protected under SEPP Coastal Management?	No
Lands protected under SEPP 44 – Koala Protection?	No. Dubbo LGA is not identified in SEPP 44.
Lands protected under SEPP Sydney Drinking Water Catchment?	No
Land identified as wilderness under the *Wilderness Act 1987* or declared as wilderness under the *National Parks and Wildlife Act 1974*?	No
Aquatic reserves dedicated under the *Fisheries Management Act 1994*?	No
Wetland areas dedicated under the Ramsar Wetlands Convention?	No
Land subject to a conservation agreement under the *National Parks and Wildlife Act 1974*?	No
Land identified as State Forest under the *Forestry Act 1916*?	No
Acid sulphate area?	No
Protected riparian habitat?	No. Macquarie River is 1.8 km to the west, Talbragar River is 7 km to the north.
Map Key Fish Habitat?	No. The Proposal Site does not contain this aquatic habitat.

3.1.6 Watercourses

The study area is located approximately 1.8 kilometres east of the Macquarie River, the region's major waterway and 6 kilometres to the south of the Talbragar River at its confluence with the Macquarie (**Figure 3-1**). The study area is south of Troy Creek, a major tributary of the Macquarie River. An unnamed ephemeral tributary of Eulomogo Creek is located about two kilometres southeast of the study area. The land slopes gently to the west, towards the Macquarie River however there are no mapped watercourses or discernible drainage lines which would constitute aquatic habitat within the Proposal Site.

The site Proposal Site is located near the natural depression and the prior natural swamp of the Victoria Park precinct. Local historical sources refer to this area as Wingewarra Swamp. The current Proposal Site is situated on the gentle slopes to the northeast of Victoria Park. Remnant trees in this part of Dubbo comprise large Fuzzy Box (*Eucalyptus conica*) trees near No 2 and 3 Ovals and at Elston Park, which are indicative of the historical extent of the alluvial woodlands. The hydrology of the area has been impacted through the installation of ponds, concrete drainage channels and drains for purposes of urban development, including the landscaping of Victoria Park, sporting ovals and the railway infrastructure.

3.1.7 Groundwater dependant ecosystems

Groundwater plays an important ecological role in directly and indirectly supporting terrestrial and aquatic ecosystems. Groundwater sustains terrestrial and aquatic ecosystems by supporting vegetation and providing discharge to channels, lacustrine and palustrine wetlands, and both the estuarine and marine environment. Aquifer ecosystems are inherently groundwater dependent (QLD Department of Environment and Heritage Protection, 2017).

The Bureau of Meteorology (BoM) Atlas of Groundwater Dependant Ecosystems (Australian Government Bureau of Meteorology, 2017) does not identify any groundwater dependant ecosystems as being present on the Proposal Site (**Appendix A**). However, given the topographic location on a depression near the junction of two major rivers – the Macquarie and the Talbragar – and the history of the area being a swamp, the site is likely to have some degree of groundwater dependence.

3.2 Native vegetation

3.2.1 Flora species observed

The field survey identified a total of 62 flora species at the site during the two survey efforts, comprising 38 native species 24 exotic species (**Appendix B**). The native species include many groundcover plants typical of grassy woodland communities in the region. The relatively high number of weeds is an indication of past clearing of overstorey and a long history of disturbance.

The relative dominance of native versus exotic species varies considerably across the site and in response to seasonal conditions (refer to spring 2017 and summer 2018 observations; **Figure 3-4** and **Figure 3-5**, respectively). Some areas are predominantly native and other areas are predominantly weeds, the latter being in areas where there has been extensive soil disturbance. The detention basins contain a diverse assemblage of native groundcover species (**Figure 3-6**).

There are few trees across the site due to past clearing. The few remnant trees that are present provide an indication of the native woodland overstorey that would originally have been present in this location and adjoining areas prior to the development of Dubbo. The most notable native trees species comprise a single Fuzzy Box (*Eucalyptus conica*) tree near the southernmost point of the site (**Figure 3-7**) and scattered Kurrajong (*Brachychiton populneus*) trees (**Figure 3-8**). These species have been used to support the decisions on the identification of the PCT present, and the form of the derived native grassland community.

Some additional planted or naturalised native trees are also present. A number of White Cedar (*Melia azedarach*) trees occur at the site. This is a native dry rainforest species native to the Hunter and north coast of NSW and widely planted across inland NSW (**Figure 3-9**). A single specimen of Wallangarra White Gum (*Eucalyptus scoparia*) is likely a planted specimen in the northwest corner of the site. Wallangarra White Gum is an endangered species in its natural habitat near Tenterfield in northern NSW (Vulnerable at Commonwealth level); however it has also been widely planted, and is not considered to have conservation significance at this site. There is a line of planted eucalypts along the southeastern edge of the site behind the residential properties, likely for visual screening.

The shrub layer is largely absent across the site, except for a few isolated individuals of Cooba (*Acacia salicina*), Western Silver Wattle (*Acacia decora*), Green Wattle (*Acacia deanei*), and an introduced *Senna* sp. The ground cover contains a diversity of native species including grasses, including Kangaroo Grass (*Themeda triandra*), Red-leg Grass (*Bothriochloa macra*), Queensland Bluegrass (*Dichanthium sericeum*), Wallaby grasses, (*Rhytidosperma* spp.), Curly Windmill Grass (*Enteropogon acicularis*) among other grasses, and herbs/forbs including *Portulaca oleracea*, *Oxalis perennans*, *Rumex brownii*, *Sida corrugata*, *Wahlenbergia* spp., and abundant *Glycine tabacina*.

Figure 3-4: Example of typical groundcover with prominent weed component (Wild Oats and Variegated Thistle) observed during the spring 2017 survey effort

Figure 3-5: Example of groundcover with minimal weed cover and native species dominant (e.g. *Enteropogon acicularis*, *Bothriochloa sp.*) observed during the summer 2018 survey effort

Figure 3-6: Remnant native groundcover in the detention basin area (summer 2018) - the clumps in this view are native grasses. During wetter times this area would be dominated by weeds

Figure 3-7: The lone Fuzzy Box (Eucalyptus conica) tree near the southernmost point of the site – this specimen indicates the Fuzzy Box woodland EEC potential for overstorey regeneration

Figure 3-8: Scattered Kurrajong (*Brachychiton populneus*) trees are remnants of the original woodland overstorey, and are associated with the Fuzzy Box woodland EEC

Figure 3-9: White Cedar (*Melia azedarach*), a native dry rainforest species from the coastal hinterland are naturalised across NSW, occurs as scattered trees at the Proposal Site

3.2.2 Vegetation communities

A number of Plant Community Types (PCTs) have been previously mapped in the vicinity of the Proposal Site (**Figure 3-10**). Based on this mapping, in addition to local knowledge and previous studies in the Dubbo area, the following candidate PCT were considered as potentially occurring at this site:

- PCT 248: *Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW*.
- PCT 76: *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions.*
- PCT 70: *White Cypress Pine woodland on sandy loams in central NSW wheatbelt*.
- PCT 81: *Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion*.
- PCT 201: *Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion*.
- PCT 796: *Derived grassland of the NSW south western slopes*.

On review of the candidate PCT descriptions in the context of the site conditions and flora species (including the diagnostic tree species *Eucalyptus conica* and *Brachychiton populneus* found on site), the following vegetation communities were confirmed as being present on the site:

- PCT 201: *Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion*.
- PCT 796: *Derived grassland of the NSW south western slopes*.

These vegetation communities are outlined in **Appendix C** and the confirmed communities present at the site are described below. The extent of native vegetation at the site is summarised in **Table 3-2** and mapped in **Figure 3-11**.

Table 3-2: Type and extent of native vegetation at the Proposal Site

Location	PCT extent	LEP Zone	Lot Area
Lot 1 DP1185204 (John Holland Land)	• PCT 201 Fuzzy Box woodland - approximately 1.88 ha. • PCT 796 Derived grassland - approximately 6.84 ha.	Light Industrial	21.9 ha
Lot 100 DP710487 (Council Land)	• PCT 796 Derived grassland - approximately 2.36 ha.	Private Recreation	3.5 ha
Lots 1 to 5 DP1006357 (ARTC Land)	Negligible native vegetation present.	Infrastructure	2.17 ha
Railway corridor of the Main Western Line	Negligible native vegetation present.	Infrastructure	-

Figure 3-10: Previously mapped vegetation communities in the study area, based on Central West Lachlan VIS mapping ID 4468

Figure 3-11: Native vegetation communities present at the Proposal Site

Plant Community Type: PCT 201 *Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion*.

NSW Vegetation Class: Western Slopes Grassy Woodland.

Associated Threatened Ecological Communities: *Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions* (NSW Endangered)

Description: Tall woodland or open forest dominated by Fuzzy Box (*Eucalyptus conica*) often growing with Western Grey Box (*Eucalyptus microcarpa*), Yellow Box (*Eucalyptus melliodora*) or Kurrajong (*Brachychiton populneus* subsp. *populneus*). Shrubs are generally sparse and include *Acacia deanei* subsp. *deanei*, *Dodonaea viscosa* subsp. *cuneata*, *Geijera parviflora*, *Acacia implexa*, among other. Small shrubs include *Maireana enchylaenoides*, *Maireana microphylla* and *Sclerolaena muricata* var. *muricata*. The ground cover may be dense after rain but is usually mid-dense and may be dominated by weed species. Native forbs include *Calotis cuneifolia*, *Eremophila debilis*, *Sida corrugata*, *Einadia hastata*, *Dianella revoluta* var. *revoluta* and *Xerochrysum viscosa*. Native grasses include *Austrostipa scabra* subsp. *scabra*, *Chloris truncata*, *Elymus scaber* var. *scaber*, *Themeda australis* and *Austrodanthonia setacea*. The example of this community at the Proposal Site is shown in **Figures 3-13** and **3-14**.

Figure 3-12: Fuzzy Box (Eucalyptus conica) tree in the southern part of the site, February 2018. Note that this specimen has been cut in the past and has regrown with multiple stems

Figure 3-13: Example of typical groundcover near the Fuzzy Box tree, with native species prominent due to the dry conditions, February 2018

Plant Community Type: PCT 88 *Derived grassland of the NSW south western slopes.*

NSW Vegetation Class: Western Slopes Grassy Woodland (derived grassland).

Associated Threatened Ecological Communities: *White Box Yellow Box Blakely's Red Gum Woodland* (NSW Endangered, Commonwealth Critically Endangered)

Site description: Derived grassland communities resulting from the clearing of various grassy woodland and forest communities. Occurs on any landscape position formerly occupied by woodland and dry forest communities from which these grassland communities are derived. A typical example of this community at the Proposal Site is shown in **Figure 3-14**. In the absence of overstorey species to confirm the original woodland community type, this grassland is attributed to a derived form of PCT 201 which is confirmed on the southern part of the site with a Fuzzy Box (*Eucalyptus conica*) tree present.

Figure 3-14: Example of derived native grassland in the eastern part of the site. Native species in this view include Twining Glycine (*Glycine tabacina*), Queensland Bluegrass (*Dichanthium sericeum*), Curly Windmill Grass (*Enteropogon acicularis*), Red-leg Grass (*Bothriochloa macra*), Common Couch (*Cynodon dactylon*).

3.2.3 Weeds

Weeds are present across most of the site in varying density. These include numerous exotic grasses, thistles, verbena, wild sage, onion weed, among other weeds. Some areas are heavily dominated by Paspalum, which is a persistent and invasive grass that can rapidly outcompete native species. These areas have been excluded from the derived native grassland areas mapped in this study as they are considered to be weed dominated and in very low condition not consistent with identification as native vegetation. Control of the spread and proliferation of these weeds into any areas of native vegetation that are to be retained and/or rehabilitated would need to be a priority to minimise the environmental impacts of the Proposal. A list of the exotic species recorded at the site is provided in **Appendix B**.

3.3 Threatened biodiversity

3.3.1 Aquatic ecological communities

Endangered aquatic ecological communities are determined by the NSW Fisheries Scientific Committee and listed on under the FM Act as aquatic systems that have undergone a very large reduction in ecological function, geographic distribution or genetic diversity, and continue to be affected by a threatening process (NSW Department of Primary Industries, 2016).

The study area is in the catchment of the Macquarie River which forms part the endangered *Aquatic ecological community in the natural drainage system of the lowland catchment of the Darling River* (Darling River EEC). The community occurs in lowland riverine environments of the Darling River catchment and includes the meandering channels and a variety of aquatic habitats including deep channels and pools, wetlands, gravel beds and floodplains. This community is known to contain habitat for 21 native fish species and hundreds of native invertebrate species.

The Proposal Site does not contain any identified watercourses and is therefore not considered to be part of the Darling River EEC.

3.3.2 Endangered ecological communities

An ecological community is listed as threatened if there is a significant decline in its distribution or ecological function. This could include a change in community structure or composition, disruption of ecological processes, invasion by exotic species, or habitat degradation or fragmentation (NSW Office of Environment & Heritage, 2017).

A number of endangered ecological communities (EEC) are known or predicted to occur in the Brigalow Belt South, Talbragar Valley subregion (**Appendix A**, **Table 3-3**). The descriptions of these potential EECs were reviewed and a determination made as to their presence at the site based on the field survey observations and site location.

Table 3-3: Threatened ecological communities known or predicted to occur in the Brigalow Belt South, Talbragar Valley subregion.

Scientific Name	Common Name	NSW Status	Commonwealth Status	Likelihood
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Coolibah - Black Box Woodlands	Endangered Ecological Community	Endangered	No. The PProposal Site is not within the range of Coolibah - Black Box. These species do not occur in the immediate area of Dubbo, but further to the west and north.
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Fuzzy Box Woodland	Endangered Ecological Community		Yes. This community was confirmed to occur on the site, due to the presence of PCT 201 Fuzzy Box Woodland.
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Inland Grey Box Woodland	Endangered Ecological Community	Endangered	Unlikely. This community was not confirmed to occur on the site, due to the presence Fuzzy Box (*Eucalyptus conica*) and Kurrajong (*Brachychiton populneus*) trees.
Natural Grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland			Critically Endangered	No. The site was formerly woodland and therefore contains derived grassland, not a natural grassland community.
Weeping Myall Woodlands	Weeping Myall Woodlands	Endangered Ecological Community	Endangered	No. The PProposal Site does not contain Myall (*Acacia pendula*). This community typically occurs but further to the west and north.
White Box Yellow Box Blakely's Red Gum Woodland	Box Gum Woodland	Endangered Ecological Community	Critically Endangered	Unlikely. This community was not confirmed at the site, due to the presence Fuzzy Box (*Eucalyptus conica*) and Kurrajong (*Brachychiton populneus*) trees, which is a different EEC. The derived grassland was also attributed to a cleared form of PCT 201 Fuzzy Box Woodland.

Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions EEC

As described above, Fuzzy Box (*Eucalyptus conica*) and Kurrajong (*Brachychiton populneus*) trees occur at the Proposal Site and indicate that the vegetation comprises PCT 201 *Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion*. The grassland areas without overstorey trees are also attributed to a derived form of this PCT.

PCT 201 community is associated with the *Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions* EEC. The following identification criteria (NSW Department of Environment, Climate Change and Water, 2010) and responses in relation to the Proposal have been used to determine that the Fuzzy Box Woodland EEC is present at the site:

- **Is the site on the western slopes of NSW and in the South Western Slopes, Darling Riverine Plains or Brigalow Belt South Bioregion?** Yes, Brigalow Belt South Bioregion.
- **Is the site on a prior stream, abandoned channel, slight depression, undulating plain or flat with alluvial or colluvial soils?** Yes, the site is on a slight depression with drainage towards the historic Wingewarra Swamp.
- **Is the site a woodland dominated by fuzzy box with a sparse shrubby understorey and/or open forb and grassy groundcover?** Portions of the site have an open woodland structure with sparsely scattered remnant overstorey trees including a lone Fuzzy Box (*Eucalyptus conica*), with Kurrajong, and a grassy ground layer and few shrubs.
- **Does the site contain a combination of the diagnostic tree species marked in bold in Table 1 (see Appendix C)?** Yes, Fuzzy Box (*Eucalyptus conica*) and Kurrajong (*Brachychiton populneus*) are present.
- **Is the site situated on an upper floodplain above the level of frequent inundation and upslope from a River Red Gum community, or on a lower slope or valley flat with other tree species, such as inland grey box, yellow box, white box or Blakely's red gum?** The site location is generally consistent with the lower slope / valley flat criteria, well above the frequently inundated River Red Gum corridor along the Macquarie River, however presence of Grey Box, Yellow Box, White Box and/or Blakely's Red Gum is not able to be determined due to the surrounding vegetation being cleared and developed. The upslope portions of the site and adjoining areas to the east could once have contained these trees due to their being in the typical topographic position for these species.
- **Are there any plant species present at the site from those listed as characteristic in Table 1 (see Appendix C)?** Yes, Fuzzy Box (*Eucalyptus conica*), Kurrajong (*Brachychiton populneus*), Hickory Wattle (*Acacia implexa*), Deane's Wattle (*Acacia deanei*), Wingless Bluebush (*Maireana enchylaenoides*), Fuzzweed (*Vittadinia cuneata*), Slender dock (*Rumex brownii*), Corrugated Sida (*Sida corrugata*), Variable Glycine

(*Glycine tabacina*), Kangaroo Grass (*Themeda australis*), and Red-leg Grass (*Bothriochloa macra*) among other species.

The Fuzzy Box woodland EEC has been subject to an assessment of significance due to its confirmed occurrence at the site and potential direct and indirect impacts to the community (see **section 4**).

It is concluded that none of the other EECs listed above are present at the site, in preference to the site being assigned to the Fuzzy Box woodland EEC. This conclusion is made on the basis that either the diagnostic species are absent and/or the site does not represent suitable habitat for the community (**Table 3-3**). There is no confirmed evidence that the area previously contained tree species consistent with the Grey Box or Box Gum Woodland EECs.

3.3.3 Threatened flora

Review of the Threatened Species Profiles database has found 20 threatened flora species are predicted or known to occur in the Brigalow Belt South, Talbragar Valley subregion (**Appendix A**). Of these, five species have previously been recorded within 10 kilometres of the Proposal Site, namely Mauve Burr-daisy (*Calotis glandulosa*), Leafless Indigo (*Indigofera efoliata*), *Commersonia procumbens*, *Homoranthus darwinioides* and Pine Donkey Orchid (*Diuris tricolor*). These species are summarised in **Table 3-4**.

Table 3-4: Threatened species with potential to be impacted by the Proposal

Type	Scientific Name	Common Name	NSW Status	Commonwealth Status	BioNet records within 10km	Likelihood of occurrence
Orchid	*Diuris tricolor*	Pine Donkey Orchid	Vulnerable		7	**Possible** - The Pine Donkey Orchid grows in sclerophyll forest among grass, often with native Cypress Pine; it is found in sandy soils, either on flats or small rises.
Shrub	*Commersonia procumbens*		Vulnerable	Vulnerable	3	**Unlikely** - Grows in sandy sites, often along roadsides.
Shrub	*Homoranthus darwinioides*		Vulnerable	Vulnerable	1	**Unlikely** - Grows in gravely sandy soils, in vegetation with a shrubby understorey.
Shrub	*Indigofera efoliata*	Leafless Indigo	Endangered	Endangered	9	**Unlikely** - Very rare and possibly now extinct, known only from a few collections in the Dubbo area; records near the study area.

The field survey of the site did not detect any of the predicted threatened flora species at the site.

Based on the habitat requirements and field survey, the following conclusions are made for each of the most likely species outlined. All other threatened flora are not considered likely to occur (refer to **Appendix D**).

- Pine Donkey Orchid (*Diuris tricolor*) – Occurs in sporadic populations in remnant reserves within and around the urban area of Dubbo. Historic records from 1907 exist at

the southern edge of the site (**Figure 3-16**). The species grows in dry forest and woodland, often with native Cypress Pine; usually in sandy soils, either on flats or small rises. This species was not observed during either of the site assessment (spring 2017 and summer 2018), however it is possible that species could be present but have remained undetected. The survey was undertaken during an above-average dry year, when other local populations of the species exhibited poor rates of emergence (pers comm. L Auld DRC), and if present on the rail site, may have remained undetected due to being dormant. This species has been subject to an assessment of significance due to its potential occurrence at the site (see **section 4**).

- *Commersonia procumbens* – This species is known to occur in the local area, in sandy sites, including along disturbed roadsides. As a perennial ground cover plant, targeted site surveys in any season should be able to detect the species. The February 2018 survey effort included searches of the native ground layer vegetation for this species. All occurrences of the superficially similar species *Sida corrugata* where checked against the characteristics of *Commersonia procumbens*, and none of the plants were found to be the threatened species. If present, this species would most likely have been detected during the survey effort. It is concluded that the species is unlikely to be present on the site.
- *Homoranthus darwinioides* – This species is rare in the central tablelands and western slopes of NSW, occurring from Putty to the Dubbo district. Grows in various woodland habitats with shrubby understoreys, usually in gravely sandy soils. This habitat type is not present at the Proposal Site, which is on fine-grained soils with grassy vegetation community types. The species is a small perennial shrub and would be visible during most seasons in open areas. On the basis that suitable habitat is not present and that the survey effort would have detected this species it is concluded that this species is highly unlikely to be present at the site.
- Leafless Indigo (*Indigofera efoliata*) – this species could occur as it is known in the local area. The species forms an erect and multi-stemmed small shrub, with a woody rootstock. Older plants appear leafless. Historic records from 1903 exist near the western edge of the site within the grounds of the adjoining Dubbo Showground (**Figure 3-16**), however there are no recent records in the area. As the species is a perennial shrub it would be visible during most season surveys. Neither the spring 2017 nor the summer 2018 survey effort detected this species at the site. On this basis it is concluded that this species is unlikely to be present at the site.
- Mauve Burr-daisy (*Calotis glandulosa*) – One record exists north of the study area (**Figure 3-16**). This species is currently known to occur in montane and subalpine grasslands in the Australian Alps. The record near the study area is an old record from 1903 and possibly dubious, as no subsequent records of the species have been made locally. It is concluded that this species is unlikely to be present at the site.

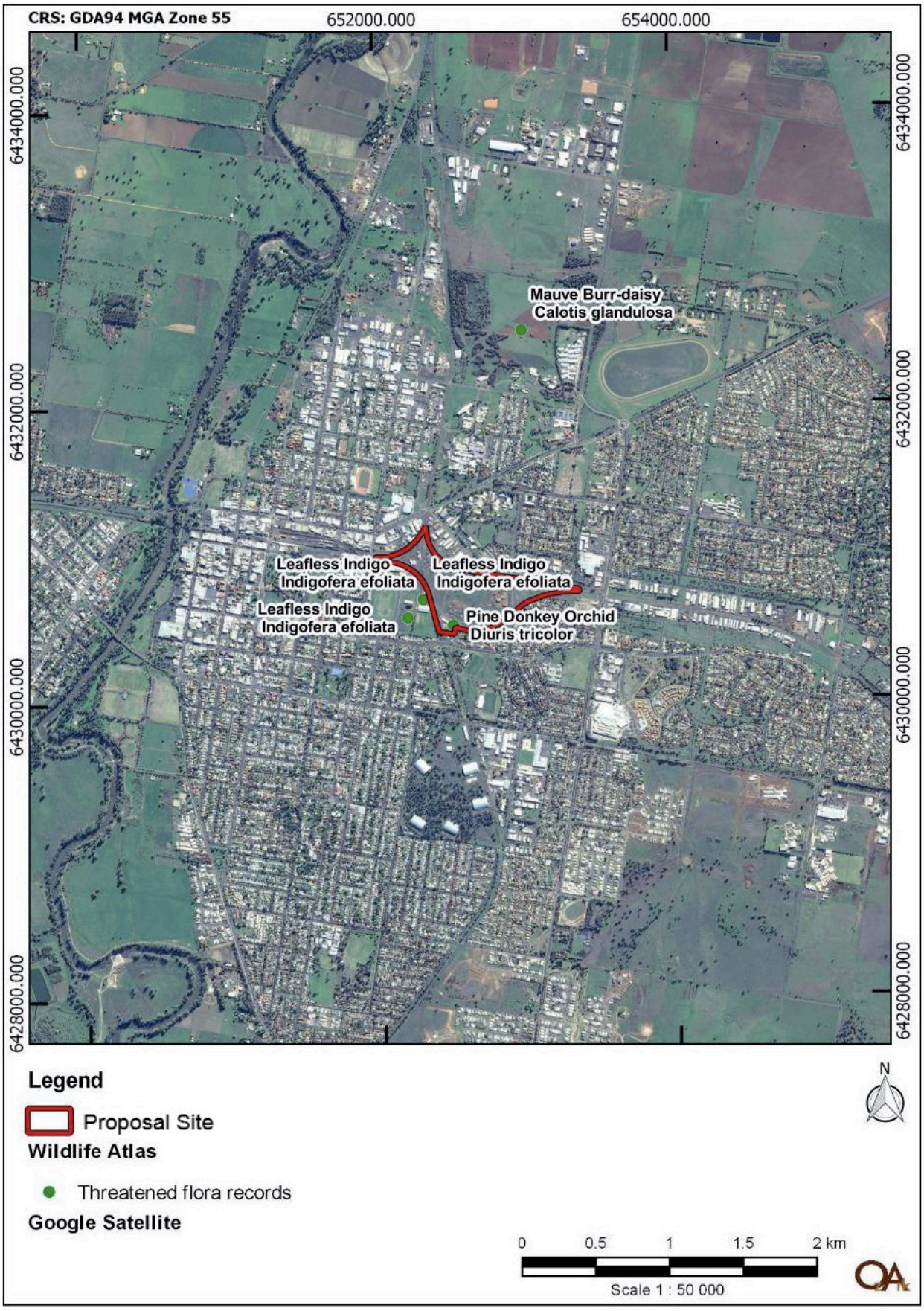

Figure 3-15: Threatened flora previously recorded in the vicinity of the study area

3.3.4 Threatened fauna

Review of the Threatened Species Profiles database has found 20 threatened fauna species are predicted or known to occur in the Brigalow Belt South, Talbragar Valley subregion (**Appendix A**). Based on the habitat requirements of each species and the type of habitat present at the site, it has been concluded that three species have potential to be present and could possibly be impacted by the Proposal, namely Little Pied Bat, Eastern Bentwing-bat and Yellow-bellied Sheathtail-bat (**Table 3-5**).

All other predicted threatened fauna species, including those previously recorded within 10 kilometres (**Figure 3-17**), were not considered likely to occur or be impacted by the Proposal due to the absence of suitable habitat in the immediate area.

Table 3-5: Threatened species with potential to be impacted by the Proposal

Class	Scientific Name	Common Name	NSW Status	Commonwealth Status	10km records	Likelihood
Bats	*Chalinolobus picatus*	Little Pied Bat	Vulnerable	Not listed	3	**Possible** - the foraging habitat identified for this species within the study area was highly degraded. Roosting habitat for this species (old buildings) was identified within the study area
Bats	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	Vulnerable	Not listed	3	**Possible** - the foraging habitat identified for this species within the study area was highly degraded. Roosting habitat for this species (old buildings) was identified within the study area
Bats	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	Vulnerable	Not listed	4	**Possible** - the foraging habitat identified for this species within the study area was highly degraded. Roosting habitat for this species (old buildings) was identified within the study area

No threatened fauna species or confirmed signs or traces of threatened fauna species were recorded during the field surveys.

The potential for the bats to be present at the site is due to the presence of manmade structures (existing buildings) that could provide roosting or breeding habitat for these species. Planning for mitigation measures as part of the commencement of works and removal of these structures is needed to reduce the risk of injury to these animals, and allow them to escape, if present. These measures should consider the timing of works outside of the breeding season for these species and pre-works detailed inspections on and under the structures to detect if the animals are, or could be, present.

The sparse and open nature of the grassland portions within the study area favour common generalist species capable of utilising open ground for foraging, and common disturbance-tolerant species which are ubiquitous in modified habitats. Many of the bird species recorded

in such habitats on-site utilise the open grassland areas for foraging but are reliant on native woodland and forest communities for roosting and nesting (e.g. raptors and parrots). The derived grasslands provide limited habitat and protection for animals under the critical weight range.

Several common birds were recorded:

- Australian Magpie (*Cracticus tibicen*)
- Common Starling (*Sturnus vulgaris*)
- Crested Pigeon (*Ocyphaps lophotes*)
- Galah (*Eolophus roseicapillus*)
- Magpie-lark (*Grallina cyanoleuca*)

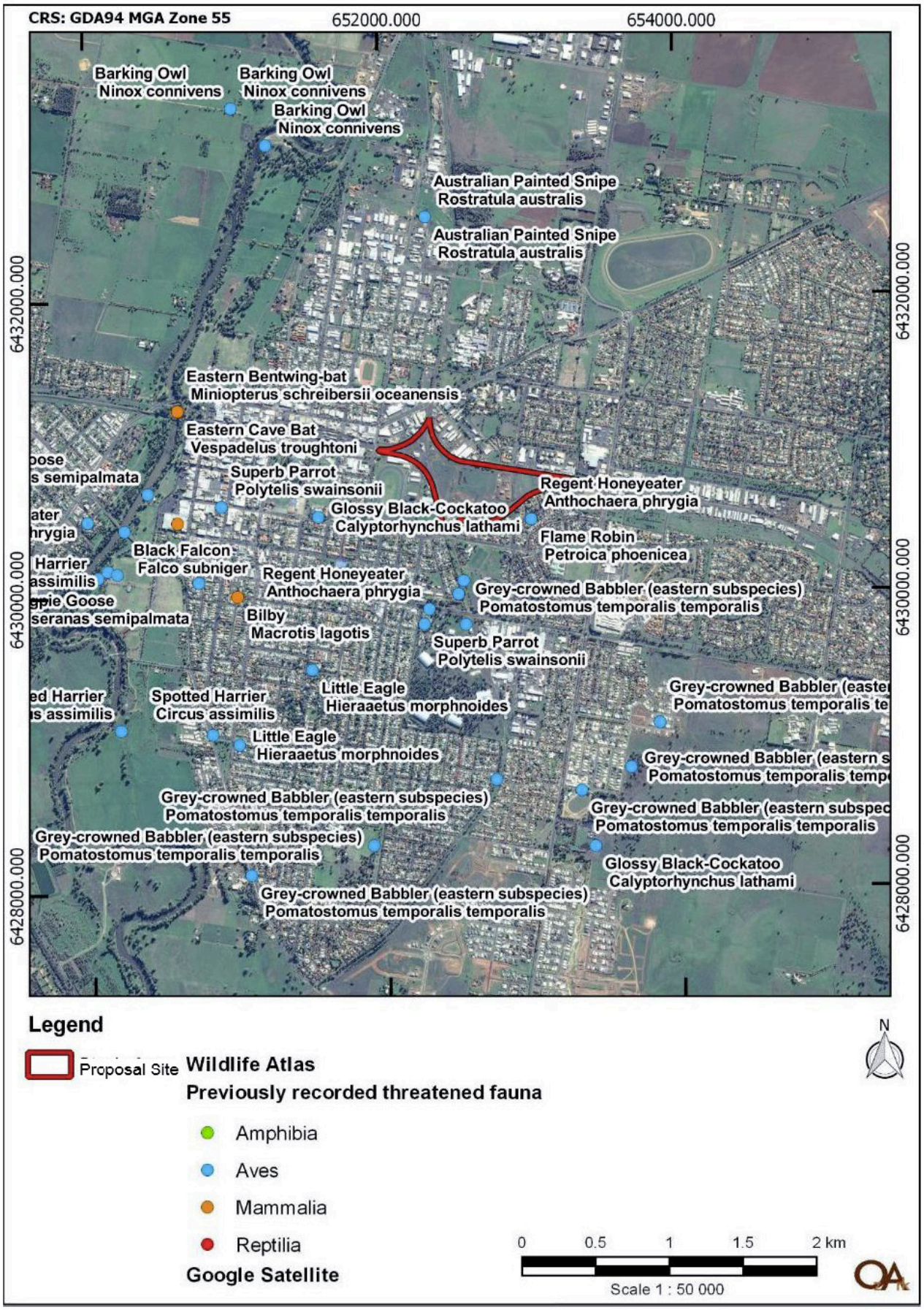

Figure 3-16: Threatened fauna previously recorded in the vicinity of the study area

4. Impact Assessment

4.1 Aquatic habitat

The Proposal Site does not contain any identified (mapped) watercourses and is not considered to be part of the Darling River EEC. The study area does not contain a tributary or any direct drainage line to the Macquarie River. Significant rainfall and associated runoff is not likely to carry sediments or construction waste to any watercourse or the Macquarie River. There are no expected impacts to any watercourses, aquatic endangered ecological communities or key fish habitat as these are absent from the study area.

4.2 Native vegetation

The direct impacts of the Proposal would comprise clearing of native vegetation for construction of the Proposal including stockpiles, access and areas for machinery movements.

Whilst there is a significant weed presence across the site, there is also a diverse groundcover of native species which is most discernible in summer and following drier periods when weeds have died back. Direct impacts to native vegetation across the site are summarised below:

- **PCT 796 *Derived grassland of the NSW south western slopes*.** The Proposal would affect approximately 9.2 hectares of derived native grassland. The conservation value of derived grasslands is that they represent the original ground cover vegetation for an area and habitat for native species. Derived grasslands can be regenerated to a woodland condition by active revegetation and/or be a source of local native seed stock for regeneration. In the broader context, this community is derived from a number of woodland types. At the Proposal Site, the derived grassland is most likely a derived form of Fuzzy Box woodland, where trees have been cleared in the past.
- **PCT 201 *Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion*.** Based on the current design, the Proposal would avoid direct impacts to 1.88 hectares of PCT 201. This area is considered to be part of the Fuzzy Box woodland EEC, where scattered trees remain and there is potential for assisted natural regeneration. It is estimated that 95 per cent of PCT 201 has been cleared relative to its original extent across the state (NSW Office of Environment & Heritage, 2018). Due to this relatively small extent remaining, all areas of this PCT therefore have conservation significance.

Native vegetation impacts in different section of the site are summarised in **Table 4-1**.

Table 4-1: Type and extent of native vegetation at the Proposal Site.

Location	Vegetation impacted	Vegetation avoided	Lot Area
Lot 1 DP1185204 (John Holland Land – middle section of site)	6.84 hectares of PCT 796 Derived grassland	1.88 hectares of PCT 201 Fuzzy Box woodland	21.9 hectares
Lot 100 DP710487 (Council Land -eastern end of site)	2.26 hectrares of PCT 796 Derived grassland	Assumed nil	3.5 hectrares
Lots to 5 DP1006357 (ARTC Land – western section of site)	Negligible native vegetation present or impacted		2.17 hectrares
Railway corridor of the Main Western Line	Negligible native vegetation impact		-

4.3 Endangered ecological communities

The remnant native vegetation at the Proposal Site has been assessed as being a combination of *Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions* EEC, and adjoining derived grasslands which would have supported this community. The significance of impact to the EEC has been assessed in the context of the regional and local scale and based on the 'test of significance' as set out in section 7.3 of the BC Act (**Appendix E**). An outline of the information used to inform the test of significance is provided below.

4.3.1 Fuzzy Box woodland EEC

The Fuzzy Box woodland community occurs in the Darling Riverine Plains and Brigalow Belt South bioregions of NSW, and predominantly within the South Western Slopes bioregion. It is most common between Dubbo, Narromine, Parkes and Forbes, with the greatest abundance recorded at Forbes (NSW Department of Environment, Climate Change and Water, 2010).

Approximately 95 per cent of its original extent has been historically cleared for agriculture. The community is naturally restricted to the higher alluvial flats subject to infrequent flooding. This results in patches that are relatively small and often linear in shape. In turn, this means localised patches are particularly susceptible to edge effects and other disturbance.

OEH mapping predicts approximately 20,000 hectares of Fuzzy Box woodland occurs across NSW. At the local scale, the VIS 4468 mapping indicates a total area of approximately 4,000 hectares of Fuzzy Box woodland occurs within the Dubbo Regional local government area (LGA) (**Figure 4-2**).

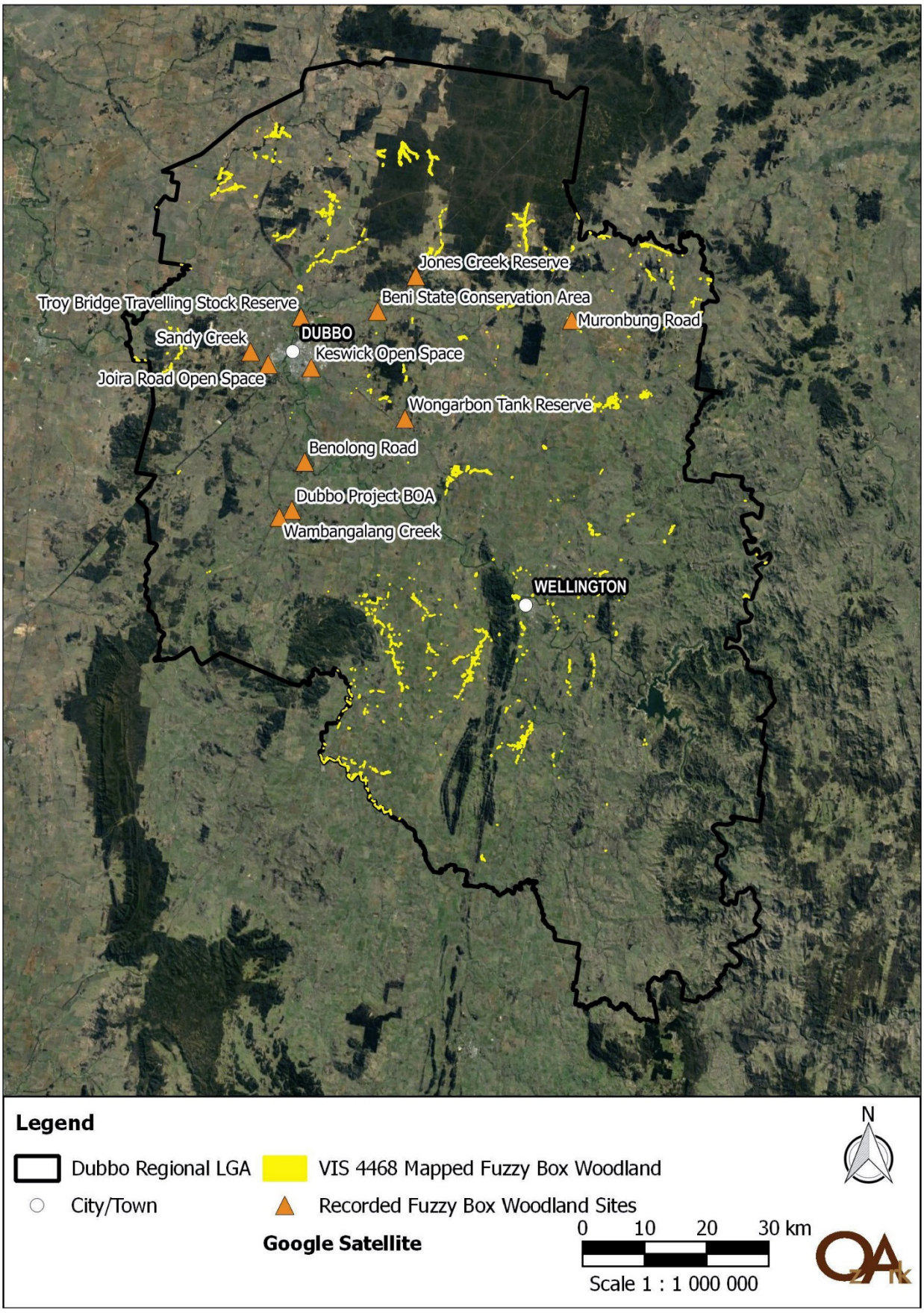

Figure 4-1: Approximate extent of Fuzzy Box woodland EEC recorded in the Dubbo LGA.

The following threats affect the ongoing survival of Fuzzy Box woodland, each operating to a different extent and severity in different areas (NSW Office of Environment & Heritage, 2011):

- Clearing of remaining remnants and isolated paddock trees.
- Senescence and lack of regeneration.
- Inappropriate fire regimes, primarily complete suppression.
- Weed invasion.
- Species diversity, composition and structure would be impacted by long term climate change (NSW Office of Environment & Heritage, 2017).

The Proposal has potential to exacerbate these threats by clearing of the vegetation at the site. Design amendments have sought to avoid and minimise impacts to the Fuzzy Box woodland EEC at the site by retaining an area of 1.88 hectares in the southern part of the site, where the overstorey trees are present (**Figure 4-2**). Of the total Proposal Site, this area has the greatest potential for assisted natural regeneration of the *Eucalyptus conica* overstorey and is the area which could most feasibly be restored to a woodland condition.

Figure 4-2: Remnant Fuzzy Box (*Eucalyptus conica*) in the southern section of the Proposal Site, where vegetation is proposed to be retained and could be restored.

The proposed impact to this EEC for the comprises:

- an estimated 9.2 hectares of loss of derived native grassland which would most likely have supported the EEC in the past, although its current condition is not consistent with the definition of the EEC due to the absence of Fuzzy Box trees.
- retention and possible restoration of an adjoining area of 1.88 hectares of partially cleared open woodland vegetation, where Fuzzy Box (*Eucalyptus conica*) and

Kurrajong (*Brachychiton populneus*) trees are present over a grassy understorey, indicating the EEC is present.

The test of significance (**Appendix E**) has concluded that, given the wider landscape context and the intention to retain and restore a representative area of the Fuzzy Box woodland EEC at the site, the Proposal is not expected to have a significant impact such that the local occurrence of the EEC would be placed at risk of extinction.

A vegetation management plan including ongoing weed management strategy is recommended to improve the restoration of this area to a viable patch of the EEC.

4.4 Threatened species

The BC Act test of significance (referred to as a 5 part test) has been completed for one threatened flora species, the Pine Donkey Orchid (*Diuris tricolor*), and three threatened fauna species, which have been determined as possibly inhabiting the site, or visiting the site from time to time due to the present of suitable habitat (see habitat assessment table in **Appendix D**).

The tests of significance are set out in full in **Appendix E**. The findings and conclusions from the tests of significance are provided below:

- **Pine Donkey Orchid (*Diuris tricolor*):** Searches across the Proposal Site did not find any evidence of this species (no live plants or spent flower stalks) either in spring 2017 or summer 2018. Given the dry conditions however, the species could have been dormant at the time of the survey and remained undetected. The subject site does not contain the typical native Cypress Pine woodland nor the sandy soils, slopes or small rises. The Proposal would clear or disturb approximately 9.2 hectares of derived grassland which is not the known preferred habitat for the species. The species was not detected on the site during two survey efforts. The existing records are historic sightings from 1907 and it seems likely that the species is no longer present in the immediate area. The test of significance has concluded that the Proposal is not likely to significantly remove, modify, fragment or isolate habitat for the Pine Donkey Orchid to the extent a local population of the species would be placed at risk of extinction.
- **Bats:** Little Pied Bat (*Chalinolobus picatus*). Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) and Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*). The Proposal would not affect any natural habitat or hollow bearing trees. However, the old buildings on the site provide potential man-made habitat which could be suitable for roosting or breeding. Some of these structures are proposed to be removed for the Proposal. As the current study did not undertake targeted survey for these bats, a precautionary approach is required. Mitigation measures are proposed which would comprise: (i) further site checks for evidence of the bats; (ii) appropriate timing of the works to be outside of the breeding season for these species; and (iii) an animal handler/ecologist to be on site and supervise during the removal of structures. If these mitigation measures are in place, potential impacts/injury to these bat species would be mitigated and the Proposal would be unlikely to adversely affect the life cycle of any of these species to the point that a local population is at risk of extinction.

4.5 Indirect impacts

The main impacts of the Proposal are expected to be contained within the Proposal Site, subject to there being adequate demarcation of the construction area and identification of all non-construction areas as environmental protection zones.

The site is situated within the existing urban area of Dubbo and as a result would not cause an increase in the fragmentation of any existing habitat corridors in the landscape sense. Urban development occurs to the north, east, south and west of the site.

Some ongoing indirect impacts of the Proposal may include effects of noise and light on avifauna and bats, however these impacts are not expected to be detrimental to flight paths, or other movements or behaviour of these fauna groups given the existing disturbed urban setting of the Proposal.

There are potential positive impacts of the Proposal given the current design would retain the area of remnant Fuzzy Box woodland in the southern part of the site and possibly rehabilitate the area to an improved condition.

4.6 Key threatening processes

Key Threatening Processes (KTP's) at the NSW State and Federal level would be exacerbated by the Proposal. A summary of the proposed impacts relating to the relevant key threatening processes is given in **Table 4-2**.

Table 4-2: Review of proposed impacts to key threatening processes

Key Threatening Process	BC Act	FM Act	EPBC Act	KTP present in study area?	Exacerbated?
Aggressive exclusion of birds by noisy miners (*Manorina melanocephala*)	✔		✔	Yes	No
Alteration of habitat following subsidence due to longwall mining	✔			No	No
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	✔	✔		Yes	No
Anthropogenic climate change	✔	✔	✔	Yes	Negligible
Bushrock removal	✔			Yes	No
Clearing of native vegetation	✔		✔	**Yes**	**Yes. The site would be cleared of some native vegetation, mainly derived grassland**
Competition and grazing by the feral European rabbit (*Oryctolagus cuniculus*)	✔		✔	Yes	No
Competition and habitat degradation by feral goats (*Capra hircus*)	✔		✔	No	No
Competition from feral honey bees (*Apis mellifera*)	✔			Yes	No

Key Threatening Process	BC Act	FM Act	EPBC Act	KTP present in study area?	Exacerbated?
Death or injury to marine species following capture in shark control programs on ocean beaches	✔	✔		No	No
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments	✔		✔	No	No
Forest Eucalypt dieback associated with over-abundant psyllids and bell miners	✔			No	No
Herbivory and environmental degradation caused by feral deer	✔			No	No
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	✔			No	No
Hook and line fishing in areas important for the survival of threatened fish species		✔		No	No
Importation of red imported fire ants (*Solenopsis invicta*)	✔		✔	No	No
Incidental catch (bycatch) of Sea Turtle during coastal otter-trawling operations within Australian waters north of 28 degrees South			✔	No	No
Incidental catch (or bycatch) of seabirds during oceanic longline fishing operations			✔	No	No
Infection by psittacine circoviral (beak and feather) disease affecting endangered psittacine species and populations	✔		✔	Yes	No
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	✔		✔	No	No
Infection of native plants by *Phytophthora cinnamomi*	✔		✔	No	No
Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	✔			No	No
Introduction of non-indigenous fish and marine vegetation to the coastal waters of New South Wales		✔		No	No
Introduction of the large earth bumblebee (*Bombus terrestris*)	✔			No	No
Invasion and establishment of exotic vines and scramblers	✔			No	No
Invasion and establishment of Scotch broom (*Cytisus scoparius*)	✔			No	No
Invasion and establishment of the cane toad (*Bufo marinus*)	✔		✔	No	No
Invasion of native plant communities by African Olive *Olea europaea* L. subsp. *cuspidata*	✔			No	No
Invasion of native plant communities by exotic perennial grasses	✔			Yes	No
Invasion of native plant communities by *Chrysanthemoides monilifera* (bitou bush and boneseed)	✔			No	No

Key Threatening Process	BC Act	FM Act	EPBC Act	KTP present in study area?	Exacerbated?
Invasion of northern Australia by Gamba Grass and other introduced grasses			✔	No	No
Invasion of the yellow crazy ant (*Anoplolepis gracilipes* (Fr. Smith)) into NSW	✔		✔	No	No
Invasion, establishment and spread of *Lantana camara*	✔			No	No
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	✔		✔	Yes	No
Loss of hollow-bearing trees	✔			Yes	No
Loss or degradation (or both) of sites used for hill-topping by butterflies	✔			No	No
Novel biota and their impact on biodiversity			✔	Yes	No
Predation and hybridisation of feral dogs (*Canis lupus familiaris*)	✔			Yes	No
Predation by exotic rats on Australian offshore islands of less than 1000 km2 (100,000 ha)			✔	No	No
Predation by the European red fox (*Vulpes vulpes*)	✔		✔	Yes	No
Predation by the feral cat (*Felis catus*)	✔		✔	Yes	No
Predation by the ship rat (*Rattus rattus*) on Lord Howe Island	✔		✔	No	No
Predation by Gambusia holbrooki Girard, 1859 (plague minnow or mosquito fish)	✔			No	No
Predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)	☐		☐	No	No
Removal of dead wood and dead trees	☐em	Yes	Negligible		
The degradation of native riparian vegetation along New South Wales water courses		☐heNo	No		
The introduction of fish to fresh waters within a river catchment outside their natural range		☐heNo	No		
The removal of large woody debris from NSW rivers and streams		☐heNo	No		

4.7 Matters of National Environmental Significance

Under the environmental assessment provisions of the EPBC Act, matters of National Environmental Significance (MNES) and impacts on Commonwealth land are required to be considered to assist in determining whether the Proposal should be referred to the Australian Government DoEE.

The EPBC Act protected matters search has identified four wetlands of international importance, five EECs, 21 threatened species and 10 migratory species that could possibly occur in the study area (**Appendix A**). A summary of these matters and a conclusion on whether or not the Proposal is likely to impact them is provided in **Table 4-3**. It is concluded that no MNES would be impacted by the Proposal.

Table 4-3: Impacts to Matters of National Environmental Significance

Factor	Potential impact
Any impact on a World Heritage property?	NIL
Any impact on a National Heritage place?	NIL
Any impact on a wetland of international importance?	NIL
Any impact on a listed threatened species or communities?	The Proposal would not impact on any Commonwealth-listed threatened species or ecological communities. The vegetation has been identified as a NSW-listed EEC, that is not associated with the nearby Commonwealth-listed EEC.
Any impacts on listed migratory species?	Migratory species predicted to occur (see **Appendix A**) would not be significantly impacted by the Proposal. There are no permanent or ephemeral wetland habitats, or suitable flowering eucalypts, that comprise important habitat for migratory species (water birds, wader, honeyeater).
Any impact on a Commonwealth marine area?	NIL
Does the proposal involve a nuclear action (including uranium mining)?	NIL
Additionally, any impact (direct or indirect) on Commonwealth land?	NIL
Any impact on a water resource, in relation to coal seam gas development and large coal mining development?	NIL

5. Impact mitigation

The following recommendations have been proposed to inform the design of the Proposal and further survey of the study area.

5.1 Avoid impact

Proposed impact avoidance measures:

- The proposed impact to the EEC for the current Proposal comprises an estimated 9.2 hectares of loss of derived native grassland which would most likely have supported the EEC. The adjoining area where diagnostic Fuzzy Box tree is present is proposed to be retained, and represents an important measure that would avoid impacts of the Proposal to this proportion of the remnant native vegetation on the site.

5.2 Minimise impact

Proposed impact minimisation measures:

- The proposed design has been refined to minimise impacts to the higher quality EEC.
- The construction works and vehicle access to the construction site is to be constrained to the minimum area practical and would use as few entry/exit points as possible.
- Material stockpiles, equipment and machinery storage and laydown areas would be consolidated within a defined impact area to minimise the overall impact footprint and retain the southern area of native vegetation.
- The impact footprint would be minimised by restricting access across the site beyond the defined development footprint including avoiding unnecessary vehicle and personnel movements across unused land.

5.3 Mitigate and offset

Proposed impact mitigation measures:

- Site checks for evidence of the bats prior to commencement of construction.
- Programming demolition of man-made structures to be outside of the breeding season for the identified bat species.
- Pre-works detailed inspections on and under the structures prior to detect if the animals are, or could be, present.
- Animal handler/ecologist to be on site and supervise during the removal of man-made structures.
- A vegetation management plan is recommended to guide the appropriate restoration of the retained EEC area towards benchmark condition of the EEC. This would include native vegetation management actions and an ongoing weed management strategy. The 1.88 hectare of retained Fuzzy Box woodland can be restored by either assisted natural regeneration or active revegetation, depending on Proposal requirements. Any restoration works would need to be appropriate to the status of the vegetation as an

EEC and consistent with OEH guidelines and licence conditions. This measure is not a formal offset, rather it represents a minimisation and mitigation measure.

Offsetting is not a statutory requirement for this Proposal and has not been considered in the current study. The NSW Biodiversity Offset Scheme is not compulsory for developments assessed under Part 5, Division 5.1 of the EP&A Act that do not have a significant impact.

Transport for NSW has a Vegetation Offset Guide for Native Vegetation for those projects where statutory offsets do not apply, in order to achieve an 'improved or maintained' outcome through the provision of offsets for impacts native vegetation and individual trees. The process outlined in this guide would be implemented for this Proposal.

6. Summary and conclusions

The following summary of findings and conclusions are provided to assist with ongoing project planning.

- The Proposal Site contains remnant native vegetation with a variable cover and diversity of native and weed species, representing two PCTs:
    - PCT 201: *Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion*.
    - PCT 796: *Derived grassland of the NSW south western slopes*.
- PCT 201 is a community associated with the *Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions* EEC. Given the vegetation classification as Fuzzy Box woodland and the lack of evidence of other overstorey trees, the native vegetation on the site is not considered to be part of any other EEC.
- The Proposal would remove 9.2 hectares of derived grassland, but would retain 1.88 hectares of the identified Fuzzy Box woodland EEC in the area where occasional overstorey trees are present. The impact to Fuzzy Box woodland EEC has been assessed on a regional and local scale and it is concluded that the Proposal would not cause a significant impact to this community due to the small extent of the disturbance and the proposed restoration of a representative proportion of the community on the site.
- There are no expected significant impacts to threatened species or populations. This is concluded on the basis that suitable habitat for most of the predicted species is not present on the site, or they were not detected on site during the targeted searches on the day of the field assessment.
- There is a residual risk that threatened bats could be using the man-made structures as roosting or breeding habitat. The field survey did not include targeted survey for three predicted bat species, which are known to occur in the region, and a precautionary approach is therefore required, which assumes they could be present. Mitigation measures are proposed to ensure animals are not present and/or injured during the removal of man-made structures.
- A vegetation management plan is recommended to guide the appropriate restoration of the retained Fuzzy Box woodland based on methods and actions that are consistent with OEH guidelines and relevant licence conditions.
- Impacts to native vegetation would be offset in accordance with the Transport for NSW Vegetation Offset Guide for Native Vegetation.

7. References

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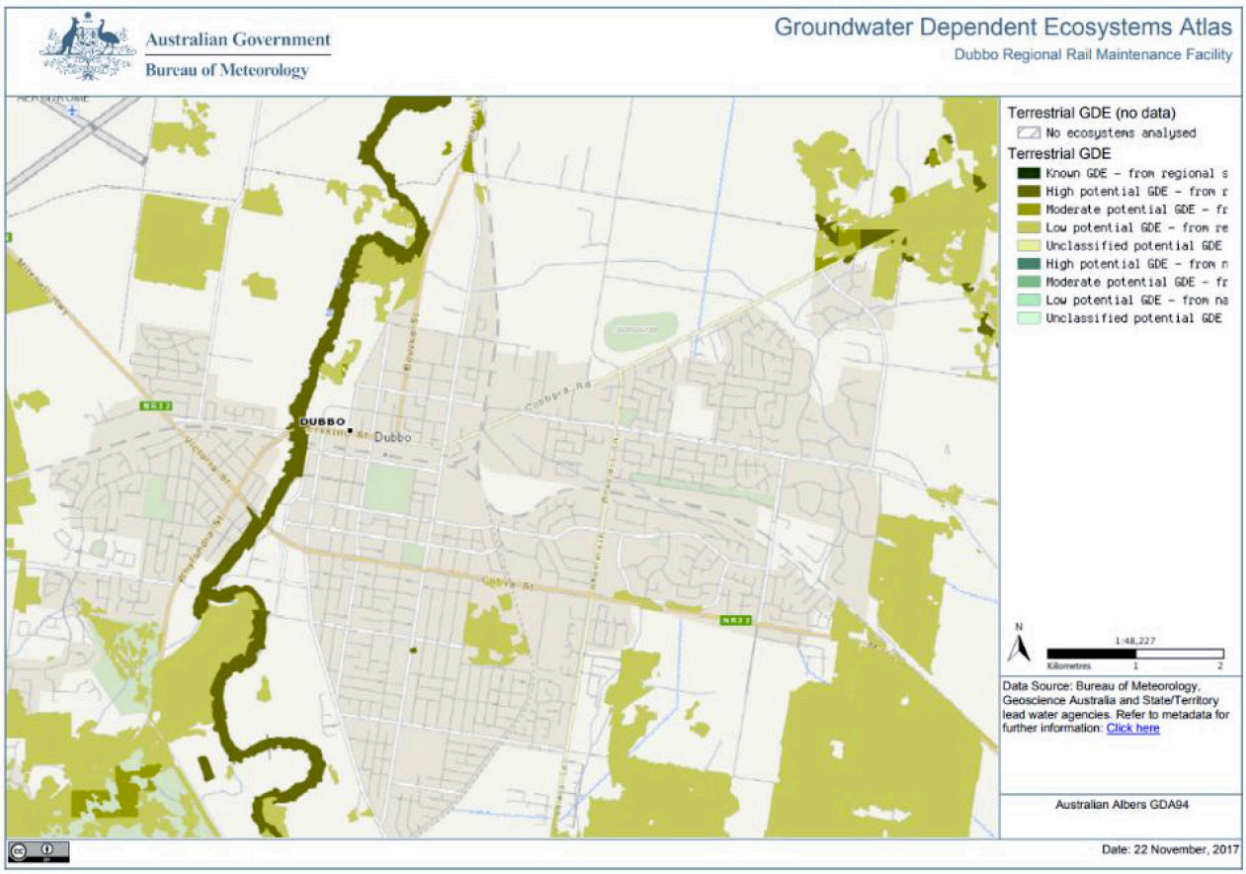
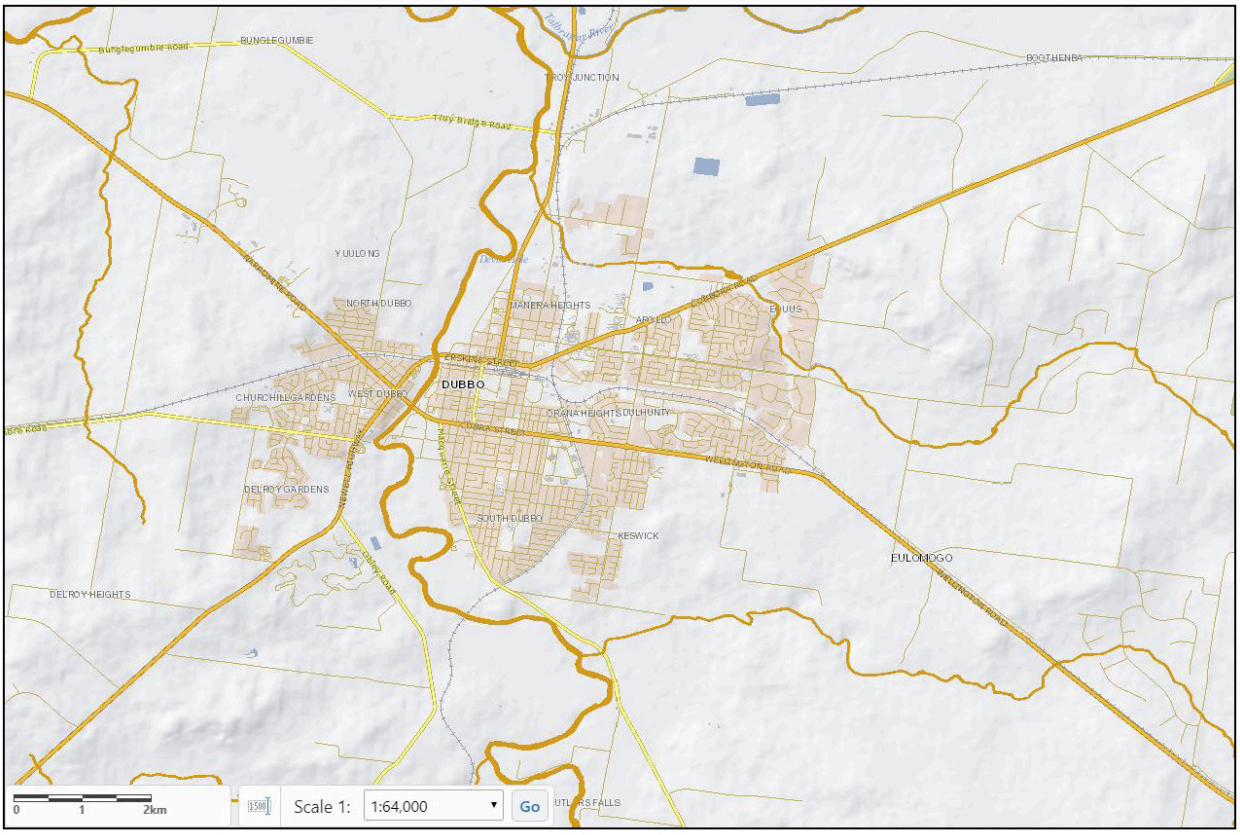
Appendix A: Database search results

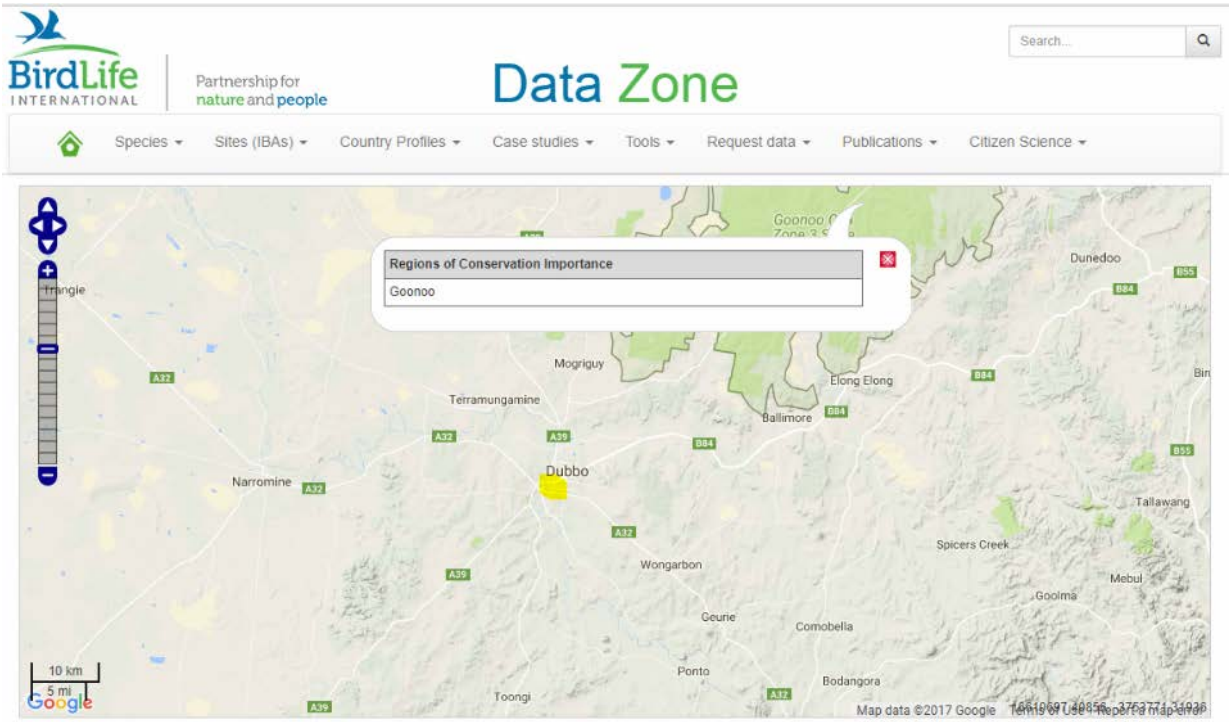
Ground water dependant ecosystems (Source: BoM)



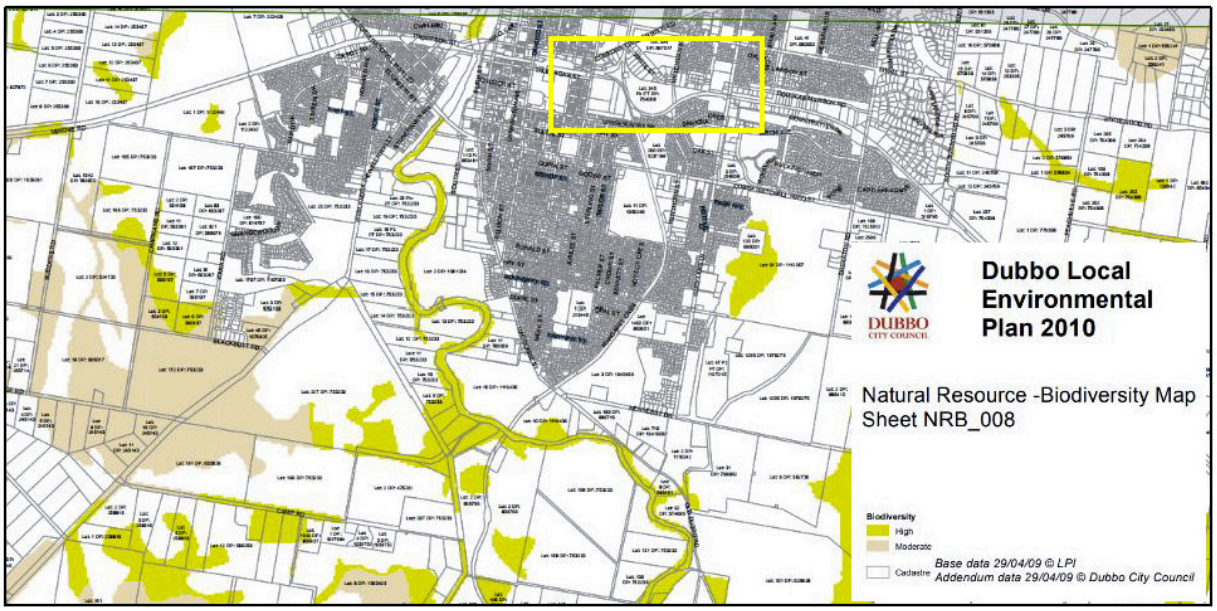
NSW Government 'biodiversity values' Map



Nearest important bird area (study area highlighted yellow)



Dubbo Local Environmental Plan Natural Resources Map



Known and predicted threatened species and ecological communities, based on a search of the NSW OEH Threatened Species Profiles Database for the Brigalow Belt South>Talbragar Valley subregion.

Type	Group	Scientific name	Common name	NSW status	Commonwealth status
Community	Endangered Ecological Community	Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Coolibah - Black Box Woodlands	Endangered Ecological Community	Endangered
Community	Endangered Ecological Community	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Fuzzy Box Woodland	Endangered Ecological Community	
Community	Endangered Ecological Community	Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Inland Grey Box Woodland	Endangered Ecological Community	Endangered
Community	Endangered Ecological Community	Natural Grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	-	Not listed	Critically Endangered
Community	Endangered Ecological Community	Weeping Myall Woodlands	Weeping Myall Woodlands	Endangered Ecological Community	Endangered
Community	Endangered Ecological Community	White Box Yellow Box Blakely's Red Gum Woodland	Box Gum Woodland	Endangered Ecological Community	Critically Endangered
Fauna	Amphibians	*Crinia sloanei*	Sloane's Froglet	Vulnerable	
Fauna	Bats	*Chalinolobus dwyeri*	Large-eared Pied Bat	Vulnerable	Vulnerable
Fauna	Bats	*Chalinolobus picatus*	Little Pied Bat	Vulnerable	
Fauna	Bats	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	Vulnerable	
Fauna	Bats	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	Vulnerable	
Fauna	Bats	*Mormopterus lumsdenae*	Northern Free-tailed Bat	Vulnerable	
Fauna	Bats	*Nyctophilus corbeni*	Corben's Long-eared Bat	Vulnerable	Vulnerable
Fauna	Bats	*Pteropus poliocephalus*	Grey-headed Flying-fox	Vulnerable	Vulnerable

Type	Group	Scientific name	Common name	NSW status	Commonwealth status
Fauna	Bats	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	Vulnerable	
Fauna	Bats	*Vespadelus troughtoni*	Eastern Cave Bat	Vulnerable	
Fauna	Birds	*Anseranas semipalmata*	Magpie Goose	Vulnerable	
Fauna	Birds	*Anthochaera phrygia*	Regent Honeyeater	Critically Endangered	Critically Endangered
Fauna	Birds	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	Vulnerable	
Fauna	Birds	*Botaurus poiciloptilus*	Australasian Bittern	Endangered	Endangered
Fauna	Birds	*Burhinus grallarius*	Bush Stone-curlew	Endangered	
Fauna	Birds	*Calidris ferruginea*	Curlew Sandpiper	Endangered	Critically Endangered
Fauna	Birds	*Calyptorhynchus lathami*	Glossy Black-Cockatoo	Vulnerable	
Fauna	Birds	*Chthonicola sagittata*	Speckled Warbler	Vulnerable	
Fauna	Birds	*Circus assimilis*	Spotted Harrier	Vulnerable	
Fauna	Birds	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	Vulnerable	
Fauna	Birds	*Daphoenositta chrysoptera*	Varied Sittella	Vulnerable	
Fauna	Birds	*Epthianura albifrons*	White-fronted Chat	Vulnerable	
Fauna	Birds	*Falco hypoleucos*	Grey Falcon	Endangered	
Fauna	Birds	*Falco subniger*	Black Falcon	Vulnerable	
Fauna	Birds	*Glossopsitta pusilla*	Little Lorikeet	Vulnerable	
Fauna	Birds	*Grantiella picta*	Painted Honeyeater	Vulnerable	Vulnerable
Fauna	Birds	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	Vulnerable	CAMBA
Fauna	Birds	*Hamirostra melanosternon*	Black-breasted Buzzard	Vulnerable	
Fauna	Birds	*Hieraaetus morphnoides*	Little Eagle	Vulnerable	

Type	Group	Scientific name	Common name	NSW status	Commonwealth status
Fauna	Birds	*Lathamus discolor*	Swift Parrot	Endangered	Critically Endangered
Fauna	Birds	*Leipoa ocellata*	Malleefowl	Endangered	Vulnerable
Fauna	Birds	*Lophochroa leadbeateri*	Major Mitchell's Cockatoo	Vulnerable	
Fauna	Birds	*Lophoictinia isura*	Square-tailed Kite	Vulnerable	
Fauna	Birds	*Melanodryas cucullata cucullata*	Hooded Robin (south-eastern form)	Vulnerable	
Fauna	Birds	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	
Fauna	Birds	*Neophema pulchella*	Turquoise Parrot	Vulnerable	
Fauna	Birds	*Ninox connivens*	Barking Owl	Vulnerable	
Fauna	Birds	*Ninox strenua*	Powerful Owl	Vulnerable	
Fauna	Birds	*Pachycephala inornata*	Gilbert's Whistler	Vulnerable	
Fauna	Birds	*Pandion cristatus*	Eastern Osprey	Vulnerable	
Fauna	Birds	*Petroica boodang*	Scarlet Robin	Vulnerable	
Fauna	Birds	*Petroica phoenicea*	Flame Robin	Vulnerable	
Fauna	Birds	*Phaethon rubricauda*	Red-tailed Tropicbird	Vulnerable	CAMBA
Fauna	Birds	*Polytelis swainsonii*	Superb Parrot	Vulnerable	Vulnerable
Fauna	Birds	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	Vulnerable	
Fauna	Birds	*Rostratula australis*	Australian Painted Snipe	Endangered	Endangered
Fauna	Birds	*Stagonopleura guttata*	Diamond Firetail	Vulnerable	
Fauna	Birds	*Stictonetta naevosa*	Freckled Duck	Vulnerable	
Fauna	Birds	*Tyto novaehollandiae*	Masked Owl	Vulnerable	
Fauna	Marsupials	*Cercartetus nanus*	Eastern Pygmy-possum	Vulnerable	

Type	Group	Scientific name	Common name	NSW status	Commonwealth status
Fauna	Marsupials	*Dasyurus maculatus*	Spotted-tailed Quoll	Vulnerable	Endangered
Fauna	Marsupials	*Macrotis lagotis*	Bilby	Extinct	Vulnerable
Fauna	Marsupials	*Ningaui yvonneae*	Southern Ningaui	Vulnerable	
Fauna	Marsupials	*Petauroides volans*	Greater Glider		Vulnerable
Fauna	Marsupials	*Petaurus norfolcensis*	Squirrel Glider	Vulnerable	
Fauna	Marsupials	*Petrogale penicillata*	Brush-tailed Rock-wallaby	Endangered	Vulnerable
Fauna	Marsupials	*Phascolarctos cinereus*	Koala	Vulnerable	Vulnerable
Fauna	Reptiles	*Aprasia parapulchella*	Pink-tailed Legless Lizard	Vulnerable	Vulnerable
Fauna	Reptiles	*Delma impar*	Striped Legless Lizard		Vulnerable
Fauna	Reptiles	*Hoplocephalus bitorquatus*	Pale-headed Snake	Vulnerable	
Fauna	Reptiles	*Tiliqua occipitalis*	Western Blue-tongued Lizard	Vulnerable	
Flora	Grasses	*Austrostipa wakoolica*	A spear grass	Endangered	Endangered
Flora	Grasses	*Dichanthium setosum*	Bluegrass	Vulnerable	Vulnerable
Flora	Herbs and forbs	*Calotis glandulosa*	Mauve Burr-daisy	Vulnerable	Vulnerable
Flora	Herbs and forbs	*Lepidium hyssopifolium*	Aromatic Peppercress	Endangered	Endangered
Flora	Herbs and forbs	*Swainsona recta*	Small Purple-pea	Endangered	Endangered
Flora	Herbs and forbs	*Swainsona sericea*	Silky Swainson-pea	Vulnerable	
Flora	Orchids	*Caladenia arenaria*	Sand-hill Spider Orchid	Endangered	Endangered
Flora	Orchids	*Caladenia tessellata*	Thick Lip Spider Orchid	Endangered	Vulnerable
Flora	Orchids	*Diuris tricolor*	Pine Donkey Orchid	Vulnerable	
Flora	Shrubs	*Acacia ausfeldii*	Ausfeld's Wattle	Vulnerable	
Flora	Shrubs	*Acacia meiantha*		Endangered	
Flora	Shrubs	*Commersonia procumbens*		Vulnerable	Vulnerable

Type	Group	Scientific name	Common name	NSW status	Commonwealth status
Flora	Shrubs	*Homoranthus darwinioides*		Vulnerable	Vulnerable
Flora	Shrubs	*Indigofera efoliata*	Leafless Indigo	Endangered	Endangered
Flora	Shrubs	*Indigofera longibractea*	Showy Indigo	Endangered	
Flora	Shrubs	*Philotheca ericifolia*			Vulnerable
Flora	Shrubs	*Pomaderris queenslandica*	Scant Pomaderris	Endangered	
Flora	Shrubs	*Zieria ingramii*	Keith's Zieria	Endangered	Endangered
Flora	Shrubs	*Zieria obcordata*		Endangered	Endangered
Flora	Twiners	*Tylophora linearis*		Vulnerable	Endangered

Threatened species previously recorded within 10 km of the Proposal Site, comprising 24 threatened fauna species and 12 threatened flora species. These species have been assessed in terms of their presence (flora) and/or suitable habitat on the site -see Appendix D. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1Â°; ^^ rounded to 0.01Â°)

(Source: BioNet Wildlife Atlas, March 2018)

Kingdom	Class	Family	Scientific name	Common name	NSW status	Common-wealth status	# of records
Animalia	Aves	Anseranatidae	*Anseranas semipalmata*	Magpie Goose	V,P		2
Animalia	Aves	Phaethontidae	*Phaethon rubricauda*	Red-tailed Tropicbird	V,P	C	1
Animalia	Aves	Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	P	C	1
Animalia	Aves	Accipitridae	*Circus assimilis*	Spotted Harrier	V,P		4
Animalia	Aves	Accipitridae	*Hieraaetus morphnoides*	Little Eagle	V,P		5
Animalia	Aves	Falconidae	*Falco subniger*	Black Falcon	V,P		1
Animalia	Aves	Rostratulidae	*Rostratula australis*	Australian Painted Snipe	E1,P	E	2
Animalia	Aves	Scolopacidae	*Calidris acuminata*	Sharp-tailed Sandpiper	P	C,J,K	2
Animalia	Aves	Scolopacidae	*Philomachus pugnax*	Ruff	P	C,J,K	1
Animalia	Aves	Scolopacidae	*Tringa stagnatilis*	Marsh Sandpiper	P	C,J,K	1
Animalia	Aves	Cacatuidae	*^^Calyptorhynchus lathami*	Glossy Black-Cockatoo	V,P,2		2
Animalia	Aves	Psittacidae	*Glossopsitta pusilla*	Little Lorikeet	V,P		2
Animalia	Aves	Psittacidae	*Polytelis swainsonii*	Superb Parrot	V,P,3	V	2
Animalia	Aves	Strigidae	*Ninox connivens*	Barking Owl	V,P,3		5
Animalia	Aves	Meropidae	*Merops ornatus*	Rainbow Bee-eater	P	J	8
Animalia	Aves	Climacteridae	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P		2
Animalia	Aves	Acanthizidae	*Chthonicola sagittata*	Speckled Warbler	V,P		1
Animalia	Aves	Meliphagidae	*Anthochaera phrygia*	Regent Honeyeater	E4A,P	CE	7
Animalia	Aves	Meliphagidae	*Epthianura albifrons*	White-fronted Chat	V,P		1
Animalia	Aves	Meliphagidae	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V,P		1
Animalia	Aves	Pomatostomidae	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V,P		18
Animalia	Aves	Petroicidae	*Petroica phoenicea*	Flame Robin	V,P		1
Animalia	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	Koala	V,P	V	1
Animalia	Mammalia	Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P		2
Animalia	Mammalia	Vespertilionidae	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	V,P		1
Animalia	Mammalia	Vespertilionidae	*Nyctophilus corbeni*	Corben's Long-eared Bat	V,P	V	1

Kingdom	Class	Family	Scientific name	Common name	NSW status	Common-wealth status	# of records
Plantae	Flora	Asteraceae	*Calotis glandulosa*	Mauve Burr-daisy	V,P	V	2
Plantae	Flora	Fabaceae (Faboideae)	*Indigofera efoliata*	Leafless Indigo	E1,P,3	E	8
Plantae	Flora	Malvaceae	*Commersonia procumbens*		V,P	V	3
Plantae	Flora	Myrtaceae	*Homoranthus darwinioides*		V,P	V	1
Plantae	Flora	Orchidaceae	^^*Diuris tricolor*	Pine Donkey Orchid	V,P,2		3

Priority weeds for the Central West

Note: this region includes the local council areas of Bogan (lower), Coonamble, Dubbo Regional, Forbes, Gilgandra, Lachlan, Narromine, Parkes, Warren, Warrumbungle and Weddin.

Select another region

Weed	Duty
All plants	**General Biosecurity Duty** *All plants are regulated with a **general biosecurity duty** to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.*
African boxthorn *Lycium ferocissimum*	**Prohibition on dealings** *Must not be imported into the State or sold*
Alligator weed *Alternanthera philoxeroides*	**Prohibition on dealings** *Must not be imported into the State or sold*
Alligator weed *Alternanthera philoxeroides*	**Biosecurity Zone** The Alligator Weed Biosecurity Zone is established for all land within the state except land in the following regions: Greater Sydney; Hunter (but only in the local government areas of City of Lake Macquarie, City of Maitland, City of Newcastle or Port Stephens). *Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone*
Anchored water hyacinth *Eichhornia azurea*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Arrowhead *Sagittaria calycina var. calycina*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.* **This Regional Recommended Measure applies to all species of *Sagittaria***
Athel pine *Tamarix aphylla*	**Prohibition on dealings** *Must not be imported into the State or sold*
Athel pine *Tamarix aphylla*	**Regional Recommended Measure** Exclusion zone: all waterways and riparian areas in the region. Core infestation area: whole region except for the exclusion zone. *Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land. Core infestation area: Land managers should reduce impacts from the plant on priority assets. Land managers should mitigate the risk of the plant being introduced to their land.*
Bellyache bush *Jatropha gossypiifolia*	**Prohibition on dealings** *Must not be imported into the State or sold*
Bitou bush *Chrysanthemoides monilifera subsp. rotundata*	**Prohibition on dealings** *Must not be imported into the State or sold*

Bitou bush *Chrysanthemoides monilifera subsp. rotundata*	**Biosecurity Zone** The Bitou Bush Biosecurity Zone is established for all land within the State except land within 10 kilometres of the mean high water mark of the Pacific Ocean between Cape Byron in the north and Point Perpendicular in the south. *Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone*
Black knapweed *Centaurea X moncktonii*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Black willow *Salix nigra*	**Prohibition on dealings** *Must not be imported into the State or sold*
Blackberry *Rubus fruticosus* species aggregate	**Prohibition on dealings** *Must not be imported into the State or sold* **All species in the *Rubus fruticosus* species aggregate have this requirement, except for the varietals Black Satin, Chehalem, Chester Thornless, Dirksen Thornless, Loch Ness, Murrindindi, Silvan, Smooth Stem, and Thornfree**
Blue heliotrope *Heliotropium amplexicaule*	**Regional Recommended Measure** Exclusion zone: Weddin local government area. Core infestation area: whole region except for exclusion zone. *Whole region: The plant should not be bought, sold, grown, carried or released into the environment. Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land. Core infestation area: Land managers should reduce impacts from the plant on priority assets. Land managers should mitigate the risk of the plant being introduced to their land.*
Boneseed *Chrysanthemoides monilifera subsp. monilifera*	**Prohibition on dealings** *Must not be imported into the State or sold*
Boneseed *Chrysanthemoides monilifera subsp. monilifera*	**Control Order** Bonseed Control Zone: Whole of NSW *Boneseed Control Zone (Whole of NSW): Owners and occupiers of land on which there is boneseed must notify the local control authority of new infestations; immediately destroy the plants; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of boneseed must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant.*
Boxing glove cactus *Cylindropuntia fulgida var. mamillata*	**Prohibition on dealings** *Must not be imported into the State or sold*
Boxing glove cactus *Cylindropuntia fulgida var. mamillata*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land.* **This Regional Recommended Measure applies to all species of Cylindropuntia except Cylindropuntia rosea (Hudson pear)**
Bridal creeper *Asparagus asparagoides*	**Prohibition on dealings** *Must not be imported into the State or sold* ***this requirement also applies to the Western Cape form of bridal creeper**

Bridal creeper *Asparagus asparagoides*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land.*
Bridal veil creeper *Asparagus declinatus*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Broomrapes *Orobanche* species	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species of *Orobanche* are Prohibited Matter in NSW, except the natives *Orobanche cernua* var. *australiana* and *Orobanche minor***
Burr ragweed *Ambrosia confertiflora*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment.*
Cabomba *Cabomba caroliniana*	**Prohibition on dealings** *Must not be imported into the State or sold*
Cane cactus *Austrocylindropuntia cylindrica*	**Prohibition on dealings** *Must not be imported into the State or sold* **All species in the *Austrocylindropuntia* genus have this requirement**
Cape broom *Genista monspessulana*	**Prohibition on dealings** *Must not be imported into the State or sold*
Carrion flower *Orbea variegata*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment.*
Cat's claw creeper *Dolichandra unguis-cati*	**Prohibition on dealings** *Must not be imported into the State or sold*
Cat's claw creeper *Dolichandra unguis-cati*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land.*
Chilean needle grass *Nassella neesiana*	**Prohibition on dealings** *Must not be imported into the State or sold*
Chilean needle grass *Nassella neesiana*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.*
Climbing asparagus *Asparagus africanus*	**Prohibition on dealings** *Must not be imported into the State or sold*
Climbing asparagus fern *Asparagus plumosus*	**Prohibition on dealings** *Must not be imported into the State or sold*
Common pear *Opuntia stricta*	**Prohibition on dealings** *Must not be imported into the State or sold*

Common pear *Opuntia stricta*	**Regional Recommended Measure** *Whole region: Land managers should mitigate the risk of new weeds being introduced to their land. Core infestations: Land managers should mitigate spread from their land.* ***This Regional Recommended Measure applies to all species of Opuntia except for Opuntia ficus-indica (Indian fig)**
Coolatai grass *Hyparrhenia hirta*	**Regional Recommended Measure** Exclusion zone: whole region except for the core infestation area of the Warrumbungle and Coonamble Shire Council areas *Whole region: The plant should not be bought, sold, grown, carried or released into the environment. Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land. Core infestation area: Land managers should reduce impacts from the plant on priority assets. Land managers should mitigate the risk of the plant being introduced to their land.*
East Indian hygrophila *Hygrophila polysperma*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.*
Eurasian water milfoil *Myriophyllum spicatum*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Fireweed *Senecio madagascariensis*	**Prohibition on dealings** *Must not be imported into the State or sold*
Fireweed *Senecio madagascariensis*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant.*
Flax-leaf broom *Genista linifolia*	**Prohibition on dealings** *Must not be imported into the State or sold*
Frogbit *Limnobium laevigatum*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species of *Limnobium* are Prohibited Matter**
Gamba grass *Andropogon gayanus*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Giant reed *Arundo donax*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment.*
Gorse *Ulex europaeus*	**Prohibition on dealings** *Must not be imported into the State or sold*
Grey sallow *Salix cinerea*	**Prohibition on dealings** *Must not be imported into the State or sold*

Ground asparagus *Asparagus aethiopicus*	**Prohibition on dealings** *Must not be imported into the State or sold*
Harrisia cactus *Harrisia* species	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment.*
Hawkweeds *Hieracium* species	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species in the genus *Hieracium* are Prohibited Matter**
Honey locust *Gleditsia triacanthos*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment.*
Hudson pear *Cylindropuntia rosea*	**Prohibition on dealings** *Must not be imported into the State or sold*
Hudson pear *Cylindropuntia rosea*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant.*
Hydrocotyl *Hydrocotyle ranunculoides*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Hygrophila *Hygrophila costata*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.*
Hymenachne *Hymenachne amplexicaulis* and hybrids	**Prohibition on dealings** *Must not be imported into the State or sold*
Hymenachne *Hymenachne amplexicaulis* and hybrids	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.*
Johnson grass *Sorghum halepense*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment.*
Karroo thorn *Vachellia karroo*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Kidney-leaf mud plantain *Heteranthera reniformis*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.*

Kochia *Bassia scoparia*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **Excluding the subspecies *trichophylla***
Koster's curse *Cilolemia hirta*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Lagarosiphon *Lagarosiphon major*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Lantana *Lantana camara*	**Prohibition on dealings** *Must not be imported into the State or sold*
Long-leaf willow primrose *Ludwigia longifolia*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.*
Ludwigia *Ludwigia peruviana*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.*
Madeira vine *Anredera cordifolia*	**Prohibition on dealings** *Must not be imported into the State or sold*
Mesquite *Prosopis* species	**Prohibition on dealings** *Must not be imported into the State or sold* **All species in the genus *Prosopis* have this requirement**
Mesquite *Prosopis* species	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant.*
Mexican feather grass *Nassella tenuissima*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Miconia *Miconia* species	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species of *Miconia* are Prohibited Matter in NSW**
Mikania vine *Mikania micrantha*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* ***all species in the genus *Mikania* are Prohibited Matter in NSW**

Mimosa *Mimosa pigra*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Mother-of-millions *Bryophyllum* species	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment.*
Parkinsonia *Parkinsonia aculeata*	**Prohibition on dealings** *Must not be imported into the State or sold*
Parkinsonia *Parkinsonia aculeata*	**Control Order** Parkinsonia Control Zone: Whole of NSW *Parkinsonia Control Zone (Whole of NSW): Owners and occupiers of land on which there is parkinsonia must notify the local control authority of new infestations; immediately destroy the plants; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of parkinsonia must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant.*
Parthenium weed *Parthenium hysterophorus*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Parthenium weed *Parthenium hysterophorus*	**Prohibition on dealings** *The following equipment must not be imported into NSW from Queensland: grain harvesters (including the comb or front), comb trailers (including the comb or front), bins used for holding grain during harvest operations, augers or similar for moving grain, vehicles used to transport grain harvesters, support vehicles driven in paddocks during harvest operations, mineral exploration drilling rigs and vehicles used to transport those rigs, unless set out as an exception in Division 5, Part 2 of the Biosecurity Order (Permitted Activities) 2017*
Pond apple *Annona glabra*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Prickly acacia *Vachellia nilotica*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Prickly pears - Austrocylindropuntias *Austrocylindropuntia* species	**Prohibition on dealings** *Must not be imported into the State or sold* **All species in the *Austrocylindropuntia* genus have this requirement**
Prickly pears - Cylindropuntias *Cylindropuntia species*	**Prohibition on dealings** *Must not be imported into the State or sold* **All species in the *Cylindropuntia* genus have this requirement**
Prickly pears - Cylindropuntias *Cylindropuntia species*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land.* **This Regional Recommended Measure applies to all species of *Cylindropuntia* except *Cylindropuntia rosea* (Hudson pear)**

Prickly pears - Opuntias *Opuntia* species	**Prohibition on dealings** *Must not be imported into the State or sold* **Except for *Opuntia ficus-indica* (Indian fig)**
Prickly pears - Opuntias *Opuntia* species	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land.* *Land managers should mitigate spread from their land.* **This Regional Recommended Measure applies to all species of *Opuntia* except for *Opuntia ficus-indica* (Indian fig)**
Rope pear *Cylindropuntia imbricata*	**Prohibition on dealings** *Must not be imported into the State or sold* **All species in the *Cylindropuntia* genus have this requirement**
Rope pear *Cylindropuntia imbricata*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land.* *Land managers should mitigate spread from their land.* **This Regional Recommended Measure applies to all species of *Cylindropuntia* except *Cylindropuntia rosea* (Hudson pear)**
Rubber vine *Cryptostegia grandiflora*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Sagittaria *Sagittaria platyphylla*	**Prohibition on dealings** *Must not be imported into the State or sold*
Sagittaria *Sagittaria platyphylla*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land.* *The plant should be eradicated from the land and the land kept free of the plant.* *Notify local control authority if found.* **This Regional Recommended Measure applies to all species of *Sagittaria***
Salvinia *Salvinia molesta*	**Prohibition on dealings** *Must not be imported into the State or sold*
Salvinia *Salvinia molesta*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land.* *The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment.* *Notify local control authority if found.*
Scotch broom *Cytisus scoparius* subsp. *scoparius*	**Prohibition on dealings** *Must not be imported into the State or sold*
Serrated tussock *Nassella trichotoma*	**Prohibition on dealings** *Must not be imported into the State or sold*
Serrated tussock *Nassella trichotoma*	**Regional Recommended Measure** Exclusion zone: whole region except for the core infestation area that is bounded by the Central West Local Land Services boundary north along Burrendong Way to Stuart Town, east along Mookerawa Road to Burrendong Dam, and east along Oaky Creek, bounded by the Central West Local Land Services boundary *Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land. Core infestation area: Land managers should reduce impacts from the plant on priority assets. Land managers should mitigate the risk of the plant being introduced to their land.*

Siam weed *Chromolaena odorata*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Silverleaf nightshade *Solanum elaeagnifolium*	**Prohibition on dealings** *Must not be imported into the State or sold*
Silverleaf nightshade *Solanum elaeagnifolium*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land.*
Smooth tree pear *Opuntia monacantha*	**Prohibition on dealings** *Must not be imported into the State or sold*
Smooth tree pear *Opuntia monacantha*	**Regional Recommended Measure** *Whole region: Land managers should mitigate the risk of new weeds being introduced to their land. Core infestations: Land managers should mitigate spread from their land.* ***This Regional Recommended Measure applies to all species of Opuntia except for Opuntia ficus-indica (Indian fig)**
Snakefeather *Asparagus scandens*	**Prohibition on dealings** *Must not be imported into the State or sold*
Spiny burrgrass - longispinus *Cenchrus longispinus*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment.*
Spiny burrgrass - spinifex *Cenchrus spinifex*	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment.*
Spongeplant *Limnobium spongia*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species of *Limnobium* are Prohibited Matter**
Spotted knapweed *Centaurea stoebe* subsp. *micranthos*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Tiger pear *Opuntia aurantiaca*	**Prohibition on dealings** *Must not be imported into the State or sold*
Tiger pear *Opuntia aurantiaca*	**Regional Recommended Measure** *Whole region: Land managers should mitigate the risk of new weeds being introduced to their land. Core infestations: Land managers should mitigate spread from their land.* ***This Regional Recommended Measure applies to all species of Opuntia except for Opuntia ficus-indica (Indian fig)**

Tropical soda apple *Solanum viarum*	**Control Order** Tropical Soda Apple Control Zone: Whole of NSW *Tropical Soda Apple Control Zone (Whole of NSW): Owners and occupiers of land on which there is tropical soda apple must notify the local control authority of new infestations; destroy the plants including the fruit; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of tropical soda apple must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant on the land, or on or in a carrier.*
Velvety tree pear *Opuntia tomentosa*	**Prohibition on dealings** *Must not be imported into the State or sold*
Velvety tree pear *Opuntia tomentosa*	**Regional Recommended Measure** *Whole region: Land managers should mitigate the risk of new weeds being introduced to their land. Core infestations: Land managers should mitigate spread from their land.* **This Regional Recommended Measure applies to all species of Opuntia except for Opuntia ficus-indica (Indian fig)**
Water caltrop *Trapa* species	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species in the *Trapa* genus are Prohibited Matter in NSW**
Water hyacinth *Eichhornia crassipes*	**Prohibition on dealings** *Must not be imported into the State or sold*
Water hyacinth *Eichhornia crassipes*	**Biosecurity Zone** The Water Hyacinth Biosecurity Zone applies to all land within the State, except for the following regions: Greater Sydney or North Coast, North West (but only the local government area of Moree Plains), Hunter (but only in the local government areas of City of Cessnock, City of Lake Macquarie, MidCoast, City of Maitland, City of Newcastle or Port Stephens), South East (but only in the local government areas of Eurobodalla, Kiama, City of Shellharbour, City of Shoalhaven or City of Wollongong). *Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone*
Water lilies *Nymphaea* species	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.*
Water soldier *Stratiotes aloides*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Willows *Salix* species	**Prohibition on dealings** *Must not be imported into the State or sold* **All species in the *Salix* genus have this requirement, except *Salix babylonica* (weeping willows), *Salix x calodendron* (pussy willow) and *Salix x reichardtii* (sterile pussy willow)**

Witchweeds *Striga* species	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species in the *Striga* genus are Prohibited Matter in NSW, except the native *Striga parviflora***
Yellow burrhead *Limnocharis flava*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*

The content provided here is for information purposes only and is taken from the *Biosecurity Act 2015* and its subordinate legislation, and the Regional Strategic Weed Management Plans (published by each Local Land Services region in NSW). It describes the state and regional priorities for weeds in New South Wales, Australia.

www.dpi.nsw.gov.au

EPBC Protected matters report

Australian Government
Department of the Environment and Energy

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.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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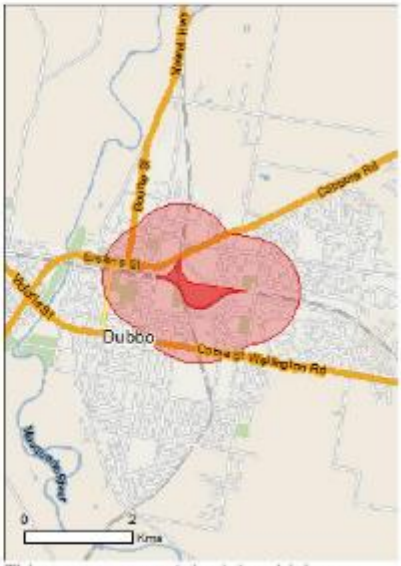

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Coordinates
Buffer: 1.0Km

Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	21
Listed Migratory Species:	10

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	3
Commonwealth Heritage Places:	None
Listed Marine Species:	16
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	26
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Banrock station wetland complex	700 - 800km upstream
Riverland	700 - 800km upstream
The coorong, and lakes alexandrina and albert wetland	900 - 1000km upstream
The macquarie marshes	150 - 200km upstream

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.		
Name	Status	Type of Presence
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 may 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
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 may occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species

Name	Status	Type of Presence
		habitat may occur within area
Fish		
Galaxias rostratus		
Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat may occur within area
Maccullochella peelii		
Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Macquaria australasica		
Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Nyctophilus corbeni		
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Plants		
Androcalva procumbens		
[87153]	Vulnerable	Species or species habitat likely to occur within area
Austrostipa wakoolica		
[66623]	Endangered	Species or species habitat may occur within area
Philotheca ericifolia		
[64942]	Vulnerable	Species or species habitat may occur within area
Swainsona recta		
Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area
Tylophora linearis		
[55231]	Endangered	Species or species habitat may occur within area
Reptiles		
Aprasia parapulchella		
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area
Delma impar		
Striped Legless Lizard [1649]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		

Name	Threatened	Type of Presence
Hirundapus caudacutus		
White-throated Needletail [682]		Species or species habitat may occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat may occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land	[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.

Name
Commonwealth Land -
Commonwealth Land - Australian Telecommunications Commission
Defence - DUBBO TRAINING DEPOT

Listed Marine Species	[Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat may occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax,		Species or species

Name	Status	Type of Presence
Florist's Smilax, Smilax Asparagus [22473]		habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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.

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-32.245774 148.614288,-32.245847 148.616006,-32.245012 148.616993,-32.243505 148.617915,-32.243124 148.61813,-32.244778 148.618259,-32.2485 148.619588,-32.24777 148.629138,-32.247861 148.628451,-32.247988 148.627142,-32.248151 148.626282,-32.248589 148.62519,-32.249095 148.624546,-32.249639 148.623752,-32.249948 148.623087,-32.250202 148.622293,-32.250256 148.621649,-32.250274 148.620705,-32.250093 148.620168,-32.249821 148.619246,-32.24895 148.618817,-32.248351 148.618538,-32.247752 148.61828,-32.247189 148.618066,-32.246808 148.617529,-32.246536 148.617164,-32.246246 148.616392,-32.245973 148.615319,-32.245937 148.614332,-32.245774 148.614288

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

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

Please feel free to provide feedback via the Contact Us page.

Appendix B: Field survey results

Flora species list

These species were identified on the site during the combined site assessment in spring 2017 and summer 2018. Most native species were identified in the summer 218 survey effort, when weed species had died back significantly. Overall, the survey placed most focus on area with native species, and less focus on weed-dominated areas (e.g. areas with dense Paspalum cover). It is noted that late summer to autumn is the preferred survey time for detecting native grasses and other perennial species, and has led to an increased conservation status for the vegetation on the site following the more-detailed survey effort in February 2018.

Growth form	Scientific Name	Common Name	Status
Tree	*Acacia deanei*	Green Wattle	Native
Tree	*Acacia implexa*	Hickory Wattle	Native
Tree	*Acacia salicina*	Cooba	Native
Tree	*Brachychiton populneus*	Kurrajong	Native
Tree	*Eucalyptus conica*	Fuzzy Box	Native
Tree	*Eucalyptus scoparia*	Wallangarra White Gum	Native (Planted)
Tree	*Melia azedarach*	White Cedar	Native (Planted)
Shrub	*Acacia decora*	Western Silver Wattle	Native
Shrub	*Maireana enchylaenoides*	Wingless Bluebush	Native
Shrub	*Senna sp.*	Cassia	Exotic
Herb	*Arctotheca calendula*	Cape Weed	Exotic
Herb	*Asperula conferta*	Common Woodruff	Native
Herb	*Asphodelus fistulosus*	Onion Weed	Exotic
Herb	*Atriplex semibaccata*	Creeping Saltbush	Native
Herb	*Boerhavia coccinea*	Tarvine	Native
Herb	*Brassica sp.*	Hedge Mustard	Exotic
Herb	*Carthamus lanatus*	Saffron Thistle	Exotic
Herb	*Chondrilla juncea*	Skeleton Weed	Exotic
Herb	*Convolvulus arvensis*	Field Bindweed	Exotic
Herb	*Dianella revoluta*	Flax Lily	Native
Herb	*Echium plantagineum*	Paterson's curse	Exotic
Herb	*Erodium malacoides*	Storksbill	Exotic
Herb	*Euphorbia sp.*	Spurge	Exotic
Herb	*Geranium molle*	Dove's foot Crane's-bill	Exotic
Herb	*Glandularia aristigera*	Mayne's Pest	Exotic
Herb	*Glycine tabacina*	Variable Glycine	Native
Herb	*Gomphrena celosioides*	Kakhi Weed	Exotic
Herb	*Lomandra sp.*	Mat-rush	Native
Herb	*Oxalis perennans*	Woodsorrel	Native
Herb	*Plantago lanceolata*	Plantain	Exotic
Herb	*Portulaca oleracea*	Pigweed	Native
Herb	*Rumex brownii*	Swamp Dock	Native
Herb	*Salvia verbenaca*	Wild Sage	Exotic
Herb	*Sida corrugata*	Currugated sida	Native
Herb	*Sida rhombifolia*	Paddy's Lucerne	Exotic
Herb	*Silybum marianum*	Variegated Thistle	Exotic
Herb	*Solanum esuriale*	Quena	Native

Growth form	Scientific Name	Common Name	Status
Herb	*Urtica incisa*	Stinging Nettle	Native
Herb	*Verbena bonariensis*	Purpletop	Exotic
Herb	*Vittadinia cuneata*	Fuzzweed	Native
Herb	*Wahlenbergia communis*	Tufted Bluebell	Native
Herb	*Wahlenbergia stricta*	Tall Bluebell	Native
Grass	*Anthosachne scabra*	Common Wheatgrass	Native
Grass	*Aristida ramosa*	Wiregrass	Native
Grass	*Austrostipa sp.*	Speargrass	Native
Grass	*Avena fatua*	Wild Oats	Exotic
Grass	*Bothriochloa macra*	Red-leg Grass	Native
Grass	*Bromus diandrus*	Great Brome	Exotic
Grass	*Chloris gayana*	Rhodes Grass	Exotic
Grass	*Chloris truncata*	Windmill Grass	Native
Grass	*Cynodon dactylon*	Common Couch	Exotic
Grass	*Dactyloctenium radulans*	Button Grass	Native
Grass	*Dichanthium sericeum*	Queensland Bluegrass	Native
Grass	*Digitaria divaricatissima*	Umbrella Grass	Native
Grass	*Enteropogon acicularis*	Curly Windmill Grass	Native
Grass	*Eragrostis lacunaria*	Purple Love-grass	Native
Grass	*Panicum effusum*	Hairy Panic	Native
Grass	*Paspalidium sp.*	Panic Grass	Native
Grass	*Paspalum dilatatum*	Paspalum	Exotic
Grass	*Rytidosperma auriculatum*	Lobed Wallaby Grass	Native
Grass	*Rytidosperma sp.*	Wallaby Grass 1	Native
Grass	*Rytidosperma sp.*	Wallaby Grass 2	Native
Grass	*Themeda triandra*	Kangaroo Grass	Native
Grass	*Urochloa panicoides*	Urochloa Grass	Exotic

Site photos.

See Figure 2-1 for locations of photo points.

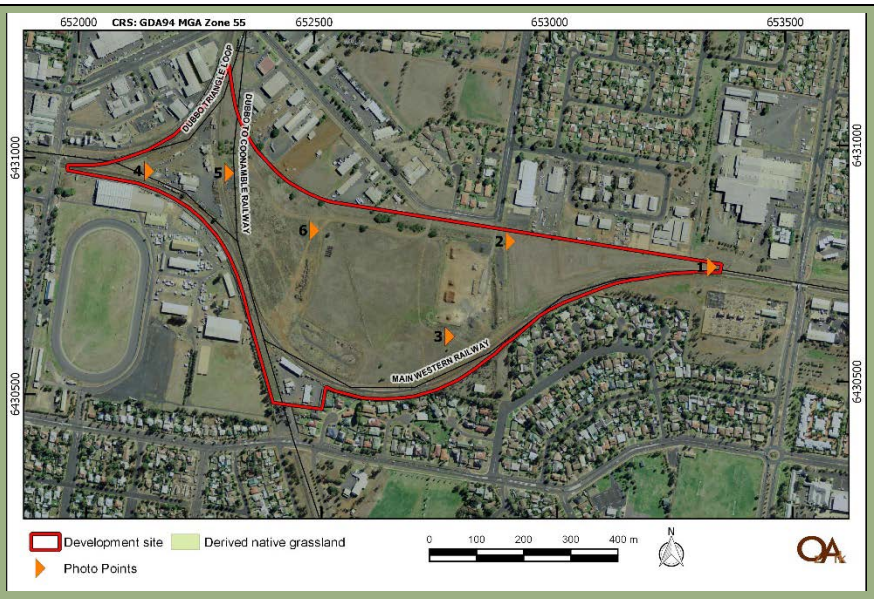
Photo point locations:	
Photo point 1. **Far eastern part of the site. View looking west, February 2018.**	

Photo point 2. **Existing detention basins. View looking east, February 2018.**	
Photo point 3. **Southern part of the site. View looking west, February 2018. This area contains remnant overstorey trees indicative of the Fuzzy Box Woodland EEC, namely Fuzzy Box (*Eucalyptus conica*) emergent on the horizon and Kurrajong (*Brachychiton populneus*) which are the dense round trees at left.**	

Photo point 4. **Far western part of the site. View looking east, February 2018. The main native species present in this area is Button Grass (*Dactyloctenium radulans*).**	
Photo point 5. **Western part of the site. View looking north, February 2018. The tree in this view is a planted specimen of Wallangarra White Gum (*Eucalyptus scoparia*).**	

Photo point 6. **Approximate position of the new rail line. View looking north, February 2018.**	

Examples of native shrubs and groundcover species observed at the site (February 2018).

Deane's Wattle (*Acacia deanei*)	
Cooba (*Acacia salicina*)	
Common Woodruff (*Asperula conferta*)	

Kangaroo Grass (*Themeda triandra*)	
Lomandra sp (*Mat-rush*)	
Corrugated Sida (*Sida corrugata*)	

Swamp Dock (*Rumex brownii*)	
Wood sorrel (*Oxalis perennans*)	
Bluebell (*Wahlenbergia stricta*)	

Fuzzweed (*Vittadinia cuneata*)	
Variable Glycine (*Glycine tabacina*) and Queensland Bluegrass (*Dichanthium sericeum*)	
Red-leg Grass (*Bothriochloa macra*)	

Appendix C: Vegetation community identification

NSW Plant Community Types (PCT) considered in this assessment. The list of potential PCTs was derived from BioNet VIS database, and existing mapping of the Dubbo area (Central West Lachlan State Vegetation Map VIS ID 4468).

PCT ID	Common Name	PCT Description	Associated NSW EEC	Associated Commonwealth EEC	Site Assessment
248	Mixed box eucalypt woodland on low sandy-loam rises on alluvial plains in central western NSW	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. They include Senna form taxon 'zygophylla', Hakea tephrosperma, Myoporum montanum, Acacia deanei subsp. deanei and Maireana microphylla. 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.	Artesian Springs Ecological Community in the Great Artesian Basin (E), Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions €	White Box Yellow Box Blakely's Red Gum Woodland (CE)	Not present. The diagnostic overstorey species are not present.
76	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Tall woodland to 25 m high dominated by Western Grey Box (Eucalyptus microcarpa) often as the only tree species often occupying 90% of the cnaopy cover but other trees may include Yellow Box (Eucalyptus melliodora), White Cypress Pine (Callitris glaucophylla) and minor Buloke. The shrub layer is absent or sparse and includes Dodonaea viscosa subsp. cuneata, Acacia buxifolia, Acacia acinacea, Acacia hakeoides, Bursaria spinosa. Grazing has eliminated shrubs these in many places. A mid-dense or dense grass ground cover is present composed of Austrodanthonia caespitosa, Austrodanthonia setacea, Austrostipa scabra subsp. falcata, Paspalidium constrictum,Themeda australis, Austrostipa aristiglumis, Aristida behriana and Elymus scaber var. scaber along with introduced grass species such as Bromus spp., Vulpia spp.and Hordeum leporinum. The small scrambler Einadia nutans subsp. nutans is usually present. Native forbs include Sida corrugata, Wahlenbergia gracilis, Vittadinia gracilis, Dianella porracea, Oxalis perennans and Chamaesyce drummondii. Occurs on texture contrast red or brown earths or grey clay soils (that may be gilgaied) on undulating alluvial plains in the predominantly winter rainfall belt of south-central western NSW with an average annual rainfall between 550 and 450 mm. Mainly restricted to the eastern section of the Riverina Bioregion and the western section of the NSW South-western Slopes Bioregion. Distributed from north of Forbes in the north to near Albury in the south extending into north-central Victoria. It has lost its original shrub layer in many locations where grazing has been intense. Grades into the more	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (E)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (E)	Not present. The diagnostic overstorey species are not present.

PCT ID	Common Name	PCT Description	Associated NSW EEC	Associated Commonwealth EEC	Site Assessment
		shrubby Western Grey Box-White Cypress Pine - Buloke community (ID80) on loamy-sand soils and grades into White Box (Eucalyptus albens) on podzolic soils to the east on the western slopes. Grades into a riverine Western Grey Box community ID237 along the floodplains of the Murrumbidgee and Murray Rivers. Due to its occurrence on arable soils, this community has largely been cleared. Much of its remaining extent is threatened by grazing and weed invasion. It is a critically endangered community.			
70	White Cypress Pine woodland on sandy loams in central NSW wheatbelt	Tall or mid-high woodland to about 18 m high dominated by White Cypress Pine (Callitris glaucophylla) that may occupy >90% of the canopy cover. The canopy structure alters depending on degree of clearing, thinning or regrowth. Various box eucalypts may be present including Poplar Box (Eucalyptus populnea) and Western Grey Box (Eucalyptus microcarpa). Small trees may include Buloke (Allocasuarina luehmannii) or Belah (Casuarina cristata). Shrubs are sparse and include Deane's Wattle (Acacia deanei subsp. deanei), Wilga (Geijera parviflora), hopbush (Dodonaea viscosa), Maireana enchylaenoides, Thorny Saltbush (Rhagodia spinescens) and Senna spp. The ground cover is sparse dominated by grasses such as Austrostipa scabra subsp. scabra, Enteropogon acicularis, Thyridolepis mitchellii, Austrodanthonia eriantha, Austrodanthonia setacea, Enteropogon acicularis and Eragrostis lacunaria. Forb species include Calotis cuneifolia, Sida cunninghamii, Oxalis perennans, Goodenia cycloptera, Xerochrysum bracteatum and Chrysocephalum apiculatum. The rock fern Cheilanthes sieberi subsp. sieberi is often present. In dry times the ground may be nearly bare. Occurs on red, brown or yellow sandy or loamy soils on flats and rises on alluvial plains. Vegetation structure varies depending on the history of disturbance including logging. Dense regrowth of young Pines may be present. Distributed in central NSW, generally with annual rainfall between 400 and 600 mm. Mainly in the NSW South-western Slopes and Darling Riverine Plain Bioregions. A significant proportion of this community has been cleared as it occurs in the wheatbelt. Remnants occur in state forests, other public lands and on leasehold and private land. This community grades into Poplar Box or Western Grey Box woodlands in the mid-central and south and Poplar Box and Coolabah woodlands in the north that occur on finer texture soils. Grades into White Cypress Pine-Poplar Box community (ID72) in the Cobar Peneplain Bioregion.	Nil	Nil	Not present. The diagnostic overstorey species are not present.

PCT ID	Common Name	PCT Description	Associated NSW EEC	Associated Commonwealth EEC	Site Assessment
796	Derived grassland of the NSW South Western Slopes	Derived grassland communities resulting from the clearing of various grassy woodland and forest communities; occurs on any landscape position formerly occupied by woodland and dry forest communities, from which these grassland communities are derived.; LandscapePosition: On footslopes, midslopes, upper slopes and crests, on all lithologies. Widespread throughout the slopes.	White Box Yellow Box Blakely's Red Gum Woodland (E)	White Box Yellow Box Blakely's Red Gum Woodland (CE)	Yes, present across most areas with native groundcover species, due to past clearing of trees.
201	Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	Tall woodland or open forest dominated by Fuzzy Box (Eucalyptus conica) often growing with Western Grey Box (Eucalyptus microcarpa), Yellow Box (Eucalyptus melliodora) or Kurrajong (Brachychiton populneus subsp. populneus). Buloke (Allocasuarina luehmannii) is common in places. Shrubs are generally sparse and include Acacia deanei subsp. deanei, Dodonaea viscosa subsp. cuneata, Geijera parviflora, Acacia implexa, Senna artemisioides sens lat., Myoporum montanum and Cassinia aculeata. Small shrubs include Maireana enchylaenoides, Maireana microphylla and Sclerolaena muricata var. muricata. The ground cover may be dense after rain but is usually mid-dense and may be dominated by weed species. Native forbs include Calotis cuneifolia, Eremophila debilis, Sida corrugata, Einadia hastata, Dianella revoluta var. revoluta and Xerochrysum viscosa. Native grasses include Austrostipa scabra subsp. scabra, Chloris truncata, Elymus scaber var. scaber, Themeda australis and Austrodanthonia setacea. Weeds may be very common. They include the pepper Tree Schinus areica and forb species such as Plantago lanceolata, Lepidium africanum, Verbena bonariensis and Marrubium vulgare and the grass species Bromus diandrus, Vulpia myuros, Lolium perenne and Paspalum dilatatum. This community occurs on brown loam or clay, alluvial or colluvial soils on flats, low slopes, prior streams and abandoned channels or slight depressions on the undulating plains mainly in the NSW South-western Slopes Bioregion but extending into the Cobar Peneplain and Brigalow Belt South Bioregions. Outliers occur near Byalong in the east. Most abundant in the Forbes district but extends north to Narromine. This community often occurs upslope from River Red Gum communities just above frequently inundated areas on the floodplain. Less than 5% of this community is estimated to remain compared to pre-European times due to past clearing. Clearing has largely ceased now but other ecological problems prevail such as sensescence, lack of fire and weed invasion. It is considered a critically endangered community with less than 0.5% in protected areas. as of 2005 a small stand of 27 hectrareswas represented in a reserve - at Weddin Mountains National Park. This community requires both protection in reserves or on private land and rehabilitation. Grades into and similar to ID202 in the central part of the Brigalow Belt South Bioregion.	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions (E)	Nil	Yes, present in southern area of the site, where Fuzzy Box (*Eucalyptus conica*) and Kurrajong (*Brachychiton populneus*) are present over a predominantly grassy understorey. Other areas without trees are likely to have been this community, but are now derived grasslands.

PCT ID	Common Name	PCT Description	Associated NSW EEC	Associated Commonwealth EEC	Site Assessment
81	Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion	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 along with Cassinia spp., Dodonaea spp., Senna form taxon 'zygophylla' and Bursaria spinosa. The ground cover is mid-dense to dense and is dominated by grass and forb species. Native grass species include Austrostipa scabra, Austrostipa verticillata, Austrodanthonia fulva and Enteropogon acicularis. The decumbent shrub Eremophila debilis may be a common species in the ground cover. Forbs include Einadia nutans subsp. nutans, Dichondra repens, Calotis cuneifolia, Calotis lappulacea, Chrysocephalum apiculatum, Oxalis perennans, Sida corrugata, Senecio lautus subsp. lanceolatus, Podolepis jaceoides, Solanum parvifolium, Arthropodium milleflorum and Hybanthus monopetalus. The climbers Hardenbergia violacea and Glycine tabacina are often present. 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. Most common in the southern Warrumbungle Shire extending to Dubbo and Coolah. Small areas on the western Liverpool Plains. Mainly confined to the Brigalow Belt South Bioregion. Similar in structure to ID76 or ID80 in the south western slopes. Merges into Poplar Box woodlands (ID244) in the Darling Riverine Plains and Pilliga Box woodland (ID88) on sandier soil in the BBS Bioregion. Mostly cleared for grazing or cropping with remnants on roadsides or in Travelling Stock Reserves. Part of a NSW and Federally listed endangered ecological community.	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (E)	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (E)	Not present. The diagnostic overstorey species are not present.

Fuzzy Box (*Eucalyptus conica*) species identification

Fuzzy Box (*Eucalyptus conica*) diagnostic features observed on site – leaves, fruits (capsules), buds and bark.

NEW SOUTH WALES FLORA ONLINE

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New South Wales Flora Online

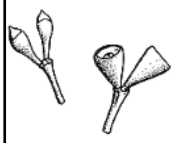
Eucalyptus conica H.Deane & Maiden

Family **Myrtaceae**

Common name: Fuzzy Box

Eucalyptus conica H.Deane & Maiden APNI*

Synonyms: *Eucalyptus baueriana* var. *conica* (H.Deane & Maiden) Maiden APNI*



Description: Tree to 20 m high; bark persistent on trunk and larger branches, grey with whitish patches, fibrous-flaky ('box'), smooth above, grey, shedding in short ribbons.

Juvenile leaves disjunct, ovate, dull grey-green to dull green.

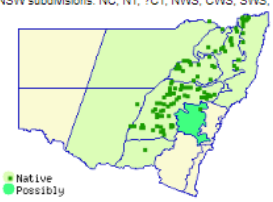
Adult leaves disjunct, lanceolate or narrow-lanceolate, 7–12 cm long, 0.8–2.5 cm wide, grey-green, dull, concolorous. Conflorescence compound or simple; umbellasters 7-flowered; peduncle terete, 4–10 mm long; pedicels terete, 2–4 mm long. Buds clavate to shortly fusiform, 3–8 mm long, 2–3 mm diam.; scar present; calyptra hemispherical or conical, shorter than and narrower or as wide as hypanthium. Outer stamens infertile; anthers cuboid.

Fruit conical, 5–7 mm long, 3–5 mm diam.; disc depressed; valves enclosed.

Herbarium Sheet | Herbarium Sheet | Type Specimen

Distribution and occurrence: Locally frequent, in grassy or sclerophyll woodland on light loamy soils of medium fertility; north from Wagga.
NSW subdivisions: NC, NT, ?CT, NWS, CWS, SWS, NWP, SWP

Other Australian states: Qld



Text by K. Hill
Taxon concept: Flora of NSW 2 (1991)

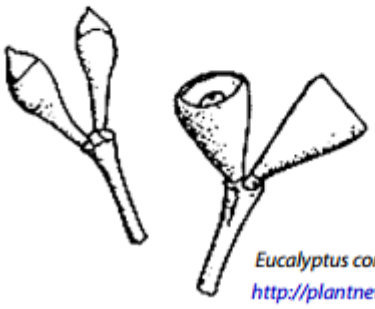
Fuzzy Box woodland EEC diagnostic species:

Common name	Scientific name
Overstorey – tree or shrub layer species (1.5 m+)	
Deane's wattle+	*Acacia deanei* subsp. *deanei*
Ironwood+ (NW)	*Acacia excelsa*
Western black wattle+	*Acacia hakeoides*
Hickory wattle+ (SE)	*Acacia implexa*
Mountain hickory+ (SE)	*Acacia penninervis* var. *longiracemosa*
Bulloak+	***Allocasuarina luehmannii***
Kurrajong+	***Brachychiton populneus* subsp. *populneus***
White cypress pine+	*Callitris glaucophylla*
Belah+	*Casuarina cristata*
Blakely's red gum+	*Eucalyptus blakelyi*
Fuzzy box+	***Eucalyptus conica***
Western red box+ (NW)	*Eucalyptus intertexta*
Yellow box+	***Eucalyptus melliodora***
Western grey box+	***Eucalyptus microcarpa***
Poplar box+	*Eucalyptus populnea* subsp. *bimbil*
Wilga+	*Geijera parviflora*
Needlewood+ (NW)	*Hakea leucoptera*
Sugarwood+	*Myoporum platycarpum* subsp. *perbellum*
Native olive+ (SE)	*Notelaea microcarpa*
Groundcover/understorey species (0-1.5 m)	
shrubs / forbs	
Lesser joyweed	*Alternanthera denticulata*
Hairy joyweed+	*Alternanthera nana*
Slender-fruited saltbush+ (NW)	*Atriplex leptocarpa*
Creeping saltbush+	*Atriplex semibaccata*
Sticky everlasting+	*Bracteantha viscosa*
Purple burr-daisy+	*Calotis cuneifolia*
Yellow burr-daisy	*Calotis lappulacea*
Tufted burr-daisy+	*Calotis scapigera*
Dolly bush+	*Cassinia aculeata*
Maltese cockspur+	*Centaurea melitensis**
Crested goosefoot+	*Chenopodium cristatum*
Desert goosefoot+	*Chenopodium desertorum*
Mistletoe+	*Dendrophthoe glabrescens*
Blue flax-lily+	*Dianella longifolia* var. *longifolia*
Blue flax-lily+	*Dianella revoluta* var. *revoluta*
Wedge-leaf hopbush+	*Dodonaea viscosa* subsp. *cuneata*
Paterson's curse	*Echium plantagineum**
Berry saltbush+	*Einadia hastata*
Climbing saltbush+	*Einadia nutans* sens. lat.
Amulla+	*Eremophila debilis*

Common name	Scientific name
Peppercress	*Lepidium pseudohyssopifolium*
Wingless fissure-weed+	*Maireana enchylaenoides*
Small fissure-weed+	*Maireana humillima*
Eastern cottonbush	*Maireana microphylla*
Horehound	*Marrubium vulgare**
Water bush+	*Myoporum montanum*
Australian broomrape+	*Orobanche cernua* var. *australiana*
Lamb's tails+	*Ptilotus semilanatus*
Thorny saltbush+ (NW)	*Rhagodia spinescens*
Slender dock	*Rumex brownii*
Galvanised burr + (NW)	*Sclerolaena birchii*
Black roly-poly+	*Sclerolaena muricata* var. *muricata*
Silver cassia+	*Senna artemisioides* sens. lat.
Corrugated sida+	*Sida corrugata*
Rock sida+ (NW)	*Sida petrophila*
London rocket	*Sisymbrium irio**
Quena+	*Solanum esuriale*
Fuzzweed+	*Vittadinia cuneata* sens. lat.
Herbs / ferns	
Pimpernel	*Anagallis arvensis**
Capeweed	*Arctotheca calendula**
Small vanilla-lily+	*Arthropodium minus*
Tarvine+	*Boerhavia dominii*
Variable daisy	*Brachyscome ciliaris* var. *lanuginosa*
Golden lily+	*Bulbine bulbosa*
Leek lily	*Bulbine semibarbata*
Blue fairy orchid	*Caladenia caerulea*
Pink fingers	*Caladenia carnea*
Small purslane	*Calandrinia eremaea*
Garland lily	*Calostemma purpureum*
Caustic weed+	*Chamaesyce drummondii*
Rock fern+ (SE)	*Cheilanthes austrotenuifolia*
Rock fern	*Cheilanthes sieberi* subsp. *sieberi*
Australian bindweed+	*Convolvulus erubescens*
Dense stonecrop	*Crassula colorata* var. *acuminata*
Native carrot	*Daucus glochidiatus*
Kidney weed+	*Dichondra repens*
Kidney weed	*Dichondra* species A
Nodding chocolate-lily+	*Dichopogon fimbriatus*
Blue crowsfoot	*Erodium crinitum*
Native geranium	*Geranium solanderi* var. *solanderi*
Silky glycine	*Glycine canescens*
Twining glycine+	*Glycine clandestina*

Common name	Scientific name
Variable glycine+	*Glycine latifolia*
Variable glycine	*Glycine tabacina*
Stinking pennywort	*Hydrocotyle laxiflora*
Smooth catsear	*Hypochaeris glabra**
Burr medic	*Medicago polymorpha**
Common onion orchid	*Microtis unifolia*
Wood sorrel+	*Oxalis chnoodes*
Yellow wood sorrel	*Oxalis perennans*
Proliferous pink	*Petrorhagia nanteuilii**
Sago weed+	*Plantago cunninghamii*
Common pigweed+	*Portulaca oleracea*
Midget greenhood orchid	*Pterostylis mutica*
Small-flowered buttercup	*Ranunculus sessiliflorus* var. *sessiliflorus*
Pink tongues+	*Rostellularia adscendens* subsp. *adscendens*
Common sowthistle	*Sonchus oleraceus**
Creamy candles+	*Stackhousia monogyna*
Chickweed	*Stellaria media**
Slender sun orchid	*Thelymitra pauciflora*
Haresfoot clover	*Trifolium arvense**
Tufted bluebell	*Wahlenbergia communis*
River bluebell+	*Wahlenbergia fluminalis*
Native bluebell+	*Wahlenbergia luteola*
Native bluebell+ (SE)	*Wahlenbergia victoriensis*
Grasses / sedges	
Silvery hairgrass	*Aira cupaniana**
Bunch wiregrass+	*Aristida behriana*
Wiregrass+	*Aristida muricata*
Purple wiregrass+	*Aristida ramosa* var. *speciosa*
Ringed wallaby grass	*Austrodanthonia caespitosa*
Wallaby grass	*Austrodanthonia racemosa*
Small-flowered wallaby grass+	*Austrodanthonia setacea*
Plains grass+	*Austrostipa aristiglumis*
Foxtail speargrass+	*Austrostipa densiflora*
Feather speargrass+	*Austrostipa elegantissima*
Stout bamboo grass+	*Austrostipa ramosissima*
Rough speargrass	*Austrostipa scabra* subsp. *falcata*
Rough speargrass+	*Austrostipa scabra* subsp. *scabra*
Slender bamboo-grass+	*Austrostipa verticillata*
Corkscrew grass	*Austrostipa setacea*
Wakool speargrass+ (SE)	*Austrostipa wakoolica*

Common name	Scientific name
Pitted bluegrass+	*Bothriochloa decipiens*
Red-leg grass+	*Bothriochloa macra*
Shivery grass	*Briza minor**
Great brome	*Bromus diandrus**
Tall sedge+	*Carex appressa*
Sedge+ (SE)	*Carex incomitata*
Windmill grass+	*Chloris truncata*
Button grass+	*Dactyloctenium radulans*
Queensland bluegrass+	*Dichanthium sericeum*
Cotton panic grass+	*Digitaria brownii*
Finger grass	*Digitaria diffusa*
Spreading umbrella grass+	*Digitaria divaricatissima*
Common wheatgrass+	*Elymus scaber* var. *scaber*
Bottlewashers+	*Enneapogon* spp.
Windmill grass+	*Enteropogon acicularis*
Canegrass+	*Eragrostis australasica*
Weeping lovegrass+	*Eragrostis parviflora*
Slender cupgrass+	*Eriochloa procera*
Rush+	*Juncus flavidus*
Rush	*Juncus remotiflorus*
Umbrella Canegrass+	*Leptochloa digitata*
Perennial ryegrass	*Lolium perenne**
Many-flowered mat-rush+	*Lomandra multiflora* subsp. *multiflora*
Meadow rice-grass	*Microlaena stipoides* var. *stipoides*
Long-leaved wallaby grass+ (SE)	*Notodanthonia longifolia*
Native millet+	*Panicum decompositum*
Pepper grass+	*Panicum laevinode*
Pale summer-grass+	*Paspalidium albovillosum*
Tussock grass+	*Poa labillardieri* var. *labillardieri*
Kangaroo grass+	*Themeda australis*



Eucalyptus conica buds and fruits
http://plantnet.rbgsyd.nsw.gov.au

Appendix D: Habitat assessment

Habitat assessment for threatened species and ecological communities - Likelihood of occurrence and potential impact.

Kingdom	Class	Scientific Name	Common Name	NSW Status	Commonwealth Status	NSW Occurrence	Commonwealth Occurrence	10km records	Likelihood of occurrence	Potential impact
Community	Ecological Community	Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Coolibah - Black Box Woodlands	Endangered Ecological Community	Endangered		Community may occur within area		No - this community was not recorded during the field survey	No
Community	Ecological Community	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Fuzzy Box Woodland	Endangered	Not listed	Known	Not listed		Yes - this community was recorded during the field survey on the basis of the diagnostic overstorey species *Eucalyptus conica* and *Brachychiton populneus,* with a grassy understorey.	Yes
Community	Ecological Community	Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Inland Grey Box Woodland	Endangered	Endangered		Community may occur within area		No - this community was not recorded during the field survey	No
Community	Ecological Community	Natural Grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland		Not listed	Critically Endangered		Community may occur within area		No - this community was not recorded during the field survey	No
Community	Ecological Community	Weeping Myall Woodlands	Weeping Myall Woodlands	Endangered	Endangered		Community may occur within area		No - this community was not recorded during the field survey	No
Community	Ecological Community	White Box Yellow Box Blakely's Red Gum Woodland	Box Gum Woodland	Endangered	Critically Endangered	Known	Community may occur within area		No - this community was not recorded during the field survey	No
Fauna	Amphibians	*Crinia sloanei*	Sloane's Froglet	Vulnerable		Known			No - no aquatic, wetland or riparian habitat exists within the study area	No
Fauna	Bats	*Chalinolobus dwyeri*	Large-eared Pied Bat	Vulnerable	Vulnerable	Known	Species or species habitat likely to occur within area		Unlikely - no foraging or roosting (cave) habitat for this species was identified within the study area	No

Kingdom	Class	Scientific Name	Common Name	NSW Status	Commonwealth Status	NSW Occurrence	Commonwealth Occurrence	10km records	Likelihood of occurrence	Potential impact
Fauna	Bats	*Chalinolobus picatus*	Little Pied Bat	Vulnerable		Known		3	Potential - the foraging habitat identified for this species within the study area was highly degraded. Roosting habitat for this species (old buildings) was identified within the study area	Possible
Fauna	Bats	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	Vulnerable		Known			Unlikely - The study area is outside the core distribution of this species. Roosting habitat for this species (old buildings) was identified within the study area	Unlikely
Fauna	Bats	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	Vulnerable		Known		3	Likely - the foraging habitat identified for this species within the study area was highly degraded. Roosting habitat for this species (old buildings) was identified within the study area	Possible
Fauna	Bats	*Mormopterus lumsdenae*	Northern Free-tailed Bat	Vulnerable		Known			Unlikely - The study area is outside the core distribution of this species. Roosting habitat for this species (old buildings) was identified within the study area	Unlikely
Fauna	Bats	*Nyctophilus corbeni*	Corben's Long-eared Bat	Vulnerable	Vulnerable	Known	Species or species habitat known to occur within area	1	Unlikely - no foraging or roosting (tree hollows, exfoliating bark) habitat for this species was identified within the study area	No
Fauna	Bats	*Pteropus poliocephalus*	Grey-headed Flying-fox	Vulnerable	Vulnerable	Known	Foraging, feeding or related behaviour likely to occur within area	1	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No

Kingdom	Class	Scientific Name	Common Name	NSW Status	Commonwealth Status	NSW Occurrence	Commonwealth Occurrence	10km records	Likelihood of occurrence	Potential impact
Fauna	Bats	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	Vulnerable		Known		4	Potential - the foraging habitat identified for this species within the study area was highly degraded. Roosting habitat for this species (old buildings) was identified within the study area	Possible
Fauna	Bats	*Vespadelus troughtoni*	Eastern Cave Bat	Vulnerable		Known		2	Unlikely - no foraging or roosting (cave) habitat for this species was identified within the study area	No
Fauna	Birds	*Anseranas semipalmata*	Magpie Goose	Vulnerable		Known		2	No - no aquatic, wetland or riparian habitat exists within the study area	No
Fauna	Birds	*Anthochaera phrygia*	Regent Honeyeater	Critically Endangered	Critically Endangered	Known	Species or species habitat known to occur within area	8	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	Vulnerable		Known			Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Botaurus poiciloptilus*	Australasian Bittern	Endangered	Endangered	Known			No - no aquatic, wetland or riparian habitat exists within the study area	No
Fauna	Birds	*Burhinus grallarius*	Bush Stone-curlew	Endangered		Known			Unlikely - the habitat identified for this species within the study area was highly degraded	No
Fauna	Birds	*Calidris ferruginea*	Curlew Sandpiper	Endangered	Critically Endangered		Species or species habitat may occur within area		No - no aquatic, wetland or riparian habitat exists within the study area	No
Fauna	Birds	*Calyptorhynchus lathami*	Glossy Black-Cockatoo	Vulnerable		Known		2	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Chthonicola sagittata*	Speckled Warbler	Vulnerable		Known		2	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No

Kingdom	Class	Scientific Name	Common Name	NSW Status	Commonwealth Status	NSW Occurrence	Commonwealth Occurrence	10km records	Likelihood of occurrence	Potential impact
Fauna	Birds	*Circus assimilis*	Spotted Harrier	Vulnerable		Known		14	Potential - the habitat identified for this species within the study area was highly degraded	No
Fauna	Birds	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	Vulnerable		Known		5	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Daphoenositta chrysoptera*	Varied Sittella	Vulnerable		Known		1	No - this species does not inhabit open grasslands	No
Fauna	Birds	*Epthianura albifrons*	White-fronted Chat	Vulnerable		Known		1	Potential - the habitat identified for this species within the study area was highly degraded	No
Fauna	Birds	*Falco hypoleucos*	Grey Falcon	Endangered		Known			Potential - the habitat identified for this species within the study area was highly degraded	No
Fauna	Birds	*Falco subniger*	Black Falcon	Vulnerable		Known		7	Potential - the habitat identified for this species within the study area was highly degraded	No
Fauna	Birds	*Glossopsitta pusilla*	Little Lorikeet	Vulnerable		Known		2	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Grantiella picta*	Painted Honeyeater	Vulnerable	Vulnerable	Known	Species or species habitat likely to occur within area		Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	Vulnerable	CAMBA	Known			No - no coastal, aquatic, wetland or riparian habitat exists within the study area	No
Fauna	Birds	*Hamirostra melanosternon*	Black-breasted Buzzard	Vulnerable		Known			Potential - the habitat identified for this species within the study area was highly degraded	No
Fauna	Birds	*Hieraaetus morphnoides*	Little Eagle	Vulnerable		Known		8	Potential - the habitat identified for this species within the study area was highly degraded	No

Kingdom	Class	Scientific Name	Common Name	NSW Status	Commonwealth Status	NSW Occurrence	Commonwealth Occurrence	10km records	Likelihood of occurrence	Potential impact
Fauna	Birds	*Lathamus discolor*	Swift Parrot	Endangered	Critically Endangered	Known	Species or species habitat likely to occur within area		Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Leipoa ocellata*	Malleefowl	Endangered	Vulnerable	Known	Species or species habitat may occur within area		Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Lophochroa leadbeateri*	Major Mitchell's Cockatoo	Vulnerable		Known		1	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Lophoictinia isura*	Square-tailed Kite	Vulnerable		Known			Potential - the habitat identified for this species within the study area was highly degraded	No
Fauna	Birds	*Melanodryas cucullata cucullata*	Hooded Robin (south-eastern form)	Vulnerable		Known		1	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	Vulnerable		Known		1	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Neophema pulchella*	Turquoise Parrot	Vulnerable		Known			Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Ninox connivens*	Barking Owl	Vulnerable		Known		5	Potential - the habitat identified for this species within the study area was highly degraded	No
Fauna	Birds	*Ninox strenua*	Powerful Owl	Vulnerable		Known			Potential - the habitat identified for this species within the study area was highly degraded	No
Fauna	Birds	*Pachycephala inornata*	Gilbert's Whistler	Vulnerable		Known			Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Pandion cristatus*	Eastern Osprey	Vulnerable		Known			No - no aquatic, wetland or riparian habitat exists within the study area	No

Kingdom	Class	Scientific Name	Common Name	NSW Status	Commonwealth Status	NSW Occurrence	Commonwealth Occurrence	10km records	Likelihood of occurrence	Potential impact
Fauna	Birds	*Petroica boodang*	Scarlet Robin	Vulnerable		Known			Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Petroica phoenicea*	Flame Robin	Vulnerable		Known		2	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Phaethon rubricauda*	Red-tailed Tropicbird	Vulnerable	CAMBA	Known		1	No - no coastal, aquatic, wetland or riparian habitat exists within the study area	No
Fauna	Birds	*Polytelis swainsonii*	Superb Parrot	Vulnerable	Vulnerable	Known	Species or species habitat known to occur within area	9	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	Vulnerable		Known		29	Potential - the habitat identified for this species within the study area was highly degraded	No
Fauna	Birds	*Rostratula australis*	Australian Painted Snipe	Endangered	Endangered	Known	Species or species habitat may occur within area	2	No - no aquatic, wetland or riparian habitat exists within the study area	No
Fauna	Birds	*Stagonopleura guttata*	Diamond Firetail	Vulnerable		Known		2	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Birds	*Stictonetta naevosa*	Freckled Duck	Vulnerable		Known			No - no aquatic, wetland or riparian habitat exists within the study area	No
Fauna	Birds	*Tyto novaehollandiae*	Masked Owl	Vulnerable		Known			Potential - the habitat identified for this species within the study area was highly degraded	No
Fauna	Marsupials	*Cercartetus nanus*	Eastern Pygmy-possum	Vulnerable		Known			Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Marsupials	*Dasyurus maculatus*	Spotted-tailed Quoll	Vulnerable	Endangered	Known			Unlikely - no foraging or roosting habitat for this species was identified within the study area	No

Kingdom	Class	Scientific Name	Common Name	NSW Status	Commonwealth Status	NSW Occurrence	Commonwealth Occurrence	10km records	Likelihood of occurrence	Potential impact
Fauna	Marsupials	*Macrotis lagotis*	Bilby	Extinct	Vulnerable	Known		1	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Marsupials	*Ningaui yvonneae*	Southern Ningaui	Vulnerable		Known			Unlikely - Closely tied to vegetation with spinifex clumps (in NSW mainly associated with mallee woodlands), though occasionally recorded in other habitats	Unlikely
Fauna	Marsupials	*Petauroides volans*	Greater Glider		Vulnerable	Known			Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Marsupials	*Petaurus norfolcensis*	Squirrel Glider	Vulnerable		Known			Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Marsupials	*Petrogale penicillata*	Brush-tailed Rock-wallaby	Endangered	Vulnerable	Known			Unlikely - core habitat (rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges) for this species was not identified within the study area	No
Fauna	Marsupials	*Phascolarctos cinereus*	Koala	Vulnerable	Vulnerable	Known	Species or species habitat may occur within area	1	Unlikely - no foraging or roosting habitat for this species was identified within the study area	No
Fauna	Reptiles	*Aprasia parapulchella*	Pink-tailed Legless Lizard	Vulnerable	Vulnerable	Known	Species or species habitat may occur within area		Unlikely - core habitat (bushrock on slopes and hill crests) for this species was not identified within the study area	No
Fauna	Reptiles	*Delma impar*	Striped Legless Lizard		Vulnerable		Species or species habitat may occur within area		Unlikely - Beyond the core range of this species, habitat (grassland dominated by perennial, tussock-forming grasses) was highly degraded in the	No

Kingdom	Class	Scientific Name	Common Name	NSW Status	Commonwealth Status	NSW Occurrence	Commonwealth Occurrence	10km records	Likelihood of occurrence	Potential impact
									study area	
Fauna	Reptiles	*Hoplocephalus bitorquatus*	Pale-headed Snake	Vulnerable		Predicted			Unlikely - no foraging or roosting (tree hollows) habitat for this species was identified within the study area	No
Fauna	Reptiles	*Tiliqua occipitalis*	Western Blue-tongued Lizard	Vulnerable		Known			Unlikely - Beyond the core range of this species, habitat was highly degraded in the study area	No
Flora	Grasses	*Austrostipa wakoolica*	A spear grass	Endangered	Endangered		Species or species habitat may occur within area		Unlikely - Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils	No
Flora	Grasses	*Bothriochloa biloba*	Lobed Bluegrass	Not listed		Known			Potential - Prefers (but not limited to) heavy textured soils, such as brown or black clay soils, was not recorded during field survey	Potential
Flora	Grasses	*Dichanthium setosum*	Bluegrass	Vulnerable	Vulnerable	Predicted			Unlikely - Associated with heavy basaltic black soils and red-brown loams with clay subsoil; often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture	Unlikely
Flora	Herbs and forbs	*Calotis glandulosa*	Mauve Burr-daisy	Vulnerable	Vulnerable	Known			Unlikely - Found in montane and subalpine grasslands in the Australian Alps; There is an old and possibly dubious record from near the study area	Unlikely

Kingdom	Class	Scientific Name	Common Name	NSW Status	Commonwealth Status	NSW Occurrence	Commonwealth Occurrence	10km records	Likelihood of occurrence	Potential impact
Flora	Herbs and forbs	*Lepidium hyssopifolium*	Aromatic Peppercress	Endangered	Endangered	Known			Unlikely - In NSW the species was known to have occurred in both woodland with a grassy understorey and in grassland; The species may be a disturbance opportunist, as it was discovered at the most recently discovered site (near Bungendore) following soil disturbance; The cryptic and non-descript nature (appearing like several weed species) of the species makes it hard to detect	Unlikely
Flora	Herbs and forbs	*Swainsona recta*	Small Purple-pea	Endangered	Endangered	Known	Species or species habitat may occur within area		Unlikely - outside core range of this species; grows in association with understorey dominants that include tussocks and spear-grasses	Unlikely
Flora	Herbs and forbs	*Swainsona sericea*	Silky Swainson-pea	Vulnerable		Known			Unlikely - Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes	Unlikely
Flora	Orchids	*Caladenia arenaria*	Sand-hill Spider Orchid	Endangered	Endangered	Known			Unlikely - Occurs in woodland with sandy soil, especially that dominated by White Cypress Pine (*Callitris glaucophylla*)	Unlikely
Flora	Orchids	*Caladenia tessellata*	Thick Lip Spider Orchid	Endangered	Vulnerable	Known			Unlikely - outside core range of this species; generally found in grassy sclerophyll woodland on clay loam or sandy soils	Unlikely

Kingdom	Class	Scientific Name	Common Name	NSW Status	Commonwealth Status	NSW Occurrence	Commonwealth Occurrence	10km records	Likelihood of occurrence	Potential impact
Flora	Orchids	*Diuris tricolor*	Pine Donkey Orchid	Vulnerable		Known			Likely - The Pine Donkey Orchid grows in sclerophyll forest among grass, often with native Cypress Pine; it is found in sandy soils, either on flats or small rises	Possible
Flora	Shrubs	*Acacia ausfeldii*	Ausfeld's Wattle	Vulnerable		Known			Potential - no mature individuals recorded in the study area; *Acacia ausfeldii* is likely to have a dormant soil seedbank from which germination is stimulated by fire; a small number of seeds have been observed to germinate in the absence of fire	No
Flora	Shrubs	*Acacia meiantha*		Endangered		Known			Unlikely - It is found in three disjunct populations; none of which are near the study area	No
Flora	Shrubs	*Commersonia procumbens*		Vulnerable	Vulnerable	Known	Species or species habitat likely to occur within area		Potential - Grows in sandy sites, often along roadsides	Unlikely
Flora	Shrubs	*Homoranthus darwinioides*		Vulnerable	Vulnerable	Known			Unlikely - was not recorded during field survey; grows in in various woodland habitats with shrubby understoreys, usually in gravely sandy soils	Unlikely
Flora	Shrubs	*Indigofera efoliata*	Leafless Indigo	Endangered	Endangered	Known			Potential - Very rare and possibly now extinct, known only from a few collections in the Dubbo area; records near the study area	Unlikely
Flora	Shrubs	*Indigofera longibractea*	Showy Indigo	Endangered		Known			No - Restricted to an area just north of Broken Hill known as the Waukeroo Hills	No

Kingdom	Class	Scientific Name	Common Name	NSW Status	Commonwealth Status	NSW Occurrence	Commonwealth Occurrence	10km records	Likelihood of occurrence	Potential impact
Flora	Shrubs	*Philotheca ericifolia*			Vulnerable	Known	Species or species habitat may occur within area		Unlikely - Grows chiefly in dry sclerophyll forest and heath on damp sandy flats and gullies	No
Flora	Shrubs	*Pomaderris queenslandica*	Scant Pomaderris	Endangered		Known			Unlikely - Found in moist eucalypt forest or sheltered woodlands with a shrubby understorey, and occasionally along creeks	No
Flora	Shrubs	*Zieria ingramii*	Keith's Zieria	Endangered	Endangered	Known			Unlikely - Known predominately from Goonoo SCA, about 40 km north-east of Dubbo	No
Flora	Shrubs	*Zieria obcordata*		Endangered	Endangered	Known			No - Occurs at two sites with a geographic range of 105 km away from the study area	No
Flora	Twiners	*Tylophora linearis*		Vulnerable	Endangered	Known	Species or species habitat may occur within area		Unlikely - 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*	Unlikely

Appendix E: Assessment of significance

Biodiversity Conservation Act 2016 Test of significance

The threatened species 'test of significance' (or '5-part test') is used to determine if a development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. The test of significance is set out in s.7.3 of the *Biodiversity Conservation Act 2016*, and is completed in accordance with the questions set out below:

The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

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

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

   i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

   ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

c. in relation to the habitat of a threatened species or ecological community:

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

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

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

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

e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

Community	Test of significance – responses by species / group				
	a	b	c	d	e
Fuzzy Box woodland	N/A	OEH mapping predicts approximately 20,000 hectares of Fuzzy Box woodland occurs across the state, predominately in the South Western Slopes bioregion, but also in the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion. At the local scale, the VIS 4468 mapping indicates a total area of approximately 4000 hectares of Fuzzy Box woodland occurs within the Dubbo Regional LGA. The Proposal would cause the loss of 9.2 hectares of derived grassland, which may have previously supported Fuzzy Box woodland. The area with the Fuzzy Box overstorey trees still present would be retained. Due to this relatively small extent remaining overall, all areas of this PCT have conservation	Habitat	No	Yes, clearing of native vegetation.

Species	Test of significance – responses by species / group				
	a	b	c	d	e
Pine Donkey Orchid (*Diuris tricolor*)	The Proposal is unlikely to have an adverse effect on the life cycle of the Dubbo population of the species. Searches on the Proposal Site did not find any evidence of the species. The local record for the species is a historic sighting from 1907. There are a number of local occurrences of the species in the Dubbo area. However, since there are no known populations at the PProposal Site, and the site survey did not detect the species,	N/A	This species is often associated with *Callitris glaucophylla, Eucalyptus populnea, Eucalyptus intertexta*, Ironbark and *Acacia* shrubland. The understorey is often grassy with herbaceous plants such as ***Bulbine*** species. The species is usually recorded as common and locally frequent in populations and has been noted as growing in large colonies. Only one or two plants have also been observed at some sites. The habitat on the site is a grassy woodland remnant and is not consistent with the preferred habitat. It is concluded that the site is not important habitat for the species, nor would the Proposal remove, modify, fragment or isolate the species or its habitat to the extent that the long-term survival of the species would be at risk.	No	Yes, clearing of native vegetation.

Species	Test of significance – responses by species / group				
	a	b	c	d	e
Little Pied Bat (*Chalinolobus picatus*) Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*)	These bat species roost and breed in tree hollows and would also roost in man-made structures. The old building on the site could potentially provide roosting or breeding habitat for these species. No hollow bearing trees were identified as being impacted by the Proposal. Removal of the old buildings could affect the breeding cycle of these species are present. As the current study did not undertake targeted survey for these bats, a precautionary approach is required. mitigation measures are proposed which would comprise: (i) further site checks for evidence of the bats and (ii) appropriate timing of the works to be outside of the breeding season for these species (iii) an animal handler/ecologist to be on site and supervise during the removal of structures. If these mitigate measures are in place, potential impacts/injury to these bat species would be mitigated and the Proposal would be unlikely to adversely affect the life cycle of any of these species to the point that a local population is at risk of extinction.	N/A	The Proposal would not clear any clear or disturb any natural habitat with hollow-bearing trees, however potential habitat in the form of man-made structures would be removed. These bats are highly mobile and are able to relocate to other suitable habitat within the area. It is concluded that the Proposal would not significantly remove, modify, fragment or isolate habitat for these bat species to the extent a population is placed at risk of extinction.	No	Yes, clearing of native vegetation.

Appendix F: Terms and abbreviations

Terms and abbreviations used in this report

Abbreviation	Terminology	Description
BC Act	*Biodiversity Conservation Act 2016* (NSW)	The purpose of this Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. This Act contains schedules relating to the listing of threatened species, populations and communities in NSW. It also outlines the framework regulating development impact assessments in relation to biodiversity.
	Biosecurity Act 2015 (NSW)	The broad objectives for biosecurity in NSW are to manage biosecurity risks from animal and plant pests and diseases, weeds and contaminants by • Preventing their entry into NSW • Quickly finding, containing and eradicating any new entries • Effectively minimising the impacts of those pests, diseases, weeds and contaminants that cannot be eradicated through robust management arrangements. The *Biosecurity Act 2015* provides a statutory framework to help achieve these objectives.
CAMBA	China-Australia Migratory Bird Agreement	A bilateral migratory bird agreement with China entered into in 1986. It provides an important mechanism for pursuing conservation outcomes for migratory birds, including migratory waterbirds.
	Cumulative impacts	Impacts, when considered together, lead to a stronger impact than any impact in isolation.
	Direct impacts	Directly affect the habitat and individuals. They include, but are not limited to, death through predation, trampling, poisoning of the animal/plant itself and the removal of suitable habitat. When applying each factor, consideration must be given to all of the likely direct impacts of the proposed activity or development.
DoEE	Australian Government Department of Environment and Energy	The Department of the Environment designs and implements the Australian Government's policies and programmes to protect and conserve the environment, water and heritage and promote climate action.
DP	Deposited Plan	A plan of land deposited in Land and Property Information (part of the Land Management Authority) and used for legal identification purposes. They most commonly depict a subdivision of a parcel of land.
EEC	Endangered Ecological Community	An ecological community identified by relevant legislation likely to become extinct or is in immediate danger of extinction.
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW).	Provides the legislative framework for land use planning and development assessment in NSW.
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).	Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
FM Act	*Fisheries Management Act 1994* (NSW)	The objects of this Act are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. This Act protects aquatic habitats and species which are not protected under the BC Act.
IBRA	Interim Biogeographic Regionalisation of Australia	The Interim Biogeographic Regionalisation for Australia (IBRA) is a biogeographic regionalisation of Australia developed by the Australian Government's Department of the Environment. Each region is a land area made up of a group of interacting ecosystems repeated in similar form across the landscape.

Abbreviation	Terminology	Description
	Indirect impacts	Occur when project-related activities affect species, populations or ecological communities in a manner other than direct loss. Indirect impacts can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas. As with direct impacts, consideration must be given, when applying each factor, to all of the likely indirect impacts of the proposed activity or development.
JAMBA	Japan-Australia Migratory Bird Agreement	A bilateral migratory bird agreement with Japan entered into in 1974. It provides an important mechanism for pursuing conservation outcomes for migratory birds, including migratory waterbirds.
KTP	Key Threatening Process	A key threatening process is defined as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities. A requirement of their listing on the TSC Act is that the process adversely affects two or more threatened species, populations or ecological communities, or may cause species, populations or ecological communities not threatened to become threatened.
	Local population (species)	A local population of a threatened plant species comprises those individuals occurring in a defined area or a cluster of individuals extend into habitat adjoining and contiguous with the study area where the individuals could reasonably be expected to cross-pollinate. A local population of fauna species comprises those individuals known or likely to occur in in a defined area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area. The local population of migratory or nomadic fauna species comprises those individuals likely to occur in the study area from time to time.
	Local occurrence (EEC)	The ecological community present within the study area. However, the local occurrence may include adjacent areas if the ecological community on the study area forms part of a larger contiguous area of the ecological community and the movement of individuals and exchange of genetic material across the boundary of the study area can be clearly demonstrated.
	Low condition (vegetation)	Vegetation in low condition means: a) woody native vegetation with native over-storey percent foliage cover less than 50% of the lower value of the over-storey percent foliage cover benchmark for that vegetation type, and where either: - less than 50% of ground cover vegetation is indigenous species, or - greater than 90% of ground cover vegetation is cleared OR b) native grassland, wetland or herbfield where either: - less than 50% of ground cover vegetation is indigenous species, or - more than 90% of ground cover vegetation is cleared If native vegetation is not in low condition, it is in moderate to good condition. The percentages for the ground cover calculations must be made in a season when the proportion of native ground cover vegetation compared to non-native ground cover vegetation in the area is likely to be at its maximum. NOTE: Clearing the habitat of threatened species, populations or communities for the purposes of reducing its condition prior to assessment under the methodology may be a breach of environmental legislation, including sections 118A and 118D of the *National Parks and Wildlife Act 1974* (NPW Act), the *Native Vegetation Act 2003* (NV Act) and/or the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Abbreviation	Terminology	Description
MNES	Matters of national environmental significance	Refers to the seven matters of national environmental significance outlined under the EPBC Act.
NPW Act	*National Parks and Wildlife Act 1974* (NSW)	The objects of this Act are as follows: • The conservation of nature, including, but not limited to, the conservation of: • habitat, ecosystems and ecosystem processes, and • biological diversity at the community, species and genetic levels, and • landforms of significance, including geological features and processes, and • landscapes and natural features of significance including wilderness and wild rivers, The conservation of objects, places or features (including biological diversity) of cultural value within the landscape, including, but not limited to: • places, objects and features of significance to Aboriginal people, and • places of social value to the people of New South Wales, and • places of historic, architectural or scientific significance, • Fostering public appreciation, understanding and enjoyment of nature and cultural heritage and their conservation, • Providing for the management of land reserved under this Act in accordance with the management principles applicable for each type of reservation. The objects of this Act are to be achieved by applying the principles of ecologically sustainable development.
OEH	Office of Environment and Heritage	The Office of Environment and Heritage (OEH) is a separate agency within the Planning and Environment cluster. OEH was formed on 4 April 2011 and works to protect and conserve the NSW environment, including the natural environment, Aboriginal country, culture and heritage and our built heritage, and manages NSW national parks and reserves.
PoEO Act	*Protection of the Environment Operations Act 1997*	The objects of this Act are as follows: • to protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development, • to provide increased opportunities for public involvement and participation in environment protection, • to ensure the community has access to relevant and meaningful information about pollution, • to reduce risks to human health and prevent the degradation of the environment by the use of mechanisms promoting: • pollution prevention and cleaner production, • the reduction to harmless levels of the discharge of substances likely to cause harm to the environment, • the elimination of harmful wastes, • the reduction in the use of materials and the re-use, recovery or recycling of materials, • the making of progressive environmental improvements, including the reduction of pollution at source, • the monitoring and reporting of environmental quality on a regular basis, • to rationalise, simplify and strengthen the regulatory framework for environment protection, • to improve the efficiency of administration of the environment protection legislation, • to assist in the achievement of the objectives of the *Waste Avoidance and Resource Recovery Act 2001*.
RAMSAR	Convention on Wetlands of International Importance	The Ramsar Convention's broad aims are to halt the worldwide loss of wetlands and to conserve, through wise use and management, those remaining. This requires international cooperation, policy making, capacity building and technology transfer.

Abbreviation	Terminology	Description
	Risk of extinction	The likelihood that the local population would become extinct either in the short-term or in the long-term as a result of direct or indirect impacts on the viability of that population.
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement	A bilateral migratory bird agreement with the Republic of Korea entered into in 2007. It provides an important mechanism for pursuing conservation outcomes for migratory birds, including migratory waterbirds.
RF Act	*Rural Fires Act 1997*	The objects of this Act are to provide: • for the prevention, mitigation and suppression of bush and other fires in local government areas (or parts of areas) and other parts of the State constituted as rural fire districts, and • for the co-ordination of bush firefighting and bush fire prevention throughout the State, and • for the protection of persons from injury or death, and property from damage, arising from fires, and • for the protection of infrastructure and environmental, economic, cultural, agricultural and community assets from damage arising from fires, and • for the protection of the environment by requiring certain activities referred to in paragraphs (a)-(c1) to be carried out having regard to the principles of ecologically sustainable development described in section 6 (2) of the *Protection of the Environment Administration Act 1991*.
SEPP 44	State Environmental Planning Policy No.44 – Koala Habitat	This Policy aims to encourage the proper conservation and management of areas of natural vegetation with habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline: • by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and • by encouraging the identification of areas of core koala habitat, and • by encouraging the inclusion of areas of core koala habitat in environment protection zones.
Significant impact		A 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity.
SIS	Species Impact Statement	A document included with an Environmental Impact Statement which details a full description of the action proposed, including its nature, extent, location, timing and layout and, to the fullest extent reasonably practicable, the information referred to in this section. The requirements as to the contents of an SIS for different categories of protected species are given in section 110 of the TSC Act.
Strahler stream order		Strahler stream order and are used to define stream size based on a hierarchy of tributaries.