Appendix 6

Ecology Assessment

(Total No. of pages including blank pages = 68)

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Brown Falcon (*falco berigora*) perching on a tree stag in the Study Area.

Environmental &
Heritage Management P/L

Nyngan Waste Management Facility

Terrestrial Ecology Assessment:

Bogan Shire Local Government Area

January 2013

Report Prepared by

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Executive Summary

The Nyngan Waste Management Project is located approximately four kilometres (km) north of the centre of Nyngan on Colane Road, NSW. Bogan Shire Council (BSC) propose to extend the existing Waste Management Facility to allow for the long term management of domestic and commercial waste within the Local Government Area (LGA) (**Figures 1 and 2**).

The Proposal would comprise approximately 26 cells, each approximately 40m x 80m in area and approximately 5m to 6m deep. All ground disturbing activities would be undertaken within an area of 600m x 200m referred to as the Water Management Area (the 'Impact Footprint'). Additional infrastructure such as construction of monitoring bores and firebreaks would be undertaken within the Project Site Boundary, which would be offset approximately 50m from the Waste Management Boundary.

12 hectares (800 x 200m) of the total 24 hectares of vegetation within the Project Site is within the Water Management Area (Impact Footprint) for the Project:

- Disturbed areas c. 0.075ha;
- *Leopardwood woodland of alluvial plains* (Benson 144), c. 4.7ha;
- *Windmill Grass - Curly Windmill Grass - Button Grass alluvial plains grasslands in the dry subtropical climate zone* (Benson 49), c. 7.2ha;

A further 14ha of vegetation is within the Waste Management Boundary:

- Disturbed areas c. 3ha (site of the existing waste management facility);
- *Leopardwood woodland of alluvial plains* (Benson 144), c. 4.95ha;
- *Windmill Grass - Curly Windmill Grass - Button Grass alluvial plains grasslands in the dry subtropical climate zone* (Benson 49), c. 6.05ha.

Not all vegetation within the Project Site Boundary will be directly impacted by the Proposal.

No threatened species of plants of animals were recorded and none were determined to be directly 'affected' by the proposal. A small stand of Myall (*Acacia Pendula*) within *Benson 144* was recorded in the Water Management Area Impact Footprint. The patch is consistent with the state listed *Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions endangered ecological commnunity (Weeping Myall Woodland* EEC) listed in the schedules of the *Threatened Species Conservation Act 1995 (TSC Act)*. This community does not however fit the condition thresholds listed by the scientific community for *Weeping Myall Woodlands* listed under the *Environmental Protection and Biodiversity Act 1999 (EPBC Act)*

One family of Grey-crowned Babblers (*TSC Act*) was recorded outside, but adjacent to the Study Area. No nests were noted in the Project Site Boundary. It is highly likely that Grey Crown Babblers (*TSC Act*) and the migratory Superb Parrot (*TSC* & *EPBC Act*) would forage and utilise resources within the Project Site.

Seven-part Tests / Assessments of Significance as specified under the *TSC* and *EPBC Act* were completed to properly characterise the threat to *Weeping Myall Woodland* (EEC *TSC Act*) the Grey-crowned Babbler (*TSC Act*) (Table 5 and 6 **Appendix 2**). These assessments concluded that no

significant impacts will occur as a result of the Proposal ensuring offsets and recommendations in this report are followed.

Impacts to vegetation communities in the Project Site would remove potential habitat (breeding and food resources) for the Grey-crowned Babbler (*TSC Act*) and migratory feeding resources for the Superb Parrot (*TSC* & *EPBC Act*). Offsetting Myall EEC at a ratio of 40:1 will benefit these two species in addition to providing myall (*Acacia pendula*) habitat largely missing in the greater locality. Recommendations within this report have provided the mechanisms to achieve a 'maintain or improve' outcome to offset this potential loss.

Having given consideration to the ecology within the Study Area, it is apparent that the Proposal is:

- unlikely to significantly affect any of the listed threatened species, fauna populations or communities;
- unlikely to augment or significantly contribute to any of the National or State listed key threatening processes, if the appropriate safeguards regarding the control of potential vertebrate pests are effectively applied;
- unlikely to significantly affect any Ramsar wetland or any CAMBA or JAMBA listed species;
- unlikely to significantly affect any of the creeks if adequate safeguards are adopted for water run-off from the site; and
- consistent with ESD principles with regard to fauna and would not adversely affect the local biodiversity and no issue of inter-generational or value added matters are relevant in this instance.

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1.0 Introduction

1.1 Brief Description of the Project

The Nyngan Waste Management Project is located approximately 4km north of the centre of Nyngan on Colane Road, NSW. Bogan Shire Council (BSC) propose to extend the existing Waste Management Facility to allow for the long term management of domestic and commercial waste within the Local Government Area (LGA) (**Figures 1 and 2**).

The Proposal would comprise approximately 26 cells, each approximately 40m x 80m in area and approximately 5m to 6m deep. All ground disturbing activities would be undertaken within an area of 600m x 200m referred to as the Water Management Area (the 'Impact Footprint'). Additional infrastructure such as construction of monitoring bores and firebreaks would be undertaken within the Project Site Boundary, which would be offset approximately 50 m from the Waste Management Boundary.

The proposed life of the facility would be approximately 50 to 80 years, however, it is possible that an application may be required for a shorter period.

BSC proposes to accept general and commercial solid waste, as well as contaminated waste in a dedicated cell. In addition, recyclable material, including glass, paper and cardboard, metal, tyres, hydrocarbons and green waste would also be accepted, processed and removed from site.

BSC anticipates that an application under Part 4 of *the Environmental Planning & Assessment Act* will be required.

1.2 Date of, and Weather Conditions During the Assessment

The field assessment for this project was undertaken on Thursday 27th of May 2010. Weather was clear and cool in the morning (8° Celsius) warming throughout the day to approximately 18°C. Weather was not an impediment for the field investigation.

1.3 OzArk EHM Involvement

This assessment was undertaken by Phillip Cameron (Bsc, Ass Dip App Sci) of OzArk under NSW Department of Primary Industries (DPI) Ethics Approval No 07/1601 & NSW Scientific Research License 11194. DECCW Data License Agreement CON99042.

Heidi Kolkert (BA, BSc-Hons) wrote this report.

1.4 Definitions Used in this Report

- **Activity** -has the same meaning as in the *Environmental Planning and Assessment Act 1979* (EP&A Act). The nature of the proposed activity is described in Section 3.1.
- **EEC** – Endangered Ecological Community
- **CEEC** – Critically Endangered Ecological Community
- **Locality** – Means the area within a 50 km radius of the subject site described in Section 2.0.
- **Study Area –** The Study Area refers to the area assessed by the ecologist within the Project Site as detailed in Section 1.3.

- **Impact Footprint –** The Impact Footprint is within the Study Area and includes an area that will be mechanically destroyed or altered to construct infrastructure associated with the activity, see Waste Management Area.
    - **Waste Management Area** – Is the Impact Footprint (600m x 200 m).
- **Project Site Boundary**– This is the collective term for the Waste Management Area including the 50 m buffer zone (**Figures 1** to **4)** and delineates the boundary for the Proposal.
- **Waste Management Boundary.** The 50 m buffer zone between the proposed Waste Management Area and Project Site Boundary. It incorporates the existing Waste Management Facility.

Figure 1: Locality Plan.

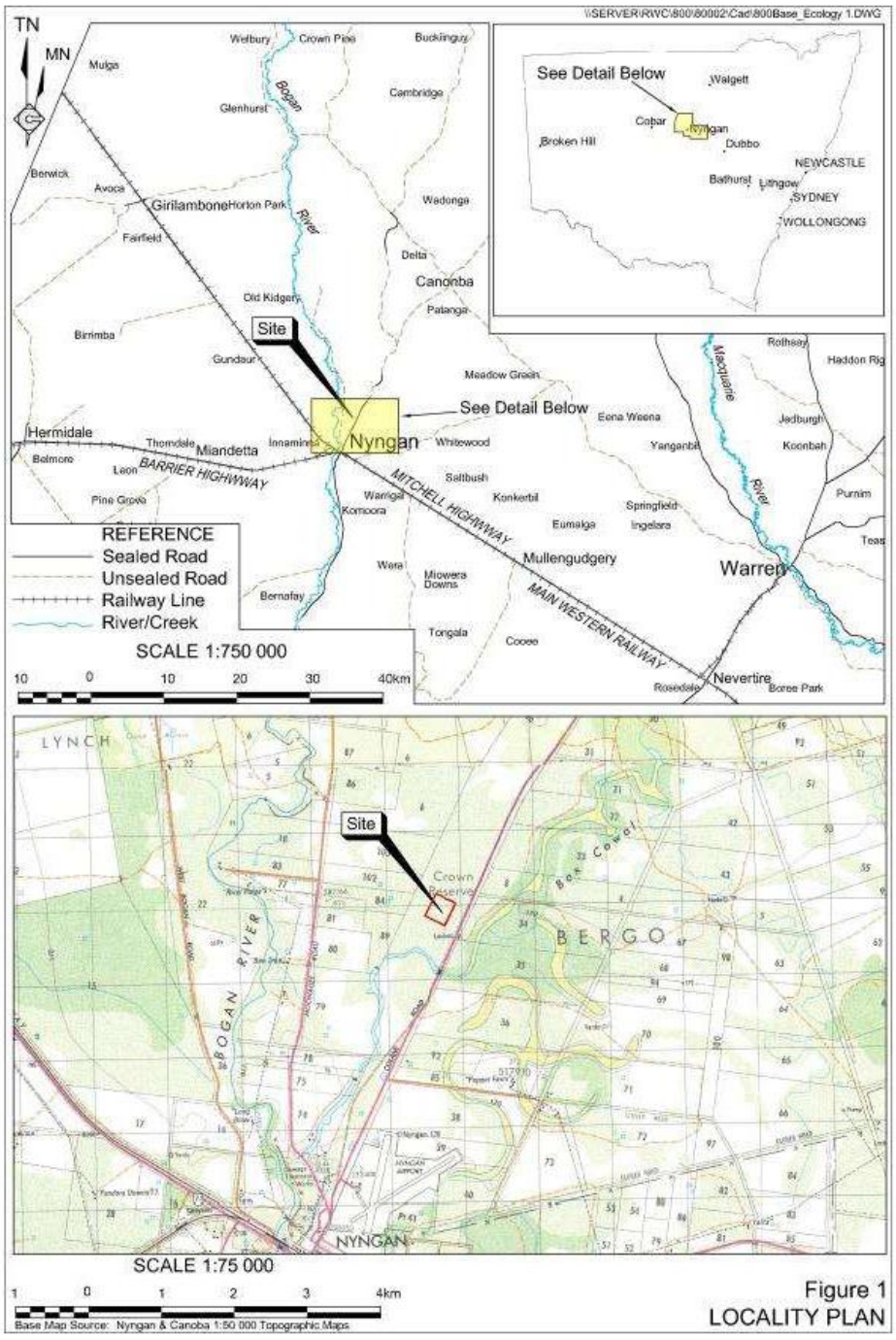
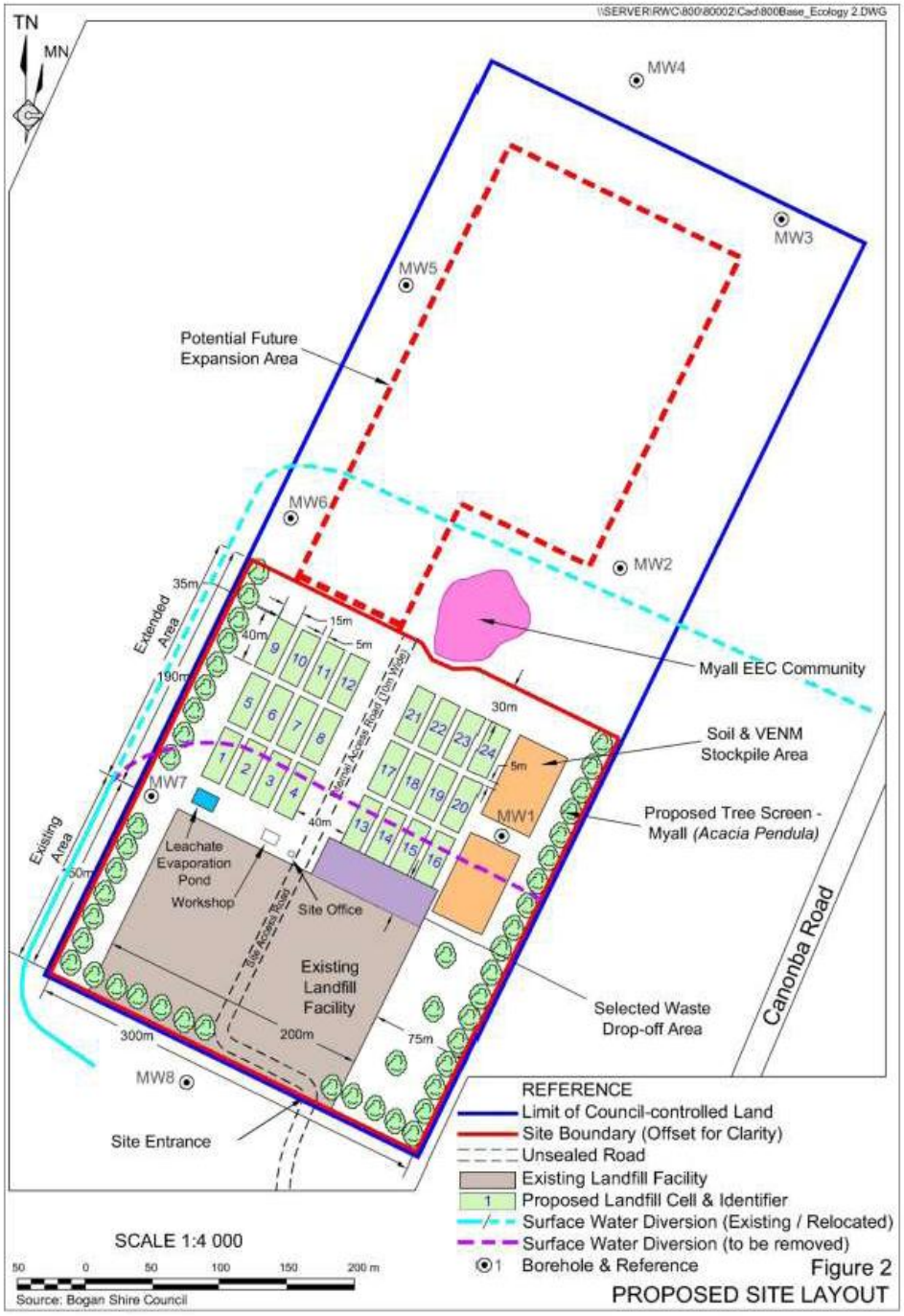


Figure 2: Project Site Layout.



2.0 Methods

2.1 General Methodology

The assessment was undertaken following the general auspices of the *DEC*[1] *Biodiversity Survey Guidelines Working Draft 2004*, *Threatened Species Survey and Assessment Guidelines (*DECC 2007*)* and *DECCW Field Survey Methods 2009*. Notable constraints have been detailed in this report. To predict the likely effect of the Proposal on species generally detected through this type of survey effort, the precautionary principle has been applied.

2.1.1 Consistency with DECCW Biodiversity Survey Guidelines November 2004

This assessment applied the DECCW 'precautionary principle'. The NSW DECCW Threatened Biodiversity Survey Guidelines (2004:30-34) states '*It is advised that where adequate surveys have not been conducted within the Study Area due to time limitations (*you can also infer season timing etc), *the precautionary principle should always be adopted. This involves assuming that threatened biodiversity which are likely to occur in the Study Area (based upon the presence of suitable habitat and recent records) inhabit the whole of the Study Area. The Assessment of Significance (7-part tests) would then be conducted on this basis*'

2.1.2 Flora

Rationale and mapping

Survey of the Study Area was conducted according to the Random Meander Method described by Cropper (1993: 30). Detailed botanical survey for native plants was carried out and the observed species composition within the community was aligned to the *BioMetric* database. Plant identification was made according to recent nomenclature in Harden (1990–2002), Cunningham *et al*. (1992) Royal Botanic Gardens (RBG 2010a) and PlantNet NSW Flora Online (RBG 2010b). The national conservation significance of flora was determined by referencing *Rare or Threatened Australian Plants* (ROTAP– Briggs and Leigh 2006) and the Schedules associated with the *Threatened Species Conservation Act 1995* (*TSC Act*) or the *Environmental Protection and Biodiversity Conservation Act 1999* (*EPBC Act*).

Special consideration was given to locating rare or threatened plants identified in the NSW Wildlife Atlas database (DECCW 2010a) or those being predicted to occur by DECCW (DECCW 2010b) or DEWHA (DEWHA 2010) for the Bogan Local Government Area (LGA) respectively (**Appendix 1**).

Visibility was good and plants without flowers/seed heads were relatively straightforward to identify given that the *BioMetric* database provides detailed lists of known species associations with the greatest affiliation with the community.

Where areas had a combination of key habitat elements which were more likely to provide an environment in which a threatened plant would be recorded, it was given closer inspection.

Community composition, health, age status, habitat value for fauna and flora species, overall conservation significance and structural or habitat importance of the vegetation present was assessed. The extent/distribution of the vegetation communities was mapped in the field.

[1] NSW DEC and DECC is now known as the Department of Environment Climate Change and Water (DECCW).

2.1.3 Red Flag Areas & Determination of 'Good, Moderate' or 'Low' Condition

A red flag area (DECCW 2008) is an area of land that has high biodiversity conservation values. An area of land is regarded as having high biodiversity conservation values if it contains one of more of the following:

- A vegetation type that has greater than 70% cleared as listed in the Vegetation Types Database "*BioMetric* database" (that is less than 30% of its estimated distribution remaining in the catchment management authority (CMA) area before the year 1750) and the vegetation is not in low condition as defined below.
- A critically endangered or endangered ecological community listed under the *TSC Act* or *EPBC Act*, and the vegetation is not in low condition as defined below.
- One or more threatened species identified in the Threatened Species Profile Database that cannot withstand further loss in the CMA area because of one or more of the following:
  - the species is naturally very rare, is critically endangered, has few populations or a restricted distribution;
  - the species or its habitat needs are poorly known;
  - the species is an identified population, as defined in section 4.6 of this methodology and listed in the Identified Population Database (when published).

Vegetation in low condition means:

- Woody native vegetation with native over-storey percent foliage cover less than 25% of the lower value of the over-storey percent foliage cover benchmark for that vegetation type, and:
  - less than 50% of ground cover vegetation is indigenous species, or
  - greater than 90% of ground cover vegetation is cleared.
- Native grassland, wetland or herb field where:
  - 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.

Where a proposed development or any part a development is on land that is, or forms part of, a red flag area, a biobanking statement may still be issued where the Director General makes a determination that it is possible for the development to be regarded as improving or maintaining biodiversity values.

2.1.4 Fauna

Fauna surveys included general habitat searches and targeted surveys for threatened species. Tailored searches for species identified as likely to occur (based upon the habitat present) but not previously recorded were undertaken.

Identification of the species present, and their diversity, can indicate the type of habitat that is present within the Study Area. Further, an assessment of the habitat present within the Study Area will also dictate which identified threatened species, although they remained unobserved during the current survey, may utilise it (the basis of the precautionary principle). The likely impacts of development can be addressed through this process.

Fauna identification was achieved via:

- Identification of scats, diggings, tracks and other traces (Triggs 2004);
- Direct observation: i.e. bird watching;
- Ground, leaf litter and other refuge searches;
- Call identification; and
- Searches for indirect evidence of mammals (vocalisation, tracks, scats, burrows etc).

2.1.5 Field data capture

Within the Impact Footprint, point data of individual trees of interest and or locations of threatened species were mapped using a Magellan MobileMapper.

2.2 Survey Constraints

2.2.1 General

Not all animals and plants can be fully accounted for within any given study area. The potential for inaccuracy increases exponentially with the size of a study area. This report is based upon data acquired from recent and current surveys, however, it should be recognised that the data gathered is indicative of the environmental conditions of the site at the time the report was prepared. The presence of threatened species is not static. It changes over time, often in response to longer term natural forces that can, at any time, be dramatically influenced by anthropomorphic disturbance.

This report has reviewed State and National agency records centred on the Study Area to establish a predictive model concerning the likelihood of flora and fauna species to occur within the Study Area. Any failings of the database records have been mentioned within the appropriate sections of this report.

For the purpose of this report, the author believes that adequate assessment has been undertaken but acknowledges that the precautionary principle has been adopted where appropriate. Inconsistencies for flora/fauna detection include but are not limited to:

- The majority of the region's rare animals and plants would have more potential to be recorded when or after long periods of rain (estimated to be three times a century). The assessment occurred after a period of very good rains and as such it was ideal for the detection of threatened fauna and flora.
- Due to the number of threatened species which all have potential to be recorded in the Study Area, the focus of this survey was to detect those animals or plants which:
  - have choreabit at elements in the Study Area;
  - were regarded as 'likely to occur' in the current climatic conditions; and
  - do not have the ability to flee in the face of mechanised disturbance and thus be at risk of death or injury in the face of the proposed works.

Any opposition to a development related project would interpret 'adequate surveys' in many different ways. In reality, commercial ecology has its limitations due to time constraints, seasonality of animals and plants, weather patterns and a general lack of prolonged base line assessments in most study areas. Further notes of inconsistencies were as follows:

- The methods used to detect the majority of animals listed were considered to be consistent with DECCW requirements and were able to detect species currently listed as threatened. This statement is based upon the available habitat being regionally fragmented in nature, having a small patch size and being located distant to permanent water in a road corridor and as such 'unlikely habitat' for the majority of the regions threatened species;
- AnaBat detection was not undertaken. Potential impacts to microbats have been based upon previous records of bat species and the availability / abundance of habitat in the Study Area; and
- Threatened orchids were not in flower at the time of the assessment. The effect of this constraint was assessed in the field by tying to identify areas of potential habitat for these species.

3.0 The Project Site

3.1 General

The Study Area is within the Central West (Bogan - Macquarie) Catchment Management Area (CMA) within the larger Darling Riverine Plains Bioregion (DRPB) within the boundaries of the Bogan Shire LGA NSW.

The Nyngan Waste Management Project is located approximately 4km north of the centre of Nyngan on Colane Road (GDA Zone 55 520032.833 E / 6513341.680 N). The Study Area can be located using the above coordinates on the Nyngan 8334n 1:25K topographic map (note map is in AGD). **Table 1**, below shows environmental characteristics salient to the Project Site.

Table 1: Characteristics of the Bogan-Macquarie Subregion of the Central West CMA (source: Morgan and Terrey 1992).

Subregion	Geology	Characteristic landforms	Typical soils	Vegetation
Bogan-Macquarie	Bogan and Macquarie River alluvial fans of Quaternary age. Western margin is bedrock of the Cobar bioregion. Alluvial sediments from mixed Palaeozoic bedrock bury basement rock to 100m. Underlying sediments of Cretaceous and Jurassic age form part of the Great Artesian Basin.	Channels, floodplains, and through flow swamps of past and present river systems.	Grey and brown clays on the plains and depressions with texture contrast soils on the low rises of former levees and channels.	River red gum and river cooba on the channels. White cypress pine and poplar box on coarser levees. Black box, belah, Myall and lignum on floodplains. Complex patterns of common reed, cumbungi, and water couch depending on water levels in marshes. Poplar box woodland with wilga, budda, white pine, grey box, yellow box and Blakely's red gum on red soils on fan margins.

3.2 Topography and Mitchell Landscapes of the Project Site

Terrain within the Project Site is generally flat. The elevation is approximately 170 m Australian Height Datum (AHD). The Project site is located on Bogan Alluvial Plains (V3 Mitchells Landscapes, **Figure 4**). Although the Study Area is itself not subject to flooding, it may, in 1:100 year floods, be subject to temporary inundation.

A review of aerial imagery shows substrative tracks and remnants of native vegetation exist adjacent to the Project Site associated with the Bogan River, Box Cowel and a Crown Reserve within which the Project Site is situated. High connectivity of surrounding vegetation provides wildlife suitable for a range of birds, mammals and small marsupials of sufficient body size to be able to travel across the Project Site to water sources.

3.3 Climate of the Project Site

The semi-arid climate of the majority of the DRPB consists of hot summers and is persistently dry (Stern et al. 2000 in DECCW 2008a). Rainfall is significantly lower in the west (c. 400mm per year) than in the eastern portion of the DRPB. The Commonwealth Bureau of Meteorology (BOM 2010) reports that the mean maximum temperature in Nyngan occurs in January (34.2°C), whilst the mean minimum temperature is recorded in July (3.7°C). Mean annual rainfall is 442.5 mm.

3.4 Hydrology of the Project Site

The Project Site is situated 2.5 km east of the Bogan River and 850 m west of Box Cowal (**Figure 3**). Water flows east and south, draining into Box Cowl a third order drainage (Strahler Stream Order[2]) line near the Project Site (**Figure 4**). All water drains eventually into the Bogan River. There are no current or historical waterways within the Project Site that would have been permanent enough to support large areas Fuzzy Box woodland.

3.5 Existing Levels of Disturbance

The main areas of disturbance in the Project Site are within the existing Waste Management Facility. Currently within the Project Site disturbance levels are low, however historical clearing of timber (most likely Bimble Box) and grazing is evident. It appears as though grazing has been excluded from the Project Site and surrounds for 30 to 50 years. This has allowed for the relatively young eucalyptus re-growth and small stand of myall in the Project Site.

[2] The Strahler Stream Order is used to define stream size based on a hierarchy of tributaries. A 2nd Order waterway must have two 1st Order waterways entering it. A 3rd Order waterway must have two 2nd Order waterways entering it. This concept is shown in the diagram below.

Figure 3: Topographic Map of the Project Site.

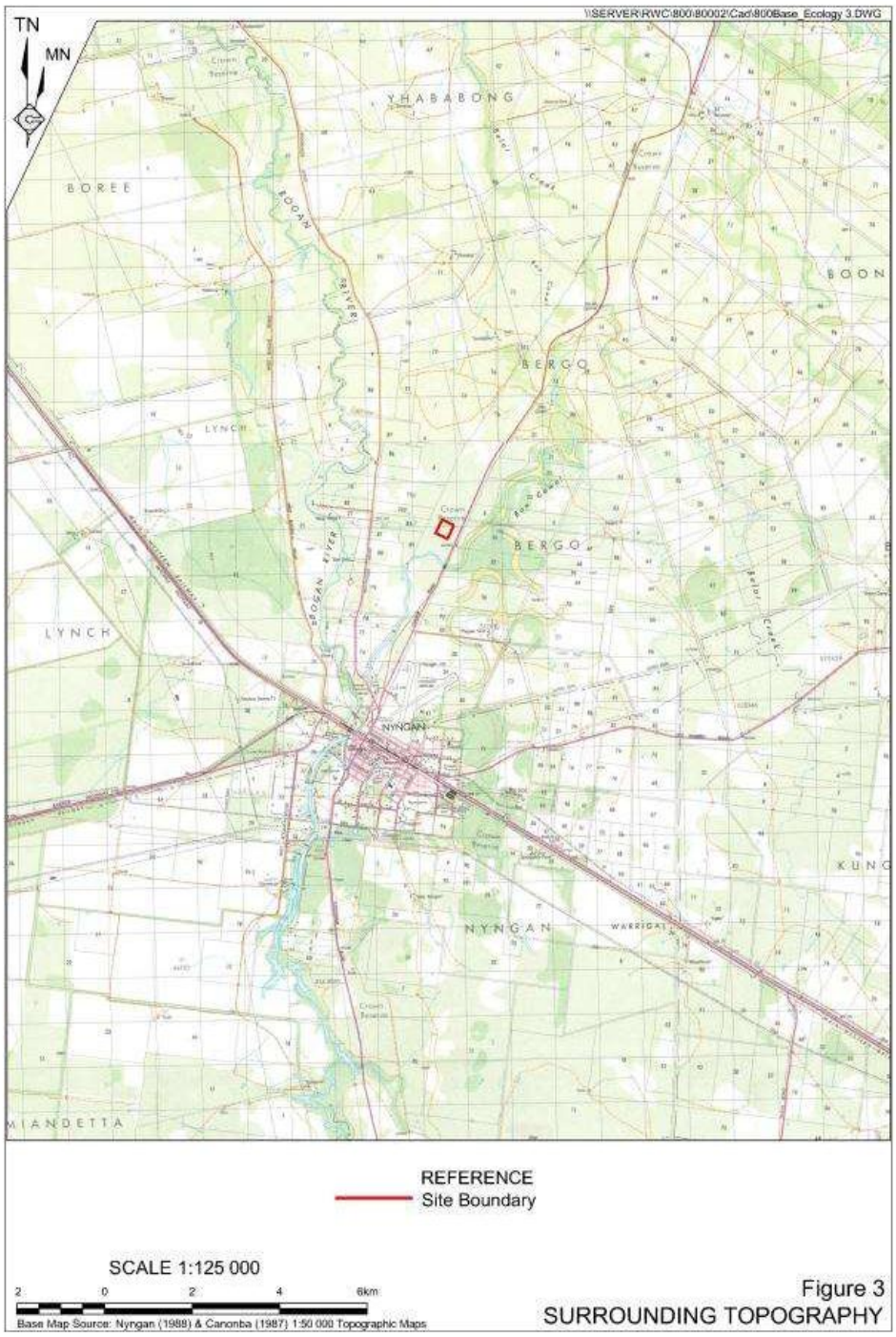
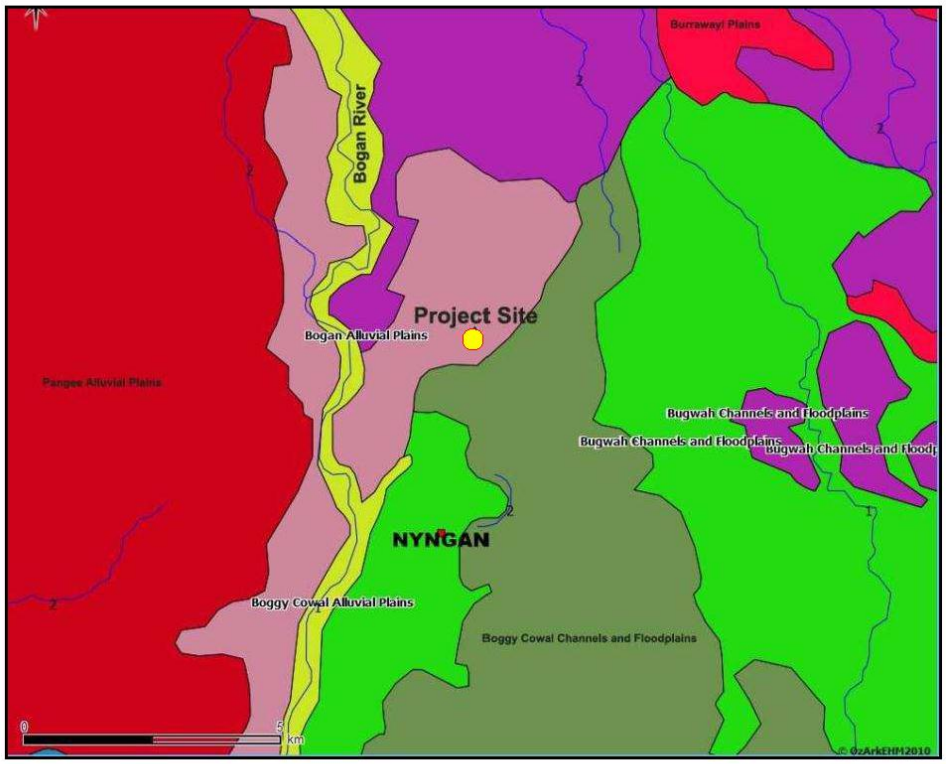


Figure 4: Mitchells Landscapes (V3), showing waterway Strahler Stream Order in the locality.



4.0 Ecological Context

4.1 Overview of the Central West Catchment Management Area

The following information is summarised from the DECCW threatened species website (http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/cma_details.aspx?name=Central+West). It provides a useful background into the area, threats it faces and justification to support recommendations within this report as they will be aimed at maintaining consistency with NSW priorities:

> The Central West catchment comprises of the Castlereagh, Bogan and Macquarie River valleys covering approximately 92,000 km^2. The region can be divided into six bioregions of which the current Study Area falls within the DRPB. The Central West Catchment has a high level of biodiversity partly due to the confluence of the eastern and western influences.
>
> Approximately 1.3% of the Catchment is currently managed as National Park or Nature Reserve. A further 3% is managed as State Forest, either in plantations or as native hardwood forests.
>
> The vegetation in the catchment as been largely cleared for agriculture, the large remaining blocks of native vegetation are either in national parks, nature reserves, state forests and travelling stock routes, on the upper slopes and ridges or on soils unsuitable for cultivation.
>
> Wetlands are a major ecological feature of the catchment and include the major streams and watercourses, the Macquarie Marshes, the various small cowals mainly to the west and north of Narromine, the Bogan Floodplain particularly near Gongolgon and the lower Castlereagh floodplain. The box-ironbark woodlands are another major ecological feature of the catchment and many of the woodland bird and mammal species reliant on these woodlands are in decline.
>
> The current major threats to biodiversity in the catchment are further loss of species from unviable remnants. Remaining remnants that are too small, too isolated and subject to stochastic events such as grazing, fire, drought or disease will continue to lose species from the remnant.
>
> There are a number of mammal, bird species and plats already known to be extinct in the catchment. These include the Bilby, Burrowing Bettong, Eastern Hare Wallaby, *Euphrasia arguta* (a herb). Despite extensive searches it appears another plant *Indigofera efoliata* is also now extinct as it was only known collection is from the Central West Catchment.
>
> There are 50 threatened flora species listed in the schedules of the *TSC Act* recorded in the Catchment. Of these, 22 are endangered, 27 are listed as vulnerable and one species, Euphrasia arguta, is considered extinct in the bioregion.
>
> Of these the only known current populations of *Lepidium hysopifolium, Eucalyptus canobolensis, Zieria ingramii* and *Zieria obcordata* occur in the catchment. The distribution of *Rulingia procumbens* is almost entirely within the catchment.
>
> Sixty-three species listed in the schedules of the *TSC Act* are found in the Catchment. Of these, 15 are listed as endangered and 58 are listed as vulnerable.
>
> Of these only the Bathurst Copper Butterfly is endemic to the catchment. Of the remainder many species will rely on retention, protection and enhancement of remaining woodland remnants, grasslands and wetlands.

The endangered Artesian Springs Ecological Community occurs throughout the Great Artesian basin and some are known to be located around Coonamble and in the lower Bogan area. It is threatened by grazing, feral pigs and lowering of the Great Artesian Basin. The endangered Coolibah-Black Box Community is threatened by reduced flooding, grazing and clearing. The Mt *Canobolas Xanthoparmelia* Lichen Community is threatened by road and drainage works, collection of bushrock and tourist visitation. There is also potential for loss of lichen habitat from increased urban encroachment and rural development such as vineyards and orchards on the north and east flanks of Mt Canobolas.

White Box Yellow Box Blakely's Red Gum Woodland (EEC *TSC* & EPBC ACT) has been drastically reduced in area and highly fragmented because of clearance for cropping and pasture improvement. Remnants are subject to varying degrees of threat that jeopardise their viability. These threats include: further clearing (for cropping, pasture improvement or other development); deterioration of remnant condition (caused by firewood cutting, increased livestock grazing, weed invasion, inappropriate fire regimes, soil disturbance and increased nutrient loads); degradation of the landscape in which remnants occur (including soil acidification, salinity, and loss of connectivity between remnants).

A number of conservation actions reappear in the threatened species profiles for species found in the Central West catchment, these include: protection of remnant native vegetation, wetlands and hollow-bearing trees, retention of native shrubs and woody debris on the ground, retention of wildlife corridors, control of feral predators, fire management, weed control, and pollution control. These key actions will also benefit many other flora and fauna species and prevent them from becoming threatened.

4.2 Regional and Local Ecological Context

A desktop search was conducted on the following databases to identify any potential issues (**Table 2**).

Table 2: Database search results for ecological issues

Name of database searched	Date of search	Type of search	Comment
Department of Environment, Water Resources, Heritage and the Arts (DEWHA) Protected Matters (*EPBC Act*) Database; http://www.environment.gov.au/erin/ert/epbc/index.html	14.1.13	Point Search centred upon Project Site with 10km radius.	3 EECs, 9 threatened species and 10 migratory birds. No items listed as known in the search area.
Office of Environment and Heritage (OEH)Threatened Species online database; http://www.environment.nsw.gov.au/threatenedSpeciesApp/cmaSearchResults.aspx?SubCmaId=843	14.1.13	Combined geographic and habitat search in Central West (Bogan-Macquarie) Catchment Management Area.	98 results returned. 5 EECs, 9 threatened plants, and 52 threatened animals 32 predicted key threatening processes.
NSW Wildlife Atlas online database 2012 http://wildlifeatlas.nationalparks.nsw.gov.au/wildlifeatlas/watlasSpecies.jsp	14.1.13	Previously recorded species in Central West (Bogan-Macquarie) Catchment Management Area.	9 threatened plants have been previously recorded in the CW (B-M) CMA. The most commonly recorded species is the Red Darling Pea (*Swainsona plagiotropis*) with hundreds of individual plants recorded. Other species include: *Cheilanthes sieberi subsp. Pseudovellea; Diuris tricolor; Prostanthera spinosa; Pterostylis cobarensis; Dichanthium setosum; Zieria granulata* and a historic record of *Swainsona recta*. 67 threatened animal species have been previously recorded in the CW (B-M) CMA. Historic records of the Western Barred Bandicoot (mainland) and Bilby also occur.
NSW Legislation website: SEPP 44: Koala Habitat Protection http://www.legislation.nsw.gov.au/fragview/inforce/epi%2B5%2B1995%2Bcd%2B0%2BN?	14.1.13	Schedule 1: LGAs listed and Schedule 2: Feed Trees listed	The Bogan LGA is not listed in Schedule 1 of SEPP 44 Koala Habitat Protection. There are no records of Koalas within 50 km of the Project Site. The Koala is known however to occur in the Central West- Bogan Macquarie CMA.
BSC Local Environment Plan 1991 (LGA)	14.1.13	Bogan Shire Council	Nothing Applicable.
Important Bird Areas	14.1.13	Project Boundary	No Important Bird Areas occur in the Project Boundary. The Macquarie marshes IBA is approximately 50 km east of the Study Area.

A search of the NSW Wildlife Atlas database shows that no threatened plants have been recorded within 30 km of the Study Area. This is not a true reflection of the distribution of these plants but rather the nature of development and research driven studies in the CMA.

The vulnerable Superb Parrot (*Polytelis swainsonii*) (*TSC* & *EPBC Act*) has been recorded in close proximity to the Project Site around Nyngan. Manning *et. al* (2006 and 2007) describes that overall, the Superb Parrot favours lower elevation sites dominated by scattered, open woodlands, where Blakely's red gum (*E. blakelyi*) is a significant component. This species forages on a wide variety of plant species, both on the ground and in tree foliage. Commonly utilised plants include wallaby grass,

barley grass, wheat and oats. Seed pods of numerous wattle species which form part of the woodland understorey are also taken such as yarran (Schrader 1980) and Myall (Webster and Ahern 1992). Surveys conducted by NPWS in the Central West (B-M) CMA recorded superb parrots in Myall, Poplar Box and Black Box Woodlands near Trangie (NPWS 2002). During one of these surveys a total of 555 superb parrots were observed, west of Narromine within Poplar Box / White Cypress Pine Woodlands (Shelley 2003). Observations were made of birds feeding on windmill grass (*Chloris truncata*) seedheads and the flowers of quena (*Solanum esuriale*) and on unidentified seeds on the ground rather than directly on plants (Shelley 2003). Within the trees, all stages of the flowers and fruits of eucalypt species are eaten. Berries of box mistletoe (*Amyema miquelii*) and grey mistletoe (*Amyema quandang*) are also consumed (Webster and Ahern 1992).

Within the Bogan LGA the parrots' presence during winter is considered 'nomadic' as it follows winter flowering resources (white box, western golden wattle, mugga ironbark).

The Superb Parrot exemplifies the challenges associated with wide-raging and nomadic species that are not managed wholly within protected habitats. These challenges include that most land the species breeds in is privately owned and that landscape use by this species does not always conform to traditional schematic and categorical landscape/fragmentation models.

Grey-crowned Babblers (*Pomatostomus temporalis temporalis*) (*TSC Act*) have also been recorded within close proximity to the Project Site and are the most commonly recorded threatened species in the CW (B-M) CMA. Grey-crowned Babblers inhabit box-cypress-pine and open box woodlands on alluvial plains. This species prefer large patches of woodland with structural layers and have potential to occur in the Study Area. This species builds both brood and roost nests (Dow and King 1984). Only one nest of the five to ten constructed will be used for breeding and this will often be slightly larger than the roost nests. Within a babblers territory (1 to 50ha) the nests will be clustered within a fairly small area (within 50m of each other). Territory size varies and is apparently more a reflection of habitat type and quality rather than the size of the group (Higgens and Peters 2002).

All birds (aside from birds of prey and nomadic species that follow feeding resources) that require, structural complexity have potential to utilise areas of the road corridor that contain vegetation. The proximity to permanent water (the Bogan River and various cowels) increases the potential for several species of small birds to be recorded in the Study Area that may utilise the available habitat i.e. Diamond Firetail Finch (*Stagonopleura guttata*), Hooded Robin (*Melanodryas cucullata*) and Speckled Warbler (*Chthonicola sagittata*).

According to the DECCW species profile, Regent Honeyeaters (*TSC* & *EPBC Act*) inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes.

Glossy Black Cockatoos (*Calyptorhynchus lathami)* and Red-tailed Black Cockatoos (Calyptorhynchus banksii) are known to occur in proximity to the Project Site and prefer vegetation with a large patch size with species dominated by *Allocasuarina* and *casuarina* species. These birds are however highly sensitive to disturbance and would be unlikely to forage within the existing disturbed Waste Management area.

Square Tailed Kites (*Lophoictinia isura)*, Barking Owls (*Ninox connivens)* and to a much lesser degree the Powerful Owl may use the Study Area for hunting. Barking Owls may remain undetected, and breeding habitat for this species is strongly associated with major waterways such the Bogan River, increasing the likelihood of reordering this species in the Study Area.

The Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris)* has been recorded closeby to the Study Area (3km north) and is more than likely to utilise hollows, fissures in branches and decorating bark in

the Study Area alongside the Little Pied Bat (*Chalinolobus pictus*). However, ecological requirements of the Little Pied Bat reduce any possibility that it would roost in the Study Area.

Results from another OzArk project (OzArk 2009a) within the Central West (Bogan –Macquarie) CMA in similar habitat revealed the presence of eight bat species including two threatened species (Little Pied Bat (*Chalinolobus pictatus)* (confident identification of one pass) and Eastern Bent-wing Bat (*Miniopterus screibersii)* (probable identification of four passes).

4.3 Previous Surveys

Beadle (1948, 1981) originally described the general location of plant alliances in the Bogan-Macquarie area, followed by Chinnick & Key (1971) who examined soils and timber density on the Bogan–Macquarie floodplain. In 1995 Thackaway & Cresswell mapped the vegetation of the DRPB followed by Metcalfe et al (2003) and Keith (2004) who mapped the vegetation formations in NSW and the ACT. During recent years DECCW has been conducting extensive mapping and research within the bioregion aimed at describing and recording many of the natural assets (Gibbons *et al.* 2005). Benson *et al.* (2006) and Benson (2008) have reviewed all previous published and much unpublished work to compile a comprehensive list and descriptions of the plant communities of the NSW western plains as part of a major project, the NSW Vegetation Classification and Assessment Project (NSWVCA), to classify the vegetation of NSW. The vegetation communities recognised by Benson *et al* (2006) are expected to form the basis of a standard vegetation classification for the State. Accordingly, the Benson *et al.* (2006) classification has been adopted in this report for the vegetation of the Study Area (NSWVCA is referred to as the *BioMetric* database in this report).

OzArk has undertaken several ecological assessments in the Central West (Bogan - Macquarie) CMA mainly within the Narromine LGA (OzArk 2005, 2006, 2007a, 2007b 2008a, 2008b, 2009a, 2009b, 2009c). Of which, all vegetation has been comprised of elements from Keith's (2004) described Floodplain Transitional Woodlands and Pilliga Outwash Dry Sclerophyll Forest formations.

4.4 Predictive Model for Threatened Species Detection

The concepts of the modelling described below formed the basis of the methodology designed for the current assessment. These reflect the predominant patterns of threatened species distribution as elicited from prior survey work and from applying habitat preference for those species within a transport corridor.

Remnant patch size is the primary factor appearing to determine the location of threatened plants and animals in the region and to a lesser degree in disturbed habitats proximity to a permanent water supply. Predictive modelling for EECs in the region is fairly straight forward as it can be summarised as likely to be any native vegetation left in the valley floor and on the undulating hills. Thus, *Weeping Myall Woodland* EEC is highly likely to occur in the Study Area on red-brown earths and heavy textured grey and brown alluvial soils subject to gilgai development.

Red sandy soil within the Project Site provides a suitable substrate for several threatened species. It is unlikely that threatened plants would remain in the Study Area due to previous disturbances, however it would not be possible to rule out that they would never be recorded should favourable conditions occur in the future. Threatened plants with the highest potential to be recorded are limited to herbs and grasses, especially *Swainsona sp.*

As noted in the regional overview, the Grey–crowned Babbler (*TSC Act*) and Superb Parrot (*TSC* & *EPBC Act*) are the most likely threatened species to be recorded in the Study Area. Particularly at this time of the year when the Superb Parrot migrates north and west of its core breeding habitat around Cowra.

The Spotted-tailed Quoll requires a large patch size of remnant vegetation and as such is considered likely to occur in the Study Area.

Although no threatened microbats have been recorded in proximity to the Study Area it is more than likely that they would utilise habitat in the Project Site.

5.0 Survey Results

5.1 Vegetation Mapping

24 hectares (800 x 300 m) of vegetation occurs within the Water Management Area with a further 12ha within the Project Site Boundary. Three distinct vegetation communities were mapped and are consistent with vegetation formations previously described by Benson et al. (2006).

- Disturbed areas;
- *Leopardwood woodland of alluvial plains* (Benson 144), **Table 5**;
- Windmill Grass - Curly Windmill Grass - Button Grass alluvial plains grasslands in the dry subtropical climate zone (Benson 49), **Table 5**.
- Weeping Myall open woodland of the Darling Riverine Plains and Brigalow Belt South Bioregions (Benson 27), c. 30m^2.

5.2 Vegetation Clearing Required

12 hectares (800 x 200) of the total 24 hectares is within the Water Management Area (Impact Footprint) for the Project.

- Disturbed areas c. 0.075ha;
- *Leopardwood woodland of alluvial plains* (Benson 144), c. 4.7ha;
- Windmill Grass - Curly Windmill Grass - Button Grass alluvial plains grasslands in the dry subtropical climate zone (Benson 49), c. 7.2ha;
- Weeping Myall open woodland of the Darling Riverine Plains and Brigalow Belt South Bioregions (Benson 27), c. 30m^2.

A further 14ha of vegetation is within the Waste Management Boundary:

- Disturbed areas c. 3ha (site of the existing waste management facility);
- *Leopardwood woodland of alluvial plains* (Benson 144), c. 4.95ha;
- Windmill Grass - Curly Windmill Grass - Button Grass alluvial plains grasslands in the dry subtropical climate zone (Benson 49), c. 6.05ha.

Not all vegetation within the Project Site Boundary will be directly impacted by the Proposal.

5.3 Communities of Conservation Concern & Endangered Ecological Communities (EEC)

A small stand of *Acacia Pendula* (11 individual trees) within *Benson 144* was recorded in the Waste Management Area Boundary. The patch is consistent with the state listed *Weeping Myall Woodland* EEC listed under the *TSC Act*. This community provides habitat for the Grey-crowned Babbler (*TSC Act*) and potentially for the Superb Parrot (*TSC & EPBC Act*). This community does not however fit the condition thresholds listed by the scientific community for *Weeping Myall Woodlands* listed under the *EPBC Act*. To be part of the federally listed community, the patch size needs to be at least 0.5 ha in size.

Only removal of the Myall EEC portion within Waste Management Area Boundary will be compensated for within the Project Boundary. The Myall EEC does not fit the scientific committee's criteria to be included in the EPBC listed ecological community

Under the Biobanking methodology (DECCW 2008) Benson 144 would be identified as a red flag area with high biodiversity conservation values. Benson 144 has been cleared by more than 70 % and contains a small portion of *Myall Woodland in the Darling Riverine Plains*, *Brigalow Belt South, Cobar Peneplain*, *Murray-Darling Depression*, *Riverina and NSW South Western Slopes bioregions* listed under both the TSC and EPBC Act.

5.4 Threatened Species, Flora and Fauna

No threatened species of plants of animals were recorded and none were determined to be directly 'affected' by the proposal.

One family of Grey-crowned Babblers (*TSC Act*) was recorded outside, but adjacent to the Study Area (see **Table 4** below). No nests were noted in the Project Site Boundary. It is highly likely that they would forage and utilise resources within the Project Site.

A lack of suitable habitat for threatened species of microbat reduces their potential to occur in the Study Area.

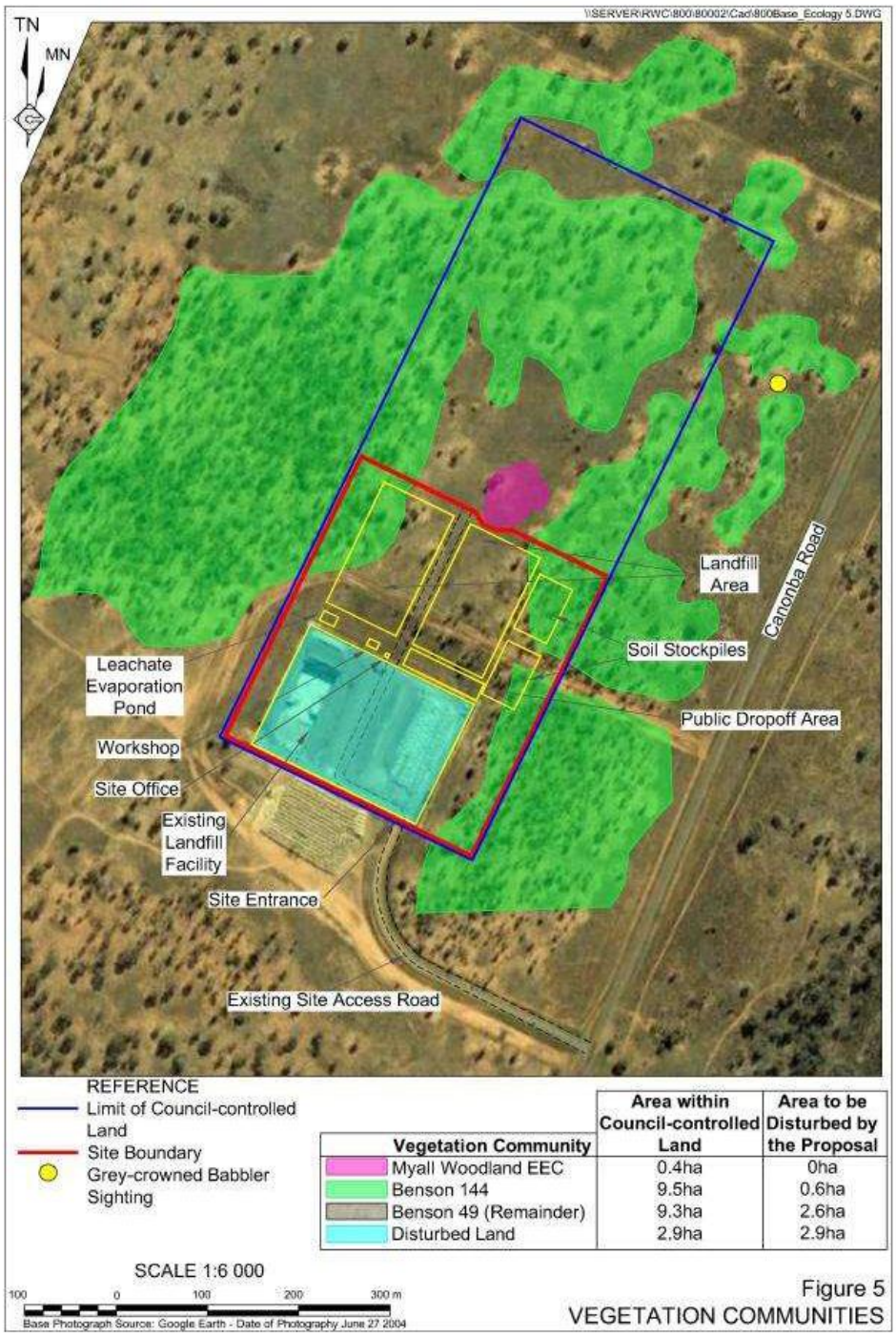
Table 3: Grey-crowned Babbler recording notes.

Easting GDA Zone 55	Northing	Scientific name	Common name	Threat	Notes
520210	6513402	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V	6 individuals

5.5 Noxious Weeds

African boxthorn (*Lycium ferocissimum*), a Class 4 Noxious Weed was recorded sporadically throughout the Project Site. The growth and spread of these plants must be controlled according to the measures specified in a management plan published by the local control authority.

Figure 5: Mapped vegetation in the Study Area.



Vegetation Community	Area within Council-controlled Land	Area to be Disturbed by the Proposal
Myall Woodland EEC	0.4ha	0ha
Benson 144	9.5ha	0.6ha
Benson 49 (Remainder)	9.3ha	2.6ha
Disturbed Land	2.9ha	2.9ha

Table 4: BioMetric description of vegetation communities in the Study Area

Vegetation Type	Dominant canopy spp	Main associated spp	Landscape position	Characteristic mid-storey spp	Characteristic groundcover spp	Other diagnostic features	Vegetation formation [CMA] Vegetation class	Cleared Estimate rounded to nearest 5%
Windmill Grass - Curly Windmill Grass - Button Grass alluvial plains grasslands in the dry subtropical climate zone (Benson 49)		Poplar Box (Eucalyptus populnea subsp. bimbil), Coolibah (Eucalyptus coolabah subsp. coolabah), Western Rosewood (Alectryon oleifolius subsp. canescens), Weeping Myall (Acacia pendula), Belah (Casuarina cristata),	On slight rises of the floodplains of the rivers in the Darling Riverine Plain Bioregion and in the Brigalow Belt South Bioregions.	River Coobah (Acacia stenophylla), Western Boobialla (Myoporum montanum), Wild Orange (Capparis mitchellii), Black Roly Poly (Sclerolaena muricata var. semiglabra)	Windmill Grass (Chloris truncata), Curly Windmill Grass (Enteropogon acicularis), Button Grass (Dactyloctenium radulans), Cup Grass (Eriochloa crebra), Sporobolus caroli, Salsola tragus subsp. tragus, Daucus glochidiatus, Ptilotus semilanatus, Atriplex leptocarpa, Atriplex muelleri, Einadia polygonoides, Portulaca oleracea, Boerhavia repleta, Sida trichopoda, Tragus australianus	Tussock grassland. Occurs on alluvial clay soils and brown earth soils.	Grasslands [CW] Semi-arid Floodplain Grasslands	65
Leopardwood woodland of alluvial plains (Benson 144)	Leopardwood (Flindersia maculosa), Poplar Box (Eucalyptus populnea subsp. bimbil), Whitewood (Atalaya hemiglauca), Western Rosewood (Alectryon oleifolius subsp. canescens),	Belah (Casuarina cristata), Black Box (Eucalyptus largiflorens)	On floodplains, sandplains and on rises on peneplains.	Wilga (Geijera parviflora), Thorny Saltbush (Rhagodia spinescens), Bladder Saltbush (Atriplex vesicaria), Wild Orange (Capparis mitchellii), Warrior Bush (Apophyllum anomalum), Tarbush (Eremophila glabra), Black Bluebush (Maireana pyramidata), Dodonaea viscosa subsp. spatulata	Ruby Saltbush (Enchylaena tomentosa), Atriplex stipitata, Tripogon loliiformis, Curly Windmill Grass (Enteropogon acicularis), Sclerolaena calcarata, Austrostipa setacea, Speargrass (Austrostipa scabra subsp. scabra), Black Roly Poly (Sclerolaena muricata), Sclerolaena diacantha	Occurs on red texture contrast soils mainly in the Darling Riverine Plain Bioregion, also occurs in the Mulga Lands Bioregion. In the northern wheatbelt it is relatively common in the Marra Creek and Macquarie River floodplains and north towards Walgett.	Arid Shrublands (Acacia subformation) [CW] North-west Plain Shrublands	75

6.0 Discussion

6.1 General

Appropriate management of ecological items is primarily determined on the basis of their assessed significance as well as the likely impacts of the proposed development. The following management options are general principles, in terms of best practice and desired outcomes based upon a 'maintain or improve' outcome for biodiversity. Impacts to Benson 144 and 49 including the Myall EEC would require biodiversity offsets to ensure a 'maintain or improve' outcome for local biodiversity.

Habitat values will be lost in the Study Area as a result of the Proposal, however impacts are mitigated by the large local representation of Benson 144 and 49 in the immediate environs.

Leopardwood woodland of alluvial plains (Benson 144) is habitat associated with the Grey-crowned Babbler in the Central West. As can be seen from **Figure 5,** Benson 144 extends outside of the Project Site Boundary onto adjacent land. As the Project Site is not currently utilised for nesting there will be no significant impact to the Grey-Crowned Babbler on condition that biodiversity values associated with the Weeping Myall EEC are offset.

6.2 Key Threatening Processes

The OEH list of Key Threatening Processes (KTP) was reviewed (search date: 14.1.2013, http://www.environment.nsw.gov.au/threatenedspecies/KeyThreateningProcessesByDoctype.htm). Of the 36 KTPs, only one KTP 'clearing of native vegetation' will be exacerbated by the Proposal. The nature and extent of the proposed impacts have been discussed in the preceding sections. The DSEWPaC (EPBC Act list of KTPs) was reviewed (search date: 14.1.2013) http://www.environment.gov.au/cgi-bin/sprat/public/publicgetkeythreats.pl and of the 19 listed KTPs only one 'land clearance' will be exacerbated by the Proposal.

6.3 Summary of the Nature and Extent of Likely Impacts to Threatened Species, Communities and Populations.

6.3.1 Affected species

Direct and indirect impact to Myall Woodland EEC will occur as a result of the Proposal and as such is considered to be 'affected'.

No threatened plant species were recorded within the Project Site during the field survey.

An 'Assessment of Significance' pursuant to the NSW *Environmental Planning and Assessment Act* and the Commonwealth *Environment Protection and Biodiversity Conservation* Act, was conducted for the Grey-crowned Babbler (*TSC Act*) and Superb Parrot (*TSC* & *EPBC Act*) known to occur in the immediate environs and associated with habitat in the Study Area. These two species are considered to be indirectly 'affected' by the Proposal. The Yellow-bellied Sheathtail Bat is considered unlikely to roost within the habitat in the Study Area and Impact Footprint and as such an assessment of significance was not prepared.

The Myall EEC (*TSC Act*) is not eligible for National listing as 'Weeping Myall Open Woodland of the Darling Riverine Plains and Brigalow Belt South Bioregions EEC' (*EPBC Act*) under the scientific committee criterion as it is less than 0.5ha in size.

Offsets are aimed at improving the habitat in the project site for these two threatened species. As no hollow bearing trees will be removed, hollow dependant fauna are not considered to be affected by the Proposal.

6.4 *TSC Act* 7 - Part Tests and *EPBC Act* Assessment of Significance

The appropriate management of ecological items is usually determined on the basis of their assessed significance as well as the likely impacts of any Proposal. Significance of a species, population or community is determined by appointed NSW and National Scientific Committees, cultural and public significance are considerations within the significance determination process. Within the framework of an impact assessment impacts to listed significant item must be assessed at a State (under the *TSC Act*) or National (under the *EPBC Act*) level – even if it is the same species. The following sections identify State or Nationally listed threatened species then determines if impacts are 'significant'. Seven part tests / Assessments of Significance as specified under the *TSC* and *EPBC Act* were completed to properly characterise the threat to Weeping Myall EEC (*TSC ACT*) Grey-crowned Babbler (*TSC Act*) and Superb Parrot (*TSC* & *EPBC Act*) recorded or known to utilise habitat in the Study Area (see **Appendix 2**).

Consideration of the type and scale of habitat to be impacted has resulted in the conclusion that no threatened fauna species will be directly impacted by the Proposal. It was determined that no significant impact will occur to *Weeping Myall Woodland* EEC as a result of the applied significance tests.

6.5 Management Options

Appropriate management of ecological items is primarily determined on the basis of their assessed significance as well as the likely impacts of the proposed development. The following management options are general principles, in terms of best practice and desired outcomes based upon a 'maintain or improve' outcome for biodiversity.

- Avoid impact by altering the development proposal.
- If impact is unavoidable then reduce the nature and extent of the impact and offset loss of habitat to achieve a 'maintain or improve'' outcome for local biodiversity.

Overall general management can be limited to:

1. Offsetting
    - Myall (*Acacia pendula*) should be offset at a ratio of 1:40 (440 total plants). Offsets should be planted out around the Project Site Boundary to act as a wind break and visual screen;
    - Using the opportunity to offset Myall, will replace a critical habitat element missing from the broader landscape for one of the regions flag ship threatened species (the Superb Parrot);
    - Due to the connectivity of Benson 144 and Benson 49 in the Project Site the general environs, offsetting the loss of this habitat is not considered requisite.
2. Inductions
    - All personnel undertaking works should be inducted such that they are aware that any stand of native vegetation outside the Project Site Boundary is protected and a such

there are legislative consequences of deliberately or accidentally impacting it without approval under the EP&A Act;

- Evidence of all personnel receiving an induction must be kept on file (signed induction sheets etc). Should an incident happen followed by a DECCW investigation, this process is likely to reduce the severity of the repercussions to Proponent whilst encouraging the willingness to comply with the ground crews.

3. Due diligence

- To ensure potential impacts to Grey–crowned Babblers (both indirect and direct) are minimised a second check by R.W Corkery environmental team personnel should be undertaken in the Study Area between July and February when the birds are breeding. An example of a Grey-crowned Babbler nest has been provided in **Plate 5**.

7.0 Relevant Legislation.

7.1 National Legislation

7.1.1 Environmental Protection and Biodiversity Act 1999 (*EPBC Act*)

Relevance to the current project: In relation to this Act, items of national environmental significance are detailed in this report.

7.2 State Legislation

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

Relevance to the current proposal: This assessment has considered critical habitat, threatened species, populations or ecological communities, or their habitats which occur in the Study Area.

7.2.2 Ecologically Sustainable Development (ESD)

Relevance to the current proposal: Consideration has been given to how the proposed modifications accord with ESD principles throughout the assessment, particularly with regard to the environmental constraints posed in the Study Area. It is summarised that the impact would be discrete such that those ecological values present / or having potential to occur would be protected or managed for future generations.

7.2.3 The Native Vegetation Act 2003 (NV Act)

Relevance to the current proposal: This project will be assessed under Part 5 of the EP&A Act where clearing of native vegetation is exempt from the NVA Act under point 'f': any clearing that is, or that is part of, designated development within the meaning of the EPA Act and for which development consent has been granted under that Act.

7.2.4 The Noxious Weeds Act 1993 (NW Act)

Relevance to the current proposal: The ecological assessment included a search for noxious weeds. Recommendations in this report will African Boxthorn addressed and see further inspections by the local authority prior, during and after the impact.

7.2.5 The Fisheries Management Act 1994 (FM Act)

Relevance to the current project: None.

7.2.6 The Water Management Act 2000 (WM Act).

Relevance to the current proposal: R.W Corkery is undertaking works under a Part 5 approval under the EP&A Act. Impacts will occur within 40m of any waterway or aquatic habitat.

7.2.7 Threatened Species Conservation Act 1995 (*TSC Act*)

Items within the *TSC Act* relevant to the current proposal include

- Threatened species, populations and ecological communities.

  Relevance to the current proposal: In relation to the Study Area, desktop and field investigations have occurred to identify if any threatened species, populations and ecological communities occur in the Study Area.

- Key threatening processes

  Relevance to the current proposal: In terms of the threatening processes as listed in Schedule 3 of the *TSC Act*, the project would involve clearing of native vegetation.

- The NSW planning and licensing system (the EP&A Act) and its relationship to threatened species, populations or ecological communities, or their habitats.

  Relevance to the current proposal: Assessments of significance have been undertaken within this document.

7.2.8 Threatened Species Conservation Amendment (Biodiversity Banking) Act 2006.

Relevance to the current proposal: This project has not been assessed using the Biobanking scheme.

7.2.9 State Environmental Planning Policies (SEPP)

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Infrastructure) 2007 aims to facilitate the effective delivery of infrastructure across the State.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not affect land or development regulated by *State Environmental Planning Policy No. 14 – Coastal Wetlands*, *State Environmental Planning Policy No. 26 – Littoral Rainforests or State Environmental Planning Policy (Major Projects) 2005*.

With respect to the above, the REF being under Part 5 of the EP&A Act removes the need for development consent. This ecological assessment provides a supporting specialist study for the REF.

7.2.10 Regional Environment Plans (REP)

No REPS apply.

7.2.11 Local Environment Plans (LEP)

Relevance to the current proposal: There are no ecological issues other than those already addressed under the *TSC* and EPBS Acts.

8.0 Recommendations

1. Vegetation to be removed would be restricted to the Waste Management Area (Impact Footprint) and potentially the Project Site Boundary area. Should additional clearing be required further environmental impact assessment will be needed to meet statutory guidelines;
2. Both State and National levels of government aim to maintain, enhance or improve biodiversity, through the developer. The most effective offset for this project would be to:
    - Offset for the removal of Myall (*Acacia pendula*) from the Weeping Myall EEC. Plant out areas between the Waste Management Area and Project Site Boundary with 440 Myall. This will provide a visual screen and windbreak to prevent the distribution of wind-blown rubbish, provide further habitat for the Grey-Crowned Babbler and migratory Superb Parrot and will be consistent with a 'maintain or improve' outcome.
        - Follow up / audit the results in a year's time, replant trees where required, make a file note and attach it to this report;
    - Scatter removed timber in surrounding area. If this is not appropriate then discuss offsets with the Bogan Shire Council Environmental Manager about the possibility of using large timber as environmental offsets in other Bogan Shire reserves.
3. Any eucalypts lopped or removed would be managed by a qualified arborist;
4. To ensure there are no errors during vegetation clearing, all vegetation within the Impact Footprint will be required to be marked in the field so as to clearly identify them from trees to be retained. Avoiding unnecessary tree clearing would have flow on effects dependant fauna;
5. Prior to lopping or clearing, inspect trees with bird nests before pushing or felling to ensure any nests are vacant (no nests were observed during the assessment). Inspection should occur immediately before pushing or felling. If a bird is in the nest, clear the trees around it first to see if the animal will disperse. If the bird is a nestling all measures should be taken to collect the bird[3] and remove to a safe location;
    - Grey-crowned Babblers are laborious flyers and are potentially at risk of being killed by construction traffic when feeding on the ground. These impacts could be managed through a stringent Traffic Control Plan which would be incorporated within internal Council administrative controls and could address issues such as increased traffic flow and vehicle speed in the Project Site Boundary.
6. Stockpile small limbs from removed trees and excess topsoil and spread the material over the disturbed area or within land to be used for offsets after the works are complete;
7. Have an appropriate plan in place and equipment on site to cater for injured animals. Seek advice from a qualified wildlife veterinarian prior to preparing this plan and ensure veterinary assistance has been organised prior to work commencing. Note – do not allow any person to handle any species of bat. Potential exists for the transmission of a virus that is detrimental to the health of humans;
8. No vegetation would be burnt on site (requirement of the POEO Act);

[3] In this event DECCW will need to be contacted and advice sought on how to proceed prior to handling the bird)

9. All soil works would be undertaken according to The NSW Department of Housing Blue Book "Managing Urban Stormwater – Soil and Conservation" (2004) to minimise the disturbance and exposure of soils;
10. An Erosion and Sediment Control Plan (ESCP), would be prepared for the works, included as part of the Contractors Environmental Management Plan. A copy of the plan shall be kept on-site and made available to Council's officers on request. All erosion and sediment control measures would be maintained in a functional condition throughout the duration of the works. Good examples of these can be found in the RTA Code of Practice for *Water Management (1999*) and implement a suitable plan as soon as possible. Other examples include the RTA Road Design Guide 1989, Section 8 – *Erosion and Sedimentation*, the NSW DOH 2004 publication *Managing Urban Stormwater-Soils and Construction* as well as relevant DIPNR soil conservation guidelines such as *Construction Site Erosion and Sediment Control Manual;*
    - Maintenance and checking of the erosion and sedimentation controls would be undertaken on a regular basis and records kept and provided at anytime upon request. Sediment would be cleared from behind barriers on a regular basis and all controls would be managed in order to work effectively at all times;
    - All vehicle and machinery movements would be restricted to the existing road alignment and table drains and areas of disturbance.
11. An appropriately qualified weeds officer would undertake an inspection of the Study Area prior to, during and three months after ground surface disturbing works. Noxious weeds identified within the Project site such as African Boxthorn would be destroyed and continuously suppressed as required under the *Noxious Weeds Act, 1993;*
12. The Proponent would undertake a pre-clearing and post-clearing audit such that it can be demonstrated that adequate systems were in place in the event that DECCW are required to investigate unauthorised impacts;
13. All personnel undertaking works would be inducted such that they are aware that any stand of native vegetation is protected and as such there are legislative consequences of deliberately or accidentally impacting it without approval of the EP&A Act. Evidence of all personnel receiving an induction would be kept on file (signed induction sheets etc). Should an incident happen followed by a DECCW investigation, this process is likely to reduce the severity of the repercussions to Proponent whilst encouraging the willingness to comply with the ground crews; and
14. Vehicles and machinery would be parked in cleared areas and not under the drip-line of retained vegetation or trees. Retained vegetation or trees would not be smothered by stockpiles, sediment, or by the storage of materials and equipment.

9.0 Conclusion

Impacts to vegetation communities in the Project Site would remove potential habitat (breeding and food resources) for the Grey-crowned Babbler (*TSC Act*) and migratory feeding resources for the Superb Parrot (*TSC* & *EPBC Act*). Although a small stand of Myall EEC (*TSC Act*) will be removed (30m^2), offsetting Myall EEC at a ratio of 40:1 will benefit these two species in addition to providing habitat largely missing in the greater locality. Recommendations within this report have provided the mechanisms to achieve a 'maintain or improve' outcome to offset this potential loss.

Having given consideration to the ecology within the Study Area, it is apparent that the Proposal is:

- unlikely to significantly affect any of the listed threatened species, fauna populations or communities;
- unlikely to augment or significantly contribute to any of the National or State listed key threatening processes, if the appropriate safeguards regarding the control of potential vertebrate pests are effectively applied;
- unlikely to significantly affect any Ramsar wetland or any CAMBA, JAMBA or ROKAMBA listed species;
- unlikely to significantly affect any of the creeks if adequate safeguards are adopted for water run-off from the site; and
- consistent with ESD principles with regard to fauna and would not adversely affect the local biodiversity and no issue of inter-generational or value added matters are relevant in this instance.

10.0 References

Beadle 1948. Beadle, N.C.W. 1948. The vegetation and pastures of western New South Wales (Government Printer: Sydney).

Beadle 1981. Beadle, N.C.W. 1981. The vegetation of Australia (Cambridge University Press: Sydney).

Benson *et al* 2006. Benson, J.S., Allen, C.B., Togher, C.& Lemmon, J. (2006) New South Wales Vegetation Classification and Assessment: Part 1 Plant Communities of the NSW Western Plains. Cunninghamia 9(3): 383-450.

Benson 2008 Benson, J.S. 2008. New South Wales Vegetation Classification and Assessment: Part 2 Plant communities in the NSW South-western Slopes Bioregion and update of NSW Western Plains plant communities. Version 2 of the NSWVCA database. Cunninghamia 10(4): 599-673 (includes CD with 800mb of reports).

BOM 2010. Commonwealth Bureau of Meteorology 2010.www.bom.gov.au.

Briggs and Leigh 1996. Briggs, J.D. and Leigh, J.H. 1996. Rare or threatened Australian Plants. Revised edition, CSIRO, Melbourne.

Chinnick and Key 1971. Chinnick, L.J. & Key, K.H.L. 1971. Map of soils and timber density in the Bogan –Macquarie outbreak area of the Locust Chortoicetes terminifera. Division of Entomology Technical Paper No.12 (CSIRO: Canberra).

Cropper 1993. Cropper, S. 1993. Management of Endangered Plants. CSIRO, Melbourne.

Cunningham *et al* 1992. Cunningham, G., Mulham, W., Millthorpe, P. and Leigh, J. 1992 Plants of Western New South Wales. Inkata Press.

DEC 2004. Department of Environment, Climate Change and Water (DECCW). Biodiversity Survey Guidelines Working Draft.

DECC 2007. Department of Environment, Climate Change and Water (DECCW). Threatened Species Assessment Guidelines: The Assessment of Significance.

DECC 2008 Department of Environment, Climate Change and Water (DECCW). Biobanking Methodology, July 2008.

DECC 2008a Department of Environment, Climate Change and Water (DECCW). http://www.environment.nsw.gov.au/bioregions/DarlingRiverinePlains-Climate.htm

DECCW 2009 Department of Environment, Climate Change and Water (DECCW). Field Survey Methods.

DECCW 2010a Department of Environment, Climate Change and Water (DECCW). NSW Wildlife Atlas (Data licence agreement No. No. CON99042)

DECCW 2010b — Department of Environment, Climate Change and Water (DECCW). Threatened Species web site http://203.202.1.211/tsprofile/index.aspx.

Dow and King 1984 — Dow, DD & King, BR 1984, 'Communal breeding of brood and roost nests by the Grey-crowned Babbler *Pomastomus temporalis*', Emu, vol. 84, pp. 193-9.

Gibbons *et al* 2005. — Gibbons, P., Ayers, D., Seddon, J., Doyle, S. and Briggs, S. 2005. BioMetric Version 1.8. A Terrestrial Biodiversity Assessment Tool for the NSW Property Vegetation Plan Developer: Operational Manual. NSW Department of Environment and Conservation.

Harden 1990a. — Harden, G.J. (Ed) 1990. Flora of New South Wales. Volume 1. Royal Botanic Gardens: Sydney. New South Wales University Press.

Harden 1992. — Harden, G.J. (Ed) 1992 Flora of New South Wales. Volume 3. Royal Botanic Gardens: Sydney. New South Wales University Press.

Harden 1993. — Harden, G.J. (Ed) 1993. Flora of New South Wales. Volume 4. Royal Botanic Gardens: Sydney. New South Wales University Press.

Harden 2002. — Harden, G.J. (Ed) 2002. Flora of New South Wales. Volume 2. Revised Edition. Royal Botanic Gardens: Sydney. New South Wales University Press.

Harden and Murray 2000. — Harden, G.J. & Murray, L.J. 2000 Supplement to Flora of New South Wales Volume 1. Royal Botanic Gardens Sydney.

Higgens and Peters 2002. — Higgens, P.J., and Peters, J.M. Handbook of Australian, New Zealand and Antarctic birds. Volume 6. Oxford University Press. 2002

Keith 2004. — Keith, D. 2004. Ocean Shores to Desert Dunes - the native vegetation of New South Wales and the ACT. Department of Environment and Conservation (NSW) Hurstville.

RBG 2010a. — Royal Botanic Gardens. 2010. http://plantnet.rbgsyd.gov.au.

RBG 2010b. — Royal Botanic Gardens. 2010. PlantNet NSW Flora Online: http://plantnet.rbgsyd.nsw.gov.au/ search/simple.htm

Manning *et al* 2006. — Manning. A.D., Lindenmayer. D.B., Barry. S.C., and Nix H. 2006 Multi-scale site and landscape effects on the vulnerable Superb Parrot of south-eastern Australia during the breeding season. Journal of Landscape Ecology 21:1119–1133

Manning *et al* 2007. — Manning. A.D., Lindenmayer. D.B., Barry. S.C., and Nix H. 2007 Large-scale spatial and temporal dynamics of the vulnerable and highly mobile superb parrot. Journal of Biogeography 34, 289–304. Blackwell Publishing Ltd.

Metcalf *et al* 2003. — Metcalf, L., Siversten, D. P., Tindall, D., & Ryan, K.M. 2003 Natural Vegetation of the NSW Wheat belt 1:250 000 Vegetation Sheet.

Morgan and Terrey 1992. Morgan, G. and Terrey, J. 1992. Nature conservation in western New South Wales. National Parks Association, Sydney.

NSW NPWS. 2002. Community data search and biodiversity survey of the Brigalow Belt South Bioregion Stage 1.

OzArk 2005. OzArk Environmental and Heritage Management. 2005. Ecological Assessment of impacts to trees resulting from proposed road widening at: Mungeribar lane & MR 572 (Narromine – EUMUNGERIE Road) near Narromine, NSW. Report to Narromine Shire Council.

OzArk 2006. OzArk Environmental and Heritage Management. 2006. Ecological Assessment: Proposed road widening ON MR 572 (Narromine – EUMUNGERIE Road) 10.6 to 14.7 km northeast of Narromine, NSW. Report to Narromine Shire Council.

OzArk 2007a. OzArk Environmental and Heritage Management. 2007. Ecological Assessment: Proposed road widening Activities on MR347, MR572 and the Narromine to Warren Rd. Report to Narromine Shire Council.

OzArk 2007b. OzArk Environmental and Heritage Management. 2007. Proposed West Trangie Road Widening on SH 17 (Mitchell Highway), 0.7 – 19.2 km west of Trangie, nsw. Report to RTA Parkes.

OzArk 2008a. OzArk Environmental and Heritage Management. 2008. Ecological Assessment: Proposed Widening of MR89, 0 to 4.5km from Tomingley to Narromine, NSW. Report to NSW Roads and Traffic Authority.

OzArk 2008b. OzArk Environmental and Heritage Management. 2008. Ecological Assessment: Proposed Road Rehabilitation works on MR572 (Narromine to Eumungerie Rd) and Weembah Rd Narromine Local Government Area, NSW. Report to Narromine Shire Council.

OzArk 2009a. OzArk Environmental and Heritage Management. 2009. Ecological Assessment: Tomingley Gold Project. Report to Alkane Resources Ltd.

OzArk 2009b. OzArk Environmental and Heritage Management. 2009. Ecological Assessment: Proposed Tree Clearing along Farendale Road, Narromine Local Government Area, NSW. Report to Narromine Shire Council.

OzArk 2009c. OzArk Environmental and Heritage Management. 2009. Ecological Assessment: Proposed HW7 widening and upgrade near Trangie, NSW. Report to RTA.

Shelly 2003. Shelley, D. 2003. Flora and Fauna of the Narromine District. Department of Infrastructure, Planning and Natural Resources.

Schrader 1980. Schrader, N. W., 1980. A review on the Distribution of the Superb Parrot in Central New South Wales. Australian Birds. Vol 14, No 3.

Stern *et al* 2000. Stern H., de Hoedt G. and Ernst, J. 2000. Objective Classification of Australian Climates. Australian Bureau of Meteorology, Melbourne.

Thakway and Cresswel 2000. Thackway, R., & Cresswel, I.D. (eds). 2000. An Interim Biogeographic Regionalisation for Australia: a Framework for Establishing the National System of Reserves, Version 5.1. Department of Environment and Heritage, Canberra. Australian ICOMOS Inc. 1998. Understanding the Burra Charter: A guide to the principles of heritage conservation in Australia. Brochure produced for Australia ICOMOS.

Triggs 2004. Triggs, B. 2004 Tracks Scats and other Traces. Oxford University Press. ISBN: 9780195550993.

Webster and Ahern 1992. Webster,R. And Ahern., L 1992. Management for the Conservation fr the Superb Parrot (Polytelis swainsonii) in New South Wales and Victoria. Department of Conservation and Natural Resources. Victoria.

Plates

Plate 1:

View of Benson 44. *Windmill Grass - Curly Windmill Grass - Button Grass alluvial plains grasslands in the dry subtropical climate zone.*

Plate 2:

View of leopardwood within *Leopardwood woodland of alluvial plains* (Benson 144).

	**Plate 3:** Myall Woodland EEC (*TSC* ACT).
	**Plate 4:** General environs within the Project Site.

Plate 5:

Example of Grey-crowned Babbler nest. The Grey-crowned Babbler is a prolific nest builder, building nests throughout the year for both breeding and roosting. The nests are found close together, often with more than 12 nests within 90 square metres (Dow & King 1984). They build clusters of distinctive and bulky nests, domed with a short tunnel beneath and an overhanging projection leading to an enclosed and roughly spherical nest-chamber (Dow & King 1984).

Appendix 1: Database Searches

OEH Threatened Species search results

Combined geographic and habitat search results.

Your search returned 98 results. You searched for the following information:

- geographic region: Central West > Bogan-Macquarie
- vegetation type: all
- type: all

Scientific name	Common name	Type of species ▲	NSW status	Occurrence	Vegetation class
Crinia sloanei	Sloane's Froglet	Animal > Amphibians	Vulnerable	Known	Show 5 linked vegetation classes
Chalinolobus picatus	Little Pied Bat	Animal > Bats	Vulnerable	Known	Show 43 linked vegetation classes
Nyctophilus corbeni	Corben's Long-eared Bat	Animal > Bats	Vulnerable	Known	Show 47 linked vegetation classes
Pteropus poliocephalus	Grey-headed Flying-fox	Animal > Bats	Vulnerable	Known	Show 65 linked vegetation classes
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Animal > Bats	Vulnerable	Known	Show 88 linked vegetation classes
Anseranas semipalmata	Magpie Goose	Animal > Birds	Vulnerable	Known	Show 20 linked vegetation classes
Ardeotis australis	Australian Bustard	Animal > Birds	Endangered	Known	Show 29 linked vegetation classes
Botaurus poiciloptilus	Australasian Bittern	Animal > Birds	Endangered	Known	Show 19 linked vegetation classes
Burhinus grallarius	Bush Stone-curlew	Animal > Birds	Endangered	Known	Show 61 linked vegetation classes
Lophochroa leadbeateri	Major Mitchell's Cockatoo	Animal > Birds	Vulnerable	Known	Show 33 linked vegetation classes
Calyptorhynchus banksii samueli	Red-tailed Black-Cockatoo (inland subspecies)	Animal > Birds	Vulnerable	Known	Show 24 linked vegetation classes
Calyptorhynchus lathami	Glossy Black-Cockatoo	Animal > Birds	Vulnerable	Known	Show 57 linked vegetation classes
Certhionyx variegatus	Pied Honeyeater	Animal > Birds	Vulnerable	Known	Show 23 linked vegetation classes
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Animal > Birds	Vulnerable	Known	Show 45 linked vegetation classes
Ephippiorhynchus asiaticus	Black-necked Stork	Animal > Birds	Endangered	Known	Show 22 linked vegetation classes
Falco hypoleucos	Grey Falcon	Animal > Birds	Endangered	Known	Show 32 linked vegetation classes
Grantiella picta	Painted Honeyeater	Animal > Birds	Vulnerable	Known	Show 49 linked vegetation classes
Grus rubicunda	Brolga	Animal > Birds	Vulnerable	Known	Show 18 linked vegetation classes
Hamirostra melanosternon	Black-breasted Buzzard	Animal > Birds	Vulnerable	Known	Show 28 linked vegetation classes
Leipoa ocellata	Malleefowl	Animal > Birds	Endangered	Known	Show 7 linked vegetation classes
Limosa limosa	Black-tailed Godwit	Animal > Birds	Vulnerable	Known	Show 15 linked vegetation classes

Lophoictinia isura	Square-tailed Kite	Animal > Birds	Vulnerable	Known	Show 82 linked vegetation classes
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Animal > Birds	Vulnerable	Known	Show 58 linked vegetation classes
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Animal > Birds	Vulnerable	Known	Show 40 linked vegetation classes
Neophema pulchella	Turquoise Parrot	Animal > Birds	Vulnerable	Known	Show 40 linked vegetation classes
Nettapus coromandelianus	Cotton Pygmy-Goose	Animal > Birds	Endangered	Known	Show 6 linked vegetation classes
Ninox connivens	Barking Owl	Animal > Birds	Vulnerable	Known	Show 60 linked vegetation classes
Oxyura australis	Blue-billed Duck	Animal > Birds	Vulnerable	Known	Show 12 linked vegetation classes
Pachycephala inornata	Gilbert's Whistler	Animal > Birds	Vulnerable	Predicted	Show 14 linked vegetation classes
Pandion cristatus	Eastern Osprey	Animal > Birds	Vulnerable	Known	Show 32 linked vegetation classes
Polytelis swainsonii	Superb Parrot	Animal > Birds	Vulnerable	Known	Show 29 linked vegetation classes
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Animal > Birds	Vulnerable	Known	Show 48 linked vegetation classes
Chthonicola sagittata	Speckled Warbler	Animal > Birds	Vulnerable	Known	Show 51 linked vegetation classes
Rostratula australis	Australian Painted Snipe	Animal > Birds	Endangered	Known	Show 16 linked vegetation classes
Stagonopleura guttata	Diamond Firetail	Animal > Birds	Vulnerable	Known	Show 49 linked vegetation classes
Stictonetta naevosa	Freckled Duck	Animal > Birds	Vulnerable	Known	Show 14 linked vegetation classes
Tyto novaehollandiae	Masked Owl	Animal > Birds	Vulnerable	Known	Show 66 linked vegetation classes
Turnix maculosus	Red-backed Button-quail	Animal > Birds	Vulnerable	Predicted	Show 27 linked vegetation classes
Petroica phoenicea	Flame Robin	Animal > Birds	Vulnerable	Known	Show 42 linked vegetation classes
Hieraaetus morphnoides	Little Eagle	Animal > Birds	Vulnerable	Known	Show 98 linked vegetation classes
Petroica boodang	Scarlet Robin	Animal > Birds	Vulnerable	Predicted	Show 50 linked vegetation classes
Circus assimilis	Spotted Harrier	Animal > Birds	Vulnerable	Known	Show 56 linked vegetation classes
Daphoenositta chrysoptera	Varied Sittella	Animal > Birds	Vulnerable	Known	Show 77 linked vegetation classes
Epthianura albifrons	White-fronted Chat	Animal > Birds	Vulnerable	Known	Show 23 linked vegetation classes
Calidris ferruginea	Curlew Sandpiper	Animal > Birds	Endangered	Known	Show 4 linked vegetation classes
Antechinomys laniger	Kultarr	Animal > Marsupials	Endangered	Known	Show 25 linked vegetation classes
Dasyurus maculatus	Spotted-tailed Quoll	Animal > Marsupials	Vulnerable	Known	Show 72 linked vegetation classes
Phascogale tapoatafa	Brush-tailed Phascogale	Animal > Marsupials	Vulnerable	Known	Show 47 linked vegetation classes
Phascolarctos cinereus	Koala	Animal >	Vulnerable	Known	Show 58 linked

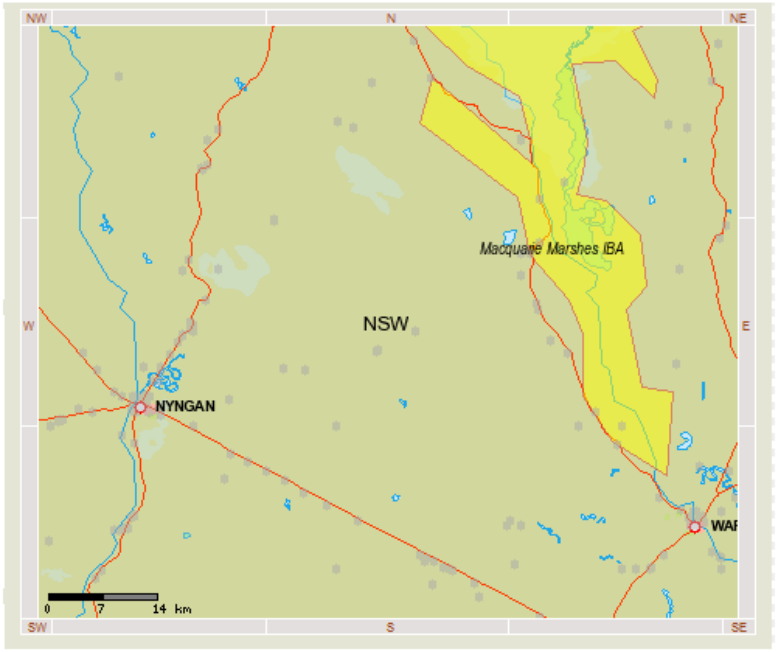
		Marsupials			vegetation classes
Sminthopsis macroura	Stripe-faced Dunnart	Animal > Marsupials	Vulnerable	Known	Show 24 linked vegetation classes
Hoplocephalus bitorquatus	Pale-headed Snake	Animal > Reptiles	Vulnerable	Predicted	Show 44 linked vegetation classes
Conilurus albipes	White-footed Tree-rat	Animal > Rodents	Extinct	Known	
Artesian Springs Ecological Community	Artesian Springs Ecological Community	Community > Threatened Ecological Communities	Endangered Ecological Community	Known	Show 14 linked vegetation classes
Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions	Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions	Community > Threatened Ecological Communities	Endangered Ecological Community	Known	Show 3 linked vegetation classes
Coolibah-Black Box Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain and Mulga Lands Bioregion	Coolibah-Black Box Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain and Mulga Lands Bioregion	Community > Threatened Ecological Communities	Endangered Ecological Community	Known	North-west Floodplain Woodlands
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Community > Threatened Ecological Communities	Endangered Ecological Community	Predicted	Show 5 linked vegetation classes
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	Community > Threatened Ecological Communities	Endangered Ecological Community	Known	Show 8 linked vegetation classes
Cheilanthes sieberi subsp. pseudovellea	Cheilanthes sieberi subsp. pseudovellea	Plant > Ferns and Cycads	Endangered	Known	Inland Rocky Hill Woodlands
Dichanthium setosum	Bluegrass	Plant > Herbs and Forbs	Vulnerable	Known	Show 22 linked vegetation classes
Swainsona murrayana	Slender Darling Pea	Plant > Herbs and Forbs	Vulnerable	Predicted	Show 16 linked vegetation classes
Swainsona plagiotropis	Red Darling Pea	Plant > Herbs and Forbs	Vulnerable	Known	Show 3 linked vegetation classes
Swainsona recta	Small Purple-pea	Plant > Herbs and Forbs	Endangered	Known	Show 7 linked vegetation classes
Diuris tricolor	Pine Donkey Orchid	Plant > Orchids	Vulnerable	Known	Show 18 linked vegetation classes
Pterostylis cobarensis	Greenhood Orchid	Plant > Orchids	Vulnerable	Known	Show 12 linked vegetation classes
Zieria granulata	Illawarra Zieria	Plant > Shrubs	Endangered	Known	Show 8 linked vegetation classes
Prostanthera spinosa	Spiny Mint-bush	Plant > Shrubs	Vulnerable	Known	Show 3 linked vegetation classes
Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered	Infection by Psittacine circoviral (beak and feather) disease affecting endangered	Threat > Disease	Key Threatening Process	Predicted	

psittacine species and populations	psittacine species			
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	Threat > Disease	Key Threatening Process	Predicted
Infection of native plants by Phytophthora cinnamomi	Infection of native plants by Phytophthora cinnamomi	Threat > Disease	Key Threatening Process	Predicted
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands.	Threat > Habitat Loss/Change	Key Threatening Process	Predicted
Bushrock removal	Bushrock Removal	Threat > Habitat Loss/Change	Key Threatening Process	Predicted
Loss or degradation (or both) of sites used for hill-topping by butterflies	Loss and/or degradation of sites used for hill-topping by butterflies	Threat > Habitat Loss/Change	Key Threatening Process	Predicted
Removal of dead wood and dead trees	Removal of dead wood and dead trees	Threat > Habitat Loss/Change	Key Threatening Process	Predicted
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	Ecological consequences of high frequency fires	Threat > Habitat Loss/Change	Key Threatening Process	Predicted
Clearing of native vegetation	Clearing of native vegetation	Threat > Habitat Loss/Change	Key Threatening Process	Predicted
Anthropogenic Climate Change	Human-caused Climate Change	Threat > Habitat Loss/Change	Key Threatening Process	Predicted
Loss of Hollow-bearing Trees	Loss of Hollow-bearing Trees	Threat > Habitat Loss/Change	Key Threatening Process	Predicted
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Threat > Other Threat	Key Threatening Process	Predicted
Competition from feral honey bees, Apis mellifera L.	Competition from feral honeybees	Threat > Pest Animal	Key Threatening Process	Predicted
Introduction of the Large Earth Bumblebee Bombus terrestris (L.)	Introduction of the large earth bumblebee (Bombus terrestris)	Threat > Pest Animal	Key Threatening Process	Predicted
Predation by the Feral Cat Felis catus (Linnaeus, 1758)	Predation by feral cats	Threat > Pest Animal	Key Threatening Process	Predicted
Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW	Invasion of the yellow crazy ant (Anoplolepis gracilipes) into NSW	Threat > Pest Animal	Key Threatening Process	Predicted
Herbivory and	Herbivory and	Threat > Pest	Key	Predicted

environmental degradation caused by feral deer	environmental degradation caused by feral deer	Animal			Threatening Process	
Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)	Predation by the European Red Fox	Threat Animal	>	Pest	Key Threatening Process	Predicted
Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)	Predation by the Plague Minnow (Gambusia holbrooki)	Threat Animal	>	Pest	Key Threatening Process	Predicted
Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758	Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758	Threat Animal	>	Pest	Key Threatening Process	Predicted
Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758	Predation, habitat degradation, competition and disease transmission by Feral Pigs (Sus scrofa)	Threat Animal	>	Pest	Key Threatening Process	Predicted
Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972	Importation of red imported fire ants into NSW	Threat Animal	>	Pest	Key Threatening Process	Predicted
Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)	Competition and grazing by the feral European rabbit	Threat Animal	>	Pest	Key Threatening Process	Predicted
Invasion and establishment of the Cane Toad (Bufo marinus)	Invasion and establishment of the Cane Toad	Threat Animal	>	Pest	Key Threatening Process	Predicted
Predation and hybridisation by Feral Dogs, Canis lupus familiaris	Predation and hybridisation by Feral Dogs, Canis lupus familiaris	Threat Animal	>	Pest	Key Threatening Process	Predicted
Invasion of native plant communities by exotic perennial grasses	Invasion of native plant communities by exotic perennial grasses	Threat > Weed			Key Threatening Process	Predicted
Invasion of native plant communities by Chrysanthemoides monilifera	Invasion of native plant communities by bitou bush & boneseed	Threat > Weed			Key Threatening Process	Predicted
Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)	Invasion, establishment and spread of Lantana (Lantana camara L. sens. lat)	Threat > Weed			Key Threatening Process	Predicted
Invasion and establishment of exotic vines and scramblers	Invasion and establishment of exotic vines and scramblers	Threat > Weed			Key Threatening Process	Predicted
Invasion and establishment of Scotch Broom (Cytisus scoparius)	Invasion and establishment of Scotch Broom (Cytisus scoparius)	Threat > Weed			Key Threatening Process	Predicted
Invasion of native plant communities by African Olive Olea europaea L. subsp. cuspidata (Wall	Invasion of native plant communities by African Olive Olea europaea L. subsp.	Threat > Weed			Key Threatening Process	Predicted

ex G. Don Cirferri)	cuspidata (Wall ex G. Don Cirferri)		
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Threat > Weed	Key Threatening Predicted Process

Important Bird Areas



EPBC Protected Matters Search – Bogan NSW

Australian Government
Department of Sustainability, Environment, Water, Population and Communities

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.

Report created: 14/01/13 11:24:57

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 10.0Km

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:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	9
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 and the heritage values of a place on the Register of the National Estate.

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.

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:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	7
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

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

Place on the RNE:	1
State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	6
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

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 likely to occur within area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community may occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may 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 may occur within area
Rostratula australis Australian Painted Snipe [77037]	Vulnerable	Species or species habitat may occur within area
Fish		
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within

Name	Status	Type of Presence
		area
Mammals		
Nyctophilus corbeni		
South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Petrogale penicillata		
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may 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
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
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Leipoa ocellata		
Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Vulnerable*	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 - Australian Telecommunications Commission

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		
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 may occur within area
Ardea ibis Cattle Egret [59542]		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
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Belar Creek Myalls	NSW	Indicative Place

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
Mammals		
Capra hircus Goat [2]		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
Oryctolagus cuniculus Rabbit, European Rabbit [128]		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		
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat may occur within area

Coordinates

-31.50207 147.21293

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 Heritage and Register of National Estate properties, Wetlands of International 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.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

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.

Acknowledgements

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

-Department of Environment, Climate Change and Water, New South Wales
-Department of Sustainability and Environment, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment and Natural Resources, South Australia
-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts
-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA 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, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Geoscience Australia
-CSIRO
-Other groups and individuals

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

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

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Appendix 2: Seven Part Test / Assessment of Significance

Myall Woodland EEC

- Consistency with NSW Scientific Committee determination: A review of *BioMetric* shows that Benson 49 is a component of this EEC and is consistent with the NSW Scientific determination.
- Location: 30m^2 (0.09ha) of Myall Woodland exist within the Study Area, see **Figure 5** and **6.**
- Quality: Good – undesirable patch size, fragmented and cleared in parts. Healthy.
- Definition of 'local population': 30m^2 including young regenerating plants.
- Extent within the Study Area: Approximately 11 individuals in the Impact Footprint.
- Type of modification: Reduction in area of extent by removing the individuals.

An assessment of significance for Myall Woodland EEC shows that the Proposal likely to cause local extinction of this EEC in the Project Site as the remnant is fragmented and contained to the 0.9ha population of eleven individual trees (**Table 5).** Offsets will see 440 Myall (*acacia pendula*) planted outside the impact footprint within the Waste Management Boundary (**Figure 5**). This is considered to be an improvement for this community compared to its original condition.

Table 5: Seven-part test of significance for Myall Woodland EEC.

	Myall Woodland EEC *V TSC Act*
1) in the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.	• Not relevant
2) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.	• Not relevant
3) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed: (i) is likely to have an adverse effect on the extent of the ecological community such that its 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,	• 11 individuals will be removed from a 0.9ha population (the entire fragment). This will remove the EEC from the Project Site and local area. However, offsets at a 1:40 ratio (for every one tree removed 40 will be planted in its place) will be planted out in the Waste Management Boundary which will substantially improve the original fragment of this EEC. It is noted land management practices (removing cattle) from the Project Site has resulted in the comeback of this EEC.
4) in relation to habitat of a threatened species, population or ecological community: i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and iii) the importance of the habitat to be removed,	• See above. • The remnant of Myall woodland is already fragmented. Recommendations will serve to increase the area of occupancy of the EEC. • Any component of an EEC is important.

	Myall Woodland EEC *V TSC Act*
modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	
5) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).	• Critical habitat does not occur in the locality.
6) Whether the actions proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.	• There are no recovery or threat abatement plans for this EEC.
7) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	• Clearing of native vegetation applies.
Conclusion	• The proposal will remove the entire fragment of EEC. This will remove this habitat from the locality. Recommendations in this report recognise that the best environmental outcome for this EEC is to offset within the Waste Management Boundary (**Figure 5**) with 440 individual trees. Genetic material from the small population should also be collected and used for rehabilitation in the Project Site area to be managed for conservation.

Grey-crowned Babbler

Definition of 'local population': A family of Grey-crowned Babblers were observed on the ground just outside of the Project Boundary Site. This species is known to utilise Benson 144 habitat including Myall within the Project Boundary Site and Impact Footprint. No nests were observed.

- Extent of habitat use within the Study Area: All remnant native vegetation in the Study Area including derived grass communities.
- Type of modification affecting this species: Removal of up to c.13.5ha of Benson 49 and c 9.6ha of Benson 144 including a community of Myall (*A. pendula*) (11 individuals 0.09ha) and associated understorey. This species will be indirectly affected through removal of vegetation, possibly increased noise and machinery in Study Area.

An assessment of significance for Grey-crowned babbler shows that the Proposal is unlikely to cause local extinction of this species if amelioration measures identified in this report are implemented (**Table 6).**

Table 6: Seven-part test of significance for Grey-crowned Babbler.

	Grey-crowned babbler *V TSC Act*
1) in the case of a threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.	• Due to the discrete nature of the impacts to suitable habitat trees it is unlikely that a local population within the Study Area would be impacted such that it would place at risk of local extinction. • Clearing of Myall feeding resources will be offset; However Benson 144 and 49 are well represented in the local area and will not be offset. • Mitigation measures have been aimed at reducing mortalities associated with tree clearing. No nests were observed in the Project Site. This species has multiple nests and are not dependant on any one breeding nest in the family's possession. • Given the above, it is unlikely that a local population within the Study Area would be impacted by the proposal such that it placed the population at risk of local extinction.
2) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.	• Not relevant
3) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed: (i) is likely to have an adverse effect on the extent of the ecological community such that its 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,	• Not relevant
4) in relation to habitat of a threatened species, population or ecological community: i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and	• Any component of an EEC /habitat / resource for this species is important. The most important items to be impacted are the isolated patch of Myall EEC.

	Grey-crowned babbler *V TSC Act*
iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	
5) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).	• Critical habitat does not occur in the locality.
6) Whether the actions proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.	• There are no recovery or threat abatement plans for this species.
7) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	• Clearing of native vegetation applies.
Conclusion	• The Proposal will remove 12ha of vegetation within potential breeding habitat for this species. Recommendations in this report will ensure that no animals are harmed by the Proposal. It's possible that the Proposal will reduce the extent of a feeding resource within the Project Area however these will be offset with Myall planted out at a 40: 1 ratio within the Project Management Boundary. It is not considered that it would cause a significant impact to the local population.