

Biodiversity Assessment Report

Appendix I



Appendix I — Biodiversity Assessment Report



Biodiversity Assessment Report

Bourke Small Stock Abattoir Environmental Impact Statement

Prepared for CAPRA Developments Pty Ltd | 3 March 2016



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Biodiversity Assessment Report

Final

Report H15101RP1 | Prepared for CAPRA Developments Pty Ltd | 3 March 2016

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Date 3 March 2016

Date 3 March 2016

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1 Introduction

1.1 Background

CAPRA Developments Pty Ltd (CAPRA) is seeking State Significant Development Consent under Part 4, Division 4.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the construction and operation of a small stock abattoir (herein referred to as the project), approximately 14 kilometres (km) north of Bourke in north-western New South Wales (NSW), as shown on Figure 1.1.

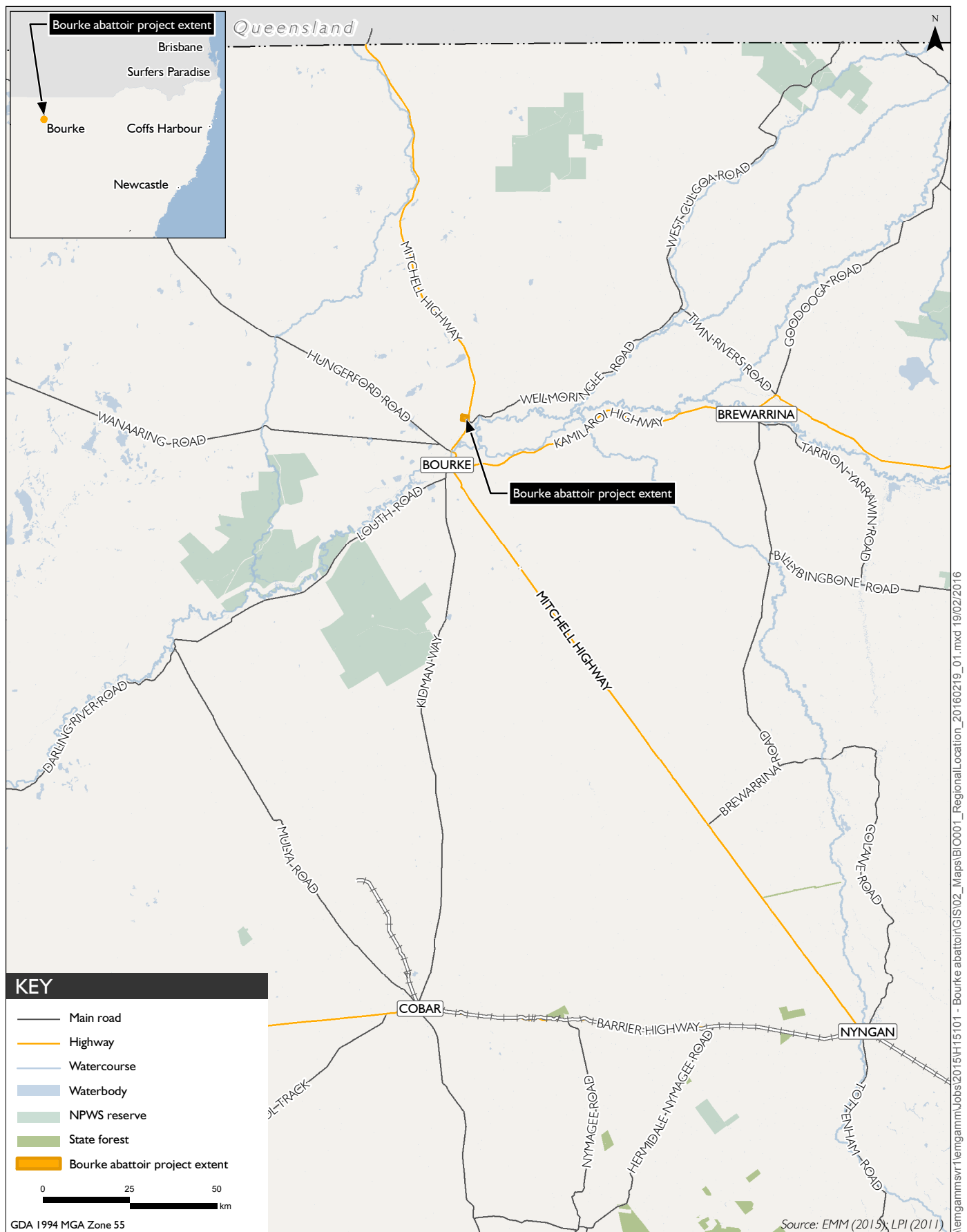
CAPRA's primary objective is to develop an abattoir adopting best practice in design, operation and management, to meet the immediate and projected long-term export demand for meat. The abattoir will have the capacity to process up to 6,000 head per day for export, comprising goats, sheep and lambs. The project represents a significant investment in the Bourke region, with a capital investment value of approximately \$60 million, and will provide approximately 200 full time equivalent (FTE) positions when fully operational, along with significant associated flow on benefits to the town of Bourke and the Far West NSW region.

1.2 Project overview

A full project description is provided in Chapter 2 of the environmental impact statement (EIS). In summary the project involves:

- construction of an abattoir with the capacity to process up to 6,000 head per day, comprising goat, sheep and lambs;
- construction and provision of ancillary infrastructure to support the abattoir, including reticulation of power, water and telecommunication services, vehicular access off the Mitchell Highway, heavy vehicle manoeuvring and turning areas, livestock holding yards, car parking, administration office, staff amenities and a wastewater treatment system;
- sourcing of livestock principally from the Far West region of NSW and trucked to the project site;
- construction of four water treatment ponds where wastewater will be treated via an anaerobic and aerobic ponding process, and then utilised for irrigation;
- meat products from the abattoir will be chilled to less than 7 degrees Celsius (°C) or frozen for transport;
- no rendering will take place on site with waste products to be transported off site for disposal at licensed facilities;
- employment of approximately 200 FTE personnel when fully operational; and
- operation of the abattoir 24 hours per day, 7 days per week.

The project will involve the clearance of approximately 17.3 hectares (ha) for construction of the abattoir and ancillary infrastructure, with a further 38 ha to be set aside for irrigated crops from treated effluent produced by the abattoir, resulting in a project footprint of approximately 55.3 ha.



Regional locality

Bourke Small Stock Abattoir
Biodiversity Assessment Report

Figure 1.1

1.3 Project site

The project site comprises 246 ha of rural land, approximately 14 km north of Bourke, which has been significantly modified by historic land clearing and agricultural activities. It is positioned off the Mitchell Highway and identified as Lot 17 in Deposited Plan (DP) 753546 within the local government area (LGA) of Bourke.

The applicant has entered in a conditional contract to purchase approximately 2,000 ha of land, pending securing project approval, known as the Artisan Block and comprising the project site (Lot 17 DP 753546), as illustrated on Figure 1.2. For the purposes of this report, the study area is defined as the disturbance footprint associated with the project; ie the access road, carparking and hardstand areas, the abattoir, wastewater treatment ponds and irrigation area, shown on Figure 1.2.

1.4 Purpose of this document

The proposed Bourke small stock abattoir is a State Significant Development (SSD) pursuant to Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011* (State and Regional Development SEPP). Accordingly, consent is required under Part 4, Division 4.1 of the NSW EP&A Act.

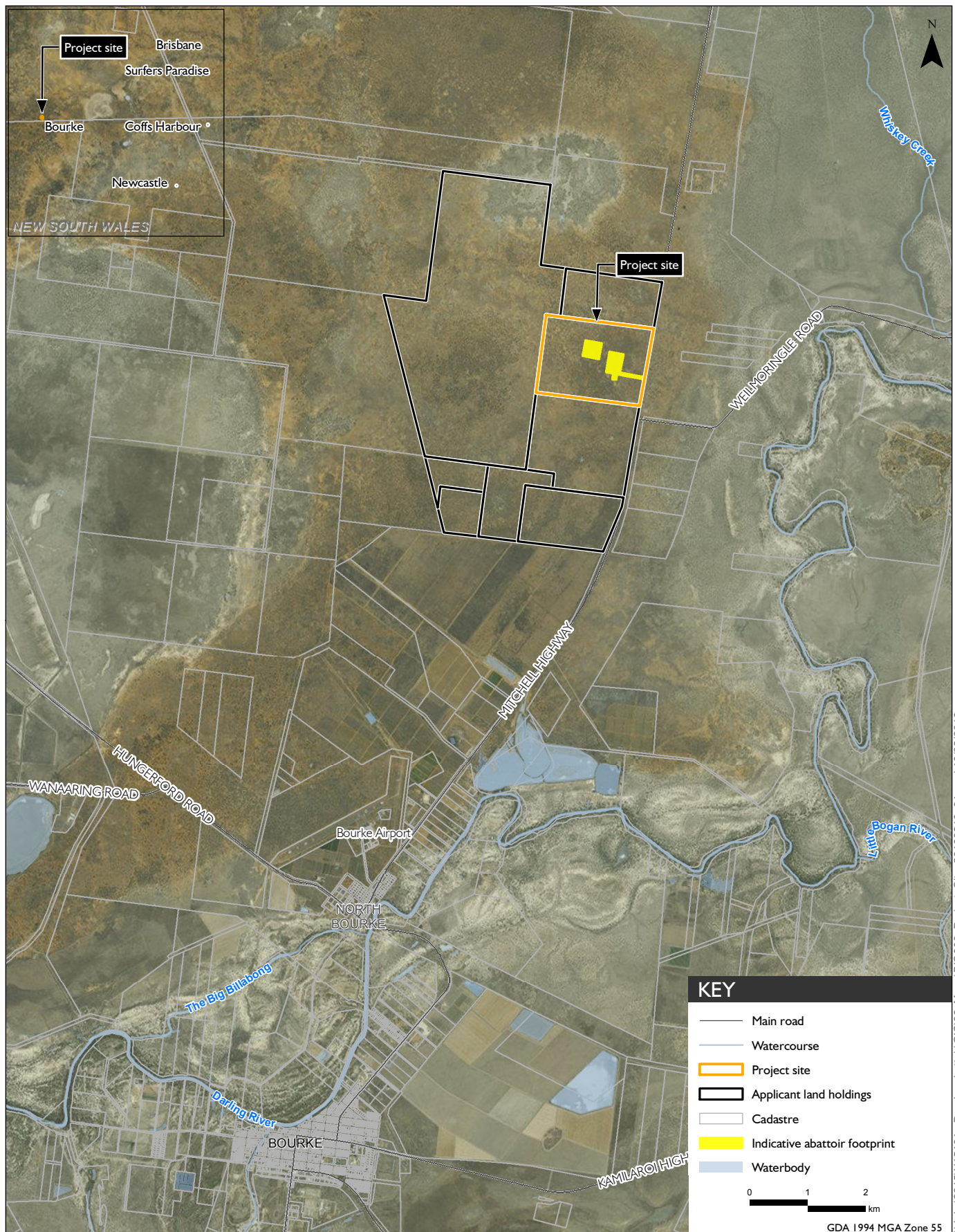
An EIS has been prepared by EMM Consulting Pty Limited (EMM) on behalf of the applicant, CAPRA, to support the SSD application for development consent under Section 78A (8A) of the EP&A Act for the project. This Biodiversity Assessment Report (BAR) is a supporting document to the EIS, and has been prepared in accordance with the *Framework for Biodiversity Assessment: NSW Biodiversity Offsets Policy for Major Projects* (OEH 2014). It also assesses matters of national environmental significance, specifically listed species and communities and migratory species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.5 Secretary's Environmental Assessment Requirements

A project briefing paper and request for Secretary's environmental assessment requirements (SEARs) relating to the form and content of the EIS required to accompany the development application for the project was submitted to the NSW Department of Planning and Environment (DP&E) in September 2015. The SEARs were subsequently issued by the DP&E on 29 October 2015. Table 1.1 presents the biodiversity related SEARs, and identifies where each requirement is addressed in the BAR.

Table 1.1 Secretary's Environmental Assessment Requirements

Secretary's Environmental Assessment Requirements	Where addressed
- Biodiversity – including: - accurate predictions of any vegetation clearing on-site or for any road upgrades; - a detailed assessment of the potential impacts on any threatened species, populations, endangered ecological communities or their habitats, groundwater dependent ecosystems, and any potential for offset requirements; and - a detailed description of the measures to avoid, minimise, mitigate and offset biodiversity impacts; and the assessment of the proposal and all biodiversity values on the site under the Framework for Biodiversity Assessment 2014 and the NSW Office of Environment and Heritage Offset Policy.	- Section 5.1 - Chapter 4 - Chapter 5 This BAR



Project site

Bourke Small Stock Abattoir
Biodiversity Assessment Report

Figure 1.2

2 Methods

2.1 Database searches

The following databases and vegetation mapping were reviewed:

- BioNet Atlas of NSW Wildlife (20 km radius as the site is in an area where less ecological research has occurred) for previous threatened species records (OEH 2015a);
- Commonwealth Department of Environment (DoE) Protected Matters Search Tool (20 km radius) for matters of national environmental significance, including threatened species records (DoE 2015a);
- *The Preclearing Vegetation Mapping of the North Eastern section of Bourke Shire, Northern Floodplains, Far Western New South Wales: VIS ID 1661* (OEH 1991);
- profiles for NSW and Commonwealth listed threatened biodiversity (OEH 2015b, DoE 2015b, RBGDT 2015);
- NSW Vegetation Information System Classification Database (VIS Classification Database) and Vegetation Benchmarks Database (OEH 2015c);
- Threatened Species Profile Database (OEH 2015d);
- Vegetation Benchmarks Database (OEH 2015e); and
- The Directory of Important Wetlands of Australia (DIWA) (DoE 2015b).

2.2 Field survey

2.2.1 Overview

To verify the desktop review results, detailed field surveys were undertaken in the study area. Surveys were completed in accordance with the *Framework for Biodiversity Assessment: NSW Offsets Policy for Major Projects* (FBA) (OEH 2014) requirements and threatened species and populations identified from the desktop review and the BioBanking Credit Calculator were targeted in accordance with *Threatened Species Survey and Assessment: Guidelines for developments and activities* (working draft) (DEC 2004) where appropriate.

Field surveys were conducted by EMM from 11 to 13 January 2016. Weather conditions were very warm during the survey period, with a maximum temperatures ranging between 43 to 43.9°C in the late afternoons. No rain was experienced during the survey (BOM 2016).

2.2.2 Vegetation survey methods

Vegetation maps on the Vegetation Map Viewer (OEH 1991) were verified in the field. The vegetation mapping and community descriptions were used as a guide to identifying plant community types in the study area and project site.

Floristic and structural vegetation data were collected from seven 20 m by 50 m nested quadrats and transects in accordance with the FBA. One rapid assessment was also completed. New flora species observed outside quadrats were also recorded to assist in the identification of vegetation communities.

Figure 2.1 includes plot and transect location of vegetation communities and condition classes.

2.2.3 Targeted species surveys

i Candidate species

The BioBanking Credit Calculator predicted a total of 19 candidate species for the study area, comprising:

- 16 ecosystem credit species (ie species that can be reliably predicted by vegetation type); and
- three species credit species (ie species that cannot be reliably predicted by vegetation type, but are predicted to occur in the area).

These species are shown in Table 2.1.

All species were surveyed during their optimal survey time, with the exception of one plant, Shrub *Sida* which was undertaken one month following the optimal survey timing. Targeted surveys were still completed for any *Sida* species, and an assessment of their occurrence was completed based on habitat suitability observed in the study area.

Table 2.1 Candidate species surveys

Species	Credit type	Survey timing	Survey methods and effort
Koala <i>Phascolarctos cinereus</i>	Species credit	Year round	Seven spot assessments were completed and spotlighting by two people over two nights
Shrub <i>Sida</i> <i>Sida rohlenae</i>	Species credit	September to December	Targeted surveys were completed in January and an assessment of habitat
Squatter Pigeon <i>Geophaps scripta</i>	Species credit	Year round	Early morning and afternoon targeted searches over two days
Australian Bustard <i>Ardeotis australis</i>	Ecosystem credit (recorded nearby, but not predicted by the BioBanking Credit Calculator)	Year round	Late afternoon surveys and spotlighting by two people over two nights
Barking Owl <i>Ninox connivens</i>	Ecosystem credit	Year round	Spotlighting by two people over two nights
Brolga <i>Grus rubicunda</i>	Ecosystem credit	Year round	Targeted morning and afternoon surveys over two days
Bush Stone-curlew <i>Burhinus grallarius</i>	Ecosystem credit	Year round	Late afternoon surveys and spotlighting by two people over two nights
Corben's Long-eared Bat <i>Nyctophilus corbeni</i>	Ecosystem credit	October to March	Ultrasonic detection surveys over two nights
Grey-crowned Babbler (eastern subspecies) <i>Pomatostomus temporalis</i> subsp. <i>temporalis</i>	Ecosystem credit	Year round	Targeted morning and afternoon surveys over two days

Table 2.1 **Candidate species surveys**

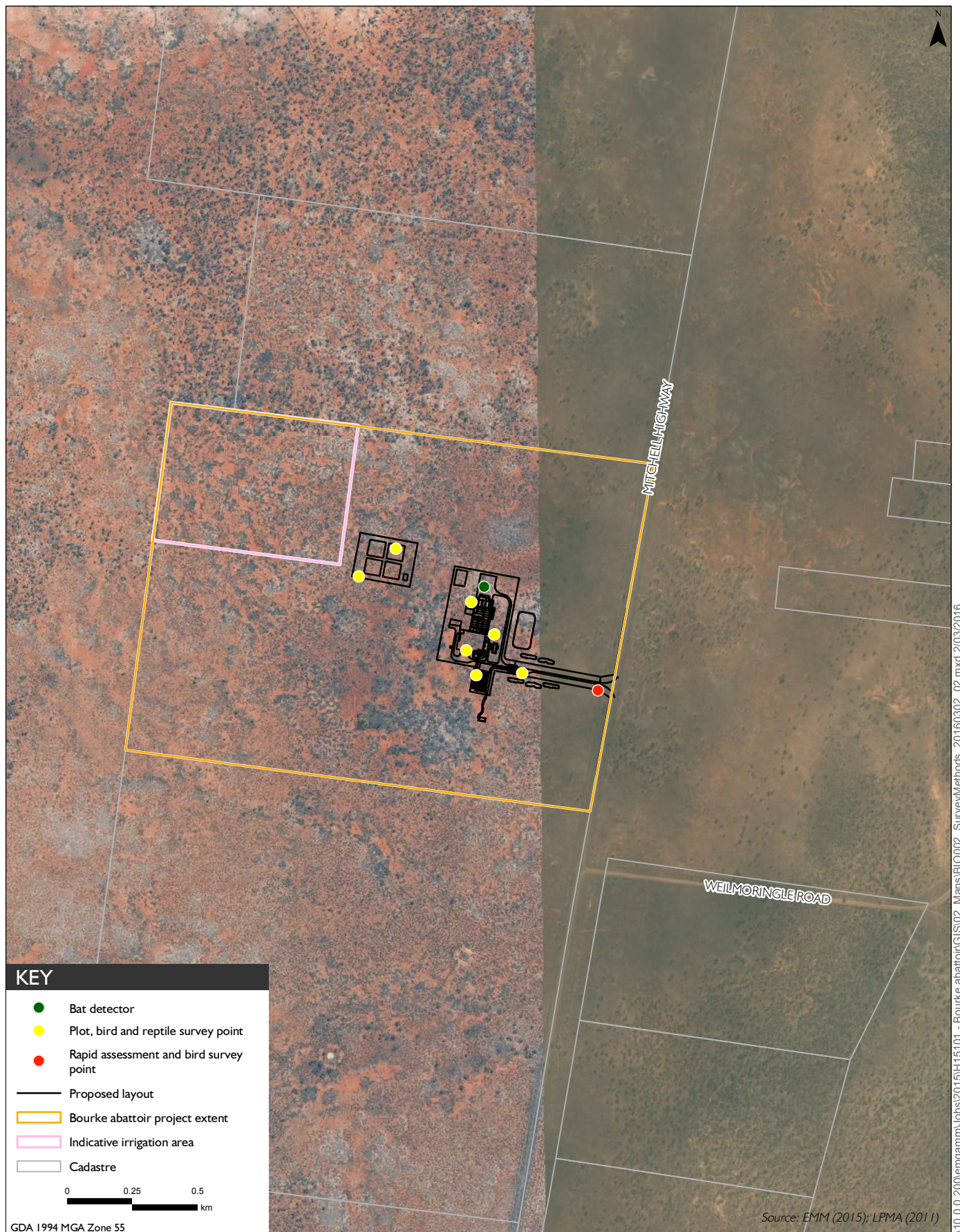
Species	Credit type	Survey timing	Survey methods and effort
Hooded Robin (south-eastern form) <i>Melanodryas cucullata cucullata</i>	Ecosystem credit	Year round	Targeted morning and afternoon surveys over two days
Inland Forest Bat <i>Vespadelus baverstocki</i>	Ecosystem credit	October to March	Ultrasonic detection surveys over two nights
Little Eagle <i>Hieraeetus morphnoides</i>	Ecosystem credit	Year round	Targeted morning and afternoon surveys over two days
Little Pied Bat <i>Chalinolobus picatus</i>	Ecosystem credit	October to March	Ultrasonic detection surveys over two nights
Painted Honeyeater <i>Grantiella picta</i>	Ecosystem credit	Year round	Targeted morning and afternoon surveys over two days
Spotted Harrier <i>Circus assimilis</i>	Ecosystem credit	Year round	Targeted morning and afternoon surveys over two days
Square-tailed Kite <i>Lophoictinia isura</i>	Ecosystem credit	Year round	Targeted morning and afternoon surveys over two days
Varied Sittella <i>Daphoenositta chrysoptera</i>	Ecosystem credit	Year round	Targeted morning and afternoon surveys over two days
Yellow-bellied Sheath-tail Bat <i>Saccolaimus flaviventris</i>	Ecosystem credit	October to March	Ultrasonic detection surveys over two nights

2.2.4 Survey effort

Table 2.2 shows the total survey effort undertaken by EMM within the study area. Ecological survey locations are shown on Figure 2.1.

Table 2.2 **EMM survey effort**

Target taxa	Survey effort
Flora	Targeted flora surveys throughout the impact area totalling 14 person hours.
Reptiles	Diurnal reptile surveys were completed between 6:00 to 9:00 am on two occasions during the field surveys by two people, totalling 6 person hours.
Mammals	Spotlighting was undertaken by two people to target nocturnal mammals in the proposed intersection area for two nights between the hours of 8:00 and 10:00 pm. The spotlighting survey effort totalled eight person hours. Seven spot assessments were completed at plot locations to determine if Koala scats were present. Fauna habitat was assessed throughout the study area. Searches were undertaken for scats, tracks and other fauna signs. Opportunistic fauna sightings were also recorded.
Bats	An ultrasonic bat detector (Wildlife Acoustics SM2BAT) was deployed for two nights in the impact area. The detector recorded for 10 hours per night to increase the detection of multiple species.
Birds	Diurnal bird surveys were completed between 6:00 to 9:00 am on two occasions during the field surveys, by two people. Afternoon bird surveys were completed between 7:00 pm and 8:00 pm on two occasions. All bird species observed and heard were recorded. The diurnal bird survey effort totalled 10 person hours. Spotlighting was undertaken to target nocturnal birds in the proposed intersection area for two nights between the hours of 8:00 and 10:00 pm. The spotlighting survey effort totalled eight person hours.



3 Biodiversity values

3.1 Native vegetation within the assessment circles

An inner assessment circle of 200 ha was placed around the centre of the study area, and encompassed all areas of proposed disturbance. Accordingly the outer assessment circle was calculated at 2,000 ha. Native vegetation was mapped in the inner assessment circle from the field results and native vegetation in the outer assessment circle was extrapolated from regional mapping datasets.

Native vegetation cover is continuous (ie 100%) in both the inner and outer assessment circle prior to disturbance. Table 3.1 summarises the change in native vegetation cover in both the inner and outer assessment circle following disturbance.

Table 3.1 Native vegetation in the assessment circles before and after development

Assessment circle	Before development (ha)	After development (ha)	Percent loss	Percent remaining	Percent range after development
Inner assessment circle	200.00	149.1	0.25	74.55	71-75%
Outer assessment circle	2,000.00	1944,7	0.03	97.24	96-100%

3.2 Landscape features

The site is surrounded by rural landholdings. The nearest residential area is North Bourke, approximately 10 km south of the site.

3.2.1 IBRA bioregion and subregion

The project is in the Mulga Lands IBRA Bioregion and the Nebine Plains - Block Range (Part B) IBRA sub-region. It also falls within the Paroo - Warrego Alluvial Plains Mitchell Landscape.

3.2.2 Rivers and streams

The nearest drainage line to the site is the Darling River, approximately 2 km east of the site at its closest point. The Darling River is a large tenth order stream. It flows south-west to the east of the site (Figure 3.2). Whiskey Creek, a tributary of the Darling River and a first order stream is north east of the site, and approximately 4.5 km away at its closest point. No rivers or streams occur in the project site.

Gundabooka National Park and State Conservation area are approximately 49 km and 45.5 km south of the site, respectively; while Toorale National Park and State Conservation Area are approximately 54 and 47 km south-west of the site, respectively (Figure 3.2).

3.2.3 Wetlands

Several swamps occur to the north of the project site, the closest of which is 3 km away. No wetlands occur in the project site. Polygonum Swamp and the Big Billabong are on the Darling River, approximately 11 km south of the project site.

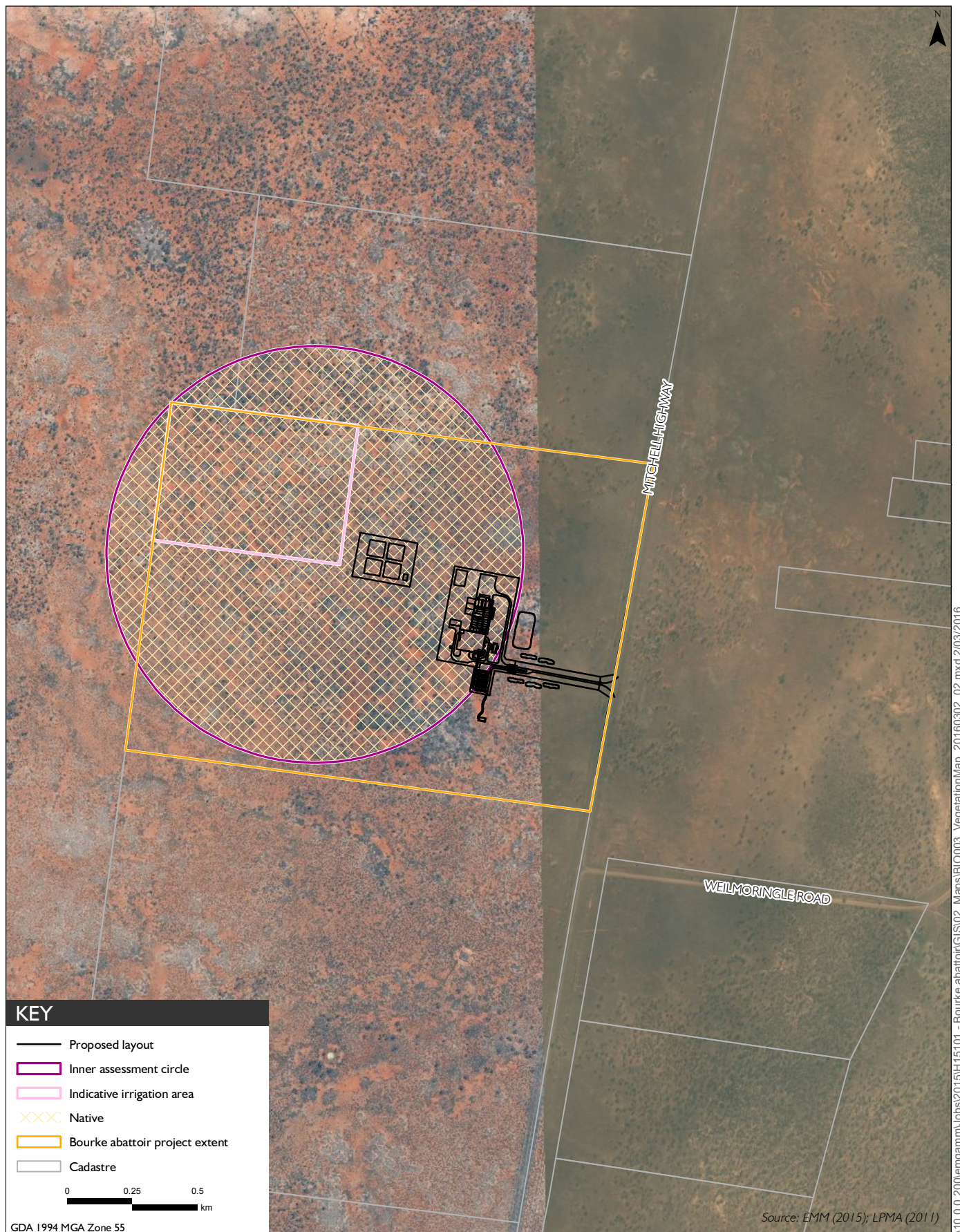
The project site is proximal to five nationally important wetlands, namely:

- The Dry Lake, approximately 17 km north of the project;
- Bottom Lila Lake, approximately 26 km west of the project; and
- Birdsnest Swamp, Racecourse Swamp and Toms Lake approximately 35 km north west of the project.

No wetlands, or nationally important wetlands, are in the project site.

3.2.4 Biodiversity links

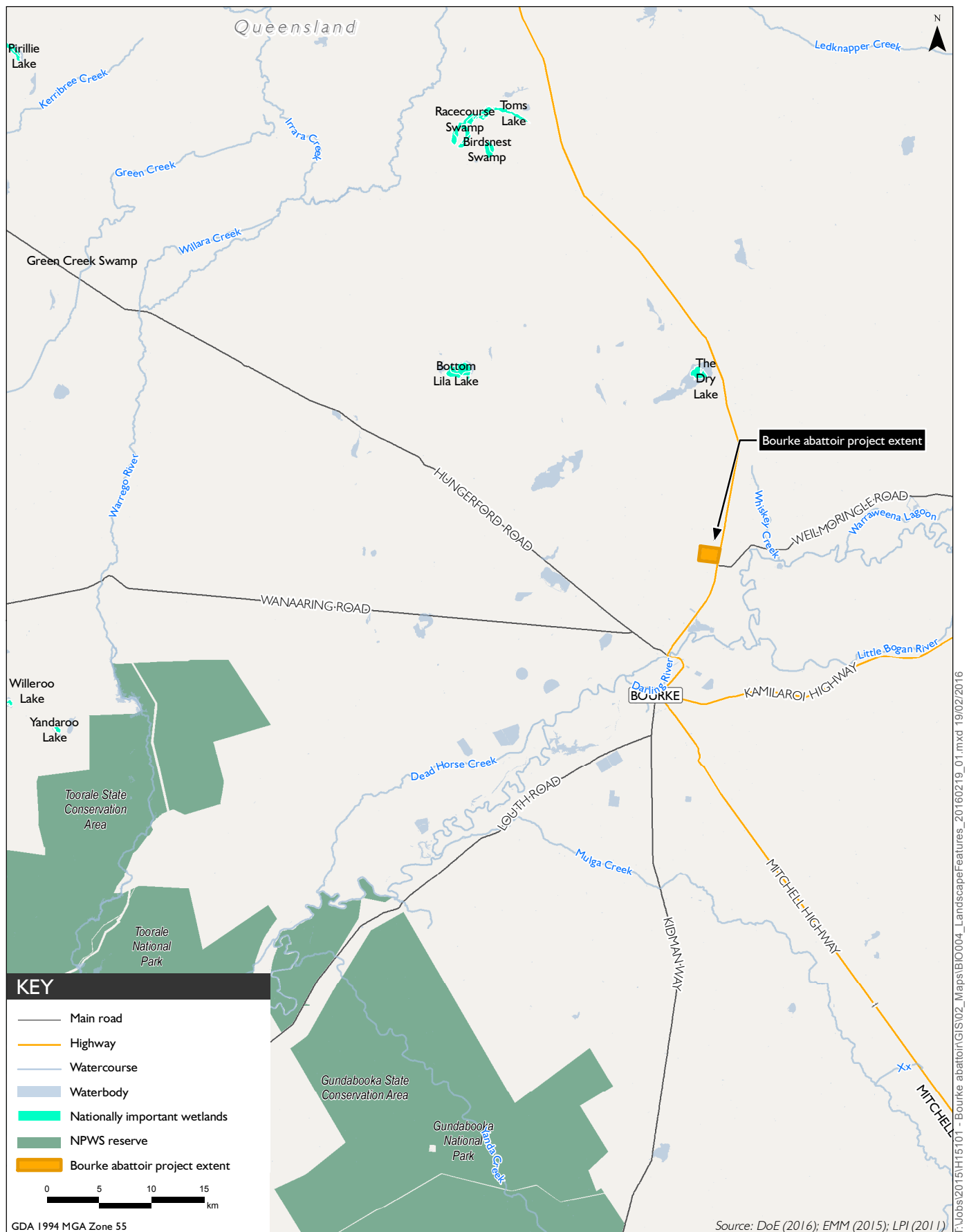
The Chief Executive of the Office of Environment and Heritage (OEH) has not approved any corridor plans and therefore there are no recognised state or regional biodiversity links.



Native vegetation extent – inner assessment circle

Bourke Small Stock Abattoir
Biodiversity Assessment Report

Figure 3.1



Landscape features
 Bourke Small Stock Abattoir
 Biodiversity Assessment Report

Figure 3.2

3.3 Native vegetation

Native vegetation was mapped in the study area and inner assessment circle (200 ha) and native vegetation extent within the outer assessment circle (2,000 ha) was extrapolated from regional vegetation mapping (OEH 1991) (Figure 3.4).

The Preclearing Vegetation Mapping of the North Eastern section of Bourke Shire, Northern Floodplains, Far Western New South Wales: VIS ID 1661 (OEH 1991), completed east of the site and the Mitchell Highway, indicates that sparse chenopod shrublands occur directly east of the site, and the vegetation intergrades with a sparse woodland containing Black Box (*E. largiflorens*) and Coolibah (*E. coolibah*).

The OEH (1991) mapping is consistent with observations made during the survey, as the study area was found to contain a sparse chenopod shrubland. Twenty four native and two introduced flora species were recorded by EMM in the study area. Weed species recorded included African Peppergrass (*Lepidium africanum*) and Skelton Weed (*Chondrilla juncea*). A full list of flora species recorded by EMM is provided in Appendix A.

3.3.1 Plant community types

Vegetation in the study area was compared to all plant community types (PCTs) for the Nebine Plains Block Range (Part B) IBRA subregion to determine which PCT occurred on site. One PCT was recorded in the study area, namely PCT98 Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland on red sandy-loam soils in the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion (Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland).

The PCT in the study area contains two of nine characteristic canopy, three of 31 characteristic midstorey and three of 38 characteristic understorey species of PCT98. It contained less or no characteristic species when compared to other PCTs from the Nebine Plains Block Range (Part B) IBRA subregion. The low number of representative species at the site is considered to be indicative of disturbances including sheep grazing, the presence of feral pigs and hot, dry weather during the survey period.

PCT98 occurs in two condition states in the study area: a shrubby woodland and a derived shrubland. The derived shrubland generally lacks canopy species, however has a similar assemblage of understorey species, and many cut stumps. Therefore, it was assumed that it is the same PCT as the woodland, however in a lower condition state. A description of this PCT is provided below.

Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland

Vegetation formation: Semi-arid woodlands (shrubby sub-formation)

Vegetation class: Western Peneplain Woodlands

PCT: 98 Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland on red sandy-loam soils in the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion

BVT: WE137 Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland on red sandy-loam soils in the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion

Condition class: Moderate - good

Threatened ecological community (TEC) status: Not threatened

Study area extent: 9.6 ha (shrubby woodland) and 45.7 ha (derived shrubland)

Category	Within known distribution
Estimate of pre-clearing area	500,000 hectares
Extant area	300,000 hectares
Estimated percentage cleared	20%

Floristic summary

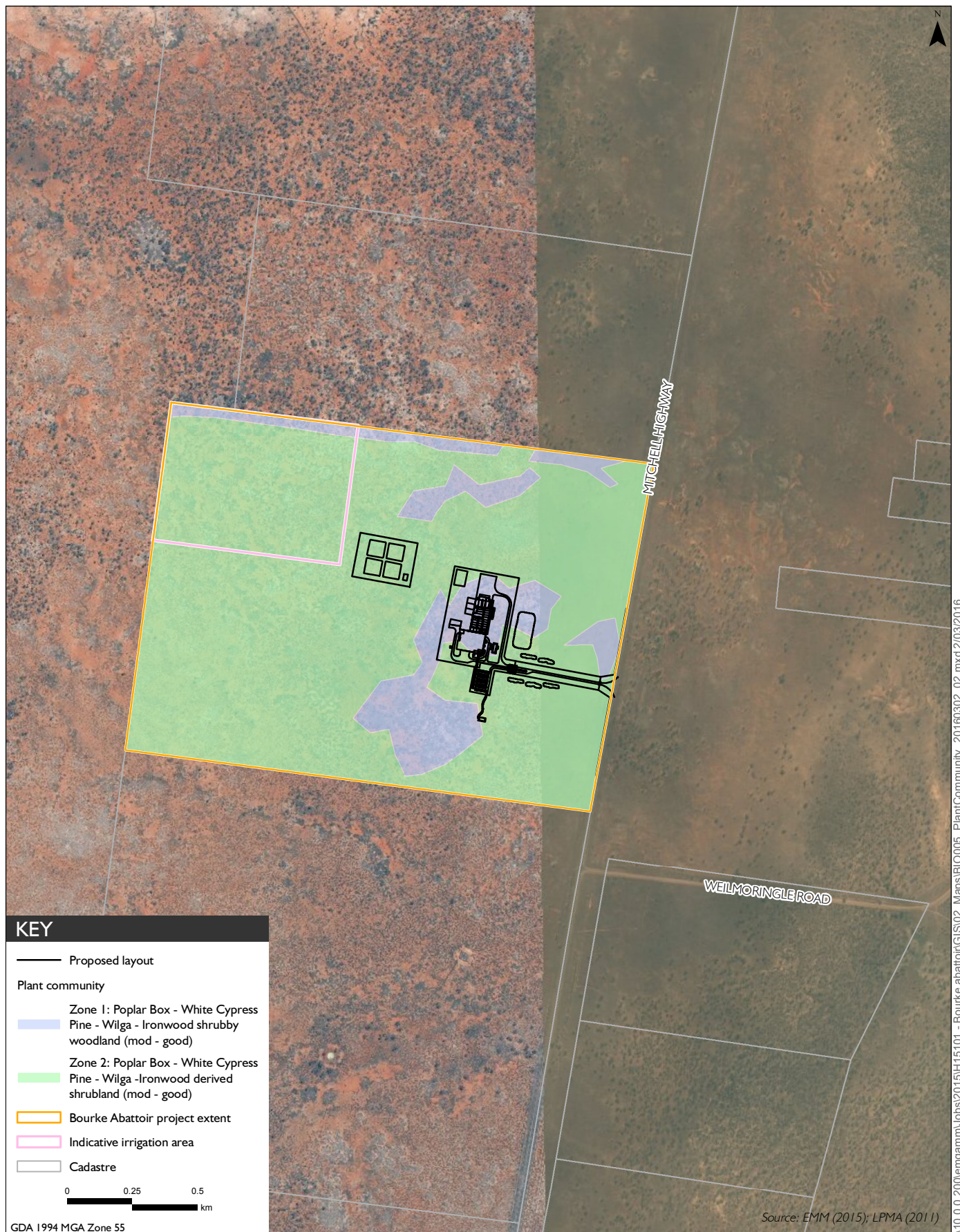
Structure	Typical species
Trees	Bimble Box (<i>Eucalyptus populnea</i> subsp. <i>bimbil</i>)
Small trees	Whitewood (<i>Atalaya hemiglauca</i>)
Shrubs	Wild Orange (<i>Capparis mitchellii</i>)
Ground covers	Grey Copperburr (<i>Sclerolaena diacantha</i>), Galvanised Burr (<i>Sclerolaena birchii</i>), Spiny Saltbush (<i>Rhagodia spinescens</i>), Western Nightshade (<i>Solanum coactiliferum</i>), Bluebush (<i>Maireana</i> sp.), Fairy Grass (<i>Sporobolus caroli</i>) Longtails (<i>Ptilotus polystachys</i>)

Description

The canopy layer is very sparse and contains Bimble Box. Whitewood dominates the shrubby woodland form of the PCT, with this species mainly absent from the derived shrubland. Occasional Wild Orange are present in the shrub layer. Grey Copperburr dominates the ground cover layer, particularly in the derived shrubland form of this PCT. Other burrs and saltbush species are present, with Bluebush and native grasses.



Photograph 3.1 **Shrubby woodland form (left) and derived shrubland form (right)**



3.3.2 Vegetation zones

Two vegetation zones occur in the study area. A summary of these is provided in Table 3.2 and shown in Figure 3.4. The required number of plots were completed for both vegetation zones.

Table 3.2 **Vegetation zone summary**

Vegetation zone	PCT	BVT	Area (ha)	Condition class	Site value score	Required survey effort	Plots completed
1	Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland (PCT98)	Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland (WE137)	9.6	Moderate - good	76	3 plots	3 plots
2	Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland - derived shrubland (PCT98)	Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland (WE137)	45.7	Moderate - good	38	4 plots	4 plots
Total			55.3			7 plots	7 plots

Notes 1. PCT – plant community type, BVT – biometric vegetation type.

3.4 Threatened ecological communities

No TECs were recorded or are predicted to occur in the study area, as described below.

Two threatened ecological communities (TECs) listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act) are known to occur within the Nebine Plains Block Range (Part B) IBRA subregion. The vegetation recorded in the study area was compared to the final determinations of the following TECs listed under the TSC Act that occur in the Nebine Plains - Block Range (Part B) subregion:

- Coolibah - Black Box Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penneplain and Mulga Lands Bioregion (Coolibah - Black Box Woodland); and
- Brigalow - Gidgee woodland/shrubland in the Mulga Lands and Darling Riverine Plains Bioregions (Brigalow - Gidgee woodland/shrubland).

Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland does not meet the description of Coolibah - Black Box Woodland as:

- it does not occur on grey, self-mulching clays of periodically waterlogged floodplains, swamp margins, ephemeral wetlands or stream levees;
- it is not a savanna woodland or grassy woodland;

- it does not contain the characteristic canopy species Coolibah (*Eucalyptus coolibah*), Black Box (*Eucalyptus largiflorens*), River Cooba (*Acacia stenophylla*), Cooba (*Acacia salicina*), Belah (*Casuarina cristata*), Eurah (*Eremophila bigoniiflora*). It does contain a small portion of Bimble Box, however this is not the dominant species in the community; and
- the PCT is not associated with this TEC.

Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland does not meet the description of Brigalow - Gidgee woodland/shrubland as:

- it does not occur on soft red earths or heavy grey clays; and
- it does not contain the representative canopy species Brigalow (*Acacia harpophylla*) or Gidgee (*Acacia cambagei*).

Two TECs listed under the EPBC Act were predicted to occur within 20 km of the study area. The vegetation recorded in the study area was compared to the listing and conservation advice for the following TECs listed under the EPBC Act:

- Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions (Coolibah - Black Box Woodlands); and
- Weeping Myall Woodlands.

Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland does not meet the description of Coolibah - Black Box Woodlands as:

- it does not occur on grey, self-mulching clays of periodically waterlogged floodplains, swamp margins, ephemeral wetlands or stream levees;
- the characteristic canopy species, Coolibah and Black Box are absent; and
- the understorey is not dominated by grasses (ie it is dominated by chenopods).

3.5 Fauna habitats

Two fauna habitat types were recorded in the study area, namely shrubby woodland and derived shrubland. Shrubby woodland provides nesting habitat to commonly occurring native birds including several individuals of the Chestnut-browed Babbler (*Pomatostomus ruficeps*). Three active nest and shelter sites were recorded for this common species in shrubby woodland in the study area. Common birds including the Noisy Miner (*Manorina melanocephala*) and Dusky Woodswallow (*Artamus cyanopterus*) also forage in this area.

Shrubby woodland also contains fallen timber and cut stumps, which provide shelter habitat for common reptiles including the common Inland Snake-eyed Skink (*Cryptoblepharus australis*), Blue-tongue Lizard (*Tiliqua scincoides*) and Shingleback Lizard (*T. rugosa*). Several Whitewood trees in the shrubby woodland contained small to medium sized hollows (ie 5-15cm diameter), potentially suitable for microbats and small parrots to roost in, although none were recorded.

The derived shrubland provides limited hunting habitat for the Nankeen Kestrel (*Falco longipennis*). It also provides foraging habitat for other common birds including the Crested Pigeon (*Ochyphaps lophotes*), Magpie (*Gymnorhina tibicen*) and Grey Butcherbird (*Cracticus torquatus*).

3.6 Threatened species

3.6.1 Database searches

The Atlas of NSW Wildlife has recorded two plant and nine animal species listed under the TSC Act within a 20 km radius of the study area. The protected matters search tool predicts that seven threatened and seven migratory species listed under the EPBC Act may occur within 20 km of the study area. The likelihood that these species would occur in the study area was assessed (Appendix B). Of these species, the Australian Bustard (an ecosystem credit species) was deemed to have a moderate likelihood of occurrence.

3.6.2 Ecosystem credit species

None of the 16 ecosystem credit species predicted by the BioBanking Credit Calculator were recorded during the survey. The likelihood that these species would occur in the study area was assessed at Appendix B, and a summary is provided in Table 3.3.

Table 3.3 Likelihood of occurrence for ecosystem credit species

Ecosystem credit species	Likelihood of occurrence
Bush Stone Curlew	Low. Their preferred habitat, a grassy understorey, is generally absent from the study area.
Spotted Harrier	Low. The required natural habitat types are absent, however this species has been recorded in agricultural areas, such as occurs in the study area.
Brown Treecreeper	None. Their preferred habitat, grassy woodlands, are absent from the study area.
Varied Sittella	Low. Their preferred habitats, eucalypt forest and woodlands, are generally absent from the study area.
Painted Honeyeater	None. Mistletoes and the required vegetation types including Boree, Brigalow, Box Gum Woodland and/or Box Ironbark Forests are absent.
Brolga	Low. This species can forage in sparsely vegetated areas like the study area, however the study area does not contain wetlands or swamps which this species is dependent upon.
Little Eagle	None. Its preferred habitat types comprising eucalypt forest, woodland, she-oaks, Acacias and riparian woodlands are absent from the study area.
Major Mitchell's Cockatoo	Low. Water and suitable tree hollows are absent from the site. May occasionally forage on shrubs at the site.
Square-tailed Kite	None. Its preferred habitat, tree-lined watercourses, are absent from the study area.
Hooded Robin	Low. Habitat in the study area has been structurally simplified such that the species is unlikely to occur.
Barking Owl	Low. The species may forage in the study area occasionally, however suitable nesting habitat (ie large tree hollows) are absent.
Grey-crowned Babbler	None. Its preferred habitat types, Box Gum Woodland and Box Cypress Pine Woodlands, are absent from the study area.
Little Pied Bat	Moderate. The project contains suitable habitat including chenopod shrubland with Bimble Box, that contains small hollows potentially suitable for roosting.
Corben's Long-eared Bat	None. Its preferred habitat types, Box Ironbark and Cypress Pine Woodlands, are absent from the study area.
Yellow-bellied Sheath-tail Bat	Moderate. This species can occur in open areas containing small hollows, which are present in the study area.

Table 3.3 Likelihood of occurrence for ecosystem credit species

Ecosystem credit species	Likelihood of occurrence
Inland Forest Bat	Moderate. This species can occur in drier habitats with stunted trees containing hollows, such as are present in the study area.

The Little Pied Bat, Yellow-bellied Sheath-tail Bat and Inland Forest Bat are considered moderately likely to occur. Many species had a low likelihood of occurrence as only potential and occasional foraging habitat was present. The Brown Treecreeper, Painted Honeyeater, Grey-crowned Babbler and Corben's Long-eared Bat had no likelihood of occurrence. These species were retained in the BioBanking Credit Calculator as they did not have high species multipliers. The highest species multiplier (3.0) influencing the ecosystem credits was generated by the Barking Owl.

3.6.3 Species credit species

None of the three species credit species predicted by the BioBanking Credit Calculator were recorded at the project site. Their likelihood of occurrence was assessed at Appendix B, and a summary is provided in Table 3.4.

Table 3.4 Likelihood of occurrence for species credit species

Species	Likelihood of occurrence
Shrub Sida	None. The species was not recorded during targeted surveys, and requires flooded areas, creek banks and rocky hills to occur, which are all absent from the study area.
Squatter Pigeon	None. The study area is dry and does not contain any standing water, which this species is reliant upon.
Koala	None. Although some Bimble Box are present, they do not comprise greater than 15% of the canopy and only occur very sparsely in the study area. Additionally, no Koala scats were found during spot assessments.

As no species credit species were recorded or are predicted to occur, they were not included in the BioBanking calculations.

3.6.4 EPBC Act listed species

No species listed under the EPBC Act were recorded at the site. The likelihood that species predicted by the protected matters search tool was assessed (Appendix B). The Rainbow Bee-eater, a migratory species, has a moderate likelihood to occur in the study area as it has been recorded to the east along the Darling River, and the species has been known to occasionally use farmland habitats. No other listed or migratory species are predicted to occur, given the absence of suitable habitat in the study area (Appendix B).

Potential impacts on the Rainbow Bee-eater are assessed in Chapter 4. An assessment of significance has been completed for this species in Appendix C.

4 Impact assessment

4.1 Impacts requiring offsetting

The project footprint has been optimised to avoid and minimise impacts to biodiversity. A careful site selection process was undertaken based on a number of factors, with biodiversity issues considered as one of these factors. A key factor was to select a site that is already disturbed to minimise clearing required for construction, and one that has a compatible agricultural land use. Therefore, careful site selection has avoided and minimised impacts to biodiversity. The location of the abattoir within the project site was then chosen based on avoiding the stands of trees within the site, as can be seen in Figure 3.3. Further discussion on alternatives is provided in Section 5.1 of this report, and Chapter 2 of the EIS.

However, as the plant community in the study area has a site value score greater than 17 (Table 3.2) in both the shrubby woodland and derived shrubland form, and contains potential habitat for threatened species (Section 3.6.2), offsetting is required in accordance with Section 3.3.1.3 of the FBA.

Direct impacts to biodiversity include vegetation clearing, loss of fauna and flora habitat, as well as possible habitat fragmentation, edge and barrier effects and fauna injury and mortality. Impacts will be restricted to the study area. The project would directly impact the following vegetation communities and potential habitat for ecosystem species:

- Approximately 9.6 ha of moderate to good condition Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland, in its shrubby woodland form; and
- Approximately 45.7 ha of moderate to good condition Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland, in its derived shrubland form.

4.2 Matters for further consideration

No impacts related to the project meet the thresholds for matters for further consideration in accordance with Section 9.2.1.3 of the FBA.

4.3 Impacts not assessed under the FBA

The SEARS require that groundwater dependent ecosystems are identified and any impacts likely to result from the project to be identified. The Atlas of Groundwater Dependent Ecosystems (BOM 2016) does not identify any groundwater dependent ecosystems in the project area. It identifies wetlands in the surrounding area (ie the Darling River and swamps north of the project site) as groundwater dependent ecosystems. As these wetlands are not within the project site and groundwater will not be accessed for the project, it is unlikely to result in any direct impacts to groundwater dependent ecosystems. As all waste water will be contained within the water treatment ponds and only clean water will be discharged onto the irrigation area, the potential for indirect impacts to these surrounding groundwater dependent ecosystems is negligible.

4.4 Impact assessment

4.4.1 Direct impacts

i Clearing of native vegetation and fauna habitat

The project will result in the loss of approximately 9.6 ha of shrubby woodland and 45.7 ha of derived shrubland of Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland to accommodate construction of the abattoir and ancillary infrastructure, including the access road, carpark, and water treatment ponds, as well as cropped and irrigated land. This vegetation type is estimated at only 20% cleared in the Western Catchment Management Authority (CMA) area where the project is located. The clearing of this 55.3 ha of native vegetation will only result in a minor increase to the clearing of this vegetation community. In addition, approximately 190.7 ha (77.5%) of native vegetation will be retained in the project site. At the IBRA subregion level, this only contributes an additional 0.01% clearing of this PCT.

The clearance of approximately 9.6 ha in the shrubby woodland form of Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland will also result in the loss of hollow Whitewood trees, which provide potential roosting habitat for threatened bats including the Little Pied Bat, Inland Forest Bat and Yellow-bellied Sheath-tail Bat and potential foraging habitat for the Varied Sitella.

The clearance of 45.7 ha of derived shrubland of Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland will also result in a minor loss (21.8% from the project site and 0.01% from the IBRA subregion) of potential hunting/foraging habitat for the threatened Barking Owl, Australian Bustard, Hooded Robin, Major Mitchell's Cockatoo, Brolga, Bush Stone Curlew and Spotted Harrier. Whilst a small risk, if not carefully managed, injury or mortality could occur to fauna during clearing operations.

ii Edge effects

The clearing of native vegetation for the project may result in edge effects, particularly in patches of shrubby woodland where a tree canopy is present. Such impacts may include increased light and a decrease in competition which, in the absence of mitigation, may lead to weed invasion. The increase in water and nutrients from irrigation of the derived shrubland is expected to encourage weed growth. Two invasive weeds were recorded in native vegetation in the study area which may spread if not appropriately managed prior to clearing.

4.4.2 Indirect impacts

i Introduced species

European Red Fox (*Vulpes vulpes*) and Feral Pig (*Sus scrofa*) were observed throughout the study area. These pest species can spread into new areas and compete with native species with the creation of new roads. However, as the study area is next to an existing road, the project is unlikely to increase opportunities for such species.

ii Noise

The project is adjacent to a section of the Mitchell Highway that has low traffic volumes (EMM 2016a) and existing background noise, and does not have any nearby residences. The abattoir is expected to generate higher noise levels during vegetation clearing and construction, which may deter fauna from using retained habitat in the area. Such disturbances are only temporary and it is expected that fauna would recolonise the area following the completion of construction.

The project is expected to result in some operational noise, including heavy truck movements and mobile plant (EMM 2016). Operational noise may cause local fauna to avoid the area initially. However, it is likely that they will acclimatise to the noise over time and recolonise the area. The operational noise levels are predicted to comply with the Industrial Noise Policy, and therefore are unlikely to impact fauna such that they would permanently avoid the area.

iii Fauna strike

The project is expected to result in a minor increase to traffic volume on the Mitchell Highway. This may also result in a minor increase in fauna strike, particularly for Kangaroos and Wallabies (*Macropus* spp.). This small increase is not expected to impact Kangaroos and Wallabies in the local area such that their populations would decline.

iv Attraction of wetland birds

Construction of the wastewater treatment ponds and their effective management through the anaerobic ponding process in a previously dry area is likely to have a positive impact on local biodiversity. Sewerage and water treatment plants are known to be foraging hotspots for wetland birds, such as the Western Treatment Plant in Melbourne (<http://www.melbournewater.com.au/whatwedo/treatsewage/wtp/pages/habitats-and-wildlife.aspx>). Therefore, it is likely that the wastewater treatment ponds will have a positive impact and attract wetland birds from the Darling River to forage.

4.5 Matters of national environmental significance

4.5.1 Threatened species and communities

Only one migratory species, the Rainbow Bee-eater, has potential to occur in the study area (Appendix B). An assessment of significance has been prepared for these species (refer to Appendix C). The assessment concluded that a significant impact is unlikely on this migratory species. Impacts to threatened species habitat listed under the EPBC Act will be offset in accordance with the FBA.

4.5.2 Nationally important wetlands

Three nationally important wetlands (The Dry Lake, Bottom Lila Lake and Birdsnest Swamp) are within 17 km, 26 km and 35 km of the project, respectively. As no waterways are present in the study area that connect to these wetlands, and impacts will be confined to the study area through effective management of the anaerobic ponding process, the potential for impacts is negligible.

The wetlands will not be adversely impacted by the disturbance of soil during vegetation clearing as erosion and sediment controls will be installed and maintained during construction of the project. Nutrients will levels be managed by the wastewater treatment ponds, and therefore the potential for nutrient runoff into local streams and these wetlands is low, provided that the anaerobic ponding process is managed appropriately. Therefore, downstream impacts to the nationally important wetlands are not expected to result from the project.

5 Impact avoidance and mitigation

5.1 Avoidance and minimisation

The project's potential impacts to biodiversity were minimised from the outset through a careful site selection process. A number of important factors need to be considered when looking for a site suitable for the development of an abattoir development, comprising:

- appropriate land use zoning;
- compatible existing agricultural land uses in and surrounding the project site. Finding a site already subject to an agricultural land use also limits the amount of clearing required for construction activities and is therefore advantageous from a biodiversity perspective;
- access to a suitable water and electricity supply; and
- proximity to major regional and State transport routes.

Finding a site that meets all of the above criteria is very difficult. CAPRA identified the project site after an extensive process, finding a site that has been subject to a long history of agricultural activities, as well as meeting the required services and transport related criteria listed above. Prior to site selection, CAPRA considered several different locations, some of which were closer to water sources and infrastructure, and more heavily vegetated than the project site. Therefore, this careful site selection process avoided significant impacts to biodiversity by choosing a site with this existing agricultural land use.

The location of the abattoir footprint within the project site was specifically chosen based on a combination of a number of factors as follows:

- local topography and relief;
- the abattoir buildings need to be placed in the eastern portion of the project site to allow the western portion to be available for irrigation of treated effluent and ongoing agricultural activities;
- the abattoir buildings were placed as close to the Highway as possible, and far enough back in consideration of visibility from the road, to minimise the length of access road construction and the distance delivery and product trucks need to travel within the site; and
- the location of the access road (and hence location of the buildings it is connected to) was placed in consideration of interaction with the Bourke-Collerina/Weilmoringle Road and Mitchell Highway intersection.

Further, in the detailed design process, CAPRA also avoided and minimised biodiversity impacts through the following:

- moving the initial abattoir location north to avoid a higher condition area of shrubby woodland; and
- placing the ancillary facilities (ie tracks, carpark, water treatment ponds and active cropping and irrigation area) in lower condition areas, containing the derived shrubland.

Further discussion on avoidance and minimisation measures is provided in Chapter 2 of the EIS.

5.2 Mitigation

The mitigation measures in Table 5.1 will be implemented to minimise impacts of the project on biodiversity values. Further details on specific measures to be implemented are provided in the following sections.

Table 5.1 Mitigation measures

Impact	Environmental safeguard	Responsibility	Timing
Direct impact			
Clearing of native vegetation	The clearing limits are to be clearly delineated in the field.	Construction manager	Prior to and during vegetation clearing
Fauna injury and mortality	A clearing procedure will be included in the sediment and erosion control plan to be prepared. The following methods must be implemented during clearing: • felling of hollow-bearing trees in the study area will follow a two-stage clearing protocol, where surrounding non-hollow vegetation is cleared 24 hours prior to the hollow trees to allow fauna time to move.	Construction manager	Prior to and during works
	• a suitably trained fauna handler will be present during hollow-bearing tree clearing to rescue and relocate displaced fauna if found on site.	Construction manager	Prior to and during works
Indirect impact			
Erosion and sedimentation	Appropriate sediment and erosion controls will be implemented through the sediment and erosion control plan to ensure that there are no off-site impacts result from the abattoir, particularly the Darling River.	Construction manager Construction staff	Prior to, during and following completion of works
Nutrient runoff	Operation of the wastewater treatment ponds and irrigation of treated effluent will be managed in accordance with the effluent management study prepared for the project (Envirowest 2016).	Abattoir manager	Operation of the treatment ponds and irrigation

6 Biodiversity credit report

6.1 Quantification of impacts

The impacts of the project were assessed according to the FBA and associated BioBanking Credit Calculator. This method allows for impacts on native vegetation and threatened flora and fauna to be quantified, so that a suitable and proportionate offset can be identified. The method details the offset requirements in terms of ecosystem and species credits. Only ecosystem credits are required to compensate for the project's impacts on biodiversity.

Two vegetation zones identified within the study area and both had site value scores of >17 (Table 6.1):

- Zone 1: Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland (PCT98) (moderate-good); and
- Zone 2: Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland (PCT98) (moderate-good derived shrubland).

Several ecosystem credit species were identified as having a low to moderate potential to occur in the study area and therefore have been assumed to be present in accordance with the FBA. The calculations assume that the vegetation to be impacted contains suitable habitat for the Barking Owl, Australian Bustard, Hooded Robin, Major Mitchell's Cockatoo, Brolga, Bush Stone Curlew, Spotted Harrier, Little Pied Bat, Inland Forest Bat and Yellow-bellied Sheath-tail Bat. The species associated with both PCTs with the highest threatened species multiplier was the Barking Owl (Table 6.1).

A total of 1,284 ecosystem credits are required to compensate for the project's impacts on PCT98 and threatened species habitat (Table 6.1). A full BioBanking Calculator Credit Report is provided at Appendix D.

Table 6.1 Ecosystem credits required

Vegetation zone	PCT	Area (ha)	TEC?	Site value score	Ecosystem credit species with the highest multiplier	Credits required to offset impact
1	98	9.6	No	76	Barking Owl	585
2	98	45.7	No	38	Barking Owl	1,483
Total		55.3				2,068

No species credit species were recorded or are predicted to occur in the study area. Therefore, species credits have not been calculated for the project.

7 Biodiversity offset strategy

7.1 Strategy

A biodiversity offset strategy will be prepared to identify offsets to compensate for the project's impacts. Preparation of this strategy will involve the following steps:

1. Identifying if suitable credits are available on the market to meet offset requirements;
2. Finding potential offset sites with the biodiversity values required to compensate for the project's impacts; and
3. In the absence of suitable offset credits or properties, applying the variation criteria rules of the FBA and finding suitable offsets to meet the requirements.

Investigations are currently underway to secure a suitable offset for the project. The Biodiversity Offset Strategy will be finalised in consultation with OEH, DP&E and DPI – Lands within 12 months of obtaining project approval.

Finalising the offset strategy post approval is driven by the need to obtain project approval in May 2016 to allow the majority of construction works to be undertaken in the winter and spring months, avoiding the hot summer months as much as possible, which can bring extreme weather in Bourke. Given the additional work required to develop the offset strategy, there is insufficient time to achieve this and adhere to the required approval and construction timeline. In addition, with further work to be done to finalise the strategy, CAPRA would prefer to do so under the certainty of a project approval, because, whilst CAPRA have entered into a contract to purchase the land within the project site (which is likely to provide an appropriate offset), this contract is conditional on consent being granted for the project. As such, CAPRA do not currently own the land, and therefore prefer to finalise the strategy post approval when they are the land owner.

7.2 Investigating offset sites

The applicant has entered into a conditional contract (pending receipt of project approval) to purchase the project site and surrounding buffer land on Lot 19 DP 753546, Lot 6297 DP 768182, Lot 2 DP 753547, Lot 100 DP 753547, Lot 102 DP 753547, Lot 4 DP 753547, and Lot 3 DP 753547, as illustrated on Figure 1.2.

Remaining areas of native vegetation on the project site were assessed to determine their feasibility as an offset site. These areas also contain Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland (PCT98) in moderate to good condition. Table 7.1 summarises the likely offset credits the remaining areas will generate.

Table 7.1 Likely offset credits generated by remaining native vegetation on the project site

Vegetation zone	Area impacted (ha)	Credits required	Area remaining following clearing (ha)	Credits per ha ¹	Potential offset credits available on the project site ²	Credit surplus/deficit
1	9.6	585	26.8	60.9	268.3	-316.7
2	45.7	1,483	164.3	32.5	1,643.3	+160.3
Total	55.3	2,068	191.2	-	1,911.6	-156.4

Notes: 1. Credits per ha calculated by dividing credits required by the area impacted.

2. Potential offset credits calculated by multiplying the area remaining by a factor of 10.

3. Likely area required calculated by dividing by a factor of 10.

Approximately 1,191 credits are available in remaining native vegetation on the project site. Therefore, an additional 156.4 credits are likely to be required outside the project site.

Offset surveys will be completed in the project site and the surrounding buffer land (ie the potential offset areas) to inform accurate offset calculations and select a preferred offset site/s and/or mechanism. As described above, this Biodiversity Offset Strategy will then be finalised into a biodiversity offset package, in consultation with OEH, DP&E and DPI - Lands, that adequately compensates for the project's impacts within 12 months of project approval.

7.3 Application of the variation criteria

Under the FBA, the offset rules can be varied to match ecosystem credits, using credits generated by a PCT from the same vegetation formation as the PCT to which the required ecosystem credit relates. Where possible and if needed, the variation rules will be applied to the project and suitable PCTs in the same vegetation class will be identified prior to matching by formation. The application of the variation criteria, if needed, will be completed in consultation with OEH and DP&E.

7.4 Offset security

Any property identified for offsetting will be secured under a biobanking agreement.

8 Conclusion

The biodiversity values in the project were assessed in accordance with the FBA. The study area has been previously disturbed by sheep grazing and feral pigs, however contains 55.3 ha of native vegetation. Vegetation within the project site (190.7 ha) will be retained, however the 55.3 ha of native vegetation in the study area will be removed to facilitate construction of the abattoir, ancillary infrastructure, wastewater treatment ponds and the irrigation area.

One PCT was identified in a shrubby woodland and a derived shrubland form in the study area, namely Poplar Box - White Cypress Pine - Wilga - Ironwood Shrubby Woodland (PCT98). Both forms of the plant community type were in moderate-good condition with site values greater than 17. The project will require the removal of approximately 55.3 ha of this PCT. This PCT does not meet the description any TEC listed under the TSC Act or EPBC Act. However, these communities provide potential habitat for a range of threatened fauna species. The project's impacts on these communities will be offset in accordance with the FBA. No species credit species were recorded or are predicted to occur in the study area, therefore species credits have not been calculated for the project.

Construction and operation of the abattoir has the potential to result in direct and indirect impacts on biodiversity, including the clearing of native vegetation and habitat, erosion and sedimentation and weed invasion if not managed appropriately. The project will involve the removal of 55.3 ha of native vegetation which will have a minor impact at the project site scale (77.5% of native vegetation will be retained) and the IBRA subregional scale (0.01% loss). A number of environmental safeguards have been proposed and these would minimise and/or mitigate potential biodiversity impacts from the project. The construction of wastewater treatment ponds may also have the positive impact of attracting wetland birds to the study area, provided that the anaerobic ponding process is effectively managed.

Only one species listed under the EPBC Act, the Rainbow Bee-eater (a migratory species) has potential to occur in the study area. An assessment of significance was completed for the species which concluded that the project was unlikely to result in significant impacts for the Rainbow Bee-eater. Five nationally important wetlands are proximal to the study area, however will not be impacted given their large distance from the study area, the absence of streams that connect to the wetlands through the study area, and the restriction of all impacts to the study area.

A total of 2,068 ecosystem credits are required to offset the project's impacts in accordance with the FBA. Investigations are underway to secure a suitable offset for the project. The Biodiversity Offset Strategy will be finalised in consultation with OEH, DP&E and DPI – Lands within 12 months of project approval.

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Appendix A

Plot data

Table A.1 Plot and opportunistic data

Family	Common name	Scientific name	Cover abundance							Opportunistic
			Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	
Amaranthaceae	Longtails	<i>Ptilotus polystachyus</i>		1		1				
Asteraceae	Skeleton Weed	<i>Chondrilla juncea</i> *	1							
Asteraceae		<i>Olearia pimeleoides</i>		2	2					
Brassicaceae	African Peppergrass	<i>Lepidium africanum</i> *		1			2	2		
Capparaceae	Wild Orange	<i>Capparis mitchellii</i>		2						
Chenopodiaceae		<i>Atriplex lindleyi</i>	1							
Chenopodiaceae		<i>Atriplex muelleri</i>	1	2				3	2	
Chenopodiaceae	A Bluebush	<i>Maireana sp. (sterile)</i>	3	1						
Chenopodiaceae	Spiny Saltbush	<i>Rhagodia spinescens</i>	1	3	3		3	2	3	
Chenopodiaceae	Galvanised Burr	<i>Sclerolaena birchii</i>	1	2		3	2		2	
Chenopodiaceae	Grey Copperburr	<i>Sclerolaena diacantha</i>	3	4	3	4	4	4	4	
Chenopodiaceae	Giant Redburr	<i>Sclerolaena tricuspis</i>		2			1	1		
Malvaceae	Fine Sida	<i>Sida filiformis</i>	1							
Myrtaceae	Gum Coolibah	<i>Eucalyptus intertexta</i>		1						X
Myrtaceae	Bimble Box	<i>Eucalyptus populnea subsp. bimbil</i>				3		1		X
Plantaginaceae		<i>Plantago debilis</i>		2						
Plantaginaceae		<i>Plantago drummondii</i>	1				2			
Poaceae	A Wiregrass	<i>Aristida sp. (sterile)</i>		2			2			
Poaceae	A Lovegrass	<i>Eragrostis sp. (sterile)</i>								X
Poaceae	Slender Wallaby Grass	<i>Rytidosperma penicillatum</i>		1						
Poaceae	Fairy Grass	<i>Sporobolus caroli</i>	1	2		3	1	2		X
Sapindaceae	Whitewood	<i>Atalaya hemiglauca</i>		3	1	3	1	3	2	
Sapindaceae	Large-leaf Hop Bush	<i>Dodonaea viscosa subsp. cuneata</i>		1						
Scrophulariaceae	Budda	<i>Eremophila mitchelli</i>		1						X
Solanaceae	Western Nightshade	<i>Solanum coactiliferum</i>	2	2		2	2	1		X

Notes 1. *denotes introduced species

2. Key to cover abundance - 1 - <5%, few individuals, 2 - <5%, many individuals, 3 - 5 - 25%, 4 - 26-50%, 5 - 51-75%, 6 - 76-100%

3. Key to opportunistic records - X – present

Appendix B

Threatened species assessment of occurrence

Table B.1 **Threatened species previously recorded or predicted to occur within 20 km of the study area**

Species	Source	Conservation status EPBC Act	Conservation status TSC Act	Habitat	Likelihood of occurrence in the study area
Flora					
<i>Austrostipa metatoris</i>	PMST	V	V	Most records occur in the Murray Valley with sites including Cunninyeuk Station, Stony Crossing, Kyalite State Forest (now part of Murrumbidgee Valley Regional Park) and Lake Benanee. Scattered records also occur in central NSW including Lake Cargelligo, east of Goolgowi, Condobolin and south west of Nymagee. Otherwise only known from near Bordertown in south east South Australia, where it may be locally extinct. Grows in sandy areas of the Murray Valley; habitats include sandhills, sandridges, undulating plains and flat open mallee country, with red to red-brown clay-loam to sandy-loam soils.	None. Sandhills, sandridges, undulating planins and mallee country are absent from the study area
Winged Peppergrass <i>Lepidium monoplacoides</i>	NPWS Atlas	E	E	Widespread in the semi-arid western plains regions of NSW. Collected from widely scattered localities, with large numbers of historical records but few recent collections. There is a single collection from Broken Hill and only two collections since 1915, the most recent being 1950. Also previously recorded from Bourke, Cobar, Urana, Lake Cargelligo, Balranald, Wanganella and Deniliquin. Recorded more recently from the Hay Plain, south-eastern Riverina, and from near Pooncarie. Occurs on seasonally moist to waterlogged sites, on heavy fertile soils, with a mean annual rainfall of around 300-500 mm. Predominant vegetation is usually an open woodland dominated by <i>Allocasuarina luehmannii</i> (Bullock) and/or Eucalypts, particularly <i>Eucalyptus largiflorens</i> (Black Box) or <i>Eucalyptus populnea</i> (Poplar Box). The field layer of the surrounding woodland is dominated by tussock grasses.	None. The study area is not seasonally moist or waterlogged, and does not contain associated tree species.
Rice Flower <i>Pimelea elongata</i>	NPWS Atlas	-	E	Occurs in the north-western plains of NSW from localities including Walgett and Bourke. Found on heavy-textured soils with a thin sandy upper layer. Dependent on seasonal rainfall events and completes its life cycle in a relatively short period; adequate wet periods are therefore important, as is a level of clay in the soil in order to facilitate moisture retention.	None. Clay soils are absent from the site and adequate water is absent. This species is dependent on adequate wet periods and clay soils for moisture retention.
Shrub Sida <i>Sida rohlenae</i>	BBCC	-	E	Shrub Sida has a limited distribution in Queensland, the Northern Territory, South Australia and Western Australia. In NSW it has been recorded south of Enngonia, south of Bourke and north-west of Coonamble with one collection north of Bourke which is likely to have been transported from Queensland. Grows on flood-out areas, creek banks and at the base of rocky hills.	None. Flooded areas, creek banks and rocky hills are absent from the study area.

Table B.1 **Threatened species previously recorded or predicted to occur within 20 km of the study area**

Species	Source	Conservation status EPBC Act	Conservation status TSC Act	Habitat	Likelihood of occurrence in the study area
Fauna					
Birds					
Australian Bustard <i>Ardeotis australis</i>	NPWS Atlas	-	E	The Australian Bustard mainly occurs in inland Australia and is now scarce or absent from southern and south-eastern Australia. In NSW, they are mainly found in the north-west corner and less often recorded in the lower western and central west plains regions. Occasional vagrants are still seen as far east as the western slopes and Riverine plain. Breeding now only occurs in the north-west region of NSW. Mainly inhabits tussock and hummock grasslands, though prefers tussock grasses to hummock grasses; also occurs in low shrublands and low open grassy woodlands; occasionally seen in pastoral and cropping country, golf courses and near dams. Breeds on bare ground on low sandy ridges or stony rises in ecotones between grassland and protective shrubland cover; roosts on ground among shrubs and long grasses or under trees.	Moderate. The site contains potential habitat, however it was not recorded during targeted surveys.
Bush Stone Curlew <i>Burhinus grallarius</i>	BBCC	-	E	Open forests and woodlands with a sparse grassy ground layer and fallen timber. Largely nocturnal, being especially active on moonlit nights. Feed on insects and small vertebrates, such as frogs, lizards and snakes. Nest on the ground in a scrape or small bare patch.	Low. A grassy groundlayer is absent from the study area.
Red-tailed Black Cockatoo (inland subspecies) <i>Calyptorhynchus banksii samueli</i>	NPWS Atlas	-	V	The Red-tailed Black-Cockatoo is the most widespread of the Black-Cockatoos, ranging broadly across much of northern and western Australia as well as western Victoria. In NSW, two subspecies occur, one in northeastern NSW and an inland subspecies. The Red-tailed Black-Cockatoo (inland subspecies) is known to occur around watercourses and overflows of the Darling, Paroo, Bogan, Macquarie and Barwon Rivers extending in an arc along the Darling River from Wentworth (though rare south of Menindee) in the south to Bourke and thence through to Brewarrina in the north. It extends east to Walgett and perhaps Boggabilla on the Barwon and south through to the Macquarie Marshes. Red-tailed Black-Cockatoos are found in a wide variety of habitats. Prefer Eucalyptus forest and woodlands, particularly river red gum and coolabah lined water courses. In the arid zone usually occur mainly near eucalypts along larger watercourses and associated Acacia and Casuarina woodlands nearby. Also utilise grasslands, scrublands, wetlands and vegetation on floodplains.	None. Tree-lined watercourses are absent from the study area.

Table B.1 **Threatened species previously recorded or predicted to occur within 20 km of the study area**

Species	Source	Conservation status EPBC Act	Conservation status TSC Act	Habitat	Likelihood of occurrence in the study area
Spotted Harrier <i>Circus assimilis</i>	BBCC	-	V	The Spotted Harrier occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.	Low. Grassy open woodland, mallee, riparian woodland, grassland and shrub-steppe are absent from the study area. However, the species has been recorded in agricultural land, such as the study area.
Brown Treecreeper (eastern subspecies) <i>Climacteris picumnus victorae</i>	BBCC	-	V	Endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (<i>Eucalyptus camaldulensis</i>) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	None. Grassy woodlands are absent from the study area.
Varied Sittella <i>Daphoenositta chrysoptera</i>	BBCC	-	V	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. The Varied Sittella's population size in NSW is uncertain but is believed to have undergone a moderate reduction over the past several decades. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy.	Low. Eucalypt forest and woodland is absent from the study area.
Squatter Pigeon <i>Geophaps scripta</i>	BBCC	V	E	Found from north Queensland to the North West Slopes of NSW and extending down to the Liverpool Plains and Dubbo. Today they are very rare in the southern parts of their range. Grassy woodlands and plains, preferring sandy areas and usually close to water.	None. The study area is dry, and does not contain any standing water.

Table B.1 **Threatened species previously recorded or predicted to occur within 20 km of the study area**

Species	Source	Conservation status EPBC Act	Conservation status TSC Act	Habitat	Likelihood of occurrence in the study area
Painted Honeyeater <i>Grantiella picta</i>	BBCC	V	V	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentration of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus <i>Amyema</i>.	None. Boree, Brigalow, Box Gum Woodland and Box Ironbark Forests and mistletoes are absent from the study area.
Brolga <i>Grus rubicunda</i>	BBCC	-	V	The Brolga was formerly found across Australia, except for the south-east corner, Tasmania and the south-western third of the country. It is still abundant in the northern tropics, but very sparse across the southern part of its range. Often feed in dry grassland or ploughed paddocks or even desert claypans, they are dependent on wetlands too, especially shallow swamps, where they will forage with their head entirely submerged.	Low. The site does not contain wetlands or swamps.
Little Eagle <i>Hieraaetus morphnoides</i>	BBCC	-	V	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used.	None. Eucalypt forest, woodland, she-oak, Acacia and riparian woodlands are absent from the study area.
Malleefowl <i>Leipoa ocellata</i>	PMST	V	E	The stronghold for this species in NSW is the mallee in the south west centred on Mallee Cliffs NP and extending east to near Balranald and scattered records as far north as Mungo NP. Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300 - 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species. Prefers areas of light sandy to sandy loam soils and habitats with a dense but discontinuous canopy and dense and diverse shrub and herb layers.	None. Mallee communities are absent from the site. Although the site contains Bimble Box, the understorey is not dense enough to support this species.

Table B.1 **Threatened species previously recorded or predicted to occur within 20 km of the study area**

Species	Source	Conservation status EPBC Act	Conservation status TSC Act	Habitat	Likelihood of occurrence in the study area
Major Mitchell's Cockatoo <i>Lophochroa leadbeateri</i>	BBCC	-	V	Found across the arid and semi-arid inland, from south-western Queensland south to north-west Victoria, through most of South Australia, north into the south-west Northern Territory and across to the west coast between Shark Bay and about Jurien. In NSW it is found regularly as far east as about Bourke and Griffith, and sporadically further east than that. Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. Nesting, in tree hollows, occurs throughout the second half of the year; nests are at least 1 km apart, with no more than one pair every 30 square kilometres.	Low. Water and suitable tree hollows are absent from the study area.
Square-tailed Kite <i>Lophoictinia isura</i>	BBCC	-	V	Typically inhabits coastal forested and wooded lands of tropical and temperate Australia. In NSW it is often associated with ridge and gully forests dominated by <i>Eucalyptus longifolia</i> , <i>Corymbia maculata</i> , <i>E. elata</i> , or <i>E. smithii</i> . Individuals appear to occupy large hunting ranges of more than 100 km ² . They require large living trees for breeding, particularly near water with surrounding woodland /forest close by for foraging habitat. Nest sites are generally located along or near watercourses, in a tree fork or on large horizontal limbs.	None. Tree-lined watercourses are absent from the study area.
Hooded Robin (south-eastern form) <i>Melanodryas cucullata cucullata</i>	BBCC	-	V	The Hooded Robin is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. However, it is common in few places, and rarely found on the coast. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.	Low. Habitat in the study area has been structurally simplified. Targeted surveys also did not record this species.
Barking Owl <i>Ninox connivens</i>	BBCC	-	V	Found throughout continental Australia except for the central arid regions. Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas.	Low. Suitable nesting hollows are absent for this species, which would preferentially use riparian woodlands along the Darling River, east of the study area.
Grey-crowned Babbler (eastern subspecies) <i>Pomatostomus temporalis temporalis</i>	BBCC	-	V	In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains.	None. Box Gum Woodland, Box-Cypress Pine woodlands are absent from the study area.

Table B.1 **Threatened species previously recorded or predicted to occur within 20 km of the study area**

Species	Source	Conservation status EPBC Act	Conservation status TSC Act	Habitat	Likelihood of occurrence in the study area
Australian Painted Snipe <i>Rostratula australis</i>	PMST	E	E	Most records are from the south east, particularly the Murray Darling Basin, with scattered records across northern Australia and historical records from around the Perth region in Western Australia. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds.	None. Wetlands, swamps and dams are absent from the study area.
Fork-tailed Swift <i>Apus pacificus</i>	PMST	Mi	-	Recorded in all regions of NSW. The Fork-tailed Swift is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher.	None. This species is almost exclusively aerial, therefore would not use habitat in the study area.
Great Egret, White Egret <i>Ardea alba</i>	PMST	Mi	-	Widespread in Australia. Reported in a wide range of wetland habitats (eg inland and coastal, freshwater and saline, permanent and ephemeral, open and vegetated, large and small, natural and artificial).	None. Wetlands are absent from the study area.
Cattle Egret <i>Ardea ibis</i>	PMST	Mi	-	Widespread and common according to migration movements and breeding localities surveys. Occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands.	None. Wetlands are absent from the study area.
Latham's Snipe, Japanese Snipe <i>Gallinago hardwickii</i>	PMST	Mi		Recorded along the east coast of Australia from Cape York Peninsula through to south-eastern South Australia. Occurs in permanent and ephemeral wetlands up to 2000 m above sea-level.	None. Wetlands are absent from the study area.
Rainbow Bee-eater <i>Merops ornatus</i>	PMST	Mi	-	Distributed across much of mainland Australia, and occurs on several near-shore islands. Occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation.	Moderate. This species has been known to occur in farmland, and has been recorded east of the study area, along the Darling River. An assessment of significance has been completed for this species at Appendix C.

Table B.1 **Threatened species previously recorded or predicted to occur within 20 km of the study area**

Species	Source	Conservation status EPBC Act	Conservation status TSC Act	Habitat	Likelihood of occurrence in the study area
Yellow Wagtail <i>Motacilla flava</i>	PMST	Mi		Breeds in northern latitudes and travels south before the onset of winter. Occurs in a variety of damp or wet habitats with low vegetation. Outside of the breeding season, it is also found in cultivated areas.	None. Wetlands are absent from the study area.
Common Greenshank, Greenshank <i>Tringa nebularia</i>	PMST	Mi		The Common Greenshank does not breed in Australia, however, the species occurs in all types of wetlands and has the widest distribution of any shorebird in Australia.	None. Wetlands are absent from the study area.
Bats					
Little Pied Bat <i>Chalinolobus picatus</i>	BBCC	-	V	The Little-Pied Bat is found in inland Queensland and NSW (including Western Plains and slopes) extending slightly into South Australia and Victoria. Occurs in dry open forest, open woodland, mulga woodlands, chenopod shrublands, cypress pine forest and mallee and Bimbil box woodlands.	Moderate likelihood as the study area contains chenopod shrublands and Bimble Box with small hollows potentially suitable for roosting.
Corben's Long-eared Bat <i>Nyctophilus corbeni</i>	BBCC	V	V	Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species. Inhabits a variety of vegetation types, including mallee, bullock Allocasuarina leuhmanni and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.	None. Box/Ironbark and Cypress Pine vegetation are absent from the study area.
Yellow-bellied Sheath-tail Bat <i>Saccolaimus flaviventris</i>	BBCC	-	V	Wide-ranging species found across northern and eastern Australia. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows.	Moderate. This species can occur in open areas, and small hollows potentially suitable for roosting are present.

Table B.1 **Threatened species previously recorded or predicted to occur within 20 km of the study area**

Species	Source	Conservation status EPBC Act	Conservation status TSC Act	Habitat	Likelihood of occurrence in the study area
Inland Forest Bat <i>Vespadelus baverstocki</i>	BBCC	-	V	Because of the difficulty of identification, the distribution of this species, particularly in NSW, is very poorly known. Believed to occur widely in all the mainland states, generally in areas with annual rainfall less than 400 millimetres. In NSW it has been most regularly captured in the far south west, north from the Murray River to Menindee, and at least as far east as the Balranald-Ivanhoe Road. Roosts in tree hollows and abandoned buildings. Known to roost in very small hollows in stunted trees only a few metres high. The habitat requirements of this species are poorly known but it has been recorded from a variety of woodland formations, including Mallee, Mulga and River Red Gum. Most records are from drier woodland habitats with riparian areas inhabited by the Little Forest Bat. However, other habitats may be used for foraging and/or drinking.	Moderate. This species can occur in drier habitats with stunted trees with hollows, which are present at the site.
Mammals					
Kultarr <i>Antechinomys laniger</i>	NPWS Atlas	-	E	Widespread across arid and semi-arid NSW but present in very low numbers. Records typically derive from captures by domestic cats or are collected after falling into steep-sided holes. Recent records have come primarily from the Cobar and Brewarrina region. A terrestrial insectivore that inhabits open country, especially claypans among Acacia woodlands. Nocturnal, sheltering by day in hollow logs or tree-stumps, beneath saltbush and spinifex tussocks, in deep cracks in the soil and in the burrows of other animals.	Low. Acacia woodlands are absent from the study area.
Koala <i>Phascolarctos cinereus</i>	BBCC	V	V	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.	None. Although a secondary food tree species, Bimble Box, is present, it comprises less than 15% of the canopy layer. No scats were found in targeted searches.

Table B.1 **Threatened species previously recorded or predicted to occur within 20 km of the study area**

Species	Source	Conservation status EPBC Act	Conservation status TSC Act	Habitat	Likelihood of occurrence in the study area
Stripe-faced Dunnart <i>Sminthopsis macroura</i>	NPWS Atlas	-	V	Throughout much of inland central and northern Australia, extending into central and northern NSW, western Queensland, Northern Territory, South Australia and Western Australia. They are rare on the NSW Central West Slopes and North West Slopes with the most easterly records of recent times located around Dubbo, Coonabarabran, Warialda and Ashford. Native dry grasslands and low dry shrublands, often along drainage lines where food and shelter resources tend to be better. They shelter in cracks in the soil, in grass tussocks or under rocks and logs. Co-occupies areas with the more common Fat-tailed Dunnart, but prefers relatively ungrazed habitats with greater diversity and healthier understorey vegetation.	None. Drainage lines and adequate shelter resources for these species are absent.
Fish					
Murray Cod <i>Maccullochella peelii</i>	PMST	E	FM Act	Found extensively throughout the Murray-Darling Basin (the Basin) in south-eastern Australia. Its range throughout the Basin includes Queensland, New South Wales (NSW), the Australian Capital Territory (ACT), Victoria and South Australia. Utilizes a diverse range of habitats from clear rocky streams, such as those found in the upper western slopes of NSW, to slow-flowing, turbid rivers and billabongs.	None. The study area does not contain any waterbodies.
Notes	1. BBCC - BioBanking Credit Calculator, NPWS Atlas - Atlas of NSW Wildlife, PMST - Protected Matters Search Tool. 2. EPBC - Act - Environment Protection and Biodiversity Conservation Act 1999, TSC Act - Threatened Species Conservation Act, FM Act - Fisheries Management Act 1994. 3. CE - critically endangered, E - endangered, V - vulnerable, Mi – migratory.				

Appendix C

Assessments of significance

C.1 Significant impact criteria in accordance with the EPBC Act

The following section provides the criteria that must be considered in the assessment of all threatened species listed under the EPBC Act. There are separate criteria for each listing category under the EPBC Act, in accordance with *EPBC Act Policy Statement 1.1 Significant Impact Guidelines: Matters of National Environmental Significance* (DoE 2013). Only one migratory species is considered likely to occur in the study area, and therefore only migratory species have been assessed (Section C.1.2) using the criteria at Section C.1.1.

C.1.1 Significant impact criteria for listed migratory species

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

- substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species;
- result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or
- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

C.1.2 Assessment of significance for the Rainbow Bee-eater

The Rainbow Bee-eater is listed as a migratory species under the EPBC Act. It has a wide foraging distribution across mainland Australia, and also occurs on offshore islands including Rottnest Island and islands in the south west Torres Strait where it breeds. Its foraging habitat includes open forests, woodlands, shrublands and agricultural areas. It was recently recorded east of the study area on the Darling River. Given the proximity of the record and the presence of shrublands and an agricultural area, this species is deemed likely to occasionally occur in the study area.

An assessment of significance has been completed for the Rainbow Bee-eater to assess potential impacts of the project on this migratory species (Table C.1).

Table C.1 **Assessment of significance for the Rainbow Bee-eater**

Assessment part	Discussion
1: substantially modify important habitat	The study area does not constitute an area of important habitat for the Rainbow Bee-eater, as an ecologically significant proportion (as defined under the guidelines (DoE 2013)) of its population does not reside in the study area, no breeding occurs in the area, it is not at the limit of their range and they are not known to be declining.
2 : result in invasive species	The project is are not expected to increase the threat of invasive species that would adversely impact the Rainbow Bee-eater.
3: disrupt lifecycle of ecologically significant proportion of population	An ecologically significant proportion of this species does not reside in the study area. In addition, they do not breed in the study area, it only provides potential foraging habitat, and the project is unlikely to disrupt migration patterns given the species high dispersal capability.
Conclusion	The project is not expected to result in significant impacts to the Rainbow Bee-eater as: • an ecologically significant proportion of the species is not known to reside in the study area; and • the study area does not contain important habitat.

Appendix D

BioBanking Calculator Credit Report

Biodiversity credit report



This report identifies the number and type of biodiversity credits required for a major project.

Date of report: 2/03/2016

Time: 1:14:03PM

Calculator version: v4.0

Major Project details

Proposal ID:	196/2016/2414MP
Proposal name:	Bourke Small Stock Abbatoir
Proposal address:	Lot 17 Mitchell Highway North Bourke NSW 2840
Proponent name:	CAPRA Developments Pty Ltd
Proponent address:	
Proponent phone:	XXXXXXXX
Assessor name:	Katie Whiting
Assessor address:	SUITE 1 20 CHANDOS ST St Leonards NSW 2065
Assessor phone:	02 9493 9500
Assessor accreditation:	196

Summary of ecosystem credits required

Plant Community type	Area (ha)	Credits created
Poplar Box - White Cypress Pine - Wilga - Ironwood shrubby woodland on red sandy-loam soils in the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion	55.30	2,068.00
Total	55.30	2,068

Credit profiles

1. Poplar Box - White Cypress Pine - Wilga - Ironwood shrubby woodland on red sandy-loam soils in the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion, (WE137)

Number of ecosystem credits created	2,068
IBRA sub-region	Nebine Plains, Block Range (Part B)

Offset options - Plant Community types	Offset options - IBRA sub-regions
Poplar Box - White Cypress Pine - Wilga - Ironwood shrubby woodland on red sandy-loam soils in the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion, (WE137) Western Rosewood - Wilga - Wild Orange - Belah low woodland of the Brigalow Belt South Bioregion and eastern Darling Riverine Plains Bioregion, (WE150) Ironwood woodland of the semi-arid plains, (WE88) Pine - Belah low open woodland of the western Cobar Peneplain and northern Murray Darling Depression Bioregion, (WE89) Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion, (WE91) Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion, (WE92) Poplar Box - Mulga - Ironwood woodland on red loam soils on plains in the Cobar Peneplain Bioregion and north-eastern Mulga Lands Bioregion, (WE93) Gum Coolabah - Mulga open woodland on gravel ridges of the Cobar Peneplain Bioregion, (WE94) White Cypress Pine - Poplar Box woodland on footslopes and peneplains mainly in the Cobar Peneplain Bioregion, (WE95)	Nebine Plains, Block Range (Part B) and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

Summary of species credits required



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