LOWER FITZROY RIVER
INFRASTRUCTURE PROJECT

Appendix O

Rookwood Weir Baseline Terrestrial Fauna Report

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Gladstone Area Water Board

Gladstone Area Water Board and SunWater

Lower Fitzroy River Infrastructure Project

Rookwood Weir Baseline Terrestrial Fauna Report

July 2014

Executive summary

A terrestial ecology study was conducted for the proposed construction of Rookwood Weir. The study aims to provide sufficient baseline information to enable identification and assessment of the potential impacts of the Lower Fitzroy River Infrastructure Project on the existing fauna values upstream of the proposed Rookwood Weir site, along the lower Dawson, lower Mackenzie and upper Fitzroy Rivers. Data for the study was collected from literature reviews and seasonal field surveys to achieve this objective.

The literature review included a study of relevant scientific and grey literature, database searches, and previously prepared technical reports. Field surveys were conducted to supplement the findings from the desktop assessments. Surveys were conducted in wet and dry seasons to document seasonal changes in the ecosystems. Six fauna survey sites were chosen based on satellite imagery, regional ecosystem mapping and initial reconnaissance of the area. The initial reconnaissance of the study area was complemented by an aerial survey, which took place prior to the wet and dry season field surveys. The chosen survey sites were to be representative of major fauna habitats, accessible and covering a geographical range of habitats and correspond with the proposed inundation areas.

The terrestrial ecological assessment aims to describe terrestrial fauna present or likely to be present in the study area, as well as the environmental values of terrestrial ecology. These may encompass habitat composition and conditions, biological diversity, composition, structure and connectivity of riparian habitats and adjacent land use. Findings of these searches and surveys inform the impact assessment on terrestrial fauna, identifying potential impacts that construction and operation of Rookwood Weir may have on environmental values such as species diversity and abundance, habitats dynamics and suitability, and breeding and nesting habits. Management measures would then be developed to avoid, minimise or mitigate these impacts.

This baseline terrestrial fauna assessment revealed that the Rookwood Weir Project footprint supports a diversity of common amphibians, reptiles, mammals and birds, and a limited number of threatened and other conservation-significant species. Furthermore, the Project footprint has the potential to support a number of threatened species (not previously recorded or observed during wet and dry season surveys), based on the availability of suitable habitat and bioclimatic modelling.

Although the landscape has been significantly altered through land clearing, remnants of the nine major terrestrial fauna habitat types identified within the Project footprint provide foraging, shelter and breeding resources for at least 208 species (as identified during wet and dry season field surveys), comprising 12 amphibians, 22 reptiles, 41 mammals (including two threatened species) and 133 birds (including four threatened species).

Since much of the lowland landscape has been cleared for agricultural development, remnants of riparian vegetation perform a valuable role, maintaining connectivity between habitat remnants. Particularly sensitive terrestrial fauna habitats within the Rookwood Weir Project footprint include brigalow communities, ephemeral off-stream water bodies and creeks. Such habitats are likely to provide resources for a wide array of animals, including amphibians (breeding and foraging), reptiles (foraging, shelter), ground-dwelling mammals (foraging and denning), microchiropteran bats (foraging) and birds (foraging and nesting amongst dense riparian vegetation).

While brigalow habitat has only moderate species richness (given the absence of hollows or canopy level vegetation), it has high ecological value as potential habitat for conservation significant species (e.g. yakka skink, ornamental snake and brigalow scaly-foot). The

abundance of fallen woody debris and relatively complex ground substrates potentially provides habitat for the aforementioned threatened reptiles, as well as common reptiles and ground-dwelling mammals.

Ecological resources and habitats critical to the survival and long-term viability of conservation significant terrestrial species and populations are unlikely to occur within the Rookwood Weir Project footprint. Nevertheless, the fragmented habitats that occur within and adjacent to the lower Dawson, lower Mackenzie and upper Fitzroy Rivers are likely to provide resources for small localised populations of threatened species, as well as a wide diversity of common, generalist species that are tolerant of a modified landscape matrix.

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Acronym	Term
AHD	Australian Height Datum
BAAM	Biodiversity Assessment and Management Pty Ltd
BPA	Biodiversity Planning Assessment
CAMBA	China-Australia Migratory Bird Agreement
CQRWSS	Central Queensland Regional Water Supply Strategy
DEHP	Department of Environment and Heritage Protection
DERM	Department of Environment and Resource Management
DEWHA	Department of Environment, Water, Heritage and the Arts
EIS	Environmental Impact Statement
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
FBA	Fitzroy Basin Association
FSL	Full Supply Level
Fitzroy ROP	Fitzroy Resource Operations Plan
Fitzroy WRP	Fitzroy Water Resource Plan
GHD	GHD Pty Ltd
JAMBA	Japan-Australia Migratory Bird Agreement
LFRIP	Lower Fitzroy River Infrastructure Project
NC Act	*Nature Conservation Act 1992*
NRM	Natural Resource Management
RE	Regional Ecosystem
REDD	Regional Ecosystem Description Database
ROKAMBA	Republic of Kora-Australia Migratory Bird Agreement

1. Introduction

1.1 Project overview

The Lower Fitzroy River Infrastructure Project (Project) comprises the construction and operation of a raised Eden Bann Weir and/or a new weir at Rookwood on the Fitzroy River, Central Queensland to facilitate capture and storage of all high priority unallocated water (76,000 ML/a) in the Fitzroy system. The Fitzroy River forms at the confluence of the Mackenzie (flowing from the north) and Dawson (flowing from the south) Rivers. The Fitzroy River flows out into the Coral Sea, including the Great Barrier Reef World Heritage Area and Marine Park, some 300 km downstream. The Fitzroy River passes through the city of Rockhampton which lies approximately 59 km from the river mouth.

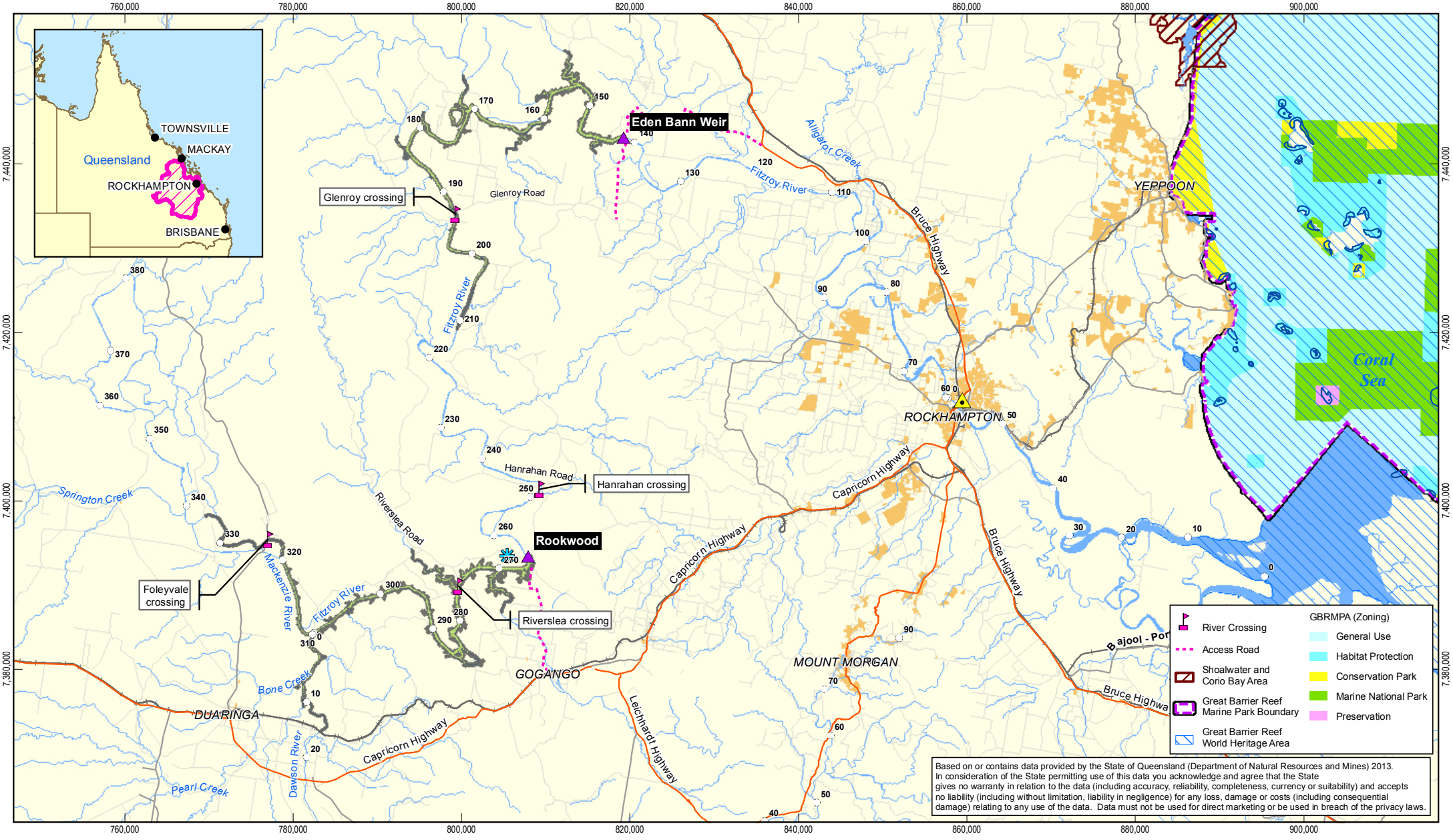
Key Project components include the following:

- Eden Bann Weir
  - Eden Bann Weir Stage 2 – a raise of the existing Eden Bann Weir to a full supply level (FSL) 18.2 m Australian Height Datum (AHD) and associated impoundment of the Fitzroy River.
  - Eden Bann Weir Stage 3 – the addition of 2 m high flap gates to achieve FSL 20.2 m AHD and associated impoundment of the Fitzroy River.
- Rookwood Weir
  - Rookwood Weir Stage 1 – a new build to FSL 45.5 m AHD, saddle dams and associated impoundment of the Fitzroy, Mackenzie and Dawson Rivers.
  - Rookwood Weir Stage 2 – the addition of 3.5 m high flap gates to achieve FSL 49.0 m AHD and associated impoundment of the Fitzroy, Mackenzie and Dawson Rivers.
  - Any combination of the above.
- Fish passage infrastructure and turtle passage infrastructure, namely fish locks and a turtle bypass, respectively, at each weir.

Other infrastructure components associated with the Project include:

- Augmentation to and construction of access roads (public and private) to and from the weir sites for construction and operations and upgrades to intersections.
- Construction of low level bridges in areas upstream of weir infrastructure impacted by the impoundments, specifically at Glenroy, Riverslea and Foleyvale crossings.
- Installation of culverts at Hanrahan Crossing downstream of Rookwood Weir to facilitate access during operation releases.
- Relocation of existing and/or installation of new gauging stations
- Removal and decommissioning of existing low level causeways and culverts at river crossings described above.
- Water supply for construction will be sourced directly from nearby rivers and creeks and will not require the construction of additional water supply infrastructure.

The location of Project components is shown on Figure 1-1.



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Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA94)
Grid: Map Grid of Australia 1994, Zone 55

N

LEGEND

- AMTD (km)
- Weir Location
- Fitzroy Barrage
- Saddle dams
- Highway
- Major Road
- Streets (Local)
- Access Road
- Fitzroy Basin
- Urbanised Area
- Rookwood Weir Stage 1 impoundment
- Rookwood Weir Stage 2 impoundment
- Eden Bann Weir Stage 2 impoundment
- Eden Bann Weir Stage 3 impoundment

Gladstone Area Water Board, SunWater
Lower Fitzroy River Infrastructure Project

Job Number 41-20736
Revision J
Date 19 Mar 2014

Project location

Figure 1-1

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Level 9, 145 Ann Street Brisbane QLD 4000 Australia T +61 7 3316 3000 F +61 7 3316 3333 E bnemail@ghd.com W www.ghd.com

Data Source: © Copyright Commonwealth of Australia (Geoscience Australia): Places, Waterways (2007); Sunwater: Waterways, Weir Locations - 2008; DNRM: Railways, Roads, RAMSAR Wetlands, World Heritage Area - 2010; © Copyright Commonwealth of Australia (GBRMPA) Zoning, Boundary - 2011. Created by: MS *See Appendix for disclaimers and copyrights.

Operationally, the Project comprises the maintenance and management of the weir infrastructure, private access roads and impoundments, inclusive of a flood buffer. Water releases will be made through 'run of river' methods and no water distribution infrastructure is required. Water releases will be made to satisfy environmental and water security objectives in accordance with the *Water Resource (Fitzroy Basin) Plan 2011* (Fitzroy WRP). Operating regimes will be developed and implemented through the Fitzroy Basin Resource Operations Plan 2004 (Fitzroy ROP) (as augmented).

The development of weir infrastructure (and associated works), the resultant storage of water (inundation of the river bed and banks) and the transfer of water between storages through 'run of river' methods on the Fitzroy River comprise the scope of the Project. Abstraction, transmission and distribution to end users are not considered as part of the proposed Project and are subject to their own environmental investigations.

1.2 Report context

In accordance with the Program of Works Notification (No 3) 2007, the investigations and studies for the Project commenced in late 2008 with most technical studies and reporting being undertaken in 2009. At that time, the target completion date for final development of a Project Business Case was 2009- 2010. It was however acknowledged that this would be dependent on the urgency associated with drought conditions in the region.

Since 2009, Central Queensland has experienced above average rainfalls and water supply infrastructure in the region has been operating at capacity. This has resulted in extended Project timeframes. Furthermore, the State had commissioned a number of investigations and assessments prior to 2008 which were used as a basis for the current environmental impact statement (EIS). Consequently, the EIS reporting spans a change of Government and subsequent reconfiguration of government departments. Names as were applicable to the specific reference are therefore used and not referenced as 'former', 'prior' or 'the then'.

The Rookwood Weir baseline terrestrial fauna assessment commenced in 2009. Relevant and applicable updates have been made to the present (2014) as appropriate and necessary.

2. Terrestrial fauna assessment scope, approach and methodology

2.1 Assessment scope

The objectives of the terrestrial fauna assessment were as follows:

- Describe terrestrial fauna present or likely to be present including:
  - Species diversity (i.e. a species list) and probable relative abundance of fauna, including mammals, birds, reptiles, and amphibians
  - Species which are poorly known but suspected of being threatened
  - The existence of conservation significant or otherwise noteworthy species or communities, (including a discussion on range, habitat, breeding, recruitment, feeding and movement requirements, and the current level of protection)
  - Use of the area by migratory birds, nomadic birds, and terrestrial fauna
  - Habitat requirements and sensitivity to changes; (including movement corridors, edge effects and barriers to movement)
  - An analysis of habitat for fauna species of conservation significance
  - The existence of feral or exotic animals.
- Describe the environmental values of the terrestrial ecology in terms of:
  - The integrity of ecological processes, including habitat composition, structure and function (particularly for conservation significant species)
  - Biological diversity
  - Composition, structure and connectivity of riparian habitats
  - Adjacent land use.

Baseline findings and conditions have informed the preparation of an environmental impact assessment that:

- Identifies and assesses potential impacts that construction and operation of a proposed weir at Rookwood may have on the environmental values described
- Outline strategies and management recommendations to primarily avoid or minimise and / or mitigate these potential impacts.

To describe the existing environmental values of the Project footprint, a combination of literature reviews and seasonal field surveys were conducted. The literature review included a study of relevant scientific and grey literature, database searches and previously prepared technical reports. Wet and dry season field surveys were conducted to supplement and ground-truth results from the desktop assessments, and fill any potential knowledge gaps regarding the existing fauna values upstream of the Rookwood Weir site.

2.2 Nomenclature

Scientific and common names for terrestrial fauna are consistent with those used in the following sources:

- Handbook of Australian, New Zealand and Antarctic Birds (HANZAB) Book Series, Volumes 1 -7 (Oxford University Press 1990-2006)

- The Field Guide to the Birds of Australia (Pizzey and Knight 2007)
- Field Guide to Mammals of Australia (Menkhorst and Knight 2004)
- Australian Bats (Churchill 2008)
- A Field Guide to Reptiles of Queensland (Wilson 2005)
- A Complete Guide to Reptiles of Australia (Wilson and Swan 2003)
- A Field Guide to Australian Frogs (Barker et al. 1995).

2.3 Literature review

Prior to the commencement of field surveys, a literature review was conducted to document the terrestrial fauna values within the Project footprint and study area and to also identify any conservation significant fauna species that have been historically recorded or have potential to occur. The literature review included searches of:

- The former Commonwealth Department of Environment, Water, Heritage and the Arts (DEWHA) EPBC Act Environmental Reporting Tool (now the EPBC Act Protected Matters Search Tool) to identify species and / or their habitat listed under the EPBC Act, that are predicted to occur within the study area, and also to identify invasive species of national significance. The search area was defined by a transect line (with a 2 km buffer) following the meander of the Fitzroy River, extending upstream from Eden Bann Weir to the maximum proposed inundation extent
- The former Queensland Department of Environment and Resource Management (DERM) (now the Department of Environment and Heritage Protection) Wildlife Online Database to identify fauna species that have been historically recorded in or surrounding the study area, including threatened species listed under the *Nature Conservation Act 1992* (NC Act). Records were returned for a search area within a 10 km radius of the Eden Bann Weir
- Regional Ecosystem (RE) (Version 6.0, 2009) and Essential Habitat Mapping (Version 3.0, 2009) databases, in order to identify the type and extent of remnant vegetation present, as well as verify areas recognised as Essential Habitat within the study area
- The Queensland Museum's Specimen Database, to obtain a record of terrestrial vertebrates previously recorded in the study area. Data is stored for discrete regions on the Queensland Museum database, and as such, a "search rectangle" encompassing the area around the proposed Rookwood weir site, and upstream to the maximum proposed inundation extent was queried for fauna species records. The location of this search rectangle was as follows:
  - 23° 29', 149° 48' (top right corner) and 23° 45', 149° 37' (bottom left corner)
- The Birds Australia Atlas Database. This resource lists all bird species previously recorded within the study area during official Birds Australia censuses. A rectangular search area encompassing the study area was queried for bird records, based on the following coordinates:
  - 23° 26.99', 150° 4.97' (top right corner) and 23° 47.99', 149° 38.58' (bottom left corner)
- DEWHA Directory of Important Wetlands database in Australia
- Threatened species profiles and field guides
- Previous studies and reports conducted for the Project including:

  - Rookwood Weir Project Terrestrial Fauna Literature Review and Gap Analysis (Biodiversity Assessment and Management Pty Ltd (BAAM) 2008)
  - Proposal for raising Eden Bann Weir and construction of Rookwood Weir – An assessment of the potential implications on native vegetation and terrestrial ecosystems (Nangura Environmental Services 2007) (Appendix H).
- Scientific and grey literature on fauna species likely to occur and / or previously recorded in the study area.

Detailed results of the DEWHA Environmental Reporting Tool, DERM Wildlife Online, Queensland Museum and Birds Australia searches are provided in Appendix A.

2.4 Biodiversity Planning Assessment

Utilising the Biodiversity Assessment and Mapping Methodology developed by the former Environmental Protection Agency (which incorporates the Queensland Herbariums' vegetation mapping data), landscape scale biodiversity values are able to be assessed in a manner that is consistent and systematic (EPA 2002). Specifically, these values are mapped and ranked at various spatial scales, being at Local, Regional and State levels (EPA 2002). As such, this methodology has given rise to the development of Biodiversity Planning Assessments (BPA) for a number of Bioregions across Queensland, particularly those that face the greatest pressure from development (EPA 2002). BPA mapping for the LFRIP study area was acquired in order to determine whether mapped bioregional corridors and/or habitat remnants (at various scales of biodiversity significance) were prevalent within the Project footprint.

2.5 Field survey

2.5.1 Overview

A number of field surveys were conducted throughout the Project footprint, firstly to identify species and communities present, and secondly to supplement and ground truth the information acquired from the literature review. The field surveys also enabled any knowledge gaps regarding the existing fauna values of the Project footprint to be filled, and the verification of the likely occurrence of significant fauna species listed on either the EPBC Act or NC Act. Surveys were replicated throughout both the wet and dry seasons in order to document seasonal changes in fauna assemblages, habitat condition and utilisation. Survey timing and design also considered the ecology of targeted threatened species, accessibility and safety. The survey methods adopted for the terrestrial fauna assessment comprised systematic, non-systematic and targeted sampling techniques. These sampling techniques aimed to document and identify terrestrial fauna species and habitats, including those of conservation significant species. Verification was also based on both direct and indirect (fauna traces and suitable habitat) observations.

2.5.2 Animal ethics and approvals

Terrestrial fauna surveys were conducted under Section 52 of the *Animal Care and Protection Act 2001 (Qld)* (Scientific Purposes Permit – WISP-02740805, Registration No. 132) and supported by the former DERM animal ethics committee (CA 2006/11/159).

2.5.3 Timing of field surveys

Wet and dry season field surveys were conducted in order to document seasonal changes in the habitats within the study area and to maximise potential of encountering seasonal and migratory species. An initial reconnaissance of the study area was undertaken between 9 December and 12

December 2008 and also included an aerial survey on 20 January 2009. The wet season survey was conducted between 22 April and 27 April 2009, while the dry season survey was undertaken between 22 July and 28 July 2009.

2.5.4 Climatic conditions

All climatic data was been sourced from the Australian Bureau of Meteorology, recorded at the Rockhampton Airport weather station (039083) (BoM 2009). This data is considered to be indicative of the general climatic conditions in the study area, yet does not necessarily represent the precise meteorological conditions prevailing at survey sites precisely when the field surveys were undertaken due to the separation distance from the sites to the Bureau of Meteorology station (approximately 60 km).

Wet season

Conditions during the wet season survey were warm and dry. Temperatures ranged between 13.2ºC and 32.6º C with a minimum average of 16.1º C and maximum of 30.5ºC. Days were generally clear with low relative humidity (average 35.5% recorded at 3 pm) and no rainfall was recorded during the survey period. A total of 22.6 mm of rain was recorded in the two-week period preceding the surveys, while 85.8 mm of rain fell in the two months prior (23 February 2009 to 22 April 2009).

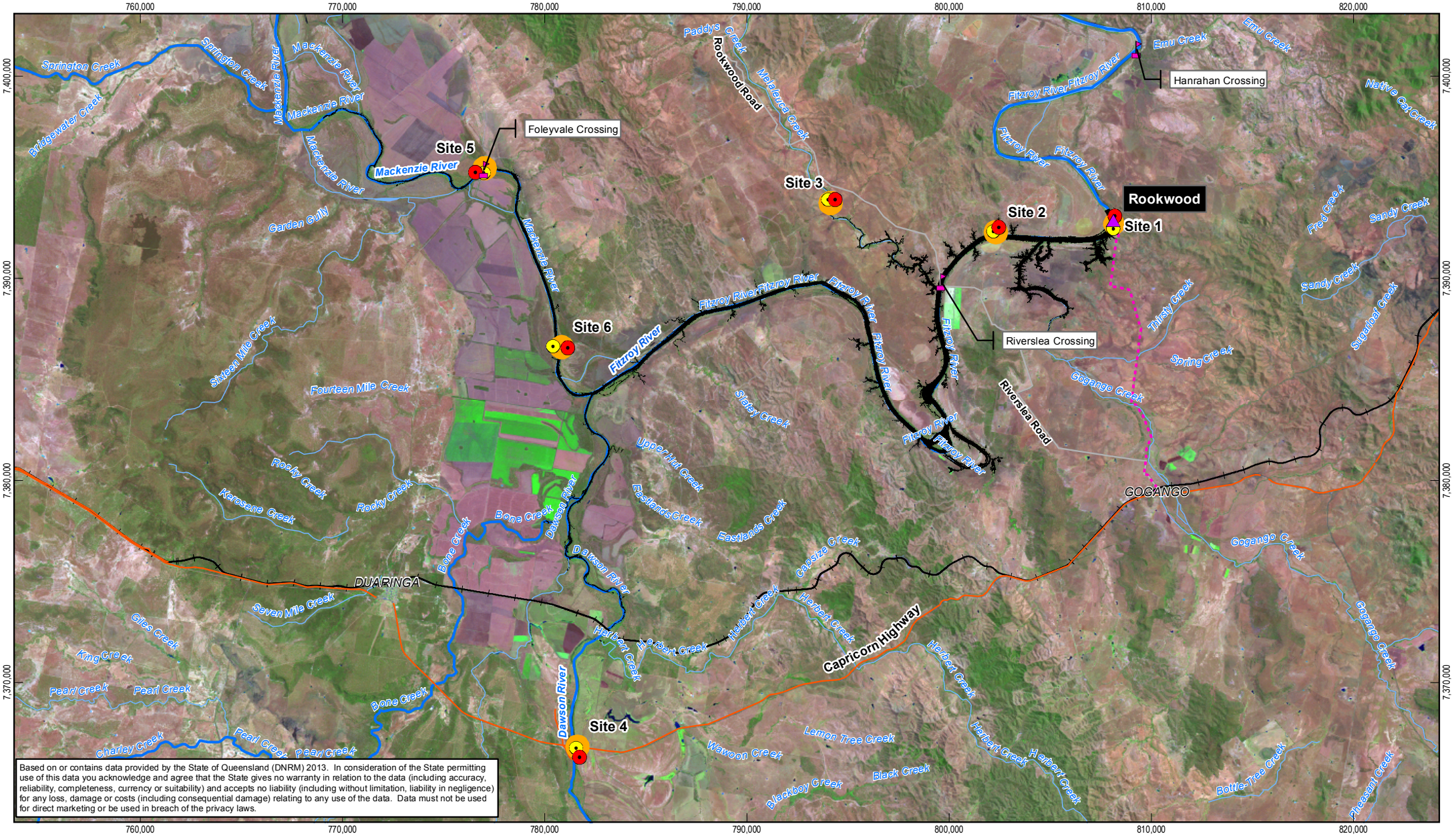
Dry season

Conditions during the dry season survey were generally fine and mild, with cool mornings and cold nights. Temperatures ranged between 7 ºC and 28.8ºC with a minimum average of 12.3 ºC and a maximum of 25.8ºC. Days were generally clear and sunny with low relative humidity (average 35.3% recorded at 3 pm), and total rainfall recorded during the survey period was 0.2 mm. No rainfall was recorded in the two week period preceding the surveys, while 7.8 mm of rain fell in the two months prior (23 May to 22 July 2009).

2.5.5 Site selection

Six fauna survey (trapping) sites (Table 2-1 and Figure 2-1) were chosen following a review of satellite imagery, RE mapping and field reconnaissance of the study area. The following criteria were considered when selecting survey site locations:

- Representative of major fauna habitats within the study area
- Covered a geographical range of habitats
- Corresponded with proposed inundation areas
- Accessibility by vehicle and/or boat and kayak (to maximise survey effort without compromising animal welfare.



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Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA94)
Grid: Map Grid of Australia 1994, Zone 55

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LEGEND

- Weir Location
- River Crossing
- Highway
- Streets (Local)
- Access Road
- Railway
- Waterway
- Impoundment Area
- Anabat
- Bird Census
- Trapping Site

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Gladstone Area Water Board

SunWater Making Water Work

Gladstone Area Water Board, SunWater
Lower Fitzroy River Infrastructure Project

Job Number 41-20736
Revision C
Date 20 Mar 2014

Rookwood Weir terrestrial fauna survey sites

Figure 2-1

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Level 9, 145 Ann St Brisbane QLD 4000 **T** 61 7 3316 3000 **F** 61 7 3316 3333 **E** bnemail@ghd.com.au **W** www.ghd.com.au

Data Source: © Copyright Commonwealth of Australia (Geoscience Australia): Waterways, State (2007); Sunwater: Waterways, Weir Locations - 2008; DNRM: Roads - 2010, Railways - 2010, Imagery - 2005; GHD Fauna Survey - 2009. Created by IH

Table 2-1 Description of terrestrial fauna trapping sites

Site number	Habitat description	Photos
1	Open woodland with grassy understorey and Melaleuca riparian fringe	 
2	Open woodland on rocky hillside	 
3	Riparian fringe with agricultural land behind	 

Site number	Habitat description	Photos
4	Open woodland with grassy understorey and Melaleuca riparian fringe	 
5	Open woodland with grassy understorey and Melaleuca riparian fringe Off-stream water body	 
6	Open woodland with grassy understorey and Melaleuca riparian fringe Brigalow	 

Note: Site 4 on the Dawson River is slightly upstream of the proposed maximum inundation extent (e.g. slightly upstream of the Project footprint). It was selected as a trapping site as it is representative of the terrestrial fauna habitats of the lower Dawson River, and was readily accessible by vehicle

2.5.6 Habitat assessments

Individual habitat types along the length of the rivers, including the riparian fringe and adjacent 500 m, were identified and classified for the purposes of the LFRIP. Habitat types are essentially vegetation communities with shared structural and floristic characteristics that provide a unique suite of resources for terrestrial wildlife. Habitat assessments were undertaken at each survey site and at sites representative of each habitat type throughout the Project footprint. This method provided a means of assessing the ecological value of each habitat. The following parameters were recorded during the habitat assessments:

- Structural complexity of vegetation (e.g. tree density, canopy cover and vertical structural complexity)
- Complexity of ground-level microhabitats (e.g. substrate type, vegetation cover, leaf litter, woody debris and presence of rocks)
- Habitat features (e.g. hollows, fallen logs, rock outcrops, nests, and water bodies)
- Abundance of hollow-bearing trees and the proportion of trees bearing arboreal mammal scratches
- Wildlife traces (e.g. scats, tracks, scratches, diggings, burrows, nests and bones)
- Opportunistic wildlife observations
- Sources of disturbance (e.g. adjacent land-use, feral animals, predation and weed infestation).

Indicative terrestrial habitat boundaries were mapped from aerial photographs and verified in the field (Appendix B).

The Relative Ecological Value (REV) of each habitat type was assessed based on features including:

- The relative abundance and diversity of resources
- The size and relative connectivity of vegetation
- Habitat condition (e.g. the level of disturbance due to weeds, feral animals and cattle grazing)
- Species richness (e.g. the number of fauna species present)
- The presence or potential presence of conservation significant species (listed under the NC Act and / or EPBC Act) and habitat suitable for these species
- Key ecological function, such as value as a habitat corridor or breeding, nesting or roosting site.

The following three categories describe the varying degree of REV of the habitat types identified in the Project footprint (Note: not all habitat components are necessarily applicable to each of the fauna habitat types assessed):

- **High:** Ground flora containing a high number of indigenous species; vegetation community structure; ground, log and litter layer intact and undisturbed; a high level of breeding, nesting, feeding and roosting resources available; a high richness and diversity of native fauna species; and / or habitat that supports or potentially supports conservation significant species through the provision of important foraging, breeding / nesting and / or shelter resources.
- **Moderate:** Ground flora containing a moderate number of indigenous species; vegetation community structure, ground log and litter layer moderately intact and undisturbed; a moderate level of breeding, nesting, feeding and roosting resources available; a moderate richness and diversity of native fauna species; and / or potential for utilisation by conservation significant species.
- **Low:** Ground flora containing a low number of indigenous species, vegetation community structure, ground log and litter layer disturbed and modified; a low level of breeding, nesting, feeding and roosting resources available; a low richness and diversity of native fauna species; and little value to conservation significant species.

2.5.7 Systematic surveys

The Systematic Surveys were comprised *of* six trapping sites that utilised a variety of trap types. The surveys were targeted, such that trap sites were selected on the basis of their potential to act as habitat for the mammals, reptiles and amphibians identified in the desktop reviews.

Terrestrial mammals, reptiles and amphibians

Trapping for terrestrial mammals, reptiles and amphibians was undertaken using a standardised combination of pit-fall traps, funnel traps, Elliott box traps, hair tubes, cage traps and drift fence complexes. At each trap site, traps were set in a single or split linear transect. Transects were split at certain sites in order to position traps in optimal microhabitats. Single linear transects consisted of a line of 20 Elliott box traps, 20 hair tubes and 10 cage traps. Split linear transects consisted of two lines each with 10 Elliott box traps, 10 hair tubes and five cage traps.

Pit-fall trap, funnel traps and drift fence complexes (Figure 2-2) were placed in four areas with suitable microhabitat, adjacent to the linear transects at each survey site. Traps were set and checked each morning for four consecutive nights. The trap configuration comprised:

- **Pit-fall trap, funnel traps and drift fence complexes**: four pit-fall traps and eight funnel traps were established at each trap site. These were configured in four separate pit-fall, funnel and drift fence complexes. Each complex consisted of a 6 m long (30 cm high) flywire drift fence with a pit-fall trap (20L plastic bucket) in the centre and two funnel traps along the fenceline either side of the bucket (Figure 2-2 and Plate 2-1). Wet sponges were placed in each pit and funnel trap and vegetation was positioned in or over the traps to provide shade and protection
- **Elliott box traps:** each survey site contained 20 Elliot traps prepared with universal bait[1]. Traps were positioned in shady areas or covered with vegetation to minimise heat exposure to trapped animals (Plate 2-2)
- **Hair tubes:** twenty hair tubes were placed at each trap site and prepared with universal bait. Hair tubes were positioned approximately 10 m parallel to the Elliott box traps. Half the hair tubes were set at ground level and the remainder on tree trunks in order to target both

[1] Universal bait consists of a mixture of peanut butter, rolled oats and sardines and / or honey.

ground and arboreal mammals (Plate 2-3). Hair traces recorded in hair tubes were sent to a specialist (Georgeanna Storey from Scats About Australia) for analysis and identification

- **Cage traps:** ten cage traps were set at each trap site (Plate 2-4). These were interspersed with Elliott box traps along linear or split liner transects. Traps were covered with hessian sacks to minimise cold or heat exposure, and to provide security and protection from harassment by predators. Cages were prepared with universal bait and/or a single raw chicken neck.

Figure 2-2 Pit-fall trap, funnel traps and drift fence complex layout

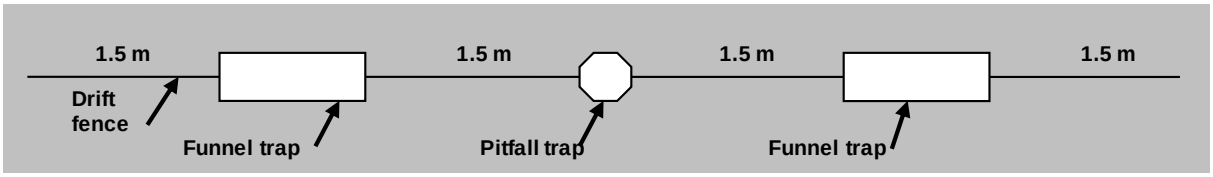


Plate 2-1 Pit-fall trap, funnel traps and drift fence complex

Plate 2-2 Elliot box trap

Plate 2-3 Hair tube

Plate 2-4 Cage trap

Bats

Anabat II Bat Detectors were used to survey microchiropteran (insectivorous) bats by recording and analysing their echolocation calls. Detectors were placed on the ground with the microphone orientated upwards at a 45° angle from the ground. Anabat units were placed in potential bat 'flyways' just before dusk and left to record calls overnight. Anabats were set at each site for one night and all bat calls recorded were sent to a qualified analyst (Greg Ford), Anabat echolocation call analysis specialist) for identification. Only bat calls with definite (one or more calls where absolutely no doubt existed as to the species identified) or probable (most likely the species named, however, some probability of confusion with species that use similar calls) identification were included in the results.

Harp traps (Plate 2-5) were also used for species identification. These were set during the late afternoon and then checked and lowered early the next morning. Up to four harp traps were used on any one night (two traps per site). Trapping locations were selected for their potential to act as bat "flyways". Captured bats were identified in the field using Churchill (2008) and Menkhorst and Knight (2004) as guides. Morphometric measurements of bats (e.g. forearm length) were taken using vernier callipers to aid identification.

Bats were released at or near their site of capture in the early morning (if removed from trap at or before dawn) or at dusk the same day (if retrieved from trap after dawn). Bats released at dusk were housed near the site of capture in a cool dark environment (hanging hessian sack) until the time of their release.

Plate 2-5 Harp traps

Birds

Bird surveys were undertaken at each of the trapping sites. A minimum of five censuses, comprising a total of 100 minutes, were undertaken at each site by at least one observer. Using the standard methodology developed by Birds Australia for the Bird Atlas project, each survey comprised a 20 minute census of birds within an unbounded two hectare area. Birds were detected either by visual observation (including use of binoculars) and / or aurally, and identified and recorded to species level. All systematic bird surveys were undertaken within three hours of dawn or two hours of dusk. Relevant weather details and the time of the surveys were also recorded. In addition to systematic surveys, opportunistic bird observations were recorded (see Section 2.5.8).

2.5.8 Non-systematic surveys

Opportunistic observations increase the likelihood of detecting rare or threatened species, which have unique habitat requirements and may not be captured / detected within the standard transects. To provide the best opportunity to determine the presence and relative prevalence of these species, use of systematic sampling with other, non-systematic targeted approaches is optimal. To address this, habitats sampled using the systematic sampling techniques were also surveyed using non-systematic techniques. Non-systematic sampling comprised the following:

- Diurnal searching – searches were conducted at each trap site for a minimum of 90 person minutes for all amphibians, reptiles, and mammals. Surveys comprised searching the ground layer (overturning logs and leaf litter) and low vegetation (under bark and in tree stumps), and recording all individuals observed. Species presence was also determined via secondary evidence, in the form of scats, tracks, diggings, burrows and remains
- Nocturnal searching – 90 person minutes were expended performing nocturnal searches at each trap site (where safety permitted). The nocturnal searches were conducted using a combination of high-powered spotlights and head torches. Spotlighting was conducted via foot traverse on land and also from boats along the banks of the river.

In addition to the non-systematic surveys at the trap sites, non-systematic surveys were also conducted throughout the study area in the form of incidental opportunistic observations. All vertebrate species observed or heard within the study area were noted and indirect evidence (such as scats, tracks, diggings, nests or dreys, feathers, bones and pellets) indicating the current or recent presence of species were recorded. Wherever possible, numbers of individuals, microhabitat use and other relevant information was recorded. Scat samples were sent to a specialist (Georgeanna Storey from Scats About Australia) for analysis and identification.

2.5.9 Fauna survey effort summary

In several instances the survey methods outlined above could not be implemented for all sites due to unsuitable trapping conditions and constraints associated with safety, access and weather (see Section 2.5.10). This was particularly true of activities associated with bat surveying (Anabat and harp trap deployment). As a result, harp trapping was focused on selected sites which represented ideal bat habitat. A summary of the survey efforts conducted at each site is outlined in Table 2-2 and Table 2-3.

Table 2-2 Summary of systematic and non-systematic techniques and locations – wet season

Systematic									Non-systematic	
Site	Number of trap nights*						Number of nights#	Number of minutes^	Number of minutes^	Number of minutes^
	Pit-fall trap	Funnel trap	Cage trap	Elliot box trap	Hair tube	Harp trap	Anabat detector	Bird survey	Diurnal searches	Nocturnal searches
1	16	32	40	80	80	6	1	100	90	90
2	16	32	40	80	80		1	100	90	90
3	16	32	40	80	80		1	100	90	90
4	16	32	40	80	80		1	100	90	90
5	16	32	40	80	80	2	1	100	90	90
6	16	32	40	80	80		1	100	90	90

*Number of nights in which traps were deployed multiplied by the number of traps at each site

#Number of nights Anabat detectors were deployed to remotely detect microchiropteran bat echolocation calls

^Minimum time in person minutes spent surveying

Table 2-3 Summary of systematic and non-systematic techniques and locations – dry season

Systematic									Non-systematic	
Site	Number of trap nights*						Number of nights#	Number of minutes^	Number of minutes^	Number of minutes^
	Pit-fall trap	Funnel trap	Cage trap	Elliot box trap	Hair tube	Harp trap	Anabat detector	Bird survey	Diurnal searches	Nocturnal searches
1	16	32	40	80	80	2	1	100	90	90
2	16	32	40	80	80		1	100	90	90
3	16	32	40	80	80		1	100	90	90
4	16	32	40	80	80		1	100	90	90
5	16	32	40	80	80	2	1	100	90	90
6	16	32	40	80	80		1	100	90	90

*Number of nights in which traps were deployed multiplied by the number of traps at each site

#Number of nights Anabat detectors were deployed to remotely detect microchiropteran bat echolocation calls

^ Minimum time in person minutes spent surveying

2.5.10 Limitations

Given that the field survey aimed to identify the maximum possible range of fauna within a discrete time period, it is recognised that not all field techniques utilised were optimal to target all taxonomic groups. As such, it is recognised that a number of limitations apply (discussed below), however the approach employed in this baseline terrestrial fauna assessment satisfied the assessment scope outlined in Section 2.1.

Placement of the trap sites

Placement of the trap sites was influenced by issues of accessibility and landholder consent. To ensure that traps could be checked and cleared of animals in a timely manner for reasons of animal welfare, some areas were not able to be targeted.

Seasons

Additional fauna species (particularly migratory species) may also have been recorded if the surveys were also undertaken at a range of different times throughout the year and during different years. A greater understanding of the use of the Project footprint by each fauna species would also be obtained. Desktop reviews were undertaken to partially compensate for these limitations.

As far as possible, timing of the field surveys were aimed at times of the year suitable to identify the greatest diversity of species, particularly threatened and migratory fauna. However, field surveys for the wet season could not commence until early autumn (22 - 27 April) as flood conditions prevented access into trap sites prior to this date, characteristic of the end of the wet season. A total of 337.4 mm of rain was recorded at Rockhampton Airport in the four months leading up to this survey, including 48.6 mm in the three weeks prior to the April survey. However, it is considered that the survey adequately sampled faunal assemblages that are likely to have prevailed in the Project footprint during the height of the wet season (i.e. January and February), when logistical constraints prevented sampling.

The dry season survey occurred at the end of July, and was preceded by two months in which only 7.8 mm of rain was recorded (at Rockhampton Airport). The prevailing climatic conditions at the time of the survey, namely warm, dry days, cool nights and very little rainfall in the preceding months are considered representative of the Central Queensland dry season. While acknowledged that the survey occurred in the early part of the season, faunal assemblages recorded during the survey are likely to have been representative of species that prevailed in the Project footprint throughout the dry season (i.e. through to approximately October).

3. Terrestrial fauna existing environmental values

3.1 Regional context

3.1.1 Bioregion

The proposed Rookwood Weir site is located in the northern extent of the Brigalow Belt South Bioregion, covering an area from Rockhampton in Central Queensland to Dubbo in New South Wales. The bioregion contains a variety of landscapes ranging from undulating hills, low ridges and valleys to flat alluvial plains. Geology within this region is predominantly Jurassic and younger deposits of the Great Artesian Basin, and Tertiary deposits with elevated basalt flows. Dominant vegetation communities include eucalypt woodlands, grasslands, brigalow-belah forests (*Acacia harpophylla, Casuarina cristata*), semi-evergreen vine thickets and open forests of ironbarks (*Eucalyptus* spp.), bloodwoods (*Corymbia spp.*), poplar box (*Eucalyptus populnea*), spotted gum (*Corymbia citriodora*) and cypress pine (*Callitris glaucophylla*).

The Brigalow Belt South Bioregion is characterised by high levels of habitat loss. In particular, the lowlands (e.g. alluvial and clay plains) and riparian zones have been extensively cleared for agriculture. Vegetation and fauna communities associated with these landscapes have therefore experienced decline. Most remnant vegetation in this bioregion persists within hills and ranges. Remnant vegetation in the area has a high proportion of endemic and naturally rare flora and fauna, the majority of which persists within hills and ranges.

Habitat reserves within the bioregion are also highly fragmented. Conservation opportunities are limited and depend heavily on off-reserve, community-based programs. Threatening processes identified within the bioregion include: vegetation clearing, linear infrastructure development, urban development, mining, road maintenance, grazing, drainage of habitat, altered water flows, impoundments, reduced water quality, altered fire regimes, feral animals, weeds, collectors, regional declines, recreation/tourism, disease, and lack of information about the region (DERM 2008). While 7.1% of the bioregion is under conservation tenure, only 27% of ecosystems present are represented (DEWHA 2009a).

3.1.2 Subregion

The Rookwood Weir Project footprint runs through two subregions of the Brigalow Belt South Bioregion, namely:

- Mount Morgan Ranges subregion (Brigalow Belt South 4)
- Boomer Range subregion (Brigalow Belt South 3).

Mount Morgan Ranges

The Mount Morgan Ranges subregion is a rugged, hilly area, extending inland of Rockhampton, south to the Eidsvold area. Geology is predominantly volcanic with areas of igneous rocks and small areas of folded meta-sediments (Sattler and Williams 1999). Vegetation varies with topography where steep areas are dominated by narrow-leaved ironbark (*Eucalyptus crebra*) woodlands with red bloodwood (*Corymbia erythrophloia*), spotted gum (*Corymbia citriodora*), and rosewood (*Acacia rhodoxylon*). Lower erosional slopes support silver leaved ironbark (*Eucalyptus melanophloia*) woodlands, while colluvial slopes support spotted gum (*Corymbia citriodora*)

woodland. Alluvial plains support forest red gum (*Eucalyptus tereticornis*) and Moreton Bay ash (*Corymbia tessellaris*).

This subregion represents a high-value habitat corridor that runs north-south. Six nationally endangered ecosystems occur within this subregion including brigalow, littoral rainforest and coastal vine thickets of eastern Australia, semi-evergreen vine thicket, native grasslands of Central Queensland and the upper Fitzroy Basin catchment, and weeping Myall woodlands. Approximately 52% of ecosystem types within this subregion are listed as endangered or vulnerable (DEWHA 2009b).

Boomer Range

Boomer Range is a hilly to mountainous subregion with relatively intact vegetation. Geology is predominantly Permian volcanics and sediments with areas of Devonian-Carboniferous sediments. This subregion generally has similar vegetation to the Mount Morgan Rangesm, where narrow-leaved ironbark (*Eucalyptus crebra*) and rosewood (*Acacia rhodoxylon*) communities are dominant. Silver leaved ironbark (*Eucalyptus melanophloia*) woodlands occur on erosional slopes, spotted gum (*Corymbia citriodora*) woodland occurs on colluvial slopes, and alluvial plains support forest red gum (*Eucalyptus tereticornis*) and Moreton Bay ash (*Corymbia tessellaris*). Areas of vine thicket occur on some slopes in sheltered locations (Sattler and Williams 1999).

This subregion forms an important regional wildlife corridor linking subregions Brigalow Belt South 17 and Brigalow Belt South 18. Approximately 54% of ecosystem types within this subregion are listed as endangered or vulnerable.

3.2 Site characteristics

3.2.1 Overview

The Rookwood Weir Project footprint contains the confluence of the Dawson and Mackenzie Rivers. The landscape is predominantly flat and has been cleared for grazing in many areas. However, low undulating rocky hills and uncleared alluvial plains occur in areas which also retain remnants of native woodland vegetation. The upper Fitzroy River, and the lower Dawson and Mackenzie Rivers are generally narrower and more dynamic than areas further downstream as there are no man-made barriers in these sections of river. Consequently, they retain many of the features of a more natural riverine system. Weirs do however occur upstream of the Project footprint on both the Dawson and Mackenzie Rivers.

The Rookwood Weir section is more dynamic than lower reaches, experiencing greater seasonal changes in river flow. As a result, this section contains a greater diversity of riparian habitats. Open riverine sections are interspersed with more confined sections of shallow water riffles and runs and mature vegetation is established on shallow sand banks within the river.

3.2.2 Vegetation communities

Flora and vegetation communities within the study area have been independently assessed and presented in a separate report (Nangura Environmental Services 2007). As the aim of this report is to document terrestrial fauna values, vegetation is only discussed within the context of its value as habitat and resources for wildlife.

3.2.3 Regional ecosystems

Seven major RE communities occur within and adjacent to the Rookwood Weir Project footprint. The RE types and special values (where documented) of these habitats as described in the Regional Ecosystem Description Database (REDD) (2007) are listed below:

- **Endangered RE11.3.1** (brigalow), *Acacia harpophylla* and / or *Casuarina cristata*:
  - Habitat for rare and threatened flora species including the painted honeyeater (*Grantiella picta*), particularly in subregion 35 (REDD 2007).
- **Of concern RE 11.3.2** *Eucalyptus populnea* woodland on alluvial plains:
  - Habitat for rare and threatened flora species including *Homopholis belsonii* (REDD 2007).
- **Of concern RE 11.3.3** *Eucalyptus coolabah* woodland on alluvial plains:
  - Mature trees provide hollows for fauna especially nesting birds. Associated with a high number fauna species (Dick 1992; Venz et al. 2002) (REDD 2007).
- **Of concern RE 11.3.4** *Eucalyptus tereticornis* tall woodland on alluvial plains:
  - Habitat for rare and threatened flora including *Eucalyptus raveretiana* in subregions 12 and 17 (REDD 2007).
- **Least concern RE 11.3.25** *Eucalyptus tereticornis* and *Eucalyptus camaldulensis* woodland fringing drainage lines:
  - Habitat for rare and threatened flora species including *Eucalyptus raveretiana*. Shown to be associated with a high fauna species richness in the Taroom area (Venz et al. 2002). Within parts of the Fitzroy Basin catchment, this RE is known habitat for the rare and threatened freshwater turtle *Rheodytes leukops*. Known to be important habitat for other riparian freshwater turtle species (REDD 2007).
- **Least concern RE 11.11.1** *Eucalyptus crebra* and *Acacia rhodoxylon* woodland on old sedimentary rocks.
- **Least concern RE 11.12.2** *Eucalyptus melanophloia* woodland on igneous rocks.

3.2.4 Habitat types

Nine broad terrestrial fauna habitats were identified as per the criteria outlined in Section 0, within the Rookwood Weir Project footprint. These were:

- Open woodland with grassy understorey and *Melaleuca* riparian fringe
- Open woodland on rocky hillside
- Brigalow
- Open woodland with sandy substrate
- *Melaleuca* on sandy substrate
- Narrow riparian fringe
- Agricultural land
- Creeks

- Off-stream water bodies[2].

The habitat types identified vary in their ecological value as habitat for terrestrial fauna due to differences in the structural complexity of vegetation, substrate type and differing levels of disturbance. These factors influence the diversity and abundance of microhabitats and resources available to terrestrial fauna.

The open woodland with grassy understorey and *Melaleuca* riparian fringe was characterized by high structural complexity/diversity and as a result this habitat supported a diversity of terrestrial fauna. The open woodland on rocky hillside was also structurally complex and provided a diversity of resources for generalist and potentially niche species. Areas of brigalow occurred near the confluence of the Mackenzie and Dawson Rivers. Due to its potential to provide critical habitat for a number of EPBC Act and NC Act listed fauna reptiles including the brigalow scaly foot (*Paradelma orientalis*), Dunmall'.s snake (*Furina dunmalli*), yakka skink (*Egernia rugosa*) and ornamental snake (*Denisonia maculata*), this habitat type was considered to have high ecological value. Open woodlands and *Melaleuca* on sandy substrates generally had low ground-level and canopy complexity but supported many shrub and tree dwelling animals (such as woodland and forest birds and arboreal mammals).

Large areas of the Rookwood Weir Project footprint had been cleared for agriculture and only a narrow fringe of eucalypt (and to a lesser extent, *Melaleuca*) riparian vegetation remained. This habitat type had lower structural complexity and provided fewer resources for native wildlife than the other habitat types. Agricultural land had reduced species richness but retained foraging habitat values for raptors, snakes, small ground mammals, macropods and other birds. Creeks and off-stream water bodies provided important resources (particularly foraging) for an array of terrestrial fauna including frogs, waterbirds and microchiropteran bats.

The fauna habitat types and boundaries in the Rookwood Weir study area are summarised in Table 3-1 and illustrated in Figure 3-1.

[2] For this study, off-stream water bodies were defined as palustrine wetlands (vegetated swamps, billabongs), oxbow lakes, and farm dams in the floodplain adjacent to the main channel and adjoining creeks, and flood-runners / secondary channels within the bed and banks (i.e. including riparian zone) occurring within the Project footprint.

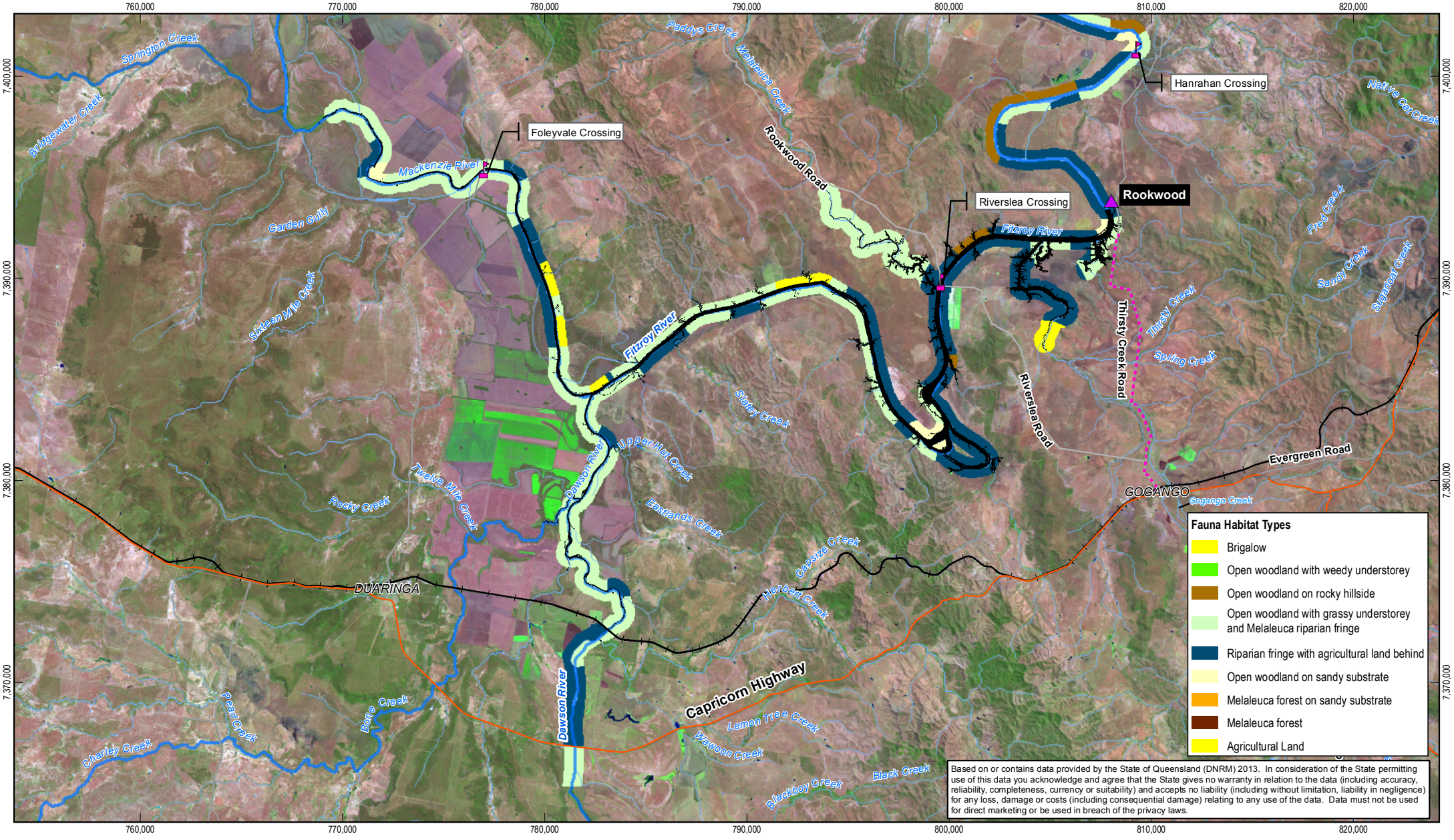
Table 3-1 Terrestrial habitat type, characteristics and values in the Rookwood Weir Project footprint

Habitat type	Characteristics	Value for wildlife	Representative example of habitat
Open woodland with grassy understorey and Melaleuca riparian fringe	Riparian fringe of Melaleuca Low-moderate density mature eucalypts Sparse shrub layer Complex understorey with native grasses and sedges Fallen woody debris and leaf litter Hollows and stags	Habitat value for: • Canopy-nesting birds • Skinks, dragons, geckos and snakes • Tree frogs and burrowing frogs • Koalas, possums and gliders • Bandicoots, rodents and macropods. Relative Ecological Value: Moderate Possible habitat for listed threatened species: squatter pigeon, yakka skink, little pied bat	 
Open woodland on rocky hillside	Low density stunted eucalypts Areas of Casuarina and vine thicket Sparse understorey vegetation Rocky substrate Abundance of fallen logs and woody debris	Habitat value for: • Canopy nesting birds • Snakes, skinks, dragons and geckos • Small ground mammals. Relative Ecological Value: High Possible habitat for listed threatened species: northern quoll	

Habitat type	Characteristics	Value for wildlife	Representative example of habitat
Brigalow	Few mature canopy trees Moderate density acacia shrub layer Sparse understorey vegetation Relatively complex ground substrates Leaf litter, fallen woody debris	Habitat value for: • Shrub-nesting birds • Skinks, dragons, geckos and snakes • Macropods. Relative Ecological Value: High Possible habitat for listed threatened species: brigalow scaly-foot, yakka skink, ornamental snake, Dunmall's snake, northern quoll	
Open woodland on sandy substrate	Sandy substrate Relatively simple understorey Shrub layer largely absent Mature eucalypts Stags abundant Many hollows	Habitat value for: • Canopy birds and waterbirds • Possums, koalas and gliders. Relative Ecological Value: Moderate Possible habitat for listed threatened species: squatter pigeon	
Melaleuca on sandy substrate	No tall canopy trees Dense low Melaleucas No understorey vegetation Sandy substrate Relatively low habitat complexity Seasonally inundated	Habitat for: • Shrub-nesting birds and waterbirds • Skinks, dragons and snakes • Nesting habitat for crocodiles and turtles. Relative Ecological Value: High Possible habitat for listed threatened species: Fitzroy River turtle, white-throated snapping turtle, estuarine crocodile	

Habitat type	Characteristics	Value for wildlife	Representative example of habitat
Narrow riparian fringe	Moderate-density tree layer of eucalypts Dense but narrow shrub layer of juvenile eucalypts Understorey of leaf litter, grass and woody debris Very narrow, exposed to edge effects including noise, light and weeds Corridor for wildlife movement	Habitat value for: • Pasture-adapted birds • Common possums • Grass skinks, wall skinks and bearded dragons • Introduced and native rodents. Relative Ecological Value: Moderate Possible habitat for listed threatened species: squatter pigeon	
Agricultural land	Tree and shrub layer absent Uniform ground cover of short to long grazed grass Few logs or woody debris Structurally simple	Habitat value for: • Pasture land birds • Raptors • Snakes • Macropods. Relative Ecological Value : Low Possible habitat for listed threatened species: none	
Creeks	Narrow stream Shallow-slow flowing water High density of overhanging vegetation High density of shrub and ground-level vegetation High density of in-stream debris	Habitat value for: • Forest birds and waterbirds • Water dragons and snakes • Frogs • Ground mammals • Microchiropteran bats. Relative Ecological Value: High Possible habitat for listed threatened species: little pied bat, black-necked stork, star finch, cotton pygmy-goose, ornamental snake	

Habitat type	Characteristics	Value for wildlife	Representative example of habitat
Off-stream water bodies	Seasonally connected to main river system by floodwaters High density of overhanging vegetation High abundance of in-stream debris	Habitat value for: • Forest birds and waterbirds • Burrowing and ephemeral breeding frogs • Snakes • Ground mammals • Microchiropteran bats. Relative Ecological Value: High Possible habitat for listed threatened species: little pied bat, black-necked stork, cotton pygmy-goose, Australian painted snipe, ornamental snake	



1:250,000 (at A4)

0 2 4 6 8 10

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA94)
Grid: Map Grid of Australia 1994, Zone 55

N

LEGEND

- Weir Location
- River Crossing
- Highway
- Streets (Local)
- Access Road
- Railway
- Waterway
- Impoundment Area

Gladstone Area Water Board, SunWater
Lower Fitzroy River Infrastructure Project

Job Number 41-20736
Revision F
Date 20 Mar 2014

Rookwood fauna habitat types

Figure 3-1

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Level 9, 145 Ann St Brisbane QLD 4000 **T** 61 7 3316 3000 **F** 61 7 3316 3333 **E** bnemail@ghd.com.au **W** www.ghd.com.au

Data Source: : © Copyright Commonwealth of Australia (Geoscience Australia): Waterways, State (2007); Sunwater: Waterways, Weir Locations - 2008; DNRM: Roads - 2010, Railways - 2010, Imagery - 2005;GHD: Fauna Habitat Types/2009. Created by IH.

3.2.5 Habitat dynamics

The riverine system within the Rookwood Weir Project footprint is more dynamic and seasonally variable than lower reaches of the Fitzroy River which are regulated and support extensive impoundments. The region is characterised by extreme seasonality in rainfall, with a distinct wet and dry season. This is turn, affects changes in the environmental and fauna habitats in the Project footprint, both through an increase in rainfall and also an increase in river level and flow. Habitats within the Project footprint are typically exposed to strong seasonal changes, particularly isolation and drying of pools towards the end of the dry season. This, in turn, affects changes in the environment and habitats in the Project footprint both through the increase in rainfall and the increase in river level and flow.

Habitats within the riparian zone are also subject to variation as a result of seasonal changes in river level and flow, with a period of extreme wet season inundation followed by a gradual decline in water level over the dry season. As water levels subside, pools become increasingly isolated, thereby increasing the diversity of terrestrial habitats. In particular, towards the end of the dry season stretches of the lower Dawson and lower Mackenzie Rivers are converted from flowing systems to a chain of isolated pools. Local fauna assemblages are characterised by species able to take advantage of these stochastic conditions.

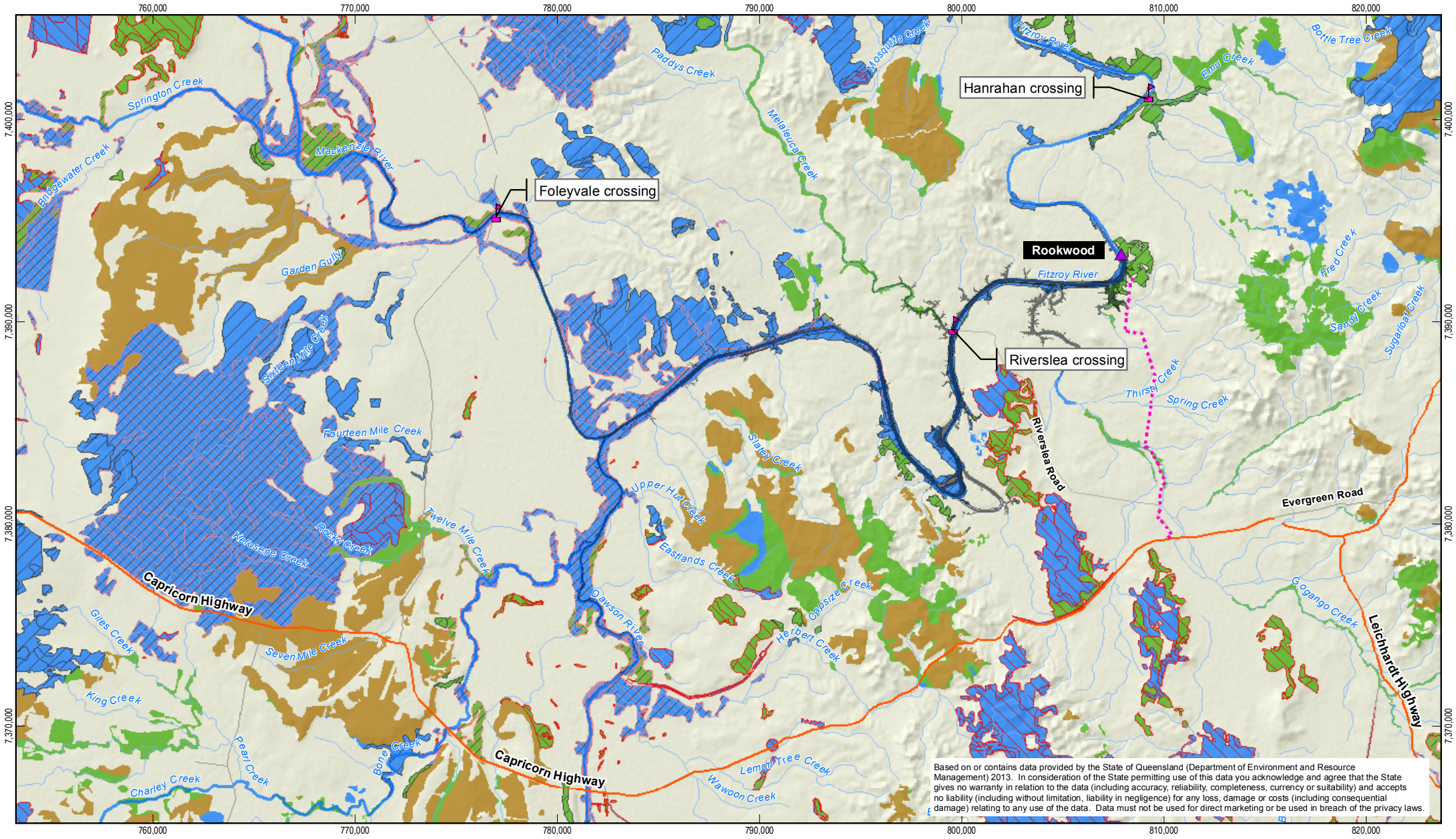
Many fauna species are adapted to utilise habitats and resources that are seasonally available and are likely to occur only within habitats that are seasonally inundated. Off-stream water bodies represent an ephemeral resource that plays an important role in the ecology of many wildlife species. These areas are particularly important as potential breeding habitat for ephemeral pond-breeding frogs, foraging habitat for a number of species of microchiropteran bats and foraging and sheltering habitats for water birds (potentially including EPBC Act listed 'Migratory' and 'Marine' species).

Away from the river, habitats in the Project footprint are subject to changes that are driven by the seasonal difference in rainfall. The ground-level productivity in woodland and grassland habitats increases during and immediately following the wet season in response to rainfall, and this provides a seasonal resource that can be utilised by a range of terrestrial animals.

3.2.6 Wildlife corridors and connectivity

Habitat connectivity within the Rookwood Weir Project footprint is predominantly determined by patterns of historical land clearing. Lowland areas along the Fitzroy River have been largely cleared for agriculture (grazing and cropping) such that the most extensive, interconnected networks of regional habitat persist on hills and rocky outcrops where vegetation clearing has not occurred. These areas support extensive networks of open woodland habitats with rocky substrate. Given their connectivity and unique resource values, these areas have high ecological value as habitat and regional corridors for wildlife movement. Under DERM Biodiversity Planning Assessment (BPA) mapping, these areas are classified as being state significant bioregional wildlife corridors (Figure 3-2).

Within the agricultural lowland areas, vegetation has been retained, predominantly along the riparian fringe. Although this lowland vegetation has been subjected to significant edge effects and consequently supports a reduced number of species, it does play an important ecological role, providing a level of connectivity between habitat remnants.



1:250,000 (at A4)

0 2.5 5 7.5 10

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA94)
Grid: Map Grid of Australia 1994, Zone 55

N

LEGEND

- Weir Location
- River Crossing
- Waterway
- Access Road
- Impoundment Area

BPA Qualifying Information
- Bioregional Corridor
- Habitat Remnant
- Habitat Remnant and Bioregional Corridor

Biodiversity Significance
- State Habitat for EVR taxa
- State
- Regional
- Local or Other Values

GHD
CLIENTS|PEOPLE|PERFORMANCE

Gladstone Area Water Board

SunWater Making Water Work

Gladstone Area Water Board, SunWater
Lower Fitzroy River Infrastructure Project

Job Number 41-20736
Revision F
Date 20 Mar 2014

Rookwood Biodiversity Planning Assessment mapping Overview

Figure 3-2

G:\41\20736\GIS\Projects\MXD\200_Report\4120736_230_Rev_E_Index.mxd

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Data Sources: © Copyright Commonwealth of Australia (Geoscience Australia): Waterways (2007); Sunwater: Waterways, Weir Locations - 2008; DNRM: BPA -2009; GHD: Access Road - 2013. Created by: MS

At a finer scale, habitat connectivity in the upper reaches of the Rookwood Weir Project footprint changes seasonally as water levels subside over the dry season. Animals dependent upon ponded water become increasingly isolated, while terrestrial ground-dwelling animals have increased landscape connectivity and therefore have access to resources on both sides of the river.

3.3 Fauna species and diversity

3.3.1 Overview

Fauna species and diversity (including common species, threatened species, 'Marine' and / or 'Migratory' species and introduced species) was recorded through desktop analysis and field fauna surveys. Table 3-2 summarises the number of mammals, birds, reptiles and amphibians recorded according to the survey method. Full desktop database search results are presented in Appendix A, while a summary of field survey results is presented in Appendix B.

Table 3-2 Total number of fauna species predicted to occur or recorded within the study area

	EPBC Environmental Reporting Tool (predicted to occur)	DERM Wildlife Online Database (historically recorded)	Queensland Museum Specimen Database (historically recorded)	Birds Australia Atlas (historically recorded)	Field surveys (observed within Project footprint)
Species diversity		6 amphibians 9 reptiles 14 mammals 112 birds	6 reptiles 3 mammals	148 birds	12 amphibians 22 reptiles 41 mammals 133 birds
EPBC Act and NC Act threatened species	4 reptiles 3 mammals 4 birds	3 birds	1 mammal	1 bird	2 mammals 4 birds
EPBC 'Marine' and / or 'Migratory' species	14 birds	21 birds	-	39 birds	23 birds
Introduced/pest species	5 mammals	1 amphibian 5 mammals	-	-	1 amphibian 8 mammals

3.3.2 Amphibians

Twelve amphibian species were recorded during the wet and dry season surveys, including the introduced cane toad (*Rhinella marina*), however no conservation significant amphibian species were detected. Amphibian diversity comprised tree frog species such as the green tree frog (*Litoria caerulea*) (Plate 3-1), Peron's tree frog (*Litoria peronii*), stony creek frog (*Litoria wilcoxi*), broad palmed frog (*Litoria latopalmata*) and red tree frog (*Litoria rubella*), and burrowing frogs such as the ornate burrowing frog (*Platyplectrum ornatum*), spotted grass frog (*Limnodynastes tasmaniensis*) salmon-striped frog, (*Limnodynastes salmini*) (Plate 3-2). The ornate burrowing frog was the most abundant native species observed during the wet season with individuals recorded at five of the six survey sites.

A full list of amphibian species observed within the Project footprint is provided in Appendix B.

Plate 3-1 Green tree frog (Litoria caerulea)

Plate 3-2 Salmon-striped frog (*Limnodynastes salmini*)

3.3.3 Reptiles

A total of twenty-two reptile species were recorded during wet and dry season surveys within the Rookwood Weir Project footprint, however no species of conservation significance were detected. Reptile diversity was greatest during the wet season with seventeen species recorded throughout the Project footprint. Only thirteen species were recorded during the dry season surveys. The higher diversity of reptiles observed during the wet season was expected due to the positive relationship that exists between environmental temperature and reptile activity level. A full list of reptile species observed is provided in Appendix B.

The family Scincidae (skinks) were the most abundant and diverse reptilian group recorded within the Project footprint. Rainbow skinks from the genus *Carlia* were observed frequently throughout the Project footprint in both the wet and dry season surveys. Less frequently encountered species included: Martin's skink (*Eulamprus martini*), eastern water skink (*Eulamprus quoyii*), copper-tailed skink (*Ctenotus taeniolatus*), *Morethia taeniopleura* and *Morethia boulengeri*. Overall, the wall skink (*Cryptoblepharus virgatus*) was the most widespread species, with individuals observed at multiple sites during both the wet and dry season surveys (Plate 3-3).

Four species of gecko were recorded within the Project footprint, including the dubious dtella (*Gehyra dubia*), Bynoe's gecko (*Heteronotia binoei*), oscellated velvet gecko (*Oedura monilis*) (Plate 3-4) and *Gehyra catenata*. Geckos were most commonly observed sheltering under tree bark or fallen logs. The oscellated velvet gecko was the only species not recorded during the wet season surveys.

Dragons (family Agamidae) were represented by two species: the bearded dragon (*Pogona barbata*) and the eastern water dragon (*Physignathus lesueurii*). Two pythons, the coastal carpet python (*Morelia spilota*) and the black-headed python (*Aspidites melanocephalus*) were identified, whilst the keelback (*Tropidonophis mairii*) and eastern brown snake (*Pseudonaja textilis*) represented the only recordings of snakes belonging to the families Colubridae and Elapidae respectively. Elapid and colubrid snakes were poorly represented throughout the Project footprint however the abundance of snake tracks observed along the sand banks suggests additional common species such as the taipan (*Oxyuranus scutellatus*), yellow-faced whip snake (*Demansia psammophis*) and common tree snake (*Dendrelaphis calligastra*) are likely to occur. Goanna tracks were also commonly observed on the sand banks suggesting one or more species from the family Varanidae may occur within the Project footprint.

Plate 3-3 Wall skink (*Cryptoblepharus virgatus*)

Plate 3-4 Ocellated velvet gecko (*Oedura monilis*)

3.3.4 Mammals

Forty-two mammal species were recorded during both the wet and dry season surveys, including eight introduced species and two conservation significant species. Mammalian diversity varied between seasons with twenty-three native species recorded in the wet season and thirty-three native species observed during the dry season. Microchiropteran bats were the most diverse mammalian group observed within the Project footprint with seventeen species recorded on the Anabat II bat detector and / or captured in the harp traps.

The Troughton's shealthtail bat (*Taphozous troughtoni*) was recorded in the open woodland habitat at Site 5 in the wet season, and in open woodland on rocky hillside habitat at Site 2 in the dry season. This species was listed as 'Endangered' under the NC Act when reporting was completed in 2009 however, this species is no longer listed as threatened under the NC Act.

The little pied bat (*Chalinolobus picatus*) was detected in the dry season by the Anabat detector at Sites 4 and 5 (characterised by open woodland with a grassy understorey and *Melaleuca* riparian fringe). This species is listed as 'Near threatened' under the NC Act. Bat species captured in the harp traps included the little bent-winged bat (*Miniopterus australis*), an undescribed broad-nosed bat (*Scotorepens sp*), large-footed myotis (*Myotis macropus*) and hoary wattled bat (*Chalinolobus nigrogriseus*) (Plate 3-5).

Arboreal mammals recorded within the Project footprint included the common brushtail possum (*Trichosurus vulpecula*) (Plate 3-6), greater glider (*Petauroides volans*), yellow-bellied glider (*Petaurus australis*), sugar glider (*Petaurus breviceps*) and squirrel glider (*Petaurus norfolcensis*). Whilst no koalas were observed within the study area, scats belonging to the species were recorded at Site 6 and throughout the riparian vegetation within the Dawson River Project footprint area.

Macropods were represented by five species, the agile wallaby (*Macropus agilis*), whiptail wallaby (*Macropus parryi*), eastern grey kangaroo (*Macropus giganteus*), euro (*Macropus robustus*) (Plate 3-7), and swamp wallaby (*Wallabia bicolor*).

The water rat (*Hydromys chrysogaster*) and the delicate mouse (*Pseudomys deliculatus*) were the only native rodents recorded within the Project footprint. The water rat was recorded during both the wet and dry season surveys, while the delicate mouse was identified from a hair sample collected during the dry season. Other ground dwelling mammals observed included the northern

brown bandicoot (*Isoodon macrourus*), rufous bettong (*Aepyprymnus furescens*) (Plate 3-8) and echidna (*Tachyglossus aculeatus*). Indirect evidence of these species in the form of dirt diggings and scats were abundant throughout the Project footprint.

Introduced species recorded in the Rookwood Weir Project footprint included the domestic cow (*Bos taurus*), wild dog (*Canis familiaris*), red fox (*Vulpes vulpes*), deer (*Cervus sp*), feral cat (*Felis catus*), European rabbit (*Oryctolagus cuniculus*), feral pig (*Sus scrofa*) and house mouse (*Mus musculus*).

Plate 3-5 Hoary wattle bat (Chalinolobus nigrogriseus)

Plate 3-6 Common brushtail possum (Trichosurus vulpecula

Plate 3-7 Euro (Macropus robustus)

Plate 3-8 Rufous bettong (Aepyprymnus furescens)

3.3.5 Birds

A total of 133 bird species were recorded during the wet and dry season surveys within the Rookwood Weir Project footprint (Appendix B). The bird diversity comprised species from 50 families, and included waterbirds, raptors, parrots, forest birds, woodland birds, grassland birds and owls. Four threatened bird species were recorded, namely the cotton pygmy-goose (*Nettapus coromandelianus*), black-necked stork (*Ephippiorhynchus australis*) (Plate 3-9) and black-chinned honeyeater (*Melithreptus albogularis*) all listed as 'Near threatened' under NC Act, and the southern sub-species of squatter pigeon (*Geophaps scripta scripta*), listed as 'Vulnerable' under EPBC Act and NC Act. Twenty-three species listed as 'Marine' and / or 'Migratory' under the

EPBC Act were also observed, one of the most common of which was the rainbow bee-eater (*Merops ornatus*) (Plate 3-10) (see Section 3.4.4).

Waterbirds were prevalent in the Rookwood Weir Project footprint, with species recorded including the grey teal (*Anas gracilis*), Australasian shoveler (*Anas rhynchotis*), Pacific black duck (*Anas superciliosa*), plumed whistling-duck (*Dendrocygna eytoni*), cotton-pygmy-goose (*Nettapus coromandelianus*), green pygmy-goose (*Nettapus pulchellus*), white-faced heron (*Egretta novaehollandiae*), black bittern (*Ixobrychus flavicollis australis*), nankeen night heron (*Nycticorax caledonicus*), Australian pelican (*Pelecanus conspicillatus*), great crested grebe (*Podiceps cristatus*) and pied cormorant (*Phalacrocorax varius*).

Forest birds were encountered in habitats boasting remnant woodland vegetation and riparian forest. Species encountered included the white-throated treecreeper (*Cormobates leucophaeus*), topknot pigeon (*Lopholaimus antarcticus*), restless flycatcher (*Myiagra alecto*), leaden flycatcher (*Myiagra rubecula*), forest kingfisher (*Todiramphus macleayii*), Lewin's honeyeater (*Meliphaga lewinii*) and brown thornbill (*Acanthiza pusilla*). More heavily vegetated habitats along the riparian fringe and, in and along ephemeral gullies provided suitable habitat for such species.

Birds recorded in more open woodland areas included the spangled drongo (*Dicrurus bracteatus*), red-winged parrot (*Aprosmictus erythropterus*), blue-winged kookaburra (*Dacelo leachii*), laughing kookaburra (*Dacelo novaeguineae*), grey crowned babbler (*Pomatostomus temporalis*), common koel (*Eudynamys scolopacea*), pheasant coucal (*Centropus phasianinus*), white-winged chough (*Corcorax melanorhamphos*) and pale-headed rosella (*Platycercus adscitus*).

Eight raptor species were recorded including the brown goshawk (*Accipiter fasciatus*), wedge-tailed eagle (*Aquila audax*), Pacific baza (*Aviceda subcristata*), whistling kite (*Haliastur sphenurus*), white-bellied sea-eagle (*Haliaeetus leucogaster*), black kite (*Milvus migrans*), nankeen kestrel (*Falco cenchroides*) and brown falcon (*Falco berigora*). Five nocturnal birds, the nankeen night heron (*Nycticorax caledonicus*), southern boobook (*Ninox novaeseelandiae*), barn owl (*Tyto alba*), Pacific barn owl (*Tyto javanica*) and the tawny frogmouth (*Podargus strigoides*) were also observed.

Plate 3-9 Black-necked stork (*Ephippiorhynchus australis*)

Plate 3-10 Rainbow bee-eater (*Merops ornatus*)

3.3.6 Introduced species

Based on the search results of the DEWHA Environmental Reporting Tool, DERM Wildlife Online database and the wet and dry season field survey results, ten introduced fauna species occur, or are predicted to occur, within the study area (Table 3-3).

Table 3-3 Introduced terrestrial fauna species that occur, or may occur in the Project footprint

Species	Observed / previously recorded	Predicted to occur*	Probable abundance	Impact
Bos taurus domestic cow	✓		High	Erode soil and damage vegetation Pollute water Spread weeds
Canis familiaris wild dog	✓		Low	Predate on native mammals and birds Compete with native predators
Capra hircus goat		✓	Low	Damage vegetation Degrade land
Cervus sp deer	✓		Low	Damage vegetation Degrade land
Felis catus feral cat	✓	✓	Low	Compete with native predators Transmit disease to native fauna, domestic livestock and humans Prey on native fauna (mammals, birds and reptiles)
Mus musculus house mouse	✓		Medium#	Compete with native rodents Transmit disease to native fauna and humans
Oryctolagus cuniculus European rabbit #	✓	✓	Low	Damage vegetation Compete with native mammals
Rhinella marinus cane toad	✓		High	Compete with other insectivores Toxic to native mammals and birds May transmit disease to native fauna Prey on tadpoles of native amphibians
Sus scrofa pig	✓	✓	High	Erode soil and damage vegetation Predate on native wildlife
Vulpes vulpes fox	✓	✓	Low	Predate on native mammals and birds Compete with native predators Transmit disease to domestic livestock and humans

*Based on the search results of the DEWHA Environmental Reporting Tool

#This species is susceptible to rapid population increases and declines

3.4 Important habitats and conservation significant terrestrial species

3.4.1 Important habitats

Brigalow

Brigalow (Plate 4-11) represents potentially important habitat for a number of EPBC Act and NC Act listed reptile species, including the Brigalow scaly-foot (*Paradelma orientalis*), Dunmall's snake (*Furina dunmalli*), ornamental snake (*Denisonia maculata*), and yakka skink (*Egernia rugosa*). Brigalow is characterised by the presence of *Acacia harpophylla* and often occurs with *Casuarina cristata.* Together these form low shrubby vegetation with an abundance of fallen woody debris and relatively complex ground substrates, ideal for such species. This vegetation provides nesting habitat for shrub-nesting birds and also microhabitats for a range of reptiles. However, their dependence on just one vegetation community has subsequently led to their decline as a result of extensive clearing, such that Brigalow is now listed as a Nationally Endangered Community under the EPBC Act. In addition to providing habitat for listed reptile species, Brigalow also represents potential habitat for listed microchiropteran bats such as the little pied bat (*Chalinolobus picatus*), golden tipped bat (*Kerivoula papuensis*) and eastern long-eared bat (*Nyctophilus timoriensis*).

While this habitat has only moderate species richness (given the absence of hollows or canopy level vegetation), it has high ecological value as potential habitat for conservation significant species. It is important to note that brigalow occurs in small fragments within the Project footprint, namely near the confluence of the Dawson and Mackenzie Rivers (refer to Appendix B) and although it does have the potential to support threatened species, none were observed during wet and dry season surveys.

Plate 3-11 Brigalow woodland habitat with fallen woody debris

Off-stream water bodies

Semi-permanent and ephemeral water bodies represent an important resource for many wildlife species (Plate 3-12). They are seasonally inundated during flood conditions and gradually dry out as rainfall declines. Given their low-lying nature, off-stream water bodies also are generally wetter than the surrounding environment and support a greater diversity of aquatic and terrestrial vegetation. These areas provide seasonal breeding and larval habitat for diverse communities of aquatic and terrestrial macroinvertebrates. In turn, they represent a valuable food resource for frogs, birds and microchiropteran bats. Off-stream water bodies represent important breeding

habitat for frog species that have adapted to only breed in ephemeral water bodies. These habitats also provide a source of subterranean moisture required by burrowing frogs. Off-stream water bodies provide drinking sites for forest birds and ground mammals. The local abundance of invertebrates, crustaceans and frogs also creates a food resource for snakes and wetland birds, including species listed as migratory under the EPBC Act.

Plate 3-12 Off-stream water body habitats in the Rookwood Weir Project footprint

Creeks

Creeks are a predominant feature of the riverine landscape within the Rookwood Weir Project footprint (Plate 3-13). Creeks contain areas of shallower water and slower flow. In the dry season, flow often ceases entirely and creeks become a series of isolated pools. During this time there is greater cross-stream connectivity between habitats for ground-dwelling terrestrial fauna and hence greater access to resources. Compared with the main river system, channel widths within creeks are generally substantially reduced and have greater levels of canopy connectivity with an abundance of overhanging vegetation. This provides feeding perches for kingfishers and other birds and basking sites for water dragons. As with off-stream water bodies, creeks represent an important breeding ground for macroinvertebrates, and also support an abundance of frogs and fish. Consequently, creeks represent a notable foraging zone for birds, microchiropteran bats and snakes.

Riparian zones in the Project footprint tend to have greater structural complexity along creeks than along the main river channel, with a greater density of shrub and ground-level vegetation providing cover for ground mammals and nesting habitat for forest birds. There is however, some variation in the quality and complexity of riparian vegetation, with some riparian zones showing evidence of degradation (from cattle, weeds etc.). In general though, creeks represent a localized aggregation of resources that make them an important site for breeding, foraging, nesting and roosting among a diverse range of birds, reptiles, mammals and frogs. Given their high productivity, these areas are potentially important in maintaining the abundance and diversity of wildlife in the surrounding landscape.

Plate 3-13 Creek habitats within the Rookwood Weir Project footprint

Riparian habitat corridors

As discussed in Section 3.2.6, riparian corridors of remnant vegetation provide a movement conduit for terrestrial fauna in the cleared landscape of the Rookwood Weir Project footprint and wider study area. While the riparian vegetation corridor is narrow in places and has a sharp ecotone with the adjacent agricultural landscape matrix, it represents a linkage between larger remnant habitat patches, such as those persisting on low rocky hills or uncleared alluvial plains (Plate 3-13). Mature trees belonging to the genera *Melaluca, Eucalyptus and Corymbia* are the dominant feature of these riparian corridor habitats.

Plate 3-14 Riparian corridor with cleared agricultural land adjacent

Corridors that connect habitat patches in a fragmented landscape allow for animals to disperse away from their natal range, thereby reducing competition for resources (and associated impacts such as habitat degradation) and promoting the dispersal of genetic material (thereby reducing the potential for inbreeding). Birds and mammals that utilise different resources on a seasonal basis (e.g. flowering plants) may need to travel long distances between habitat types so as to fulfil their resource requirements throughout the year.

For animals such as frogs, reptiles, ground-dwelling birds and small mammals, long-range movement across the landscape is unlikely to occur regularly (e.g. seasonally). However, the existence of habitat corridors that allow such animals to disperse is important in the event of

environmental change. For example small animals that are isolated in fragmented patches of habitat are potentially susceptible to localised disease outbreaks, over-predation and the impacts of fire, flooding, drought and severe weather. Without access to linkages between habitat patches, small less mobile animals are likely to be severely impacted by localised changes. Furthermore, if small, cryptic and / or less mobile species are forced to traverse the hostile agricultural matrix, they may be unable to fulfil their resource requirements, and may be more exposed to predators.

3.4.2 Conservation significant terrestrial species

Fauna species considered as rare, threatened with extinction, or as having high conservation value (for example, locally endemic), are protected under Commonwealth and State legislation. At the national level, fauna are protected under the EPBC Act and within Queensland, rare and threatened fauna are listed under the NC Act (namely, the *Nature Conservation (Wildlife) Regulation 2006*).

Threatened species

Desktop surveys identified a number of threatened species previously recorded or predicted to occur within the region, based on bioclimatic modelling. A summary of these species and those recorded during the wet and dry season field surveys is provided below.

Six threatened species were identified in the Rookwood Weir Project footprint during the wet and dry season surveys. These species included:

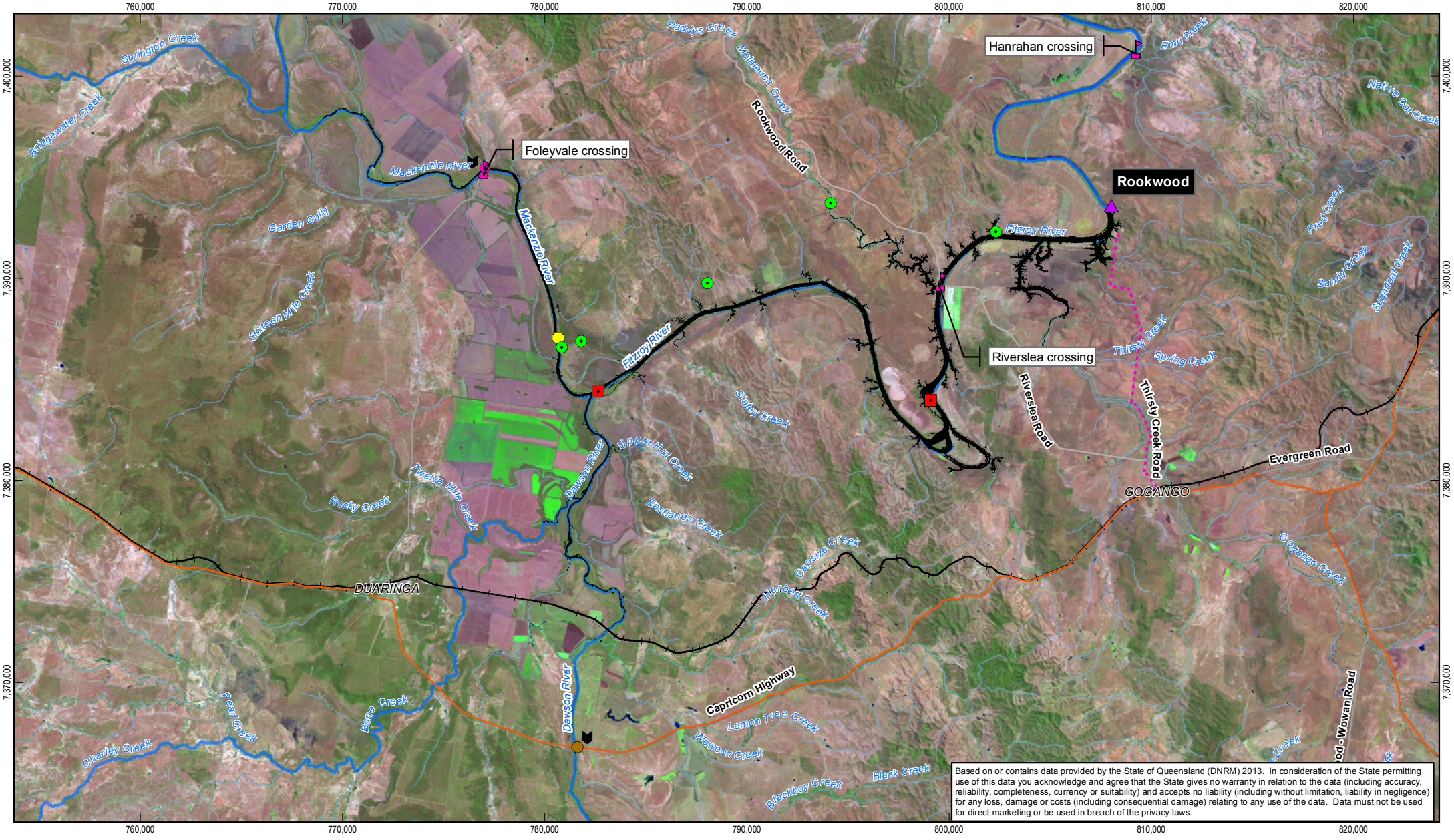
- **Troughton's sheathtail-bat (*Taphozous troughtoni*)** – The Troughton's sheathtail-bat was listed as 'Endangered' under the NC Act when reporting was completed in 2009 however, this species is no longer listed as threatened under the NC Act. This species was recorded on the Mackenzie River (Site 5) during the wet season survey and at Site 2 on the Fitzroy River in the dry season.
- **Little pied bat (*Chalinolobus picatus*)** - the little pied bat is listed as 'Near threatened' under the NC Act. Anabat detectors recorded the ultrasonic call of this species in dry season surveys in the Project footprint. This species was detected in open woodland featuring a grassy understorey and *Melaleuca* riparian fringe. Riverine open forest communities in central western Queensland have been identified as a key habitat type for this species (Churchill 2008)
- **Cotton pygmy-goose (*Nettapus coromandelianus*) –** the cotton pygmy goose is listed as 'Near threatened' under the NC Act. This species was observed in the off-stream water body habitats at Site 6 during the wet season bird surveys. Suitable foraging and breeding habitat for the cotton pygmy-goose occurs throughout the study area in creeks, off-stream water bodies and well vegetated margins of rivers and tributaries
- **Squatter pigeon (southern sub species) (*Geophaps scripta scripta*) –** the squatter pigeon (Plate 3-15) is listed as 'Vulnerable' under the EPBC Act and the NC Act. This species was encountered in wet and dry season surveys in open woodland and grassland habitats at Sites 2, 3, 6 and opportunistically in the study area adjacent to the Project footprint. Suitable nesting and foraging habitat for this species occurs in open riparian woodland habitats, open woodlands on alluvial floodplains and grasslands within the fragmented agricultural landscape. While considered threatened at the State and Commonwealth level, squatter pigeon appears to be relatively common within the Project footprint and wider area based on survey findings

- **Black-necked stork (*Ephippiorhynchus australis*) –** the black-necked stork (Plate 3-16) is listed as 'Near threatened' under the NC Act. This species was observed upstream of Riverslea Crossing during the wet season surveys and just downstream of the Dawson / Mackenzie confluence during the dry season survey. Shallow margins of the Fitzroy, Dawson and Mackenzie Rivers, as well as creeks and associated off-stream water bodies represent suitable foraging habitat for this species. Large trees abutting the river also provide suitable nesting habitat
- **Black-chinned honeyeater (*Melithreptus gularis*) –** the black-chinned honeyeater is listed as 'Near threatened' under the NC Act. This species was observed in open woodland habitat along the Dawson River (Site 4) during the dry season. This habitat is suitable for the black-chinned honeyeater, which shows a preference for open woodland and forest habitats, particularly near water. Such habitats occur in fragmented patches throughout the study area, and have the potential to support this uncommon species.

The location of threatened species observed within the Rookwood Weir Project footprint is illustrated in Figure 3-3.

Plate 3-15 Squatter pigeon (Geophaps scripta scripta)

Plate 3-16 Black-necked stork (Ephippiorhynchus australis)



1:250,000 (at A4)

0 2 4 6 8 10

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA94)
Grid: Map Grid of Australia 1994, Zone 55

N

LEGEND

- Weir Location
- River Crossing
- Highway
- Streets (Local)
- Railway
- Waterway
- Access Road
- Impoundment Area
- Little pied bat
- Squatter pigeon (southern)
- Black-necked stork
- Troughton's sheathtail-bat
- Cotton pygmy-goose
- Black-chinned honeyeater

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Gladstone Area Water Board

SunWater Making Water Work

Gladstone Area Water Board, SunWater Lower Fitzroy River Infrastructure Project

Job Number 41-20736
Revision C
Date 20 Mar 2014

Rookwood location of threatened terrestrial fauna species

Figure 3-3

G:\41\20736\GIS\Projects\MXD\900_Baseline Terrestrial Fauna Report\4120736_908_Location_of_threatened_Species_Rev_C.mxd

Level 9, 145 Ann St Brisbane QLD 4000 **T** 61 7 3316 3000 **F** 61 7 3316 3333 **E** bnemail@ghd.com **W** www.ghd.com

Data Source: © Copyright Commonwealth of Australia (Geoscience Australia): Waterways, State (2007); Sunwater: Waterways, Weir Locations - 2008; DNRM: Roads - 2010, Railways - 2010, Imagery - 2005; GHD Fauna Survey - 2009. Created by IH

Further to this, the literature review identified an additional 12 threatened species that have been previously recorded or are predicted to occur within the desktop search area (as defined in Section 2.3). These species include:

- **Red goshawk (*Erythrotriorchis radiatus*) –** the red goshawk is listed as 'Vulnerable' under the EPBC Act and 'Endangered' under the NC Act. This species was predicted to occur in the area based on bioclimatic modelling (DEWHA Environmental Reporting Tool). The red goshawk prefers coastal and subcoastal tall open forests and woodlands and also inhabits riverine habitats supporting mature riparian vegetation. Suitable habitat for foraging and nesting for this species is present in the Project footprint, but it has not been previously recorded in the desktop search area nor was it encountered during wet and dry season surveys. As the red goshawk tends to have a large home range (up to 220 km^2), the Project footprint may be occasionally visited by birds that occur within the wider study area. Red goshawks do not aggregate in populations, but rather tend to occur as single birds in very low densities across the landscape
- **Star finch (eastern, southern) (*Neochmia ruficauda ruficauda*)** – the star finch is listed as 'Endangered' under both the EPBC Act and NC Act. This species was predicted to occur in the area based on bioclimatic modelling (DEWHA Environmental Reporting Tool). It has not been previously recorded in the desktop search area, however the star finch is usually associated with habitats near water, particularly where tall grasses (including agricultural crops) and / or low woody vegetation occur. Suitable habitat for this species is likely to be confined to densely vegetated watercourses and gullies adjoining the main river channels
- **Australian painted snipe *(Rostratula australis / Rostratula benghalensis s. lat*) –** the Australian painted snipe is listed as 'Vulnerable', 'Migratory' and 'Marine' under the EPBC Act and 'Vulnerable' under the NC Act. Preferred habitat for this species includes wetlands, swamps, lakes, dams and inundated grasslands. Suitable habitat within the Project footprint is likely to be restricted to seasonally-inundated grasslands on low floodplains and ephemeral water bodies. This species has not been previously recorded in the Rookwood Weir desktop search area; however it was predicted to occur based on bioclimatic modelling (DEWHA Environmental Reporting Tool). No observations of the Australian painted snipe were made during wet or dry season surveys
- **Powerful owl (*Ninox strenua*)** – the powerful owl is listed as 'Vulnerable' under the NC Act. Although not detected during the wet and dry season surveys, this species has been previously recorded within the desktop search area. The preferred habitat of the powerful owl includes forests and woodlands with a high abundance of large trees. As the powerful owl has a large home range, the Project footprint may be visited by birds that occur within the wider study area
- **Northern quoll (*Dasyurus hallucatus*) –** the northern quoll is listed as 'Endangered' under the EPBC Act. This species was predicted to occur based on bioclimatic modelling (DEWHA Environmental Reporting Tool). While no records occur for this species in the desktop search area, rocky outcrops adjacent to the main river channels may support this species, through the provision of suitable denning, breeding and foraging habitat. No individuals or evidence of this species (e.g. scats, tracks, nesting dens) were observed during wet and dry season surveys
- **Bridled nailtail wallaby (*Onychogalae fraenata*)** – the bridled nailtail wallaby is listed as 'Endangered' under both the EPBC Act and the NC Act. Suitable habitat for this species may occur in patches in the Project footprint, however this species' sensitivity to human

impacts (such as pastoral activities and feral animals) and highly restricted range (Taunton National Park, approximately 50 km to the west of the confluence of the Dawson and Mackenzie Rivers) suggests it is unlikely to utilise such habitats

- **Large-eared pied bat (*Chalinolobus dwyeri*) –** the large-eared pied bat is listed as 'Vulnerable' under both the EPBC Act and the NC Act. This species was not encountered during wet and dry season surveys, and has not been previously recorded in the desktop search area, however it has been predicted to occur based on bioclimatic modelling *(*DEWHA Environmental Reporting Tool).. The woodlands and vegetated gullies adjacent to the river may provide suitable foraging habitat for this species, whereas roosting is restricted to cliffs and caves which are relatively limited within the study area
- **Eastern long-eared bat (*Nyctophilus timoriensis*) –** the eastern long-eared bat is only listed as 'Vulnerable' under both the EPBC Act and the NC Act. This species was not recorded during the wet and dry season field surveys and no previous records exist within the desktop search area. The eastern long-eared bat is predicted to occur in the area based on bioclimatic modelling (DEWHA Environmental Reporting Tool). Dry open woodland communities on alluvial floodplains and rocky hills within the Project footprint may support this species
- **Ornamental snake (*Denisonia maculata*) –** the ornamental snake is listed as 'Vulnerable' under both the EPBC Act and the NC Act. The ornamental snake has a restricted geographic range, and is known to favour low-lying habitats adjacent to fresh water bodies. Freshwater margins, particularly along tributaries, may provide foraging habitat for this species. Brigalow woodland communities (REs 11.3.1 and 11.4.9) which occur in small remnant patches throughout the study area may also support this species. The species is predicted to occur in the area based on bioclimatic modelling (DEWHA Environmental Reporting Tool), however it was not encountered during wet or dry season surveys, nor has it been previously recorded in the desktop search area
- **Dunmall's snake (*Furina dunmalli*) –**Dunmall's snake is listed as 'Vulnerable' under both the EPBC Act and the NC Act. Dunmall's snake has not been previously recorded in the desktop search area, however it was predicted to occur based on bioclimatic modelling (DEWHA Environmental Reporting Tool). No record of this species was acquired during wet and dry season surveys, however it may occur in small numbers in small isolated remnant patches of Brigalow woodland that occur in the Project footprint
- **Brigalow scaly-foot (*Paradelma orientalis*) –** the brigalow scaly-foot is listed as 'Vulnerable' under the NC Act. Although this species has not been previously recorded within the desktop search area, records exist within the wider study area, and a small area to the west of the Dawson River, (approximately 3 km south of the confluence of the Dawson and Mackenzie Rivers) is mapped as Essential Habitat for this species. A wide range of potential habitats occur for this species in the Project footprint, namely *Acacia* and *Eucalyptus* woodlands on cracking clay and sandy alluvial substrates may support the brigalow scaly-foot
- **Yakka skink (*Egernia rugosa*) –** the yakka skink is listed as 'Vulnerable' under both the EPBC Act and the NC Act. This species inhabits dry woodland and forest communities that feature a structurally complex ground layer. Log piles, burrows and rocky crevices are utilised by this species as communal refugia. Such habitat and resources are present within the Project footprint, particularly in less disturbed remnant mature woodland. The yakka skink has not been previously recorded in the desktop search area, and was not recorded in

the Project footprint during wet or dry season surveys, however it is predicted to occur based on bioclimatic modelling (DEWHA Environmental Reporting Tool).

The habitat preference of each threatened species and their likely occurrence within the Project footprint and wider study area is provided in Table 3-4.

3.4.3 Special least concern terrestrial fauna

The koala (*Phascolarctos cinereus*) and echidna (*Tachyglossus aculeatus*) are listed as 'Special Least Concern' under the NC Act. The koala is also listed as 'Vulnerable' under the EPBC Act, however it was not listed as threatened at the time of assessment and referral decision and as such further assessment as a matter of national environmental significance is not required. 'Special Least Concern' wildlife are those considered as having inherent value and potential importance for the maintenance of ecosystem processes. 'Special Least Concern' fauna are also considered a source of genetic information integral to an understanding of the evolution of the Australian biota as well as a genetic resource of potential benefit to society. These species are also considered culturally significant.

The koala inhabits open eucalypt woodlands and suitable habitat generally occurs in riparian zones and alluvial plains where mature eucalypt woodland have not been extensively cleared. No koalas were observed during wet and dry season surveys in the Rookwood Weir Project footprint, however faecal pellets were found at the base of eucalypts at Site 6 and in open woodlands on alluvial plains adjacent to the Dawson River (both in the dry season).

The echidna is a habitat generalist, occurring in most areas that support ants and / or termites. As this species has no specialised habitat requirements, the entire Rookwood Weir Project footprint represents potential echidna habitat. Echidna scats were recorded in open woodland habitats at Sites 1, 2 and 6, and an echidna was observed in open woodland with a grassy understorey within 200 m of Rookwood Weir site in the dry season.

Table 3-4 Threatened terrestrial fauna previously recorded or predicted to occur based on literature review

Family	Species name	Common name	Status (EPBC Act)	Status (NC Act)	Previous recording*	Habitat Characteristics	Suitable habitat in Project footprint	Likelihood of occurrence in Project footprint#
Birds								
Accipitridae	Erythrotriorchis radiatus	red goshawk	Vulnerable	Endangered	No previous recording	This bird occupies a range of habitats in northern and eastern Australia, including coastal and subcoastal tall open forests and woodlands. The red goshawk has a large home range covering between 50 and 220 km2. It prefers a mix of vegetation types with its habitat including tall open forest, woodland, lightly treed savannah and the edge of rainforest (Marchant and Higgins 1993).	Suitable habitat for foraging and some suitable habitat for breeding, however, no nests identified in surveys to date.	May occur
Ciconiidae	Ephippiorhynchus australis	black-necked stork	-	Near threatened	Wildlife Online Birds Australia	Occurs in a range of wetland and inundated habitats, from the coast to irrigated inland regions (Marchant and Higgins 1990).	Potential to occur along the river, and in adjacent farmland where irrigated crops and / or farm dams occur. This species was observed upstream of Riverslea Crossing during the wet season surveys and just downstream of the Fitzroy/Dawson/Mackenzie confluence during the dry season surveys	Confirmed present
Columbidae	Geophaps scripta scripta	squatter pigeon (southern)	Vulnerable	Vulnerable	Wildlife Online Birds Australia	Occurs mainly in grassy woodlands and open forests that are dominated by eucalypts. It has also been recorded in sown grasslands with scattered remnant trees, disturbed habitats (e.g. around stockyards, along roads and railways, and around settlements), in scrub and Acacia growth, and remains common in heavily-grazed country north of the Tropic of Capricorn. The species is commonly observed in habitats that are located close to bodies of water (DEWHA 2009b).	Suitable habitat for this species occurs in the woodland and grassland habitats wherever there is tall grass (for nesting) interspersed with cleared areas (for feeding and sunning). This species was encountered in these habitats during the wet and dry season surveys.	Confirmed present
Meliphagidae	Melithreptus gularis	black-chinned honeyeater	-	Near threatened	Wildlife Online	Habitat preferences include upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts. Also inhabits well wooded margins of watercourses (Higgins et al. 2001).	Suitable habitat may occur for this species along the river where riparian woodland/forest is in tact, and woodland/forest areas occur in the cleared agricultural landscape. This species was observed in the open woodland habitat along the Dawson River (Site 4) during the dry season.	Confirmed present
Ploceidae	Neochmia ruficauda ruficauda	star finch (eastern), star finch (southern)	Endangered	Endangered	No previous recording	Occurs mainly in grasslands and grassy woodlands that are located close to bodies of freshwater. It also occurs in cleared or suburban areas such as along roadsides and in towns. Habitats are dominated by trees that are typically associated with permanent water or areas that are regularly inundated; the most common species are Eucalyptus coolabah, E. tereticornis, E. tessellaris, Melaleuca leucadendra, E. camaldulensis and Casuarina cunninghamii (Marchant and Higgins 1993).	Reed beds and tall grasses along rivers edge and within side tributaries represent suitable habitat.	May occur
Rostratulidae	Rostratula australis/ Rostratula benghalensis s. lat.	Australian painted snipe	Vulnerable Marine	Vulnerable	No previous recording	Has potential to move into Queensland during summer. (Pizzey and Knight 2007). Generally inhabits shallow terrestrial freshwater	Potential to occur among reeds in shallow water along the edge of the river and adjacent billabongs (eg. REs 11.3.3 and 11.3.25).	May occur

Family	Species name	Common name	Status (EPBC Act)	Status (NC Act)	Previous recording*	Habitat Characteristics	Suitable habitat in Project footprint	Likelihood of occurrence in Project footprint#
			Migratory (CAMBA)			(occasionally brackish) wetlands, inundated or waterlogged grassland or saltmarsh and dams. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum Muehlenbeckia or canegrass or sometimes tea-tree (Melaleuca) (DEWHA 2009c).		
Strigidae	Ninox strenua	powerful owl	-	Vulnerable	Wildlife Online Birds Australia	Occurs in a range of habitats boasting large trees including mountain forests and woodlands, coastal forests, woodlands, pine plantations and urban areas. Mating pairs occupy a large home range (Marchant and Higgins 1993).	Potential to occur in habitats where large trees have not been cleared. Has been previously recorded in the study area.	Likely to occur
Mammals								
Dasyuridae	Dasyurus hallucatus	northern quoll	Endangered	-	No previous recording	Found in a variety of treed habitats, particularly in broken, rocky country and open eucalypt forest near the coast. This species dens in hollow tree trunks, and tends to breed more successfully when access to surface water is available (Strahan 1995).	Potential to occur in rocky outcrops within remnant vegetation.	May occur
Macropodidae	Onychogalea fraenata	bridled nailtail wallaby	Endangered	Endangered	Queensland Museum	This species occurs in semiarid areas, with a preference for open eucalypt woodland/forest and brigalow scrub growing on fertile soils. It grazes in grassy woodland, has a very restricted range and is only found in Taunton and Idalia National Parks in Central Queensland (Van Dyck and Strahan 2008).	Suitable habitat may occur in patches, however this species' sensitivity to human impacts (pastoral activities, feral animals) and highly restricted range (Taunton National Park, approximately 50 km to the west of the confluence of the Dawson and Mackenzie Rivers) suggests it is unlikely to utilise such habitats.	Unlikely to occur
Vespertilionidae	Chalinolobus dwyeri	large-eared pied bat, large pied bat	Vulnerable	Vulnerable	No previous recording	Found in well-timbered areas with gullies. Roosts in caves and crevices (Menkhorst and Knight 2004).	Species may occur in woodland and vegetated gullies adjacent to the river and has the potential to roost in caves within the study area.	May occur
Vespertilionidae	Nyctophilus timoriensis (south-eastern form)	eastern long-eared bat	Vulnerable	Vulnerable	No previous recording	Occurs in open Callitris/ironbark/box open forest and Buloke woodland (Van Dyck and Strahan 2008).	This species has the potential to occur in open ironbark or box woodland including REs 11.3.3 and 11.11.1.	May occur
Reptiles								
Elapidae	Denisonia maculata	ornamental snake	Vulnerable	Vulnerable	No previous recording	This species is known only from the Brigalow Belt region of Queensland, within the drainage system of the Fitzroy and Dawson Rivers. It occurs in Brigalow (Acacia harpophylla) woodland growing on clay and sandy soils, riverside woodland, and open forest growing on natural levees. This is a nocturnal species (DEWHA 2009d).	Suitable habitat occurs in woodland and shrubland on deep cracking clay soils including RE 11.3.1,and 11.3.25.	May occur
Elapidae	Furina dunmalli	Dunmall's snake	Vulnerable	Vulnerable	No previous recording	This species occurs in Brigalow (Acacia harpophylla) forest and woodland growing on cracking black clay and clay loam soils. It has been recorded in very few localities, most sightings have been from areas between 200 and 500 m above sea level (DEWHA 2009e).	Suitable habitat occurs in open forest and woodland on deep cracking clay soils, e.g. RE 11.3.1 and 11.3.25.	May occur
Pygopodidae	Paradelma orientalis	brigalow scaly-foot	-	Vulnerable	No previous	This lizard occurs in open forest habitats	Potential to occur in open forest and woodland	May occur

Family	Species name	Common name	Status (EPBC Act)	Status (NC Act)	Previous recording*	Habitat Characteristics	Suitable habitat in Project footprint	Likelihood of occurrence in Project footprint#
					recording	including remnant Brigalow (Acacia harpophylla) woodland with sparse tussock grasses on grey cracking clay soils; eucalypt open forest on loose sandy clay substrate; and in Allocasuarina luehamannii closed forest on a similar substrate. Specimens are often found sheltering under sandstone slabs, surface debris or in grass hummocks (DEWHA 2009f).	throughout study area.	
Scincidae	Egernia rugosa	yakka skink	Vulnerable	Vulnerable	No previous recording	This species is generally found in dry sclerophyll forest and open woodlands. It takes cover under fallen vegetation and timber (Cogger 2000).	Difficult to predict habitats but has potential to occur due to relative abundance in broader region.	May occur

CAMBA = China-Australia Migratory Bird Agreement

*Previously recorded within search extents defined in text for WildNet, Queensland Museum and Birds Australia Database searches.

#Likelihood of occurrence definitions: *Confirmed present* – species recorded from Rookwood Weir Project footprint during GHD field surveys

Likely to occur – species has been previously recorded and suitable habitat exists in the Project footprint

May occur - species has not been previously recorded, however potentially suitable habitat exists in the Project footprint

Unlikely to occur - species has not been previously recorded, has been historically recorded but has since suffered a contraction in range, and / or no suitable habitat exists in the Project footprint

3.4.4 Migratory and marine bird species

The Rookwood Weir Project footprint is inhabited by a diversity of common woodland, forest and waterbirds listed *as* 'Migratory' and / or 'Marine' under the EPBC Act. Fourteen EPBC Act listed species were predicted to occur in the areas based on bioclimatic modelling; 38 species had been previously recorded while 23 were recorded during wet and dry season surveys within the Project footprint (Table 4-5). Common woodland species such as the spangled drongo (*Dicrurus bracteatus*), black-faced cuckoo-shrike (*Coracina novaehollandiae*), rainbow bee-eater (*Merops ornatus*) and common koel (*Eudynamys orientalis*) occur in the Project footprint, with riparian and floodplain woodlands providing sufficient nesting, shelter and foraging resources. Waterbirds including the eastern great egret (*Ardea modesta*), intermediate egret (*Ardea intermedia*), Australian pelican (*Pelecanus conspicillatus*), cotton pygmy-goose (*Nettapus coromandelianus*) and green pygmy-goose (*Nettapus pulchellus*) were all encountered in the Project footprint during surveys. Forest birds such as the fan-tailed cuckoo (*Cacomantis flabelliformis*), forest kingfisher (*Todiramphus macleayii*) and silvereye (*Zosterops luteus*) were also observed during field surveys, in habitats supporting remnant woodland and riparian forest patches.

A number of 'Migratory' and / or 'Marine' species predicted to occur in the study area based on bioclimatic modelling were not recorded during field surveys, and have not been previously recorded in the Rookwood Weir desktop search area. The fragmented nature of the woodland and forest communities within the Project footprint, and the lack of suitable habitat for some species (such as black-faced monarch (*Monarcha melanopsis*) and satin flycatcher (*Myiagra cyanoleuca*)) may result in these species occurring at low densities, or not at all within the Project footprint. Other species such as the fork-tailed swift (*Apus pacificus*) and white-throated needletail (*Hirundapus caudacutus*) may be transient visitors to the area, however due to their predominantly aerial lifestyle, are difficult to record.

While utilized by a number of common 'Migratory' and / or 'Marine' species, the Project footprint is unlikely to constitute critical breeding, foraging, roosting or shelter habitat for these species, which are considered Matters of National Environmental Significance under the EPBC Act. The fragmented and disturbed landscape matrix within and adjacent to the Project footprint exacerbates this. As such, the woodland, forest and aquatic habitats within the Project footprint are not considered critical habitat for the 'Migratory' and / or 'Marine' species predicted or known to occur within the Project footprint and study area.

Table 3-5 EPBC Act listed 'Migratory' and / or 'Marine' species previously recorded or predicted to occur

Family	Species name	Common name	EPBC Act status	Predicted to occur (bioclimatic modelling)	Previously recorded (Wildlife Online, QLD Museum, Birds Australia)	Recorded during wet and dry season surveys
Accipitridae	Accipiter fasciatus	brown goshawk	Marine		✓	✓
Accipitridae	Haliaeetus leucogaster	white-bellied sea-eagle	Marine Migratory (CAMBA)	✓	✓	✓
Accipitridae	Haliastur indus	brahminy kite	Marine		✓	
Accipitridae	Haliastur sphenurus	whistling kite	Marine		✓	✓
Anatidae	Dendrocygna arcuata	wandering whistling-duck	Marine		✓	
Anatidae	Nettapus coromandelianus	cotton pygmy-goose	Marine	✓	✓	✓
Anatidae	Nettapus pulchellus	green pygmy-goose	Marine			✓
Anseranatidae	Anseranas semipalmata	magpie goose	Marine	✓	✓	
Apodidae	Apus pacificus	fork-tailed swift	Marine Migratory (CAMBA, JAMBA, ROKAMBA)	✓		
Apodidae	Hirundapus caudacutus	white-throated needletail	Marine Migratory (CAMBA, JAMBA, ROKAMBA)	✓		
Ardeidae	Ardea alba	great egret	Marine Migratory (CAMBA, JAMBA)	✓		
Ardeidae	Ardea ibis	cattle egret	Marine Migratory (CAMBA, JAMBA)	✓		

Family	Species name	Common name	EPBC Act status	Predicted to occur (bioclimatic modelling)	Previously recorded (Wildlife Online, QLD Museum, Birds Australia)	Recorded during wet and dry season surveys
Ardeidae	Ardea intermedia	intermediate egret	Marine		✓	✓
Ardeidae	Ardea modesta	eastern great egret	Marine Migratory (CAMBA; JAMBA)		✓	✓
Ardeidae	Nycticorax caledonicus	nankeen night heron	Marine		✓	✓
Campephagidae	Coracina novaehollandiae	black-faced cuckoo-shrike	Marine		✓	✓
Campephagidae	Coracina pauensis	white-bellied cuckoo-shrike	Marine		✓	✓
Campephagidae	Coracina tenuirostris	cicadabird	Marine		✓	
Coraciidae	Eurystomus orientalis	dollarbird	Marine		✓	
Cuculidae	Chalcites basalis	Horsfield's bronze-cuckoo	Marine		✓	
Cuculidae	Chalcites lucidus	shinning bronze-cuckoo	Marine		✓	
Cuculidae	Chalcites minutillus minutillus	little bronze cuckoo	Marine		✓	
Cuculidae	Chalcites osculans	black-eared cuckoo	Marine		✓	
Cuculidae	Cuculus optatus	oriental cuckoo	Marine Migratory (CAMBA, JAMBA, ROKAMBA)		✓	
Cuculidae	Scythrops novaehollandiae	channel-billed cuckoo	Marine		✓	
Cuculidae	Cacomantis flabelliformis	fan-tailed cuckoo	Marine		✓	✓
Cuculidae	Cacomantis pallidus	pallid cuckoo	Marine		✓	

Family	Species name	Common name	EPBC Act status	Predicted to occur (bioclimatic modelling)	Previously recorded (Wildlife Online, QLD Museum, Birds Australia)	Recorded during wet and dry season surveys
Cuculidae	Eudynamys scolopacea	common koel	Marine			✓
Dicruridae	Dicrurus bracteatus	spangled drongo	Marine		✓	✓
Dicruridae	Monarcha melanopsis	black-faced monarch	Marine Migratory (Bonn)	✓		
Dicruridae	Myiagra cyanoleuca	satin flycatcher	Marine Migratory (Bonn)	✓		
Falconidae	Falco cenchroides	nankeen kestrel	Marine		✓	✓
Halcyonidae	Todiramphus macleayii	forest kingfisher	Marine		✓	✓
Halcyonidae	Todiramphus sanctus	sacred kingfisher	Marine		✓	✓
Hirundinidae	Hirundo rustica	barn swallow	Marine Migratory (CAMBA, JAMBA, ROKAMBA)	✓		
Hirundinidae	Petrochelidon nigricans	tree martin	Marine		✓	✓
Laridae	Gelochelidon nilotica	gull-billed tern	Marine		✓	
Meropidae	Merops ornatus	rainbow bee-eater	Marine Migratory (JAMBA)	✓	✓	✓
Motacillidae	Anthus novaeseelandiae	Richard's pipit	Marine		✓	✓
Pelecanidae	Pelecanus conspicillatus	Australian pelican	Marine		✓	✓
Recurvirostridae	Himantopus himantopus	black-winged stilt	Marine		✓	

Family	Species name	Common name	EPBC Act status	Predicted to occur (bioclimatic modelling)	Previously recorded (Wildlife Online, QLD Museum, Birds Australia)	Recorded during wet and dry season surveys
Rostratulidae	Rostratula australis	Australian painted snipe	Vulnerable Marine Migratory (CAMBA)	✓		
Scolopacidae	Gallinago hardwickii	Latham's snipe	Marine Migratory (CAMBA, JAMBA, ROKAMBA, Bonn)	✓		
Scolopacidae	Numenius minutus	little curlew	Marine Migratory (CAMBA, JAMBA, ROKAMBA, Bonn)	✓		
Scolopacidae	Tringa stagnatilis	marsh sandpiper	Marine Migratory (Bonn, CAMBA, JAMBA, ROKAMBA)		✓	
Strigidae	Ninox novaeseelandiae	southern boobook	Marine		✓	✓
Threskiornithidae	Plegadis falcinellus	glossy ibis	Marine		✓	
Threskiornithidae	Threskiornis molucca	Australian white Ibis	Marine		✓	
Threskiornithidae	Threskiornis spinicollis	straw-necked ibis	Marine		✓	✓
Zosteropidae	Zosterops lateralis	silvereye	Marine		✓	✓

3.5 Fitzroy NRM Region 'Back on Track' Biodiversity Action Plan

The DERM (now the Department of Environment and Heritage Protection (DEHP)) in partnership with the Fitzroy Basin Association (FBA) developed a 'Back on Track' Biodiversity Action Plan for the Fitzroy Natural Resource Management (NRM) Region (DERM 2008). The purpose of this plan is to:

- Identify priority threatened species for the Fitzroy NRM region so that resources for conservation and management effort can be focussed and effective
- Provide a framework to direct management and research as well as a strategic approach to address threats to species recovery
- Raise awareness to a broader range of threatened species and threatened species issues
- Guide regional investment on biodiversity conservation and ensure progress towards the targets of the FBA Central Queensland Strategy for Sustainability: 2004 and Beyond Plan
- Achieve species recovery.

The action plan identifies species that are in decline at a "whole-of-Queensland" scale and have good potential for recovery. The "Back on Track species prioritisation framework" approach is used to determine priority species ('critical', 'high', or 'medium') for conservation effort. Seven criteria are used to score species (regardless of their current threatened classification under State or Commonwealth legislation). Priority species are nominated, assessed and assigned a ranking by both the FBA and the DEHP. The ranking of priority (e.g. 'critical', 'high') is not always the same between FBA and the DEHP, due to the differing outcomes of the respective manager's Criteria Weightings.

Table 3-6 lists the priority terrestrial fauna species for the Fitzroy NRM region. Of these species, only the bridled nailtail wallaby (*Onychogalea fraenata*) has been previously recorded within the Rookwood Weir desktop search area. The ornamental snake (*Denisonia maculata*), yakka skink (*Egernia rugosa*), red goshawk (*Erythrotriorchis radiatus*), and eastern long-eared bat (*Nyctophilus timoriensis*) are predicted to occur based on bioclimatic modelling (DEWHA Environmental Reporting Tool). One species listed under the Biodiversity Action Plan for the Fitzroy NRM region, the yellow-bellied glider (*Petaurus australis australis*), was recorded during both wet and dry season surveys.

Table 3-6 'Back on Track' priority terrestrial fauna species for the Fitzroy NRM region

Species name	Common name	Fitzroy Basin ranking	DEHP ranking
Invertebrates			
Phlogius crassipes		C	C
Selenotypus plumipes		C	C
Jalmenus evagoras eubulus		H	H
Telicota eurychlora		H	H
Frogs			
Taudactylus pleione		H	H
Reptiles			

Species name	Common name	Fitzroy Basin ranking	DEHP ranking
Phyllurus championae		C	C
Anomalopus brevicollis		H	H
Delma torquata	collared delma	H	H
Hoplocephalus stephensii	Stephens' banded snake	H	H
Lerista allanae	Allan's lerista	H	H
Varanus semiremex	rusty monitor	H	H
Acanthophis antarcticus	common death adder	H	H
Denisonia maculata1	ornamental snake	H	M
Egernia rugosa1	yakka skink	H	M
Phyllurus caudiannulatus	ringed think-tailed gecko	H	M
Strophurus taenicauda	golden-tailed gecko	H	M
Birds			
Turnix melanogaster1	black-breasted button-quail	C	C
Erythrotriorchis radiatus1	red goshaw k	H	H
Esacus neglectus	beach stone-curlew	H	H
Epthianura crocea macgregori	yellow chat (Capricorn)	H	H
Grantiella picta	painted honeyeater	H	H
Stagonopleura guttata	diamond firetail	H	H
Sterna albifrons	little tern	H	H
Mammals			
Macroderma gigas	ghost bat	C	C
Onychogalea fraenata2	bridled nailtail w allaby	C	C
Xeromys myoides	w ater mouse	C	H
Dasyurus maculatus maculatus	spotted-tailed quoll (southern subspecies)	H	H
Petaurus australis australis3	yellow -bellied glider (southern subspecies)	H	H
Pteropus poliocephalus	grey-headed flying-fox	C	C
Taphozous australis	coastal sheathtail bat	H	H
Kerivoula papuensis	golden-tipped bat	H	M
Nyctophilus timoriensis1	eastern long-eared bat	H	M

1 = Species predicted to occur in the Rookwood Weir Project footprint based on bioclimatic modelling (DEWHA Environmental Reporting Tool database). Note: none of these species were recorded during wet and dry season surveys in the Project footprint.

2 = Species previously recorded in Rookwood Weir desktop search area

3 = Species recorded in Project footprint during wet and dry season surveys

C = Critical priority; H = High priority; M = Medium priority.

4. Summary

This baseline terrestrial fauna assessment revealed that the Rookwood Weir Project footprint supports a diversity of common amphibians, reptiles, mammals and birds, and a limited number of threatened and other conservation-significant species. Furthermore, the Project footprint has the potential to support a number of threatened species (not previously recorded or observed during wet and dry season surveys), based on the availability of suitable habitat and bioclimatic modelling.

Although the landscape has been significantly altered through land clearing, remnants of the nine major terrestrial fauna habitat types identified within the Project footprint provide sufficient foraging, shelter and breeding resources for at least 208 species (as identified during wet and dry season field surveys), comprising:

- 12 amphibians
- 22 reptiles
- 41 mammals (including two threatened species – Troughton's sheathtail bat, little pied bat)
- 133 birds (including four threatened species – squatter pigeon, black-necked stork, black-chinned honeyeater, cotton pygmy-goose; and 23 'Migratory' and / or 'Marine species).

Since much of the lowland landscape has been cleared for agricultural development, remnants of riparian vegetation perform a valuable role, maintaining connectivity between habitat remnants. Particularly sensitive terrestrial fauna habitats within the Rookwood Weir Project footprint include brigalow communities, ephemeral off-stream water bodies and creeks. Such habitats are likely to provide resources for a wide array of animals, including amphibians (breeding and foraging), reptiles (foraging, shelter), ground-dwelling mammals (foraging and denning), microchiropteran bats (foraging) and birds (foraging and nesting amongst dense riparian vegetation).

While brigalow habitat has only moderate species richness (given the absence of hollows or canopy level vegetation), it has high ecological value as potential habitat for conservation significant species (e.g. yakka skink, ornamental snake and brigalow scaly-foot). The abundance of fallen woody debris and relatively complex ground substrates potentially provides habitat for the aforementioned threatened reptiles, as well as common reptiles and ground-dwelling mammals.

Ecological resources and habitats critical to the survival and long-term viability of conservation significant terrestrial species and populations are unlikely to occur within the Rookwood Weir Project footprint. Nevertheless, the fragmented habitats that occur within and adjacent to the lower Dawson, lower Mackenzie and upper Fitzroy Rivers are likely to provide resources for small localised populations of threatened species, as well as a wide diversity of common, generalist species that are tolerant of a modified landscape matrix.

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Appendices

Appendix A Rookwood Weir terrestrial fauna desktop results

DEWHA Environmental Reporting Tool

DERM Wildlife Online

Queensland Museum

Birds Australia

Environmental Reporting Tool

You are here: Environment Home > ERIN > ERT

5 March 2009 10:36

Database Report

This report includes places of national environmental significance that are registered in the Department of the Environment and Water Resources' databases, for the selected area. The information presented here has been provided by a range of groups across Australia, and the accuracy and resolution varies.

Search Type: Line

Buffer: 2 km

Coordinates: -23.5409502,150.0152765, -23.54441246,150.0173133, -23.55384239,150.0132735, -23.55294403,149.9589446, -23.56776222,149.9378455, -23.58480475,149.9325481, -23.60907349,149.9391921, -23.62658295,149.931105, -23.63286385,149.9378455, -23.65336159,149.9558615, -23.65172371,149.9355949, -23.63241371,149.9113525, -23.58437332,149.895182, -23.57584366,149.874533, -23.59021362,149.8179649, -23.61176285,149.7919219, -23.62074361,149.7771028, -23.6273732,149.7678944

Report Contents: Summary >> Details >> Caveat >> Acknowledgment

Biodiversity

Threatened Species:	15
Migratory Species:	16
Listed Marine Species:	15
Invasive Species:	11
Whales and Other Cetaceans:	None
Threatened Ecological Communities:	4

Heritage

World Heritage Properties:	None
Australian Heritage Sites:	None

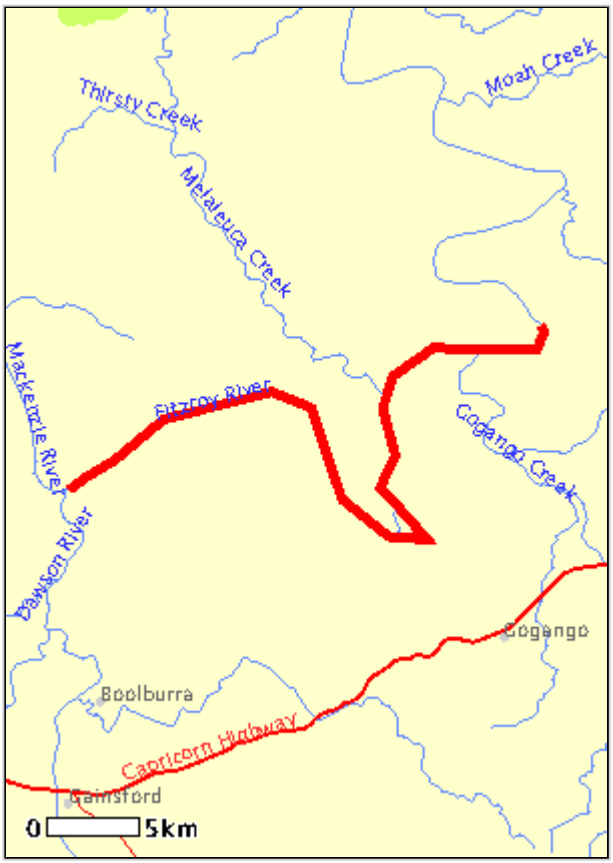
Wetlands

Ramsar sites: (Internationally important)	1
Nationally Important Wetlands:	None

National Pollutant Inventory

Reporting Facilities:	None
Airsheds:	None
Catchments:	1

Protected Areas



Reserves and Conservation Areas: None

Regional Forest Agreements: None

Biodiversity

Threatened Species [Dataset Information]	Status	Comments
Birds		
Erythrotriorchis radiatus Red Goshawk	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern)	Vulnerable	Species or species habitat likely to occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern)	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe	Vulnerable	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat	Vulnerable	Species or species habitat may occur within area
Dasyurus hallucatus Northern Quoll	Endangered	Species or species habitat may occur within area
Nyctophilus timoriensis (South-eastern form) Eastern Long-eared Bat	Vulnerable	Species or species habitat may occur within area
Reptiles		
Denisonia maculata Ornamental Snake	Vulnerable	Species or species habitat likely to occur within area
Egernia rugosa Yakka Skink	Vulnerable	Species or species habitat likely to occur within area
Furina dunmalli Dunmall's Snake	Vulnerable	Species or species habitat may occur within area
Paradelma orientalis Brigalow Scaly-foot	Vulnerable	Species or species habitat likely to occur within area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle	Vulnerable	Species or species habitat may occur within area
Plants		
Cycas megacarpa	Endangered	Species or species habitat likely to occur within area
Dichanthium queenslandicum King Blue-grass	Vulnerable	Species or species habitat likely to occur within area
Digitaria porrecta Finger Panic Grass	Endangered	Species or species habitat likely to occur within area

Migratory Species [Dataset Information]	Status	Comments
Migratory Terrestrial Species		
Birds		
Haliaeetus leucogaster White-bellied Sea-Eagle	Migratory	Species or species habitat likely to occur within area

Hirundapus caudacutus White-throated Needletail	Migratory	Species or species habitat may occur within area
Hirundo rustica Barn Swallow	Migratory	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater	Migratory	Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch	Migratory	Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher	Migratory	Species or species habitat likely to occur within area
Migratory Wetland Species		
Birds		
Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe	Migratory	Species or species habitat may occur within area
Nettapus coromandelianus albipennis Australian Cotton Pygmy-goose	Migratory	Species or species habitat may occur within area
Numenius minutus Little Curlew, Little Whimbrel	Migratory	Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe	Migratory	Species or species habitat may occur within area
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift	Migratory	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area
Migratory Marine Species		
Reptiles		
Crocodylus porosus Estuarine Crocodile, Salt-water Crocodile	Migratory	Species or species habitat likely to occur within area
Listed Marine Species [Dataset Information]	Status	Comments
Birds		
Anseranas semipalmata Magpie Goose	Listed - overfly marine area	Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift	Listed - overfly marine area	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Listed - overfly marine area	Species or species habitat may occur within area

Ardea ibis Cattle Egret	Listed - overfly marine area	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe	Listed - overfly marine area	Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle	Listed	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail	Listed - overfly marine area	Species or species habitat may occur within area
Hirundo rustica Barn Swallow	Listed - overfly marine area	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater	Listed - overfly marine area	Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch	Listed - overfly marine area	Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher	Listed - overfly marine area	Species or species habitat likely to occur within area
Nettapus coromandelianus albipennis Australian Cotton Pygmy-goose	Listed - overfly marine area	Species or species habitat may occur within area
Numenius minutus Little Curlew, Little Whimbrel	Listed - overfly marine area	Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe	Listed - overfly marine area	Species or species habitat may occur within area
Reptiles		
Crocodylus porosus Estuarine Crocodile, Salt-water Crocodile	Listed	Species or species habitat likely to occur within area
Invasive Species [Dataset Information]	Status	Comments
Selected Invasive Species: 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.		
Mammals		
Capra hircus Goat	Feral	Species or species habitat may occur within area
Felis catus Cat, House Cat, Domestic Cat	Feral	Species or species habitat likely to occur within area
Oryctolagus cuniculus	Feral	Species or species habitat likely to

Rabbit, European Rabbit		occur within area
Sus scrofa Pig	Feral	Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox	Feral	Species or species habitat likely to occur within area

Plants

Alternanthera philoxeroides Alligator Weed	WoNS	Species or species habitat may occur within area
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda	WoNS	Species or species habitat likely to occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass	WoNS	Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage	WoNS	Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean	WoNS	Species or species habitat may occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed	WoNS	Species or species habitat likely to occur within area

Threatened Ecological Communities [Dataset Information]	Status	Comments
Brigalow (*Acacia harpophylla* dominant and co-dominant)	Endangered	Community known to occur within area
Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	Endangered	Community may occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area

Wetlands

Wetlands of International Importance (Ramsar sites) [Dataset Information]

SHOALWATER AND CORIO BAYS AREA	Within same catchment as Ramsar site

National Pollutant Inventory

Catchment [Dataset Information]	Substances	Sources
Dawson River, QLD	2	12

Caveat

The information presented here has been drawn from a range of sources, compiled for a variety of purposes. Details of the coverage of each dataset are included in the metadata [Dataset

Information] links above.

Acknowledgment

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

- New South Wales National Parks and Wildlife Service
- Department of Sustainability and Environment, Victoria
- Department of Primary Industries, Water and Environment, Tasmania
- Department of Environment and Heritage, South Australia Planning SA
- Parks and Wildlife Commission of the Northern Territory
- Environmental Protection Agency, Queensland
- Birds Australia
- Australian Bird and Bat Banding Scheme
- Australian National Wildlife Collection
- Natural history museums of Australia
- 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
- Other groups and individuals

ANUCliM Version 1.8, Centre for Resource and Environmental Studies, Australian National University was used extensively for the production of draft maps of species distribution. The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Environmental Reporting Tool

You are here: Environment Home > ERIN > ERT

5 March 2009 10:38

Database Report

This report includes places of national environmental significance that are registered in the Department of the Environment and Water Resources' databases, for the selected area. The information presented here has been provided by a range of groups across Australia, and the accuracy and resolution varies.

Search Type: Line

Buffer: 2 km

Coordinates: -23.6273732,149.7678944, -23.62837571,149.7591491, -23.62343391,149.7510627, -23.58662399,149.7465728, -23.546213,149.7286132, -23.5358828,149.7299636, -23.52914223,149.7250236, -23.526903,149.7137931, -23.53229317,149.7088531, -23.53678307,149.7003234, -23.52959236,149.6917937, -23.53498253,149.6720336, -23.5345324,149.6581252, -23.53024013,149.6561875, -23.52679987,149.6595427, -23.51884219,149.6632959, -23.50523586,149.6544628, -23.50252951,149.6412031, -23.51176707,149.6284255, -23.51166942,149.620842

Report Contents: Summary >> Details >> Caveat >> Acknowledgment

Biodiversity

Threatened Species:	16
Migratory Species:	15
Listed Marine Species:	14
Invasive Species:	11
Whales and Other Cetaceans:	None
Threatened Ecological Communities:	3

Heritage

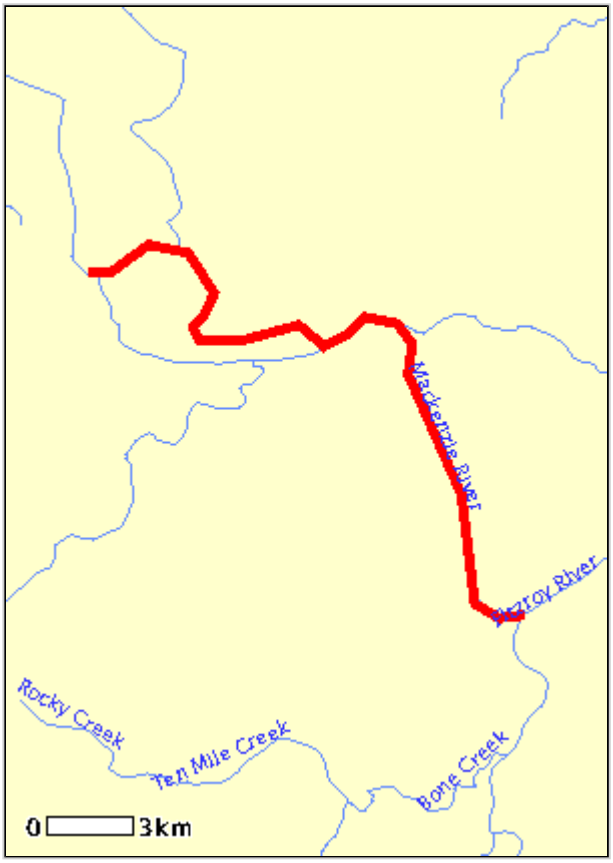
World Heritage Properties:	None
Australian Heritage Sites:	None

Wetlands

Ramsar sites: (Internationally important)	1
Nationally Important Wetlands:	None

National Pollutant Inventory

Reporting Facilities:	None
Airsheds:	None
Catchments:	1



Protected Areas

Reserves and Conservation Areas: None

Regional Forest Agreements: None

Biodiversity

Threatened Species [Dataset Information]	Status	Comments
Birds		
Erythrotriorchis radiatus Red Goshawk	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern)	Vulnerable	Species or species habitat likely to occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern)	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe	Vulnerable	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat	Vulnerable	Species or species habitat may occur within area
Dasyurus hallucatus Northern Quoll	Endangered	Species or species habitat may occur within area
Nyctophilus timoriensis (South-eastern form) Eastern Long-eared Bat	Vulnerable	Species or species habitat may occur within area
Reptiles		
Denisonia maculata Ornamental Snake	Vulnerable	Species or species habitat likely to occur within area
Egernia rugosa Yakka Skink	Vulnerable	Species or species habitat likely to occur within area
Furina dunmalli Dunmall's Snake	Vulnerable	Species or species habitat may occur within area
Paradelma orientalis Brigalow Scaly-foot	Vulnerable	Species or species habitat likely to occur within area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle	Vulnerable	Species or species habitat may occur within area
Plants		
Cadellia pentastylis Ooline	Vulnerable	Species or species habitat likely to occur within area
Dichanthium queenslandicum King Blue-grass	Vulnerable	Species or species habitat likely to occur within area
Digitaria porrecta Finger Panic Grass	Endangered	Species or species habitat likely to occur within area
Eucalyptus raveretiana Black Ironbox	Vulnerable	Species or species habitat likely to occur within area

Migratory Species [Dataset Information]	Status	Comments
Migratory Terrestrial Species		

Birds

Haliaeetus leucogaster White-bellied Sea-Eagle	Migratory	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail	Migratory	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater	Migratory	Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch	Migratory	Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher	Migratory	Species or species habitat likely to occur within area

Migratory Wetland Species

Birds

Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe	Migratory	Species or species habitat may occur within area
Nettapus coromandelianus albipennis Australian Cotton Pygmy-goose	Migratory	Species or species habitat may occur within area
Numenius minutus Little Curlew, Little Whimbrel	Migratory	Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe	Migratory	Species or species habitat may occur within area

Migratory Marine Birds

Apus pacificus Fork-tailed Swift	Migratory	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area

Migratory Marine Species

Reptiles

Crocodylus porosus Estuarine Crocodile, Salt-water Crocodile	Migratory	Species or species habitat likely to occur within area

Listed Marine Species [Dataset Information]	Status	Comments

Birds

Anseranas semipalmata Magpie Goose	Listed - overfly marine area	Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift	Listed - overfly marine area	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Listed - overfly	Species or species habitat may occur within area

	marine area	
Ardea ibis Cattle Egret	Listed - overfly marine area	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe	Listed - overfly marine area	Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle	Listed	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail	Listed - overfly marine area	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater	Listed - overfly marine area	Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch	Listed - overfly marine area	Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher	Listed - overfly marine area	Species or species habitat likely to occur within area
Nettapus coromandelianus albipennis Australian Cotton Pygmy-goose	Listed - overfly marine area	Species or species habitat may occur within area
Numenius minutus Little Curlew, Little Whimbrel	Listed - overfly marine area	Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe	Listed - overfly marine area	Species or species habitat may occur within area
Reptiles		
Crocodylus porosus Estuarine Crocodile, Salt-water Crocodile	Listed	Species or species habitat likely to occur within area
Invasive Species [Dataset Information]	Status	Comments
Selected Invasive Species: 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.		
Mammals		
Capra hircus Goat	Feral	Species or species habitat may occur within area
Felis catus Cat, House Cat, Domestic Cat	Feral	Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit	Feral	Species or species habitat likely to occur within area

Sus scrofa Pig	Feral	Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox	Feral	Species or species habitat likely to occur within area
Plants		
Acacia nilotica subsp. *indica* Prickly Acacia	WoNS	Species or species habitat may occur within area
Alternanthera philoxeroides Alligator Weed	WoNS	Species or species habitat may occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass	WoNS	Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage	WoNS	Species or species habitat may occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean	WoNS	Species or species habitat may occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed	WoNS	Species or species habitat likely to occur within area
Threatened Ecological Communities [Dataset Information]	Status	Comments
Brigalow (*Acacia harpophylla* dominant and co-dominant)	Endangered	Community known to occur within area
Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	Endangered	Community may occur within area
Weeping Myall Woodlands	Endangered	Community may occur within area
Wetlands		
Wetlands of International Importance (Ramsar sites) [Dataset Information]		
SHOALWATER AND CORIO BAYS AREA		Within same catchment as Ramsar site
National Pollutant Inventory		
Catchment [Dataset Information]	Substances	Sources
Dawson River, QLD	2	12

Caveat

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- Environmental Protection Agency, Queensland
- Birds Australia
- Australian Bird and Bat Banding Scheme
- Australian National Wildlife Collection
- Natural history museums of Australia
- Queensland Herbarium
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- University of New England
- Other groups and individuals

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Database Report

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Biodiversity

Threatened Species:	12
Migratory Species:	15
Listed Marine Species:	14
Invasive Species:	12
Whales and Other Cetaceans:	None
Threatened Ecological Communities:	3

Heritage

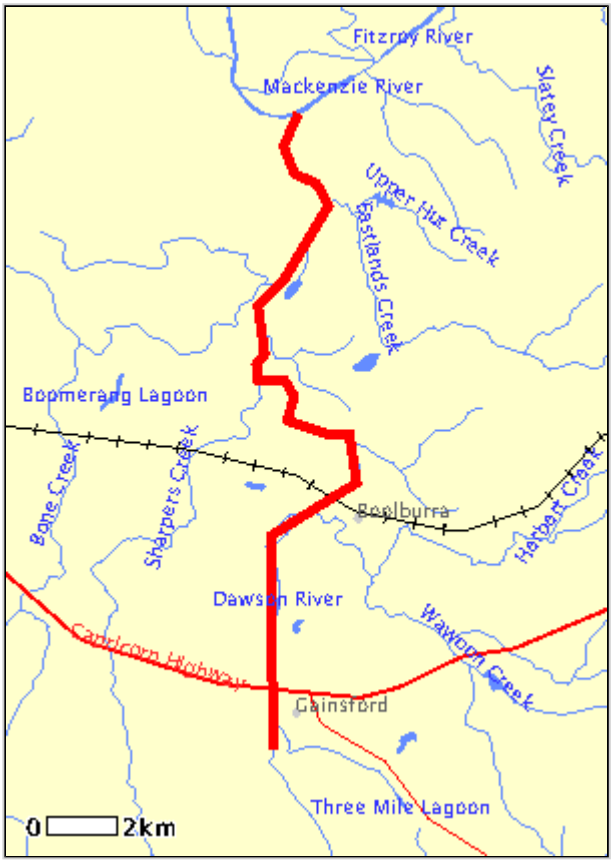
World Heritage Properties:	None
Australian Heritage Sites:	None

Wetlands

Ramsar sites: (Internationally important)	1
Nationally Important Wetlands:	None

National Pollutant Inventory

Reporting Facilities:	None
Airsheds:	None
Catchments:	1



Protected Areas

Reserves and Conservation Areas: None

Regional Forest Agreements: None

Biodiversity

Threatened Species [Dataset Information]	Status	Comments
Birds		
Erythrotriorchis radiatus Red Goshawk	Vulnerable	Species or species habitat likely to occur within area
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Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle	Vulnerable	Species or species habitat may occur within area

Migratory Species [Dataset Information]	Status	Comments
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Monarcha melanopsis Black-faced Monarch	Migratory	Species or species habitat may occur within area

Myiagra cyanoleuca Satin Flycatcher	Migratory	Species or species habitat likely to occur within area
Migratory Wetland Species		
Birds		
Ardea alba Great Egret, White Egret	Migratory	Breeding likely to occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe	Migratory	Species or species habitat may occur within area
Nettapus coromandelianus albipennis Australian Cotton Pygmy-goose	Migratory	Species or species habitat may occur within area
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Ardea alba Great Egret, White Egret	Migratory	Breeding likely to occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area
Migratory Marine Species		
Reptiles		
Crocodylus porosus Estuarine Crocodile, Salt-water Crocodile	Migratory	Species or species habitat likely to occur within area
Listed Marine Species [Dataset Information]	Status	Comments
Birds		
Anseranas semipalmata Magpie Goose	Listed - overfly marine area	Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift	Listed - overfly marine area	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Listed - overfly marine area	Breeding likely to occur within area
Ardea ibis Cattle Egret	Listed - overfly marine area	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe	Listed - overfly marine area	Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle	Listed	Species or species habitat likely to occur within area
Hirundapus caudacutus	Listed -	Species or species habitat may

White-throated Needletail	overfly marine area	occur within area
Merops ornatus Rainbow Bee-eater	Listed - overfly marine area	Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch	Listed - overfly marine area	Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher	Listed - overfly marine area	Species or species habitat likely to occur within area
Nettapus coromandelianus albipennis Australian Cotton Pygmy-goose	Listed - overfly marine area	Species or species habitat may occur within area
Numenius minutus Little Curlew, Little Whimbrel	Listed - overfly marine area	Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe	Listed - overfly marine area	Species or species habitat may occur within area
Reptiles		
Crocodylus porosus Estuarine Crocodile, Salt-water Crocodile	Listed	Species or species habitat likely to occur within area
Invasive Species [Dataset Information]	Status	Comments
Selected Invasive Species: 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.		
Mammals		
Capra hircus Goat	Feral	Species or species habitat may occur within area
Felis catus Cat, House Cat, Domestic Cat	Feral	Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit	Feral	Species or species habitat likely to occur within area
Sus scrofa Pig	Feral	Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox	Feral	Species or species habitat likely to occur within area
Plants		
Acacia nilotica subsp. *indica* Prickly Acacia	WoNS	Species or species habitat may occur within area
Alternanthera philoxeroides Alligator Weed	WoNS	Species or species habitat may occur within area
Cryptostegia grandiflora	WoNS	Species or species habitat may

Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda		occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass	WoNS	Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage	WoNS	Species or species habitat may occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean	WoNS	Species or species habitat may occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed	WoNS	Species or species habitat likely to occur within area
Threatened Ecological Communities [Dataset Information]	Status	Comments
Brigalow (*Acacia harpophylla* dominant and co-dominant)	Endangered	Community known to occur within area
Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	Endangered	Community may occur within area
Weeping Myall Woodlands	Endangered	Community may occur within area
Wetlands		
Wetlands of International Importance (Ramsar sites) [Dataset Information]		
SHOALWATER AND CORIO BAYS AREA		Within same catchment as Ramsar site
National Pollutant Inventory		
Catchment [Dataset Information]	Substances	Sources
Dawson River, QLD	2	12

Caveat

The information presented here has been drawn from a range of sources, compiled for a variety of purposes. Details of the coverage of each dataset are included in the metadata [Dataset Information] links above.

Acknowledgment

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- New South Wales National Parks and Wildlife Service
- Department of Sustainability and Environment, Victoria
- Department of Primary Industries, Water and Environment, Tasmania
- Department of Environment and Heritage, South Australia Planning SA
- Parks and Wildlife Commission of the Northern Territory
- Environmental Protection Agency, Queensland
- Birds Australia

- Australian Bird and Bat Banding Scheme
- Australian National Wildlife Collection
- Natural history museums of Australia
- 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
- Other groups and individuals

ANUCliM Version 1.8, Centre for Resource and Environmental Studies, Australian National University was used extensively for the production of draft maps of species distribution. The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

DERM Wildlife Online Database

Scientific name	Common name	NC Act status	EPBC Act status
Amphibians			
Limnodynastes salmini	salmon striped frog		
Litoria caerulea	common green tree frog		
Litoria fallax	eastern sedge frog		
Litoria latopalmata	broad palmed rocket frog		
Litoria rothii	northern laughing tree frog		
Rhinella marina	cane toad	Introduced	
Reptiles			
Antaresia maculosa	spotted python		
Carlia foliorum			
Carlia pectoralis			
Cryptoblepharus virgatus sensu lato			
Dendrelaphis punctulata	common tree snake		
Eulamprus quoyii	eastern water skink		
Gehyra dubia			
Heteronotia binoei	Bynoe's gecko		
Lialis burtonis	Burton's legless lizard		
Oedura monilis			
Oedura robusta	robust velvet gecko		
Physignathus lesueurii	eastern water dragon		
Pseudonaja textilis	eastern brown snake		
Rhinoplocephalus nigrescens	eastern small-eyed snake		
Tropidonophis mairii	freshwater snake		
Mammals			
Chalinolobus gouldii	Gould's wattled bat		
Felis catus	cat	Introduced	
Isoodon sp.	unidentified bandicoot		
Macropus giganteus	eastern grey kangaroo		
Mus musculus	house mouse	Introduced	
Nyctophilus gouldi	Gould's long-eared bat		
Ornithorhynchus anatinus	platypus		
Petauroides volans	greater glider		

Scientific name	Common name	NC Act status	EPBC Act status
Petaurus breviceps	sugar glider		
Petaurus norfolcensis	squirrel glider		
Phascolarctos cinereus	koala		
Pteropus sp.			
Rattus rattus	black rat	Introduced	
Saccolaimus flaviventris	yellow-bellied sheathtail bat		
Scotorepens sp.			
Sus scrofa	pig	Introduced	
Vulpes vulpes	red fox	Introduced	
Birds			
Acanthiza nana	yellow thornbill		
Aegotheles cristatus	Australian owlet-nightjar		
Alectura lathami	Australian brush-turkey		
Anas gracilis	grey teal		
Anas superciliosa	Pacific black duck		
Anhinga novaehollandiae	Australasian darter		
Anseranas semipalmata	magpie goose		Marine
Aprosmictus erythropterus	red-winged parrot		
Ardea pacifica	white-necked heron		
Artamus cinereus	black-faced woodswallow		
Artamus leucorynchus	white-breasted woodswallow		
Burhinus grallarius	bush stone-curlew		
Cacatua galerita	sulphur-crested cockatoo		
Cacomantis pallidus	pallid cuckoo		
Calyptorhynchus banksii	red-tailed black-cockatoo		
Chalcites basalis	Horsfield's bronze-cuckoo		Marine
Chalcites lucidus	shining bronze-cuckoo		Marine
Chalcites minutillus minutillus	little bronze-cuckoo		Marine
Chalcites osculans	black-eared cuckoo		Marine
Chenonetta jubata	Australian wood duck		
Chthonicola sagittata	speckled warbler		
Cisticola exilis	golden-headed cisticola		
Colluricincla harmonica	grey shrike-thrush		

Scientific name	Common name	NC Act status	EPBC Act status
Colluricincla megarhyncha	little shrike-thrush		
Coracina novaehollandiae	black-faced cuckoo-shrike		Marine
Coracina papuensis	white-bellied cuckoo-shrike		Marine
Coracina tenuirostris	cicadabird		Marine
Corcorax melanorhamphos	white-winged chough		
Cormobates leucophaea	white-throated treecreeper		
Corvus orru	Torresian crow		
Coturnix ypsilophora	brown quail		
Cracticus nigrogularis	pied butcherbird		
Cracticus torquatus	grey butcherbird		
Cuculus optatus	oriental cuckoo		
Dacelo leachii	blue-winged kookaburra		
Dacelo novaeguineae	laughing kookaburra		
Daphoenositta chrysoptera	varied sittella		
Dendrocygna eytoni	plumed whistling-duck		
Dicaeum hirundinaceum	mistletoebird		
Dicrurus bracteatus	spangled drongo		Marine
Dromaius novaehollandiae	emu		
Egretta novaehollandiae	white-faced heron		
Elseyornis melanops	black-fronted dotterel		
Entomyzon cyanotis	blue-faced honeyeater		
Eolophus roseicapillus	galah		
Ephippiorhynchus asiaticus	black-necked stork	Near threatened	
Eudynamys orientalis	eastern koel		
Eurystomus orientalis	dollarbird		Marine
Falco cenchroides	nankeen kestrel		Marine
Gallinula tenebrosa	dusky moorhen		
Geopelia humeralis	bar-shouldered dove		
Geopelia striata	peaceful dove		
Geophaps scripta scripta	squatter pigeon	Vulnerable	Vulnerable
Gerygone albogularis	white-throated gerygone		
Grallina cyanoleuca	magpie-lark		

Scientific name	Common name	NC Act status	EPBC Act status
Grus rubicunda	brolga		
Gymnorhina tibicen	Australian magpie		
Haliaeetus leucogaster	white-bellied sea-eagle		Migratory/Marine
Haliastur sphenurus	whistling kite		Marine
Himantopus himantopus	black-winged stilt		Marine
Hirundo neoxena	welcome swallow		
Lichenostomus fuscus	fuscous honeyeater		
Lichenostomus leucotis	white-eared honeyeater		
Lichenostomus penicillatus	white-plumed honeyeater		
Lichmera indistincta	brown honeyeater		
Malurus lamberti	variegated fairy-wren		
Malurus melanocephalus	red-backed fairy-wren		
Manorina flavigula	yellow-throated miner		
Manorina melanocephala	noisy miner		
Meliphaga lewinii	Lewin's honeyeater		
Melithreptus albogularis	white-throated honeyeater		
Melithreptus gularis	black-chinned honeyeater	Near threatened	
Merops ornatus	rainbow bee-eater		Migratory/ Marine
Microeca fascinans	jacky winter		
Myiagra inquieta	restless flycatcher		
Myiagra rubecula	leaden flycatcher		
Ninox novaeseelandiae	southern boobook		Marine
Ninox strenua	powerful owl	Vulnerable	
Nycticorax caledonicus	nankeen night-heron		
Nymphicus hollandicus	cockatiel		
Ocyphaps lophotes	crested pigeon		
Pachycephala rufiventris	rufous whistler		
Pardalotus striatus	striated pardalote		
Pelecanus conspicillatus	Australian pelican		Marine
Phalacrocorax sulcirostris	little black cormorant		
Philemon citreogularis	little friarbird		

Scientific name	Common name	NC Act status	EPBC Act status
Philemon corniculatus	noisy friarbird		
Platalea flavipes	yellow-billed spoonbill		
Platalea regia	royal spoonbill		
Platycercus adscitus	pale-headed rosella		
Plectorhyncha lanceolata	striped honeyeater		
Podargus strigoides	tawny frogmouth		
Pomatostomus temporalis	grey-crowned babbler		
Ptilonorhynchus maculatus	spotted bowerbird		
Ramsayornis fasciatus	bar-breasted honeyeater		
Rhipidura albiscapa	grey fantail		
Rhipidura leucophrys	willie wagtail		
Scythrops novaehollandiae	channel-billed cuckoo		
Smicrornis brevirostris	weebill		
Sphecotheres vieilloti	Australasian figbird		
Struthidea cinerea	apostlebird		
Taeniopygia bichenovii	double-barred finch		
Threskiornis molucca	Australian white ibis		
Todiramphus macleayii	forest kingfisher		Marine
Todiramphus sanctus	sacred kingfisher		Marine
Tribonyx ventralis	black-tailed native-hen		
Trichoglossus chlorolepidotus	scaly-breasted lorikeet		
Trichoglossus haematodus moluccanus	rainbow lorikeet		
Tringa stagnatilis	marsh sandpiper		Migratory/ Marine
Tyto javanica	eastern barn owl		
Vanellus miles novaehollandiae	masked lapwing (southern subspecies)		
Zosterops lateralis	silvereye		Marine

Queensland Museum Database

Scientific name	Common name	NC Act status	EPBC Act status
Reptiles			
Anomalopus verreauxii	Verreaux's Skink		
Carlia foliorum	Burnett's Skink		
Carlia pectoralis			
Glaphyromorphus punctulatus	fine-spotted mulch-skink		
Heteronotia binoei	Bynoe's Gecko		
Suta suta	Myall Snake		
Mammals			
Macropus giganteus	eastern grey kangaroo		
Macropus robustus	common wallaroo		
Onychogalea fraenata	bridled nailtail wallaby	Endangered	Endangered

Birds Australia Database

Species name	Common name	NC Act status	EPBC Act status
Acanthiza chrysorrhoa	yellow-rumped thornbill		
Acanthiza nana	yellow thornbill		
Accipiter cirrocephalus	collared sparrowhawk		
Accipiter fasciatus	brown goshawk		Marine
Aegotheles cristatus	Australian owlet-nightjar		
Anas castanea	chestnut teal		
Anas gracilis	grey teal		
Anas rhynchotis	Australasian shoveler		
Anas superciliosa	pacific black duck		
Anhinga novaehollandiae	Australasian darter		
Anseranas semipalmata	magpie goose		Marine
Anthus novaeseelandiae	Australasian pipit		Marine
Aprosmictus erythropterus	red-winged parrot		
Aquila audax	wedge-tailed eagle		
Ardea intermedia	intermediate egret		Marine
Ardea modesta	eastern great egret		Migratory/ Marine
Ardea pacifica	white-necked heron		
Ardeotis australis	Australian bustard		
Artamus cinereus	black-faced woodswallow		
Artamus leucorynchus	white-breasted woodswallow		
Aviceda subcristata	pacific baza		
Aythya australis	hardhead		
Burhinus grallarius	bush stone-curlew		
Cacatua galerita	sulphur-crested cockatoo		
Cacomantis flabelliformis	fan-tailed cuckoo		Marine
Cacomantis pallidus	pallid cuckoo		Marine
Centropus phasianinus	pheasant coucal		
Ceyx azureus	azure kingfisher		
Chalcites basalis	Horsfield's bronze-cuckoo		Marine
Chalcites lucidus	shining bronze-cuckoo		Marine
Chalcites minutillus	little bronze-cuckoo		Marine
Chalcites osculans	black-eared cuckoo		Marine

Species name	Common name	NC Act status	EPBC Act status
Chenonetta jubata	Australian wood duck		
Chthonicola sagittata	speckled warbler		
Cisticola exilis	golden-headed cisticola		
Colluricincla harmonica	grey shrike-thrush		
Coracina novaehollandiae	black-faced cuckoo-shrike		Marine
Coracina papuensis	white-bellied cuckoo-shrike		Marine
Coracina tenuirostris	cicadabird		Marine
Corcorax melanorhamphos	white-winged chough		
Cormobates leucophaea	white-throated treecreeper		
Corvus coronoides	Australian raven		
Corvus orru	Torresian crow		
Coturnix ypsilophora	brown quail		
Cracticus nigrogularis	pied butcherbird		
Cracticus torquatus	grey butcherbird		
Cuculus optatus	oriental cuckoo		Migratory /Marine
Cygnus atratus	black swan		
Dacelo leachii	blue-winged kookaburra		
Dacelo novaeguineae	laughing kookaburra		
Daphoenositta chrysoptera	varied sittella		
Dendrocygna arcuata	wandering whistling-duck		Marine
Dendrocygna eytoni	plumed whistling-duck		
Dicaeum hirundinaceum	mistletoebird		
Dicrurus bracteatus	spangled drongo		Marine
Dromaius novaehollandiae	emu		
Egretta novaehollandiae	white-faced heron		
Elanus axillaris	black-shouldered kite		
Elseyornis melanops	black-fronted dotterel		
Entomyzon cyanotis	blue-faced honeyeater		
Eolophus roseicapillus	galah		
Ephippiorhynchus asiaticus	black-necked stork	Near threatened	
Eurystomus orientalis	dollarbird		Marine
Falco berigora	brown falcon		
Falco cenchroides	nankeen kestrel		Marine

Species name	Common name	NC Act status	EPBC Act status
Falco longipennis	Australian hobby		
Falco peregrinus	peregrine falcon		
Fulica atra	Eurasian coot		
Gallinula tenebrosa	dusky moorhen		
Gallirallus philippensis	buff-banded rail		
Gelochelidon nilotica	gull-billed tern		Marine
Geopelia humeralis	bar-shouldered dove		
Geopelia striata	peaceful dove		
Gerygone albogularis	white-throated gerygone		
Grallina cyanoleuca	magpie-lark		
Grus rubicunda	brolga		
Gymnorhina tibicen	Australian magpie		
Haliaeetus leucogaster	white-bellied sea-eagle		Migratory/ Marine
Haliastur indus	brahminy kite		Marine
Haliastur sphenurus	whistling kite		Marine
Himantopus himantopus	black-winged stilt		Marine
Hirundo neoxena	welcome swallow		
Irediparra gallinacea	comb-crested jacana		
Lichenostomus virescens	singing honeyeater		
Lichmera indistincta	brown honeyeater		
Lonchura castaneothorax	chestnut-breasted mannikin		
Malurus cyaneus	superb fairy-wren		
Malurus lamberti	variegated fairy-wren		
Malurus melanocephalus	red-backed fairy-wren		
Manorina flavigula	yellow-throated miner		
Manorina melanocephala	noisy miner		
Meliphaga lewinii	Lewin's honeyeater		
Melithreptus albogularis	white-throated honeyeater		
Merops ornatus	rainbow bee-eater		Migratory/ Marine
Microcarbo melanoleucos	little pied cormorant		
Microeca fascinans	jacky winter		
Milvus migrans	black kite		
Mirafra javanica	Horsfield's bushlark		

Species name	Common name	NC Act status	EPBC Act status
Myiagra inquieta	restless flycatcher		
Myiagra rubecula	leaden flycatcher		
Nettapus coromandelianus	cotton pygmy-goose	Near threatened	Marine
Ninox novaeseelandiae	southern boobook		Marine
Ninox strenua	powerful owl	Vulnerable	
Nycticorax caledonicus	nankeen night-heron		Marine
Nymphicus hollandicus	cockatiel		
Ocyphaps lophotes	crested pigeon		
Oriolus sagittatus	olive-backed oriole		
Pachycephala rufiventris	rufous whistler		
Pardalotus striatus	striated pardalote		
Pelecanus conspicillatus	Australian pelican		Marine
Petrochelidon ariel	fairy martin		
Petrochelidon nigricans	tree martin		Marine
Phalacrocorax carbo	great cormorant		
Phalacrocorax sulcirostris	little black cormorant		
Phalacrocorax varius	pied cormorant		
Phaps chalcoptera	common bronzewing		
Philemon citreogularis	little friarbird		
Philemon corniculatus	noisy friarbird		
Platalea flavipes	yellow-billed spoonbill		
Platalea regia	royal spoonbill		
Platycercus adscitus	pale-headed rosella		
Plectorhyncha lanceolata	striped honeyeater		
Plegadis falcinellus	glossy ibis		Migratory/ Marine
Podargus strigoides	tawny frogmouth		
Podiceps cristatus	great crested grebe		
Pomatostomus temporalis	grey-crowned babbler		
Porphyrio porphyrio	purple swamphen		Marine
Ptilonorhynchus maculatus	spotted bowerbird		
Rhipidura albiscapa	grey fantail		
Rhipidura leucophrys	willie wagtail		
Scythrops novaehollandiae	channel-billed cuckoo		Marine

Species name	Common name	NC Act status	EPBC Act status
Smicrornis brevirostris	weebill		
Sphecotheres vieilloti	Australasian figbird		
Struthidea cinerea	apostlebird		
Tachybaptus novaehollandiae	Australasian grebe		
Taeniopygia bichenovii	double-barred finch		
Taeniopygia guttata	zebra finch		
Threskiornis molucca	Australian white ibis		Marine
Threskiornis spinicollis	straw-necked ibis		Marine
Todiramphus macleayii	forest kingfisher		Marine
Todiramphus sanctus	sacred kingfisher		Marine
Trichoglossus chlorolepidotus	scaly-breasted lorikeet		
Trichoglossus haematodus	rainbow lorikeet		
Tringa stagnatilis	marsh sandpiper		Migratory/ Marine
Tyto javanica	eastern barn owl		
Vanellus miles	masked lapwing		
Zosterops lateralis	silvereye		Marine

Appendix B Rookwood Weir terrestrial fauna survey results

					Wet Season							Dry Season						
Family	Scientific Name	Common Name	EPBC Act Status	NC Act Status	1	2	3	4	5	6	Opp.	1	2	3	4	5	6	Opp.
Amphibians																		
Bufonidae	*Rhinella marina*	cane toad		I	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	
Hylidae	*Litoria alboguttata*	striped burrowing frog						✓	✓									
Hylidae	*Litoria caerulea*	green tree frog					✓		✓	✓	✓							
Hylidae	*Litoria fallax*	eastern dwarf tree frog					✓			✓								
Hylidae	*Litoria inermis*	Peters' frog				✓	✓		✓					✓		✓		
Hylidae	*Litoria latopalmata*	broad palmed frog				✓		✓						✓				
Hylidae	*Litoria rothi*	Roth's tree frog			✓					✓						✓		
Hylidae	*Litoria rubella*	red tree frog				✓	✓											
Hylidae	*Litoria wilcoxii*	stony creek frog							✓							✓	✓	
Myobatrachidae	*Limnodynastes salmini*	salmon-striped frog			✓							✓						
Myobatrachidae	*Limnodynastes tasmaniensis*	spotted grass frog			✓			✓	✓									
Myobatrachidae	*Platyplectrum ornatum*	ornate burrowing frog			✓	✓	✓	✓	✓									
Reptiles																		
Agamidae	*Physignathus lesueurii*	eastern water dragon									✓							✓
Agamidae	*Pogona barbata*	bearded dragon				✓					✓							
Colubridae	*Tropidonophis mairii*	keelback								✓								
Elapidae	*Pseudonaja textilis*	eastern brown snake						✓										
Gekkonidae	*Gehyra catenata*									✓		✓					✓	
Gekkonidae	*Gehyra dubia*	dubious dtella			✓			✓	✓	✓		✓					✓	
Gekkonidae	*Heteronotia binoei*	Bynoe's gecko								✓			✓	✓	✓		✓	✓
Gekkonidae	*Oedura monilis*	oscellated velvet gecko															✓	
Pythonidae	*Aspidites melanocephalus*	black-headed python				✓					✓							
Pythonidae	*Morelia spilota*	carpet python									✓							
Scincidae	*Carlia foliorum*							✓				✓						
Scincidae	*Carlia pectoralis*					✓	✓					✓					✓	
Scincidae	*Carlia schmeltzi*					✓	✓											
Scincidae	*Carlia vivax*	lively rainbow skink			✓	✓	✓											

					Wet Season							Dry Season						
Family	Scientific Name	Common Name	EPBC Act Status	NC Act Status	1	2	3	4	5	6	Opp.	1	2	3	4	5	6	Opp.
Scincidae	*Cryptoblepharus virgatus*	wall skink				✓		✓	✓				✓	✓	✓		✓	✓
Scincidae	*Ctenotus robustus*	eastern striped skink			✓	✓	✓											
Scincidae	*Ctenotus taeniolatus*	copper-tailed skink				✓												
Scincidae	*Eulamprus martini*	Martin's skink															✓	
Scincidae	*Eulamprus quoyii*	eastern water skink														✓		
Scincidae	*Morethia boulengeri*	Boulenger's skink				✓	✓										✓	
Scincidae	*Morethia taeniopleura*													✓				
Varanidae	*Varanus sp*	goanna																✓
Mammals																		
Bovidae	*Bos taurus*	domestic cow		I	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓
Canidae	*Canis lupus*	wild dog		I	✓												✓	
Canidae	*Vulpes vulpes*	red fox		I								✓		✓	✓		✓	✓
Cervidae	*Cervus sp*	deer		I													✓	
Emballonuridae	*Saccolaimus flaviventris*	yellow-bellied sheathtail bat				✓		✓	✓						✓	✓		
Emballonuridae	*Taphozous troughtoni*	Troughton's shealthtail bat		E					✓				✓					
Felidae	*Felis catus*	feral cat		I									✓					
Leporidae	*Oryctolagus cuniculus*	Europen rabbit		I								✓					✓	
Macropodidae	*Macropus agilis*	agile wallaby			✓						✓	✓	✓					
Macropodidae	*Macropus parryi*	whiptail wallaby											✓			✓	✓	
Macropodidae	*Macropus giganteus*	eastern grey kangaroo														✓		
Macropodidae	*Macropus robustus*	euro											✓					
Macropodidae	*Wallabia bicolor*	swamp wallaby									✓							
Molossidae	*Chaerophon jobensis*	northern freetail bat			✓								✓					
Molossidae	*Mormopterus beccarii*	Beccari's freetail bat			✓				✓								✓	
Molossidae	*Mormopterus species 2*	undescribed freetail bat			✓								✓	✓				
Molossidae	*Tadarida australis*	white-striped freetail bat											✓			✓		
Muridae	*Mus musculus*	house mouse		I			✓	✓	✓				✓		✓	✓		
Muridae	*Hydromys chysogaster*	water rat					✓								✓			✓

					Wet Season							Dry Season						
Family	Scientific Name	Common Name	EPBC Act Status	NC Act Status	1	2	3	4	5	6	Opp.	1	2	3	4	5	6	Opp.
Muridae	*Pseudomys delicatulus*	delicate mouse														✓		
Peramelidae	*Isoodon macrourus*	northern brown bandicoot					✓	✓				✓		✓	✓			
Petauridae	*Petaurus australis*	yellow-bellied glider							✓								✓	
Petauridae	*Petaurus breviceps*	sugar glider							✓									
Petauridae	*Petaurus norfolcensis*	squirrel glider													✓	✓		
Phalangeridae	*Trichosurus vulpecula*	common brushtail possum					✓						✓	✓	✓			
Phascolarctidae	*Phascolarctos cinereus*	koala															✓	✓
Potoroidae	*Aepyprymnus rufescens*	rufous betong			✓							✓		✓			✓	
Pseudocheiridae	*Petauroides volans*	greater glider						✓		✓				✓	✓	✓	✓	
Suidae	*Sus scrofa*	pig		I	✓	✓			✓	✓							✓	
Tachyglossidae	*Tachyglossus aculeatus*	echidna			✓	✓											✓	✓
Vespertilionidae	*Chalinolobus nigrogriseus*	hoary wattled bat			✓				✓				✓					
Vespertilionidae	*Chalinolobus gouldii*	Gould's wattle bat			✓			✓	✓				✓	✓	✓	✓	✓	✓
Vespertilionidae	*Chalinolobus picatus*	little pied bat		NT											✓	✓		
Vespertilionidae	*Miniopterus australis*	little bent-winged bat			✓				✓			✓	✓		✓	✓		
Vespertilionidae	*Miniopterus orianae oceanensis*	eastern bent-winged bat			✓				✓			✓	✓	✓	✓	✓	✓	
Vespertilionidae	*Myotis macropus*	large-footed myotis			✓									✓	✓			
Vespertilionidae	*Nyctophilus sp*	undescribed long-eared bat											✓					
Vespertilionidae	*Scotorepens balstoni*	inland broad-nosed bat			✓													
Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat			✓	✓		✓	✓				✓	✓	✓	✓	✓	
Vespertilionidae	*Scotorepens sp*	undescribed broad-nosed bat														✓		
Vespertilionidae	*Vespadelus troughtoni*	eastern cave bat						✓							✓			
Birds																		
Acanthizidae	*Gerygone fusca*	western gerygone															✓	✓
Acanthizidae	*Gerygone olivacea*	white-throated gerygone			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Acanthizidae	*Smicrornis brevirostris*	weebill				✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Accipitridae	*Accipiter fasciatus*	brown goshawk	Ma								✓							
Accipitridae	*Aquila audax*	wedge-tailed eagle					✓				✓		✓			✓		

					Wet Season							Dry Season						
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Accipitridae	*Aviceda subcristata*	Pacific baza				✓												✓
Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle	Ma; Mig (CAMBA)								✓						✓	✓
Accipitridae	*Haliastur sphenurus*	whistling kite	Ma					✓	✓			✓	✓	✓	✓	✓	✓	✓
Accipitridae	*Milvus migrans*	black kite									✓							
Alcedinidae	*Alcedo azurea*	azure kingfisher												✓				
Anatidae	*Anas gracilis*	grey teal																✓
Anatidae	*Anas rhynchotis*	Australasian shoveler									✓							✓
Anatidae	*Anas superciliosa*	Pacific black duck				✓	✓			✓	✓	✓			✓	✓	✓	✓
Anatidae	*Aythya australis*	hardhead									✓						✓	✓
Anatidae	*Chenonetta jubata*	Australian wood duck					✓											
Anatidae	*Cygnus atratus*	black swan																✓
Anatidae	*Dendrocygna eytoni*	plumed whistling-duck									✓							
Anatidae	*Nettapus coromandelianus*	cotton pygmy-goose	Ma	NT						✓								
Anatidae	*Nettapus pulchellus*	green pygmy goose	Ma							✓								
Anhingidae	*Anhinga melanogaster*	Australasian darter								✓	✓	✓		✓		✓	✓	✓
Ardeidae	*Ardea intermedia*	intermediate egret	Ma															✓
Ardeidae	*Ardea modesta*	eastern great egret	Ma; Mig (CAMBA; JAMBA)															✓
Ardeidae	*Ardea pacifica*	white-necked heron												✓	✓	✓	✓	✓
Ardeidae	*Egretta novaehollandiae*	white-faced heron				✓	✓		✓		✓	✓	✓	✓		✓	✓	✓
Ardeidae	*Ixobrychus flavicollis australis*	black bittern						✓										
Ardeidae	*Nycticorax caledonicus*	nankeen night heron	Ma															
Artamidae	*Artamus cinereus*	black-faced woodswallow																✓
Artamidae	*Cracticus nigrogularis*	pied butcherbird			✓	✓		✓		✓		✓	✓		✓	✓	✓	✓
Artamidae	*Cracticus torquatus*	grey butcherbird			✓					✓		✓	✓		✓		✓	
Artamidae	*Gymnorhina tibicen*	Australian magpie			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Artamidae	*Strepera graculina*	pied currawong			✓	✓	✓			✓			✓		✓	✓	✓	✓
Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cacatuidae	*Cacatua sanguinea*	little corella				✓										✓		✓

					Wet Season							Dry Season						
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Cacatuidae	*Eolophus roseicapillus*	galah			✓	✓		✓				✓	✓	✓	✓	✓		✓
Cacatuidae	*Calyptorhynchus banksii*	red-tailed black-cockatoo					✓								✓			
Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike	Ma		✓	✓		✓	✓	✓			✓		✓	✓	✓	✓
Campephagidae	*Coracina papuensis*	white-bellied cuckoo-shrike	Ma		✓				✓					✓	✓		✓	✓
Casuaridae	*Dromaius novaehollandiae*	emu									✓						✓	✓
Charadriidae	*Elseyornis melanops*	black-fronted dotterel									✓	✓				✓		✓
Charadriidae	*Vanellus miles*	masked lapwing			✓							✓					✓	✓
Ciconiidae	*Ephippiorhynchus australis*	black-necked stork		NT							✓							✓
Cisticolidae	*Cisticola exilis*	golden-headed cisticola																✓
Climacteridae	*Climacteris picumnus*	brown treecreeper																✓
Climacteridae	*Cormobates leucophaeus*	white throated treecreeper						✓		✓								
Columbidae	*Geopelia striata*	peaceful dove			✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Columbidae	*Geophaps scripta scripta*	squatter pigeon	V	V		✓					✓			✓			✓	✓
Columbidae	*Lopholaimus antarcticus*	topknot pigeon			✓													
Columbidae	*Geopelia humeralis*	bar-shouldered dove				✓							✓			✓	✓	
Columbidae	*Ocyphaps lophotes*	crested pigeon							✓	✓					✓			
Corcoracidae	*Corcorax melanorhamphos*	white-winged chough									✓					✓	✓	
Corcoracidae	*Struthidea cinerea*	apostlebird									✓						✓	✓
Corvidae	*Corvus coronoides*	Australian raven													✓			✓
Corvidae	*Corvus orru*	Torresian crow			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cuculidae	*Cacomantis flabelliformis*	fan-tailed cuckoo	Ma				✓										✓	✓
Cuculidae	*Centropus phasianinus*	pheasant coucal				✓										✓	✓	✓
Cuculidae	*Eudynamys orientalis*	eastern koel																✓
Cuculidae	*Eudynamys scolopacea*	common koel	Ma								✓							
Dicruridae	*Dicrurus bracteatus*	spangled drongo	Ma			✓	✓	✓		✓							✓	
Dicruridae	*Grallina cyanoleuca*	magpie-lark				✓	✓	✓	✓	✓		✓			✓	✓	✓	✓
Dicruridae	*Myiagra inquieta*	restless flycatcher					✓	✓				✓	✓	✓				✓
Dicruridae	*Myiagra rubecula*	leaden flycatcher				✓	✓			✓							✓	✓

					Wet Season							Dry Season						
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Dicruridae	*Rhipidura albiscarpa*	grey fantail			✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Dicruridae	*Rhipidura leucophrys*	willie wagtail				✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Falconidae	*Falco berigora*	brown falcon									✓	✓	✓	✓				✓
Falconidae	*Falco cenchroides*	nankeen kestrel	Ma								✓		✓					
Gruiformes	*Grus rubicunda*	brolga									✓				✓			✓
Halcyonidae	*Dacelo leachii*	blue-winged kookaburra				✓			✓	✓			✓		✓	✓	✓	✓
Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Halcyonidae	*Todiramphus macleayii*	forest kingfisher	Ma					✓	✓	✓	✓			✓	✓	✓		✓
Halcyonidae	*Todiramphus sanctus*	sacred kingfisher	Ma							✓								✓
Hirundinidae	*Hirundo neoxena*	welcome swallow						✓				✓			✓			✓
Hirundinidae	*Petrochelidon nigricans*	tree martin	Ma									✓			✓		✓	✓
Jacanidae	*Irediparra gallinacea*	comb-crested jacana																✓
Maluridae	*Malurus melanocephalus*	red-backed fairy-wren				✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
Megapodiidae	*Alectura lathami*	Australian brush turkey			✓						✓							✓
Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Meliphagidae	*Lichenostomus fuscus*	fuscous honeyeater																✓
Meliphagidae	*Lichenostomus virescens*	singing honeyeater														✓		
Meliphagidae	*Lichmera indistincta*	brown honeyeater											✓	✓			✓	✓
Meliphagidae	*Manorina flavigula*	yellow-throated miner							✓			✓	✓			✓	✓	✓
Meliphagidae	*Manorina melanocephala*	noisy miner						✓	✓	✓				✓		✓		
Meliphagidae	*Meliphaga lewini*	Lewin's honeyeater			✓		✓							✓				✓
Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Meliphagidae	*Melithreptus gularis*	black-chinned honeyeater		NT											✓			
Meliphagidae	*Philemon citreogularis*	little friarbird								✓							✓	
Meliphagidae	*Philemon corniculatus*	noisy friarbird			✓						✓	✓			✓	✓	✓	✓
Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater				✓				✓				✓	✓	✓	✓	✓
Meropidae	*Merops ornatus*	rainbow bee-eater	Ma; Mig (JAMBA)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Motacillidae	*Anthus novaeseelandiae*	Richard's pipit	Ma								✓						✓	
Nectariniidae	*Dicaeum hirundinaceum*	mistletoebird			✓		✓	✓	✓				✓					✓
Neosittidae	*Daphoenositta chrysoptera*	varied sittella												✓		✓	✓	
Oriolidae	*Oriolus sagittatus*	olive-backed oriole								✓								✓
Oriolidae	*Sphecotheres viridis*	Australasian figbird			✓		✓											
Otididae	*Ardeotis australis*	Australian bustard									✓							✓
Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush			✓	✓				✓			✓		✓	✓	✓	✓
Pachycephalidae	*Colluricincla megarhyncha*	little shrike-thrush																✓
Pachycephalidae	*Pachycephala rufiventris*	rufous whistler			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pardalotidae	*Acanthiza pusilla*	brown thornbill							✓									
Pardalotidae	*Pardalotus punctatus*	spotted pardalote						✓	✓	✓					✓	✓	✓	✓
Pardalotidae	*Pardalotus striatus*	striated pardalote			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pardalotidae	*Sericornis frontalis*	white-browed scrubwren																✓
Passeridae	*Hirundo ariel*	fairy martin													✓			
Passeridae	*Neochmia modesta*	plum-headed finch											✓	✓			✓	
Passeridae	*Poephila bichenovii*	double-barred finch			✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓
Pelecanidae	*Pelecanus conspicillatus*	Australian pelican	Ma								✓						✓	✓
Petroicidae	*Microeca flavigaster*	lemon-bellied flycatcher															✓	✓
Petroicidae	*Petroica goodenovii*	red-capped robin											✓			✓		✓
Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant											✓		✓		✓	✓
Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant			✓						✓							
Phalacrocoracidae	*Phalacrocorax varius*	pied cormorant								✓	✓						✓	✓
Phasianidae	*Coturnix ypsilophora*	brown quail							✓	✓						✓	✓	
Podargidae	*Podargus strigoides*	tawny frogmouth							✓	✓		✓			✓			
Podicipedidae	*Podiceps cristatus*	great crested grebe									✓							
Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe																✓
Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler						✓						✓			✓	✓
Psittacidae	*Aprosmictus erythropterus*	red-winged parrot			✓		✓			✓		✓	✓		✓	✓	✓	✓

					Wet Season							Dry Season						
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Psittacidae	*Glossopsitta pusilla*	little lorikeet													✓			
Psittacidae	*Nymphicus hollandicus*	cockatiel				✓	✓	✓								✓	✓	✓
Psittacidae	*Platycercus adscitus*	pale-headed rosella			✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Psittacidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet			✓			✓	✓			✓			✓		✓	
Psittacidae	*Trichoglossus haematodus*	rainbow lorikeet			✓				✓		✓	✓	✓	✓	✓		✓	✓
Rallidae	*Gallinula tenebrosa*	dusky moorhen									✓						✓	
Strigidae	*Ninox novaeseelandiae*	southern boobook	Ma													✓		
Sylviidae	*Megalurus timoriensis*	tawny grassbird														✓		
Threskiornithidae	*Platalea flavipes*	yellow-billed spoonbill																✓
Threskiornithidae	*Threskiornis molucca*	Australian white ibis	Ma															✓
Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis	Ma										✓					✓
Turnicidae	*Turnix varia*	painted button quail															✓	
Tytonidae	*Tyto alba*	barn owl								✓							✓	
Tytonidae	*Tyto javanica*	Pacific barn owl														✓		
Zosteropidae	*Zosterops lateralis*	silvereye	Ma		✓			✓					✓		✓	✓	✓	

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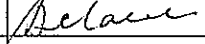
1	K Hryczyszyn	G Squires		L Delaere		25/07/2014

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