LOWER FITZROY RIVER
INFRASTRUCTURE PROJECT

Appendix N

Eden Bann Weir Baseline Terrestrial Fauna Report

SunWater
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Gladstone Area Water Board

Gladstone Area Water Board and SunWater

Lower Fitzroy River Infrastructure Project

Eden Bann Weir Baseline Terrestrial Fauna Report

July 2014

Executive summary

A terrestial ecology study was conducted for the proposed raising of Eden Bann 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 Eden Bann Weir. 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 expanded inundation areas associated with the weir raising.

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 the raised Eden Bann 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 Eden Bann 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 fauna habitat types identified within the Project footprint provide foraging, shelter and breeding resources for at least 158 species (as identified during wet and dry season field surveys), comprising 12 amphibians, 20 reptiles, 28 mammals (including one threatened species), and 98 birds (including three threatened species).

Terrestrial fauna habitats within the Eden Bann Weir Project footprint are highly seasonal responding to changes in rainfall and river flow; however the existing weir stabilises the seasonal influence to some extent. Habitats close to the existing weir are more permanently inundated, while those further upstream are more seasonally dynamic.

Since much of the lowland landscape has been cleared for agricultural development, riparian habitat corridors perform a valuable role, maintaining connectivity between habitat remnants. The most extensive habitat remnants occur in rocky hillsides and uncleared alluvial plains. Such habitats are likely to act as bioregional wildlife nodes and sources for dispersal.

Ephemeral off-stream water bodies and creeks represent sensitive terrestrial fauna habitats within the Eden Bann Weir Project footprint. Such habitats provide resources for a wide array of animals, including amphibians (breeding and foraging), reptiles (foraging), ground-dwelling mammals (foraging and denning), microchiropteran bats (foraging) and birds (foraging and nesting amongst dense riparian vegetation).

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 Eden Bann Weir Project footprint. Nevertheless, the fragmented habitats that occur within and adjacent to the Fitzroy River 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 the 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
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.

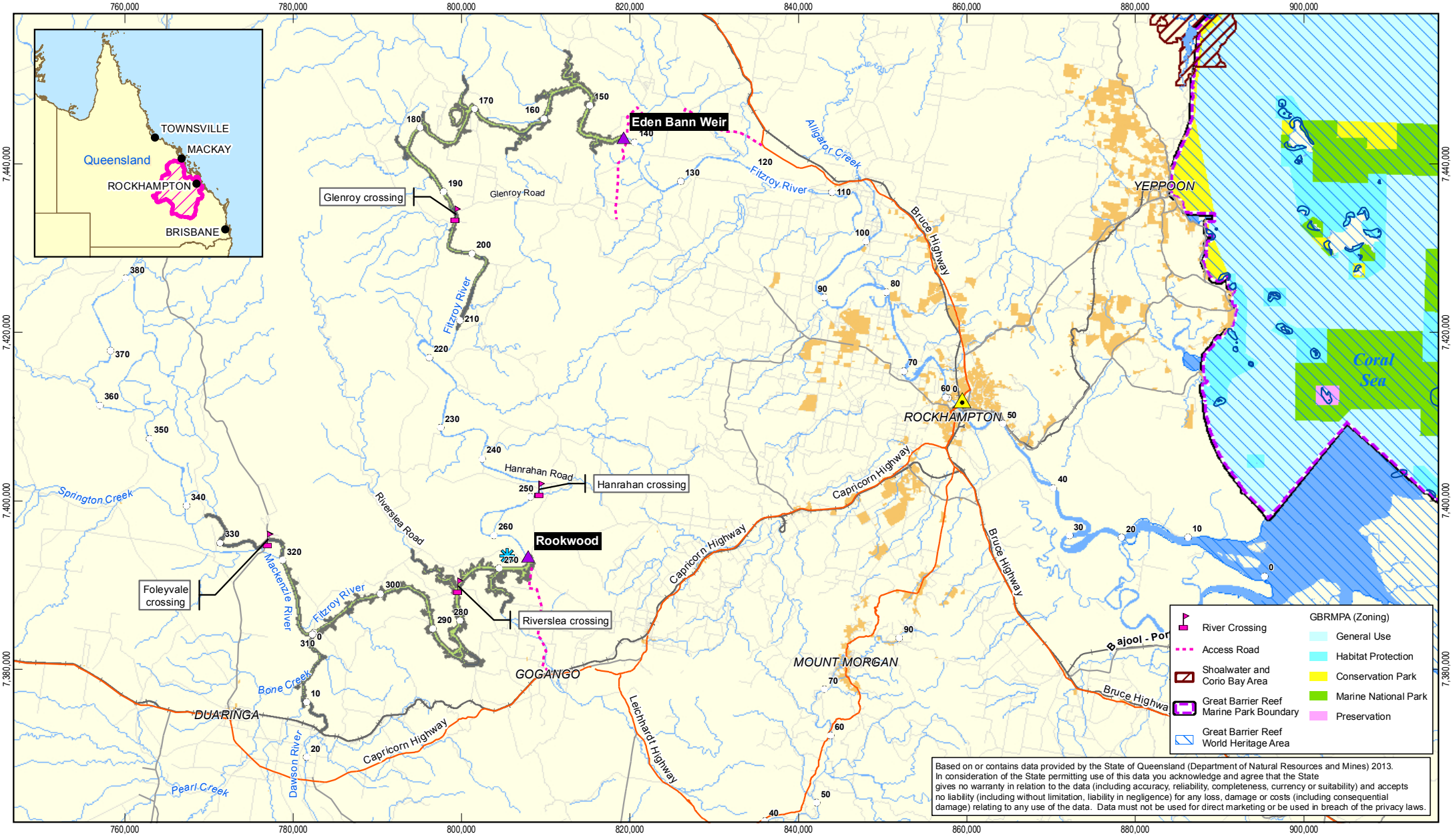
Key Project components include the following:

- 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

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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 raised weir infrastructure, private access roads and impoundments, inclusive of a flood buffer. Water releases will be made through 'run of river' methods (as is currently the case) 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* Operating regimes will be developed and implemented through the Fitzroy Basin Resource Operations Plan 2004 (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 Eden Bann 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 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 raised Eden Bann Weir may have on the environmental values described
- Outline strategies and management recommendations to primarily avoid, or minimise, 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 Eden Bann Weir.

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 2008)
- 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 Eden Bann 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:
  - 22° 59', 150° 7' (top right corner) and 23° 41', 149° 48' (bottom left corner).
- DEWHA Directory of Important Wetlands database in Australia
- Birds Australia Atlas database. This lists all bird species previously recorded from 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° 2.42', -150° 14.34' (top right corner) and 23° 27.93', -149° 51.10' (bottom left corner).
- Threatened species profiles and field guides

- Previous studies and reports conducted for the Project (by others) including:
  - Eden Bann Weir Project Terrestrial Fauna Baseline Study (Biodiversity Assessment and Management Pty Ltd (BAAM) 2008a)
  - Rookwood Weir Project Terrestrial Fauna Literature Review and Gap Analysis (BAAM 2008b)
  - 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 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 survey

Wet and dry season field surveys were conducted in order to document seasonal changes in the habitats within the study area and to maximise the potential of encountering seasonal and migratory species. An initial reconnaissance of the study area was undertaken between 15 December and 18 December 2008 and also included an aerial survey on 20 January 2009 (aerial overflight). The wet season survey was conducted between 28 January and 2 February 2009, while the dry season surveys were undertaken between 6 August and 11 August 2009.

2.5.4 Climatic conditions

All climatic data was 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 were generally warm and dry. Temperatures ranged between 21.9ºC and 31.3ºC with a minimum average of 22.9ºC and maximum of 30.2ºC. Days were generally cloudy with moderate relative humidity (average 60% recorded at 3 pm) and total rainfall recorded during the survey period was 3.4 mm. Forty-one millimetres of rain was recorded in the two-week period preceding the surveys while 177.6 mm of rain fell in the two months prior (29 November 2008 to 28 January 2009).

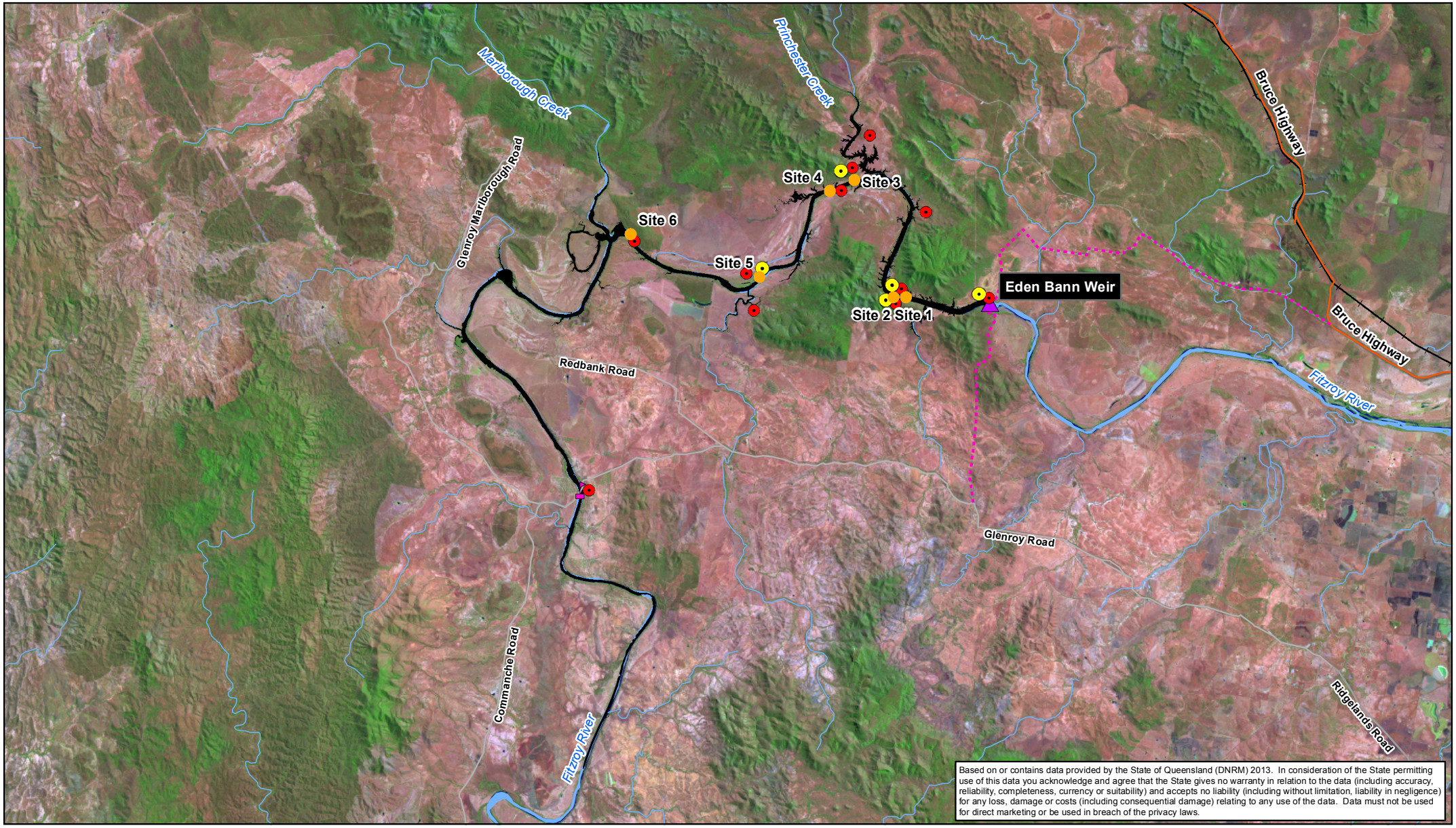
Dry season

Conditions during the dry season survey were generally fine and warm, with cool mornings. Temperatures ranged between 8ºC and 28.8ºC with a minimum average of 11.7ºC and a maximum of 26ºC. Days were generally clear and sunny with low relative humidity (average 33.7% recorded at 3 pm) and total rainfall during the survey period was 0.2 mm. A total of 0.2 mm was recorded in the two week period preceding the surveys, while 8 mm of rain fell in the two months prior (7 June to 6 August 2009).

2.5.5 Site selection

Six fauna survey (trapping) sites (Figure 2-1 and Table 2-1) were chosen following a review of satellite imagery, RE mapping and initial 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
- Were accessible by vehicle or boat (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 19 Mar 2014

Eden Bann 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 survey sites

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

Site number	Habitat description	Photos
4	Riparian fringe with agricultural land behind	 
5	Open woodland with grassy understorey and Melaleuca riparian fringe	 
6	Open woodland with grassy understorey and Melaleuca riparian fringe	 

2.5.6 Habitat assessments

Individual habitat types along the length of the river, including the riparian fringe either side of the river and adjacent 500 m of river floodplain, 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).

The relative ecological value 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 relative ecological value 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 and cage traps. 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 Elliott 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 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.

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

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

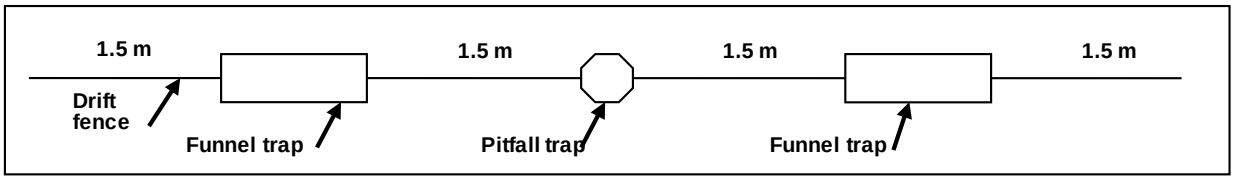


Plate 2-1 Pit-fall trap, funnel traps and drift fence complex

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 (1998) 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 nocturnal surveying (spotlighting and harp trap deployment and retrieval). A summary of the survey efforts conducted at each site is outlined in Table 2-2 and Table 2-3.

Table 2-2 Summary fauna survey techniques and locations – wet season

Systematic									Non-systematic	
Number of trap nights*							Number of nights#	Number of minutes^	Number of minutes^	Number of minutes^
Site	Pit-fall trap	Funnel trap	Cage trap	Elliot box trap	Hair tube	Harp trap1	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	2	1	100	90	90
3	8	32	40	80	80			100	90	
4	16	32	40	80	80			100	90	
5	16	32	40	80	80		1	100	90	
6	16	32	40	80	80		1	100	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.
[1]Harp trapping and nocturnal searches were undertaken in the habitat surrounding the Eden Bann Weir boat ramp in lieu of Sites 3-6. This was due to the suitability and representativeness of habitat at the boat ramp and the considerable logistical and safety concerns associated with travelling long distances by boat at night in waters containing debris and estuarine crocodiles.

Table 2-3 Summary of fauna survey techniques and locations – dry season

Systematic									Non-systematic
Number of trap nights*							Number of nights#	Number of minutes^	Number of minutes^
Site	Pit-fall trap	Funnel trap	Cage trap	Elliot box trap	Hair tube	Harp trap1	Anabat detector	Bird survey	Diurnal searches
1	16	32	40	80	80			100	90
2	16	32	40	80	80	2		100	90
3	8	32	40	80	80		1	100	90
4	16	32	40	80	80	2		100	90
5	16	32	40	80	80			100	90
6	16	32	40	80	80			100	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.
[1]As with the wet season surveys, safety constraints prevented nocturnal surveying upstream of Eden Bann Weir. This was exacerbated in the dry season by lower water levels in the impoundment. Due to suitability and abundance of habitat for bats at the boat ramp upstream of Eden Bann Weir, Anabat detectors and harp traps were deployed at this location in addition to the listed surveys sites. Nocturnal searches were also undertaken at this location.

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, 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, particularly in the upper reaches of the Project footprint, 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. Desktop reviews were undertaken to partially compensate for this limitation.

3. Terrestrial fauna existing environmental values

3.1 Regional context

3.1.1 Bioregion

The Eden Bann Weir section of the Fitzroy River occurs along the border of the Brigalow Belt North and Brigalow Belt South Bioregions. These bioregions contain a variety of landscapes ranging from rugged ranges and undulating hills to valleys and flat alluvial plains. The geology within these bioregions is also varied, where the Brigalow Belt North consists of Permian volcanics and Permian-Triassic sediments in the Bowen and Galilee basins, Carboniferous and Devonian sediments and volcanics in the Drummond basin, Cambrian and Ordovician rocks in the Anakie inlier and associated Tertiary deposits (DEWHA 2009a). The Brigalow Belt South however consists predominantly of Jurassic and younger deposits in the Great Artesian Basin and Tertiary deposits with elevated basalt flows (DEWHA 2009b). Both bioregions are characterised by the presence of brigalow (*Acacia harpophylla*). 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*).

Both bioregions are 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 declined significantly. 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 these bioregions 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). Ecosystems within these bioregions that have high conservation priority (based on low representation in reserve systems) are vine scrubs, bluegrass communities, poplar box/brigalow, blackwood and gidgee (DEWHA 2009a; DEWHA 2009b).

3.1.2 Subregions

The Eden Bann Weir Project footprint runs through two sub-regions, namely:

- Marlborough Plains (Brigalow Belt North 14)
- Mount Morgan Ranges (Brigalow Belt South 4).

Marlborough Plains

The Marlborough Plains is an undulating to hilly subregion with complex geology that includes Permian volcanics and Devonian, Carboniferous, Permian and Cretaceous sediments. The subregion is dominated by alluvial plains and colluvial slopes (Sattler and Williams 1999). Colluvial slopes support mixed woodland communities of poplar gum (*Eucalyptus platyphylla*), ghost gum

(*Corymbia dallachiana*), forest red gum (*Eucalyptus tereticornis*), and tea tree (*Melaleuca* spp.). Low hills support narrow-leaved ironbark (*Eucalyptus crebra*) and hillier areas are generally covered in open forest and woodland of spotted gum (*Corymbia citriodora*), narrow-leaved ironbark (*Eucalyptus crebra*) and bloodwood (*Corymbia* spp.).

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, whilst 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).

3.2 Site characteristics

3.2.1 Overview

The area surrounding the Eden Bann Weir Project footprint contains a high proportion of remnant vegetation relative to other sections of the river within the study area. The landscape includes a variety of rugged ranges, low undulating hills and alluvial plains. Lowland areas are predominantly cleared for grazing, however, large areas of woodland vegetation persist on low rocky hills. In this area, the river is wide and slow-flowing with a series of sand banks that are vegetated with *Melaleucas*. The Fitzroy River riparian fringe is typically narrow adjacent to grazing areas, and wider and more extensively vegetated adjacent to rocky hills. A series of creeks that join the river between the Eden Bann Weir and Glenroy Crossing generally have more natural, complex riparian vegetation and are expected to provide habitat for a range of species. The existing Eden Bann Weir modifies flows along this section of 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). Since 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

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

- **Endangered RE 11.3.1** (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 (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.
- **Least concern RE 11.3.9** *Eucalyptus platyphylla, Corymbia spp.* woodland on alluvial plains.
- **Least concern RE 11.3.25** *Eucalyptus tereticornis* and *E. 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 11.3.27** Freshwater wetlands
- **Endangered RE 11.3.38** *Eucalyptus tereticornis, Melaleuca viridiflora, Corymbia tessellaris and Eucalyptus fibrosa* subspecies (Glen Geddes) woodland with a grassy understorey:
  - Habitat for rare and threatened plant species including Stackhousia tyrnoii, Pimelea leptospermoides, Bursaria reevesii, Capparis thozetiana and Hakea trineural.
- **Least concern RE 11.11.7** *Eucalyptus fibrosa* subspecies, *E. xanthope* woodland on serpentinite:
  - Habitat for rare and threatened flora species including Corymbia xanthope, Hakea trineura, Capparis thozetiana, Leucopogon cuspidatus, Neoroepera buxifolia, Pimelea leptospermoides, Pultenaea setulosa, Stackhousia tryonii, Marsdenia brevifolia, Cycas ophiolitica, Bursaria reevesii, Capparis humistrata and Macrozamia serpentina (REDD 2007).
- **Of concern 11.11.10** *Eucalyptus melanophloia* woodland on deformed and metamorphosed sediments and interbedded volcanics
- **Least concern RE 11.12.1** *Eucalyptus crebra* woodland on igneous rocks.
- **Least concern RE 11.12.2** *Eucalyptus melanophloia* woodland on igneous rocks.

3.2.4 Habitat types

Ten broad terrestrial fauna habitat types were identified as per the criteria outlined in Section 2.5.6, within the Eden Bann Weir Project footprint. These were:

- Open woodland with grassy understorey and *Melaleuca* riparian fringe
- Open woodland with weedy understorey and *Melaleuca* riparian fringe
- Open woodland on a rocky hillside
- Open woodland with sandy substrate

- *Melaleuca* forest
- *Melaleuca* forest with sandy substrate
- Narrow riparian fringe
- Agricultural land
- Creeks
- Off-stream water bodies[2].

The habitat types identified varied 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 influenced the diversity and abundance of microhabitats and also resources available to terrestrial fauna.

The open woodland with grassy understorey and *Melaleuca* riparian fringe was characterized by substantial habitat complexity and as a result this habitat supported a notable diversity of terrestrial fauna. Open woodland and *Melaleuca* forest habitats with weedy understorey had a more homogenous ground layer, although the structural complexity of this layer still provided shelter resources for fauna. The open woodland on rocky hillside was also structurally complex, providing a diversity of resources for generalist and potentially niche species. Open woodland and *Melaleuca* forests with sandy substrates generally had low ground-level and canopy complexity but still supported important habitat resources for many shrub and tree dwelling animals (such as woodland, and forest birds, as well as arboreal mammals).

Large areas of the Eden Bann Weir Project footprint have been cleared for agriculture and only a narrow fringe of eucalypt (and to a lesser extent, *Melaleuca*) riparian vegetation remains in some places. 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 resources (particularly foraging) for an array of terrestrial fauna including frogs, waterbirds and microchiropteran bats.

The fauna habitat types and boundaries in the Eden Bann Weir Project footprint 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 in the Project footprint.

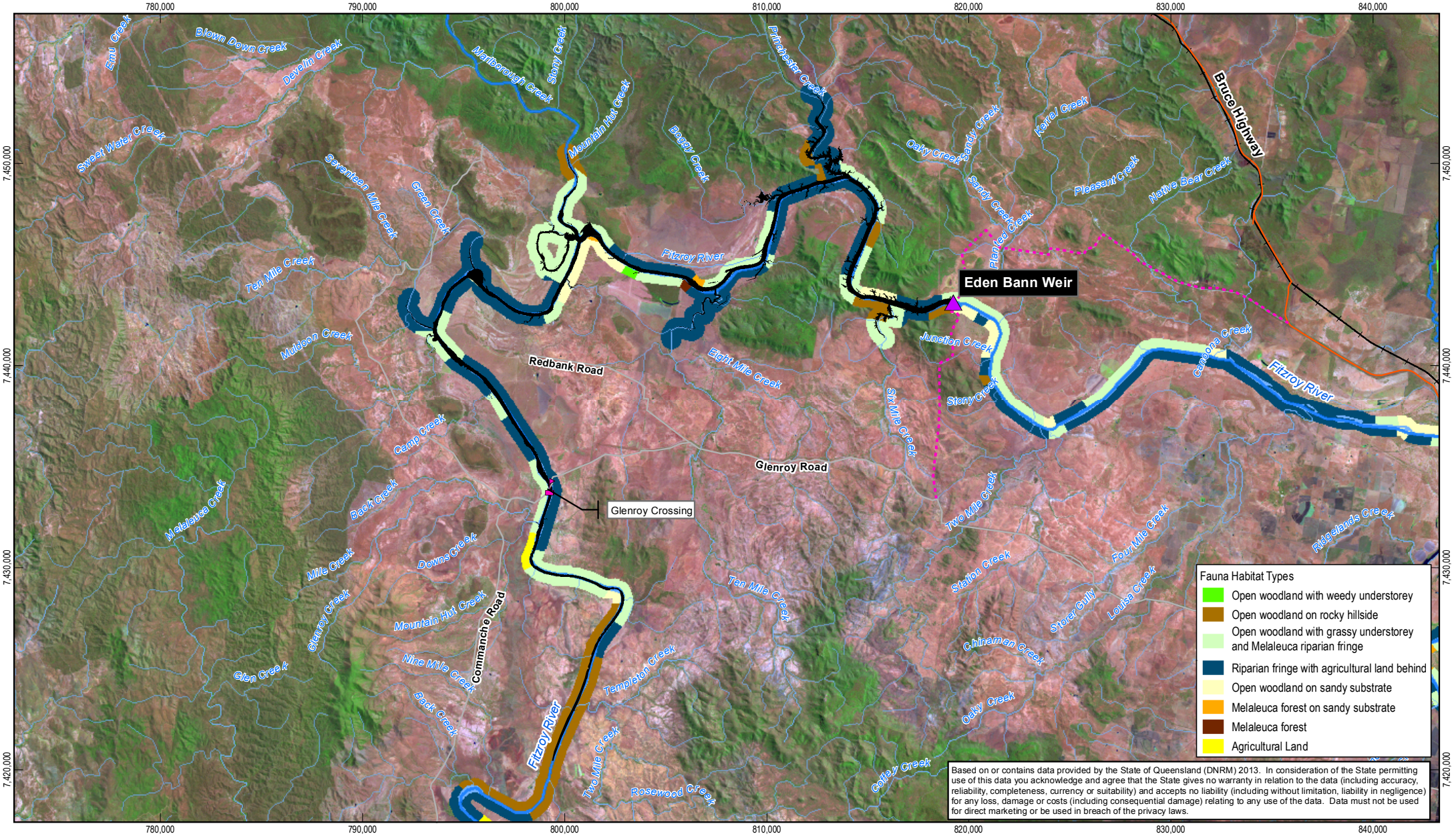
Table 3-1 Terrestrial habitat type, characteristics and values in the Eden Bann Weir Project footprint

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 with weedy understorey and Melaleuca riparian fringe	Sparse density mature eucalypt canopy present Shrub layer dominated by weed species Understorey dominated by weedy grass.	Habitat value for: • Canopy, shrub and grassland birds • Snakes, skinks and dragons • Macropods, hares and bandicoots • Rodents and common possums. Relative Ecological Value: Moderate Possible habitat for listed threatened species: 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
Open woodland with 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	
Melaleuca forest	Dense canopy of short Melaleucas Shrub layer dominated by castor oil plant (Ricinus communis) Bare muddy substrate Often inundated (seasonally) Low diversity of ground-level microhabitats.	Habitat value for: • Shrub and canopy-nesting birds • Waterbirds • Rodents. Relative Ecological Value: Moderate Possible habitat for listed threatened species: none	

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
- Access Road
- Highway
- Streets (Local)
- Railway
- Waterway
- Impoundment Area

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Lower Fitzroy River Infrastructure Project

Job Number 41-20736
Revision F
Date 19 Mar 2014

Eden Bann Weir 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, Access Roads/2013. Created by IH.

3.2.5 Habitat dynamics

Habitats within the Project footprint are exposed to strong seasonal changes. The region is characterised by extreme seasonality in rainfall with a distinct wet and dry season. This, in turn, affects fauna 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 subject to extreme variation as a result of seasonal changes in river level and flow. The changes in river level become more pronounced with increased distance from the weir. Habitats close to the weir are more permanently inundated and therefore represent a less variable environment with reduced seasonal inundation. Habitats further upstream show greater variation with a period of extreme wet season inundation, followed by a gradual decline in water level over the dry season. As water levels subside in the dry season (due to reduced flow (flooding / rainfall) and increased draw down of the weir), the amount of ponding and the diversity of terrestrial habitats increases. This seasonal influence adds a level of temporal complexity to habitats further away from the weir.

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 a critical role in the ecology of many wildlife species. These areas are particularly important as potential breeding habitat for ephemeral pond-breeding frogs, and are a potentially important foraging resource for a number of species of microchiropteran bats and EPBC Act-listed migratory birds.

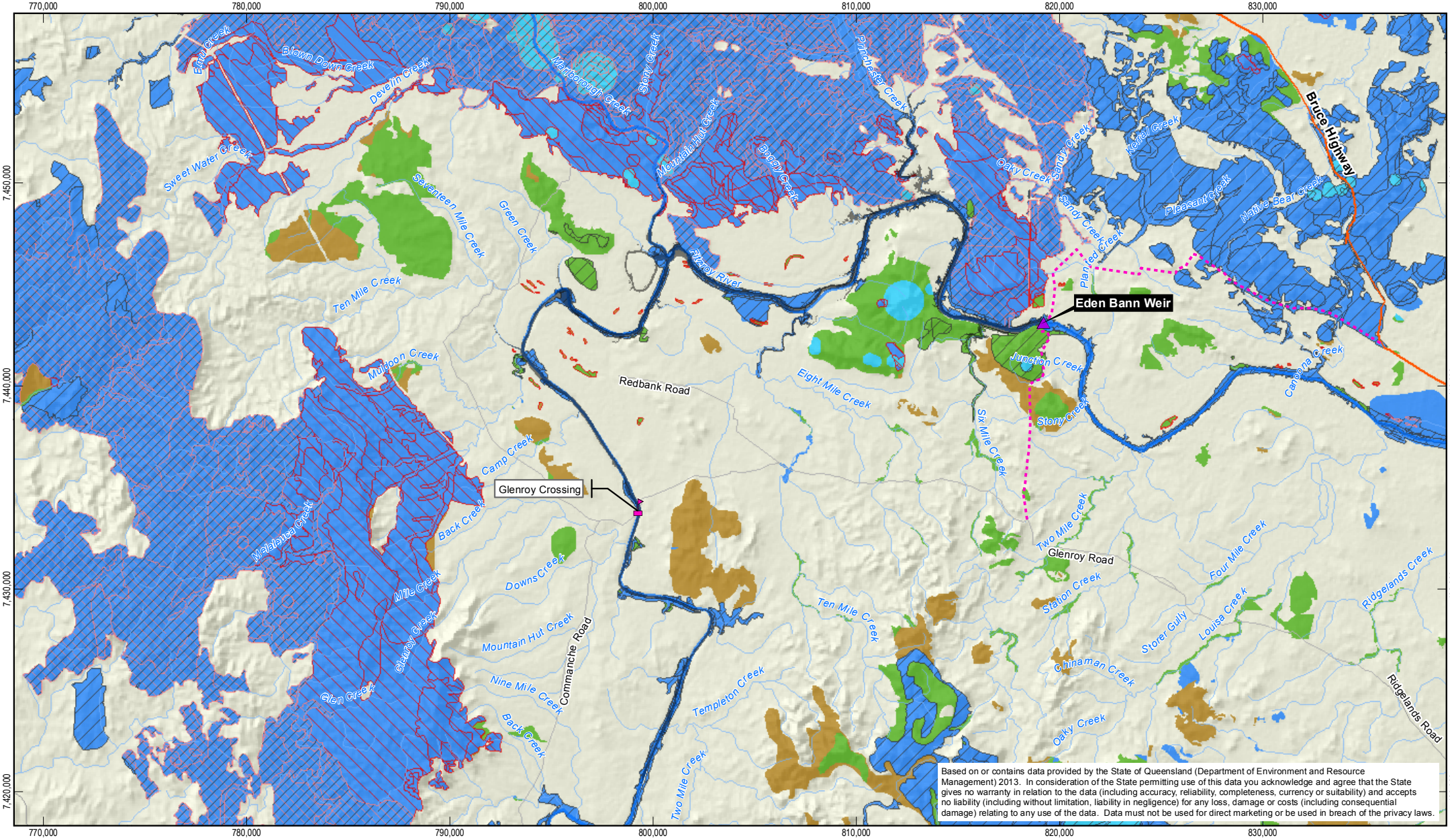
Away from the river, habitats in the Project footprint are subject to changes that are driven by the seasonal difference in rainfall. The ground-level productivity in woodland and grassland habitats increases during and immediately following the wet season in response to rainfall, and this provides a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

3.2.6 Wildlife corridors and connectivity

Habitat connectivity within the Eden Bann Weir Project footprint is predominantly determined by patterns of historical land clearing. Lowland areas have been largely cleared for agriculture 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 the Biodiversity Planning Assessment (BPA) mapping, these areas are classified as being state significant bioregional wildlife corridors, several of which abut the Eden Bann Weir Project footprint (Figure 3-2).

Within the agricultural lowland areas, vegetation has been retained predominantly along the riparian fringe. Although this lowland vegetation has been subject 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.

At a finer scale, habitat connectivity in the upper reaches of the Eden Bann Weir Project footprint changes seasonally as water level subsides 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.



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
- Access Road
- Waterway
- Highway
- 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

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Eden Bann Weir Biodiversity Planning Assessment mapping

Figure 3-2

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

3.3 Fauna species and diversity

3.3.1 Overview

Fauna species diversity (including common species and 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		4 amphibians 7 reptiles 9 mammals 75 birds	5 amphibians 13 reptiles 1 mammal	70 birds	12 amphibians 20 reptiles 28 mammals 98 birds
EPBC Act and NC Act threatened species	4 reptiles 3 mammals 5 birds	1 mammal 2 birds	1 reptile	1 bird	1 mammal 3 birds
EPBC 'Marine' and / or 'Migratory' species	16 birds	16 birds	-	17 birds	24 birds
Introduced / pest species	4 mammals	1 amphibian 4 mammals	-	-	1 amphibian 5 mammals

The results obtained from wet and dry season surveys are similar to those recorded by Biodiversity Assessment and Management Pty Ltd (BAAM) in their 2008 (one-off) survey of terrestrial habitats that may be impacted by the raising of Eden Bann Weir. BAAM recorded 159 terrestrial vertebrate animals, comprising two amphibians, 19 reptiles, 118 birds and 20 mammals. Two threatened species not recorded during GHD surveys were recorded by BAAM – namely the cotton pygmy-goose (*Nettapus coromandelianus* – 'Near threatened' NC Act) and the powerful owl (*Ninox strenua* – 'Vulnerable' NC Act).

3.3.2 Amphibians

A total of 12 amphibian species were detected in the wet and dry season surveys in the Eden Bann Weir Project footprint (11 recorded in wet season, 3 recorded in dry season), however no conservation significant amphibian species were observed. Amphibians detected included the green tree frog (*Litoria caerulea*), eastern sedge frog (*Litoria fallax*) (Plate 3-1), Peron's tree frog (*Litoria peronii*), and desert tree frog (*Litoria rubella*), as well as burrowing frogs such as the ornate burrowing frog (*Platyplectrum ornatum*), striped marsh frog (*Limnodynastes peronii*), spotted grass frog (*Limnodynastes tasmaniensis*), and New Holland frog (*Cyclorana novaehollandiae*), and the exotic cane toad (*Rhinella marina*).

The ornate burrowing frog (*Platyplectrum ornatum*) and cane toad (*Rhinella marina*) were the most commonly encountered amphibian species during the wet season, such that both species were recorded at all survey sites. Only one species, the northern banjo frog (*Limnodynastes terraereginae*) (Plate 3-2) was encountered in the dry season yet not in the wet season. As expected, amphibian diversity and abundance was notably higher in the warm, humid wet season compared to the cooler dry season. This trend is associated with frog activity levels and the availability of habitat resources.

Habitat suitable for common amphibian species occurs within the riparian zones and side tributaries throughout the Project footprint. Semi-permanent and ephemeral off-stream water bodies represent a breeding resource for many amphibian species. Many of the tree frog species only breed in these ephemeral water bodies. A number of smaller fossorial frog species (such as those from the genera *Crinia* and *Pseudophryne*) were not detected but are likely to occur due to presence of suitable habitat.

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

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Plate 3-1 Eastern sedge frog (*Litoria fallax*)

Plate 3-2 Northern banjo frog (*Limnodynastes terraereginae*))

3.3.3 Reptiles

Twenty terrestrial reptile species were detected in wet and dry season surveys within the Eden Bann Weir Project footprint, however no conservation significant terrestrial reptile species were detected. Eighteen species were recorded during wet season surveys and 10 were recorded in the dry season. 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.

Reptiles recorded comprised 11 skink species, two dragon species, two geckos, two pythons, one legless lizard, one elapid snake and one blind snake. Skinks encountered included *Carlia munda*, eastern striped skink (*Ctenotus robustus*), wall skink (*Cryptoblepharus virgatus*), fire-tailed skink (*Morethia taeniopleura*), Martin's skink (*Eulamprus martini*) and Tim Low's skink (*Menetia timlowi*). Other reptiles recorded were the bearded dragon (*Pogona barbata*), eastern water dragon (*Physignathus lesueurii*), dubious gecko (*Gehyra dubia*), Bynoe's gecko (*Heteronotia binoei*), blind snake (*Ramphotyphlops ligatus*), coastal carpet python (*Morelia spilota mcdowelli*), black-headed python (*Aspidites melanocephalus*) (Plate 3-3), red-naped snake (*Furina diadema*) (Plate 3-4) and

Burton's legless lizard (*Lialis burtonis*). A full list of reptile species observed within the Project footprint is provided in Appendix B.

Common geckos, skinks, pythons and dragons dominated the reptilian diversity in the Eden Bann Weir Project footprint, and elapid and colubrid snakes were poorly represented. However, due to the presence of suitable habitat, it is likely that a range of common snakes including the eastern brown snake (*Pseudonaja textilis*), taipan (*Oxyuranus scutellatus*), yellow-faced whip snake (*Demansia psammophis*), common tree snake (*Dendrelaphis calligastra*) and keelback (*Tropidonophis mairii*) do occur in the Project footprint.

Habitat suitable for a range of reptiles occurs throughout the Project footprint. For example defoliating bark on mature trees (e.g. eucalypts, *Melaleuca*s etc.) provides refuge for geckos and arboreal skinks. Open woodland with grassy understorey also retains fallen timber, leaf litter and other natural ground-level structures that provide microhabitat for reptiles. Rocky hillsides also support a range of reptiles including skinks, ground-dwelling geckos, dragons, elapid snakes and pythons

.

Plate 3-3 Black-headed python (*Aspidites melanocephalus*)

Plate 3-4 Red-naped snake (*Furina diadema*)

3.3.4 Mammals

Twenty-eight mammal species were detected during wet and dry season surveys (Appendix B). All 28 species were recorded in the wet season however species diversity declined in the dry season, with only 20 species recorded. This decline is likely to be associated with a decrease in foraging

resource availability as well as decrease in activity levels during this period. One conservation significant species, the little pied bat (*Chalinolobus picatus*) was recorded from three sites: the boat ramp just upstream of Eden Bann Weir, and Sites 2 and 4. This species is listed as 'Near threatened' under the NC Act. The little pied bat is known to inhabit dry timbered habitats including sclerophyll forest, woodland and scrubland, with foraging concentrated along watercourses (Menkhorst and Knight 2004). The open eucalyptus woodland habitat along the riparian zone and floodplain at the boat ramp, and Sites 2 and 4 represents suitable habitat for this species.

Small ground mammals recorded included three species of rodent: fawn-footed melomys (*Melomys cervinipes*), black rat (*Rattus rattus*) and house mouse (*Mus musculus*). The northern brown bandicoot (*Isoodon macrourus*) (Plate 3-5) and echidna (*Tachyglossus aculeatus*) were encountered in open woodland habitats with grass understorey at several sites throughout the Project footprint.

Arboreal mammals including the common brushtail possum (*Trichosurus vulpecula*) (Plate 3-6), greater glider (*Petauroides volans*) and squirrel glider (*Petaurus norfolcensis*) were found in open woodland remnants along the riparian zone and fringing alluvial floodplains. While no koalas (*Phascolarctos cinereus*) were observed during the survey program, fresh koala scats were collected at Sites 3 and 5. Although fragmented, the open eucalypt woodland along the riparian fringe and adjacent floodplain at these sites represents suitable koala habitat, such that koalas have been previously recorded within the study area (DERM Wildlife Online Database).

Sixteen microchiropteran bat species were identified via bat calls recorded on Anabat detectors and / or captures in harp traps. Twelve of these species (all common), belonged to the family Vespertilionidae.

Five introduced mammals were encountered in the Project footprint, including domestic cattle (*Bos Taurus*) at all sites. Evidence of feral pigs (*Sus scrofa*) was also observed at Sites 2 and 4, and a number of feral cats (*Felis catus*) were recorded in woodland areas.

Plate 3-5 Northern brown bandicoot (*Isoodon macrourus*) in cage trap

Plate 3-6 Common brushtail possum (*Trichosurus vulpecula*) in cage trap

3.3.5 Birds

A total of 98 bird species (from 41 families) were recorded in wet and dry season surveys (Appendix B). This comprised a range of different bird groups including waterbirds, raptors, forest birds, grassland birds, open woodland birds and nocturnal birds.

Three threatened species were encountered during surveys in the Eden Bann Weir Project footprint. The southern sub-species of squatter pigeon (*Geophaps scripta scripta*) was encountered on several occasions in woodland habitats with a grass understorey (including Sites 1 and 4). This species is listed as 'Vulnerable' under the EPBC Act and the NC Act. The black-necked stork (*Ephippiorhynchus australis*) was observed opportunistically within the vicinity of Site 6 during wet and dry season surveys. Aquatic habitats such as billabongs, wetlands, swamps and inundated fields provide suitable habitat for this species, which is listed as 'Near threatened' under the NC Act. The black-chinned honeyeater (*Melithreptus gularis*), also listed as 'Near threatened' under the NC Act, was recorded from Site 2. Dry eucalypt forest and woodlands as well as vegetation along watercourses are known preferred habitats of this species. Such habitat occurs along the riparian fringe at Site 2.

As well as the three threatened species recorded during surveys within the Eden Bann Weir Project footprint, 24 other conservation significant bird species listed under the EPBC Act were identified during field assessments. This comprised 21 species listed as 'Marine' and three species listed as both 'Marine' and 'Migratory' (see Section 0).

Waterbirds encountered included the pied cormorant (*Phalacrocorax varius*), royal spoonbill (*Platalea regia*), great egret (*Ardea alba*), white-faced heron (*Egretta novaehollandiae*), white-necked heron (*Ardea pacifica*), black bittern (*Ixobrychus flavicollis australis*), nankeen night heron (*Nycticorax caledonicus*), Australian wood duck (*Chenonetta jubata*), Pacific black duck (*Anas superciliosa*) and plumed whistling duck (*Dendrocygna eytoni*). As well as being commonly observed throughout the Project footprint, a number of Australasian darter (*Anhinga melanogaster*) nests were recorded. These were generally constructed over the water in protruding or drowned trees.

Forest birds including the restless flycatcher (*Myiagra inquieta*), Lewins honeyeater (*Meliphaga lewinii*), black-chinned honeyeater (*Melithreptus gularis*), bar-breasted honeyeater (*Ramsayornis fasciatus*), weebill (*Smicrornis brevirostris*), Horsfield's bronze cuckoo (*Chalcites basalis*), grey-shrike thrush (*Colluricincla harmonica*) and forest kingfisher (*Todiramphus macleayii*) (Plate 3-7) were encountered in woodland remnants. More heavily vegetated habitats along the riparian fringe and in / along ephemeral gullies provide 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*), cicadabird (*Coracina tenuirostris*), channel-billed cuckoo (*Scythrops novaehollandiae*), common koel (*Eudynamys scolopacea*), dollarbird (*Eurystomus orientalis*), pheasant coucal (*Centropus phasianinus*), white-winged chough (*Corcorax melanorhamphos*), pale-headed rosella (*Platycercus adscitus*) and striate pardalote (*Pardalotus striatus*) (Plate 3-8). Woodland bird diversity was relatively high and comprised species that are common in fragmented agricultural landscapes.

Seven raptor species were observed including the Australian hobby (*Falco longipennis*), Pacific baza (*Aviceda subcristata*), wedge-tailed eagle (*Aquila audax*), whistling kite (*Haliastur sphenurus*) and white-bellied sea-eagle (*Haliaeetus leucogaster*). Whistling kites and white-bellied sea-eagles were frequently encountered during travel by boat up and down the river. A large raptor nest was also recorded in open woodland approximately 500 metres downstream of Site 6 (Plate 3-9). Three owl species, namely the barn owl (*Tyto alba*), southern boobook (*Ninox novaeseelandiae*), and tawny frogmouth (*Podargus strigoides*) were recorded during nocturnal surveys.

Plate 3-7Forest kingfisher (Todiramphus macleayii)

Plate 3-8Striated pardalote (Pardalotus striatus)

Plate 3-9 Large raptor nest observed near Site 6

3.3.1 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, nine introduced fauna species occur, or are predicted to occur, within the study area (Table 3-3).

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

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

Off-stream water bodies

Semi-permanent and ephemeral off-stream water bodies provide resources for many wildlife species. They are seasonally inundated during flood conditions and gradually dry out as rainfall declines. Given their low-lying nature, off-stream water bodies are generally wetter than the surrounding environment and support a greater diversity of aquatic and terrestrial vegetation (Plate 3-10). These areas provide seasonal breeding and larval habitat for diverse communities of

aquatic and terrestrial macroinvertebrates. In turn, they represent a food resource for frogs, birds, and microchiropteran bats. Off-stream water bodies provide breeding habitat for frog species that have adapted to only breed in ephemeral water bodies as well as provide a source of subterranean moisture required by burrowing frogs. The habitats also 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.


Plate 3-10 Off-stream water body habitats within the Eden Bann Weir Project footprint

Creeks

A number of creeks run into the Fitzroy River within the Eden Bann Weir Project footprint. These creeks represent important nodes for local fauna activity. Creeks contain areas of shallower water and slower flow. Channel widths are substantially reduced and have greater levels of canopy connectivity with an abundance of overhanging vegetation (Plate 3-11). This provides feeding perches for kingfishers and other birds and basking sites for water dragons. As with off-stream water bodies, creeks are an important breeding ground for macroinvertebrates, and also support 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 as the riparian zone has been degraded by cattle grazing along some creeks. However, in general, tributaries 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 habitat value, these areas are likely to be important in maintaining the abundance and diversity of wildlife in the surrounding landscape.

Plate 3-11 Creek habitats within the Eden Bann Weir Project footprint

Riparian habitat corridors

As discussed in Section 3.2.6, riparian corridors (Plate 3-12) of remnant vegetation represent an important movement conduit for terrestrial fauna in the cleared landscape of the Eden Bann 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 significant linkage between larger remnant habitat patches, such as those persisting on low rocky hills. Mature trees belonging to the genera *Melaleuca, Eucalyptus and Corymbia* are the dominant feature of these riparian corridor habitats.

Plate 3-12 Riparian corridor with adjacent cleared agricultural land

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 minimising the chance of 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.

3.4.2 Conservation significant terrestrial species

Fauna species considered rare, threatened with extinction, or as having high conservation value, 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 provisions of 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.

Four threatened species were identified in the Eden Bann Weir Project footprint during the wet and dry season surveys. These species included:

- **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 wet and dry season surveys in the Project footprint. This species was detected in open mature eucalyptus woodland in the riparian zone and adjacent alluvial floodplain (boat ramp and Site 4), and remnant eucalyptus woodland at the foot of a large rocky hill adjacent to the Fitzroy River (Site 2). Riverine open forest communities in central western Queensland have been identified as a key habitat type for this species (Churchill 2008)
- **Squatter pigeon (southern sub species - *Geophaps scripta scripta*)** – the squatter pigeon (Plate 3-13) is listed as 'Vulnerable' under the EPBC Act and NC Act. This species was encountered in wet and dry season surveys in open woodland and grassland habitats. 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 pigeons appear to be relatively common within the Eden Bann Weir Project footprint and study area based on survey findings
- **Black-necked stork (*Ephippiorhynchus australis*) –** the black-necked stork (Plate 3-14) is listed as 'Near threatened' under the NC Act. Black-necked storks were observed during wet and dry season surveys near Site 6. Although the aquatic system has been modified upstream of Eden Bann Weir, shallow margins of the Fitzroy River, as well as creeks and associated off-stream water bodies represent suitable foraging habitat for this species. The

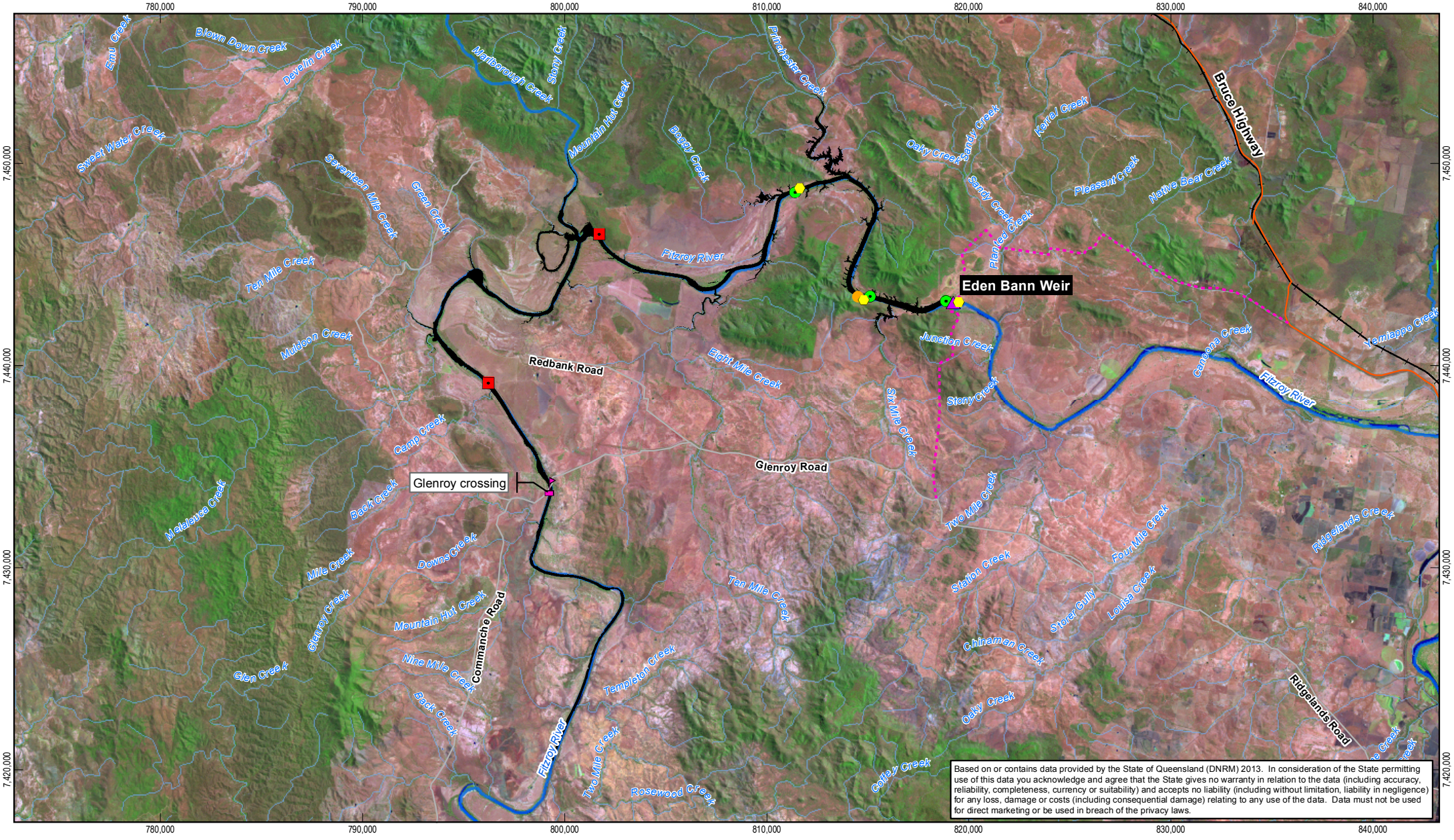
abundance of large trees abutting the river for much of its length above Eden Bann Weir provide suitable nesting habitat for the black-necked stork

- **Black-chinned honeyeater (*Melithreptus gularis*)** – the black-chinned honeyeater is listed as 'Near threatened' under the NC Act. One black-chinned honeyeater was recorded from dry open eucalypt woodland at the base of a large rocky hill (Site 2) in the wet 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 Eden Bann Weir Project footprint is illustrated in Figure 3-3.

Plate 3-13 Squatter pigeon (*Geophaps scripta scripta*)

Plate 3-14 Black-necked stork (*Ephippiorhynchus australis*)



1:250,000 (at A4)

0 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
- Highway
- Road
- Access Road
- Railway
- Waterway
- Impoundment Area
- Little pied bat
- Squatter pigeon (southern)
- Black-necked stork
- Black-chinned honeyeater

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Lower Fitzroy River Infrastructure Project

Job Number 41-20736
Revision C
Date 19 Mar 2014

Eden Bann Weir – location of threatened terrestrial fauna species

Figure 3-3

G:\41\20736\GIS\Projects\MXD\900_Baseline Terrestrial Fauna Report\4120736_904_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 Sources: © 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, Access Roads - 2013. Created by IH

Further to this, the literature review identified an additional 14 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:

- **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 was recorded upstream of Eden Bann Weir by BAAM in their 2008 survey (BAAM 2008a). 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
- **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 foraging and nesting habitat for the red goshawk is present within the Project footprint however, this species has not been previously recorded within the desktop search area nor was it encountered during the wet and dry season surveys. As red goshawks tend to have large home ranges (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
- **Cotton pygmy-goose (*Nettapus coromandelianus*) –** the cotton pygmy-goose is listed as 'Near threatened' under the NC Act. The cotton pygmy-goose has been recorded in the Eden Bann Weir desktop search area and was recorded by BAAM (2008a), although the species was not observed in the Project footprint during wet and dry season surveys. Suitable habitat occurs for this species upstream of Eden Bann Weir, particularly along well vegetated margins of the river and in tributaries, backwaters and billabongs. It is possible that this species utilises habitats within the Project footprint for foraging and breeding
- **Star finch (eastern, southern) (*Neochmia ruficauda ruficauda*) –** the star finch is listed as 'Endangered' under the EPBC Act and NC Act. This species was predicted to occur in the area based on bioclimatic modelling (DEWHA Environmental Reporting Tool). 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 Fitzroy River upstream of Eden Bann Weir. No record of this species exists for the desktop search area, nor was it encountered during wet and dry season surveys in the Project footprint
- **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 Eden Bann 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 and dry season surveys

- **Black-breasted button-quail (*Turnix melanogaster*) –** the black-breasted button-quail is listed as 'Vulnerable' under the EBPC Act and NC Act. The species was predicted to occur based on bioclimatic modelling (DEWHA Environmental Reporting Tool). Densely vegetated dry forest and vine thicket habitats represent the preferred habitat for this species. Semi-evergreen vine thicket (RE 11.12.4) does occur within the study area, however the isolated and fragmented distribution of this RE, in conjunction with the known distribution of the black-breasted button-quail, and the lack of previous records of this species in the Eden Bann Weir desktop search area suggest that it is unlikely to be present in the Project footprint
- **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 hills adjacent to the Fitzroy River upstream of the Eden Bann Weir (e.g. Site 2) 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
- **Ghost bat (*Macroderma gigas*) –** the ghost bat is listed as 'Vulnerable' under the NC Act. The ghost bat has been previously recorded from the Eden Bann Weir desktop search area, although Anabat detectors and harp trapping did not reveal the presence of this species within the Project footprint during either the wet or dry season surveys. While a variety of woodland, forest and grassland habitats are utilised by this species, access to suitable roosting sites (for example caves, cliff lines, boulder piles and abandoned mines) heavily influences local distribution within the species' wide geographic range. Within the Eden Bann Weir Project footprint, suitable roosting habitat is limited, although rocky hills with exposed boulder piles and crevices may support small populations of this species
- **Large-eared pied bat (*Chalinolobus dwyeri*) -** the large-eared pied bat is listed as 'Vulnerable' under the EPBC Act and NC Act. This species was not encountered during wet and dry season surveys, and has not been previously recorded in the desktop search area (predicted to occur based on bioclimatic modelling – DEWHA Environmental Reporting Tool). Suitable roosting habitat is restricted to rocky hills that occur adjacent to the Fitzroy River upstream of Eden Bann Weir. In Central Queensland this species has been recorded from areas with extensive roosting habitats (such as an abundance of cliffs and caves) (Churchill 2008). The lack of suitable roosting habitat in the Project footprint is likely to significantly limit the utilisation of habitats upstream of Eden Bann Weir by this species
- **Eastern long-eared bat (*Nyctophilus timoriensis*) -** the eastern long-eared bat is listed as 'Vulnerable' under both the EPBC Act and the NC Act. No records exist for this species in the desktop search area, nor was it recorded during wet or dry season field surveys. It is only predicted to occur in the study 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 of the main channel of the Fitzroy River, may provide important 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 and dry season surveys, nor has it been previously recorded in the study area

- **Dunmall's snake (*Furina dunmalli*) -** the 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 found during wet and dry season surveys. It may occur in small numbers in isolated, small 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. This species has been previously recorded from the Eden Bann Weir desktop search area, although it was not detected during wet and dry season surveys in the Project footprint. A small area of Essential Habitat is mapped for this species to the north of Marlborough Creek (beyond the Stage 3 inundation extent up this creek), approximately 10 km upstream from its junction with the Fitzroy River. A wide range of potential habitats occur for this species in the Project footprint – *Acacia* and *Eucalyptus* woodlands on cracking clay and sandy alluvial substrates
- **Yakka skink (*Egernia rugosa*) -** the yakka skink is listed as 'Vulnerable' under both the EPBC Act and the NC Act. The yakka skink 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 and 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 species

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 for this species 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 Eden Bann Weir Project footprint, however faecal pellets were found at the base of eucalypts in open woodland habitats at Site 5 in the wet season and Sites 3 and 5 in the dry season.

Table 3-4 Threatened 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 records	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 within 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
Anatidae	Nettapus coromandelianus	cotton pygmy-goose	Marine	Near threatened	Wildlife Online; BAAM 2008a	Most commonly found in freshwater lakes, swamps and large water impoundments of coastal and sub-coastal environments. Preference for deep permanent waters with abundant aquatic vegetation (both floating and submerged). It is a predominantly aquatic species (Marchant and Higgins 1990).	Suitable habitat for this species occurs in the Fitzroy River and tributaries above the Eden Bann Weir, and in billabongs and larger permanent farm dams adjacent to the river.	Likely to occur
Columbidae	Geophaps scripta scripta	squatter pigeon (southern)	Vulnerable	Vulnerable	Wildlife Online	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 2009c).	This species is not uncommon in the region and has the potential to occur in woodland and grassland wherever there is tall grass (for nesting) interspersed with cleared areas (for feeding). This particularly occurs in RE 11.12.2.	Confirmed present
Ploceidae	Neochmia ruficauda ruficauda	star finch (eastern), star finch (southern)	Endangered	Endangered	No previous records	Occurs mainly in grasslands and grassy woodlands that are located close to bodies of fresh water. 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 the rivers edge and within side tributaries represent suitable habitat.	May occur
Rostratulidae	Rostratula australis/ Rostratula benghalensis s. lat.	Australian painted snipe	Vulnerable; Marine; Migratory (CAMBA)	Vulnerable	No previous records	Has potential to move into Queensland during summer. (Pizzey and Knight 2003). Generally inhabits shallow terrestrial freshwater (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, canegrass or sometimes tea-tree (Melaleuca) (DEWHA 2009d).	Potential to occur among reeds in shallow water along the edge of the river and adjacent billabongs (eg. REs 11.3.3, 11.3.25).	May occur
Strigidae	Ninox strenua	powerful owl	-	Vulnerable	BAAM 2008a	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
Turnicidae	Turnix melanogaster	black-breasted button-quail	Vulnerable	Vulnerable	No previous records	This species is restricted to rainforests and forests, mostly in areas with 770-1200 mm rainfall per annum. They prefer drier low closed forests, particularly semi-evergreen vine thicket, low microphyll vine forest, araucarian microphyll vine forest and araucarian notophyll vine forest. They may also be found in low, dense acacia thickets and, in littoral areas, as well as in vegetation behind sand dunes (DEWHA 2009e).	Suitable habitat (vine thicket, RE 11.12.4) occurs in the study area. However, the current known geographic extent of this species is to the south of the study area.	Unlikely to 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#
Mammals								
Dasyuridae	Dasyurus hallucatus	northern quoll	Endangered	-	No previous records	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
Megadermatidae	Macroderma gigas	ghost bat	-	Vulnerable	Wildlife Online	Occurs in a range of habitats from arid regions to tropical rainforests. Patchy distribution across northern Australia. Roosts in rock fissures, caves and mine shafts (Strahan 1995).	May roost in rocky habitats in hilly areas near Eden Bann Weir.	May occur
Vespertilionidae	Chalinolobus dwyeri	large-eared pied bat, large pied bat	Vulnerable	Vulnerable	No previous records	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 records	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 RE 11.3.3.	May occur
Reptiles								
Elapidae	Denisonia maculata	ornamental snake	Vulnerable	Vulnerable	No previous records	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 2009f).	Suitable habitat occurs in woodland and shrubland on deep cracking clay soils including REs 11.3.1 and 11.3.25.	May occur
Elapidae	Furina dunmalli	Dunmall's snake	Vulnerable	Vulnerable	No previous records	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 2009g).	Suitable habitat occurs in open forest and woodland on deep cracking clay soils, e.g. REs 11.3.1 and 11.3.25.	May occur
Pygopodidae	Paradelma orientalis	brigalow scaly-foot	-	Vulnerable	Queensland Museum	This lizard occurs in open forest habitats 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 2009h).	Potential to occur in open forest and woodland throughout the study area. Previous recording was located within 5 km of the existing Eden Bann Weir inundation area.	May occur
Scincidae	Egernia rugosa	yakka skink	Vulnerable	Vulnerable	No previous records	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 in open woodland and rocky habitats where disturbance is limited.	May occur

*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 Eden Bann 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

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 Eden Bann Weir Project footprint represents potential echidna habitat. Echidna scats were recorded in open woodland habitats at Sites 3 and 5 in the wet season, whilst scats were opportunistically recorded in the study area near the Eden Bann Weir Project footprint in the dry season.

3.4.4 Migratory and marine bird species

The Eden Bann Weir Project footprint is inhabited by a diversity of common woodland, wetland and forest bird species listed as 'Migratory' and / or 'Marine' under the EPBC Act. Sixteen EPBC Act listed species were predicted to occur in the study area based on climatic modelling; 17 species have been previously recorded from the study area; and 24 species 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. Wetland birds including the great egret (*Ardea alba*), little egret (*Egretta garzetta*), intermediate egret (*Ardea intermedia*), Australian pelican (*Pelecanus conspicillatus*) and magpie goose (*Anseranas semipalmata*) were all encountered in the Project footprint during surveys. Forest birds such as the channel-billed cuckoo (*Scythrops novaehollandiae*), 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 Eden Bann 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*), satin flycatcher (*Myiagra cyanoleuca*) and rufous fantail (*Rhipidura rufifrons*)) may result in these species occurring at low densities, or not at all within the study area. Other species such as the fork-tailed swift (*Apus pacificus*) and white-throated needletail (*Hirundapus caudacutus*) may be transient visitors to the study 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 sphenurus	whistling kite	Marine		✓	✓
Anatidae	Nettapus coromandelianus	cotton 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)	✓		
Ardeidae	Ardea intermedia	intermediate egret	Marine			✓
Ardeidae	Egretta garzetta	little egret	Marine		✓	✓
Ardeidae	Nycticorax caledonicus	nankeen night heron	Marine			✓
Campephagidae	Coracina novaehollandiae	black-faced cuckoo-shrike	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
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	Eudynamys scolopacea	common koel	Marine			✓
Cuculidae	Scythrops novaehollandiae	channel-billed cuckoo	Marine			✓
Cuculidae	Cacomantis flabelliformis	fan-tailed cuckoo	Marine		✓	
Cuculidae	Cacomantis pallidus	pallid cuckoo	Marine		✓	
Dicruridae	Dicrurus bracteatus	spangled drongo	Marine		✓	✓
Dicruridae	Monarcha melanopsis	black-faced monarch	Marine/Migratory (Bonn Convention)	✓		
Dicruridae	Monarcha trivirgatus	spectacled monarch	Marine/Migratory (Bonn Convention)	✓		
Dicruridae	Myiagra cyanoleuca	satin flycatcher	Marine/Migratory (Bonn Convention)	✓		
Dicruridae	Rhipidura rufifrons	rufous fantail	Marine / Migratory (Bonn Convention)	✓		
Falconidae	Falco cenchroides	nankeen kestrel	Marine			✓
Halcyonidae	Todiramphus macleayii	forest kingfisher	Marine			✓
Halcyonidae	Todiramphus sanctus	sacred kingfisher	Marine			✓
Hirundinidae	Hirundo rustica	barn swallow	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
			Migratory (CAMBA, JAMBA, ROKAMBA)			
Meropidae	Merops ornatus	rainbow bee-eater	Marine Migratory (JAMBA)	✓	✓	✓
Pelecanidae	Pelecanus conspicillatus	Australian pelican	Marine		✓	✓
Rostratulidae	Rostratula australis	Australian painted snipe	Vulnerable Marine Migratory (CAMBA)	✓		
Scolopacidae	Gallinago hardwickii	Latham's snipe	Marine Migratory (CAMBA, JAMBA, ROKAMBA, Bonn Convention)	✓		
Scolopacidae	Numenius minutus	little curlew	Marine Migratory (CAMBA, JAMBA, ROKAMBA, Bonn Convention)	✓		
Strigidae	Ninox novaeseelandiae	southern boobook	Marine		✓	✓
Threskiornithidae	Threskiornis molucca	Australian white Ibis	Marine			✓
Threskiornithidae	Threskiornis spinicollis	straw-necked ibis	Marine		✓	✓
Zosteropidae	Zosterops lateralis	silvereye	Marine			✓

3.5 Fitzroy Natural Resource Management 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) have 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 for conservation effort. Seven criteria are used to score species (regardless of their current threatened classification under State or Commonwealth legislation). Priority species were nominated, assessed and assigned a ranking by both the FBA and DEHP. The ranking of priority (e.g. 'critical', 'high') is not always the same between FBA and 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. No species listed under the Biodiversity Action Plan were detected during the wet and dry season surveys. However, the ornamental snake (*Denisonia maculata*), yakka skink (*Egernia rugosa*), red goshawk (*Erythrotriorchis radiatus*), black-breasted button-quail (*Turnix melanogaster*) and eastern long-eared bat (*Nyctophilus timoriensis*) were predicted to occur within the Project footprint based on bioclimatic modelling (DEWHA Environmental Reporting Tool).

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			
Phyllurus championae		C	C
Anomalopus brevicollis		H	H
Delma torquata	collared delma	H	H

Species name	Common name	Fitzroy Basin ranking	DEHP ranking
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 goshawk	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 fraenata	bridled nailtail wallaby	C	C
Xeromys myoides	water mouse	C	H
Dasyurus maculatus maculatus	spotted-tailed quoll (southern subspecies)	H	H
Petaurus australis australis	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 Eden Bann 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.

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

4. Summary

This baseline terrestrial fauna assessment revealed that the Eden Bann 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 fauna habitat types identified within the Project footprint provide sufficient foraging, shelter and breeding resources for at least 158 species (as identified during wet and dry season field surveys), comprising:

- 12 amphibians
- 20 reptiles
- 28 mammals (including one threatened species - little pied bat)
- 98 birds (including three threatened species – squatter pigeon, black-necked stork, black-chinned honeyeater; and 24 'Migratory' and / or 'Marine species).

Terrestrial fauna habitats within the Eden Bann Weir Project footprint are highly seasonal responding to changes in rainfall and river flow, however the existing weir stabilises the seasonal influence to some extent. Habitats close to the weir are more permanently inundated, while those further upstream are more seasonally dynamic.

Since much of the lowland landscape has been cleared for agricultural development, riparian habitat corridors perform a valuable role, maintaining connectivity between habitat remnants. The most extensive habitat remnants occur in rocky hillsides and uncleared alluvial plains. Such habitats are likely to act as bioregional wildlife nodes and sources for dispersal.

Ephemeral off-stream water bodies and creeks represent sensitive terrestrial fauna habitats within the Eden Bann Weir Project footprint. Such habitats provide resources for a wide array of animals, including amphibians (breeding and foraging), reptiles (foraging), ground-dwelling mammals (foraging and denning), microchiropteran bats (foraging) and birds (foraging and nesting amongst dense riparian vegetation).

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 Eden Bann Weir Project footprint. Nevertheless, the fragmented habitats that occur within and adjacent to the Fitzroy River 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 Eden Bann Weir terrestrial fauna desktop results

DEWHA Environmental Report Tool

DERM Wildlife Online

Queensland Museum

Birds Australia

Environmental Reporting Tool

You are here: Environment Home > ERIN > ERT

5 March 2009 10:32

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: -23.08957367,150.1164517, -23.08915314,150.1146644, -23.09347328,150.1064628, -23.08786377,150.0702041, -23.0813826,150.0654548, -23.04636368,150.0788329, -23.03397795,150.0626948, -23.04297241,150.032225, -23.07404312,150.0248855, -23.07620224,150.013224, -23.08440384,150.004164, -23.08786377,149.9959624, -23.08181366,149.9877647, -23.07965263,149.9730819, -23.07361397,149.9523643, -23.06325325,149.9445937, -23.06365483,149.9340405, -23.09606346,149.9225829, -23.09822258,149.9079154, -23.08527359,149.8884834, -23.08095345,149.8880523, -23.07879242,149.8850349, -23.08656296,149.8742431, -23.10685333,149.8656142, -23.11634239,149.8746741, -23.12757286,149.8915046, -23.17591271,149.9234451, -23.20267281,149.9143851, -23.21303352,149.9169753, -23.21432289,149.9320853, -23.220373,149.9502128, -23.21907219,149.9562553, -23.22598251,149.9592727, -23.24195274,149.9497741, -23.29029259,149.9299224, -23.31274399,149.9234451

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

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Biodiversity

Threatened Species:	26
Migratory Species:	18
Listed Marine Species:	17
Invasive Species:	13
Whales and Other Cetaceans:	None
Threatened Ecological Communities:	2

Heritage

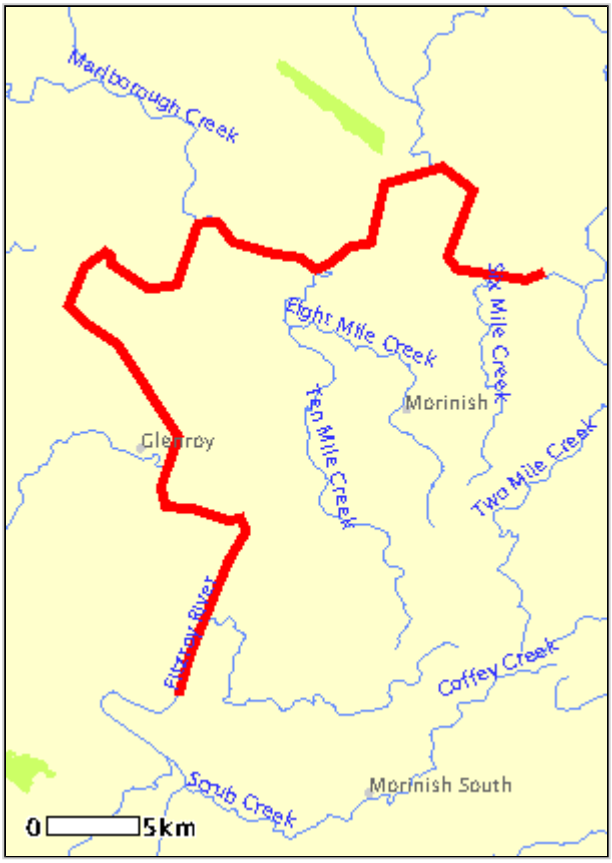
World Heritage Properties:	None
Australian Heritage Sites:	None

Wetlands

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

National Pollutant Inventory

Reporting Facilities:	None



Airsheds:	None
Catchments:	None

Protected Areas

Reserves and Conservation Areas:	1
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
Turnix melanogaster Black-breasted Button-quail	Vulnerable	Species or species habitat likely to 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)	Vulnerable	Species or species habitat may occur

Eastern Long-eared Bat		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		
Capparis thozetiana	Vulnerable	Species or species habitat likely to occur within area
Corymbia xanthope	Vulnerable	Species or species habitat likely to occur within area
Cycas megacarpa	Endangered	Species or species habitat likely to occur within area
Cycas ophiolitica	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
Hakea trineura Three-veined Hakea	Vulnerable	Species or species habitat likely to occur within area
Leucopogon cuspidatus	Vulnerable	Species or species habitat likely to occur within area
Marsdenia brevifolia	Vulnerable	Species or species habitat likely to occur within area
Neoroepera buxifolia	Vulnerable	Species or species habitat likely to occur within area
Parsonsia larcomensis	Vulnerable	Species or species habitat likely to occur within area
Pimelea leptospermoides	Vulnerable	Species or species habitat likely to occur within area
Pultenaea setulosa	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
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
Monarcha trivirgatus Spectacled Monarch	Migratory	Breeding likely to occur within area
Myiagra cyanoleuca Satin Flycatcher	Migratory	Species or species habitat likely to occur within area
Rhipidura rufifrons Rufous Fantail	Migratory	Breeding may 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
Monarcha trivirgatus Spectacled Monarch	Listed - overfly marine area	Breeding likely to 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
Rhipidura rufifrons Rufous Fantail	Listed - overfly marine area	Breeding 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
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 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 likely to 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
Prosopis spp. Mesquite, Algaroba	WoNS	Species or species habitat may occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed	WoNS	Species or species habitat may occur within area
Threatened Ecological Communities [Dataset Information]	Status	Comments
Brigalow (*Acacia harpophylla* dominant and co-dominant)	Endangered	Community known 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
Other		
Reserves and Conservation Areas [Dataset Information]		
Princhester Conservation Park, QLD		

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.

DERM Wildlife Online Database

Scientific name	Common name	NC Act status	EPBC Act Status
Amphibians			
Litoria caerulea	common green tree frog		
Litoria fallax	eastern sedge frog		
Platyplectrum ornatum	ornate burrowing frog		
Rhinella marina	cane toad	Introduced	
Reptiles			
Aspidites melanocephalus	black-headed python		
Carlia foliorum			
Carlia pectoralis			
Carlia schmeltzii			
Carlia vivax			
Cryptoblepharus virgatus sensu lato			
Ctenotus taeniolatus	copper-tailed skink		
Diporiphora bilineata	two-lined dragon		
Gehyra dubia			
Heteronotia binoei	Bynoe's gecko		
Menetia greyii			
Morethia boulengeri			
Physignathus lesueurii	eastern water dragon		
Pogona barbata	bearded dragon		
Varanus tristis	black-tailed monitor		
Mammals			
Bos taurus	European cattle	Introduced	
Canis familiaris	dog	Introduced	
Canis lupus dingo	dingo		
Macroderma gigas	ghost bat	Vulnerable	
Macropus dorsalis	black-striped wallaby		
Macropus parryi	whiptail wallaby		
Petrogale herberti	Herbert's rock-wallaby		
Phascolarctos cinereus	koala		
Sus scrofa	pig	Introduced	

Scientific name	Common name	NC Act status	EPBC Act Status
Trichosurus vulpecula	common brushtail possum		
Birds			
Acanthiza reguloides	buff-rumped thornbill		
Accipiter fasciatus	brown goshawk		Marine
Aegotheles cristatus	Australian owlet-nightjar		
Anas gracilis	grey teal		
Anas superciliosa	Pacific black duck		
Anhinga novaehollandiae	Australasian darter		
Anseranas semipalmata	magpie goose		Marine
Aprosmictus erythropterus	red-winged parrot		
Ardea modesta	eastern great egret		Migratory/ Marine
Ardea pacifica	white-necked heron		
Artamus cinereus	black-faced woodswallow		
Cacatua galerita	sulphur-crested cockatoo		
Cacomantis flabelliformis	fan-tailed cuckoo		Marine
Cacomantis pallidus	pallid cuckoo		Marine
Cacomantis variolosus	brush cuckoo		Marine
Calyptorhynchus banksii	red-tailed black-cockatoo		
Centropus phasianinus	pheasant coucal		
Colluricincla harmonica	grey shrike-thrush		
Colluricincla megarhyncha	little shrike-thrush		
Coracina novaehollandiae	black-faced cuckoo-shrike		Marine
Coracina tenuirostris	cicadabird		Marine
Corcorax melanorhamphos	white-winged chough		
Corvus orru	Torresian crow		
Cracticus nigrogularis	pied butcherbird		
Cracticus tibicen	Australian magpie		
Cracticus torquatus	grey butcherbird		
Dacelo leachii	blue-winged kookaburra		
Dacelo novaeguineae	laughing kookaburra		
Dicaeum hirundinaceum	mistletoebird		
Dicrurus bracteatus	spangled drongo		Marine

Scientific name	Common name	NC Act status	EPBC Act Status
Dromaius novaehollandiae	emu		
Egretta garzetta	little egret		Marine
Egretta novaehollandiae	white-faced heron		
Entomyzon cyanotis	blue-faced honeyeater		
Eurystomus orientalis	dollarbird		Marine
Falco berigora	brown falcon		
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		
Haliastur sphenurus	whistling kite		Marine
Lalage leucomela	varied triller		
Lichenostomus chrysops	yellow-faced honeyeater		
Lichmera indistincta	brown honeyeater		
Malurus melanocephalus	red-backed fairy-wren		
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		
Myiagra inquieta	restless flycatcher		
Myiagra rubecula	leaden flycatcher		
Myzomela sanguinolenta	scarlet honeyeater		
Nettapus coromandelianus	cotton pygmy-goose	Rare	Marine
Ninox novaeseelandiae	southern boobook		
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		

Scientific name	Common name	NC Act status	EPBC Act Status
Philemon corniculatus	noisy friarbird		
Platycercus adscitus	pale-headed rosella		
Podargus strigoides	tawny frogmouth		
Rhipidura albiscapa	grey fantail		
Rhipidura leucophrys	willie wagtail		
Smicrornis brevirostris	weebill		
Sphecotheres vieilloti	Australasian figbird		
Strepera graculina	pied currawong		
Taeniopygia bichenovii	double-barred finch		
Threskiornis spinicollis	straw-necked ibis		
Trichoglossus chlorolepidotis	scaly-breasted lorikeet		
Trichoglossus haematodus moluccanus	rainbow lorikeet		
Turnix varius	painted button-quail		

Queensland Museum Database

Scientific name	Common name	NC Act status	EPBC Act status
Amphibians			
Cyclorana alboguttata	green-stripe frog		
Limnodynastes tasmaniensis	spotted marsh frog		
Litoria caerulea	green tree frog		
Litoria rubella	naked tree frog		
Reptiles			
Carlia schmeltzii	robust rainbow-skink		
Carlia schmeltzii	robust rainbow-skink		
Cryptoblepharus virgatus	wall skink		
Delma tincta	excitable delma		
Demansia torquata	collared whipsnake		
Diporiphora australis	tommy round-head		
Gehyra dubia	dubious dtella		
Heteronotia binoei	Bynoe's gecko		
Lialis burtonis	Burton's snake lizard		
Menetia timlowi	dwarf litter-skink		
Menetia timlowi	dwarf litter-skink		
Morelia spilota	carpet python		
Morethia taeniopleura	north-eastern firetail skink		
Paradelma orientalis	brigalow scaly-foot	Vulnerable	
Ramphotyphlops wiedii	brown-snouted blind snake		
Ramphotyphlops wiedii	brown-snouted blind snake		
Mammals			
Sminthopsis murina	common dunnart		

Birds Australia Database

Scientific name	Common name	NC Act status	EPBC Act status
Anas gracilis	grey teal		
Anas superciliosa	Pacific black duck		
Anhinga novaehollandiae	Australasian darter		
Anthus novaeseelandiae	Australasian pipit		Marine
Aprosmictus erythropterus	red-winged parrot		
Aquila audax	wedge-tailed eagle		
Artamus leucorynchus	white-breasted woodswallow		
Aviceda subcristata	Pacific baza		
Cacatua galerita	sulphur-crested cockatoo		
Calyptorhynchus banksii	red-tailed black-cockatoo		
Ceyx azureus	azure kingfisher		
Chenonetta jubata	Australian wood duck		
Colluricincla harmonica	grey shrike-thrush		
Coracina novaehollandiae	black-faced cuckoo-shrike		Marine
Coracina papuensis	white-bellied cuckoo-shrike		Marine
Corcorax melanorhamphos	white-winged chough		
Corvus orru	Torresian crow		
Cracticus nigrogularis	pied butcherbird		
Cracticus tibicen	Australian magpie		
Cygnus atratus	black swan		
Dacelo leachii	blue-winged kookaburra		
Dacelo novaeguineae	laughing kookaburra		
Dendrocygna eytoni	plumed whistling-duck		
Dicrurus bracteatus	spangled drongo		Marine
Egretta novaehollandiae	white-faced heron		
Elseyornis melanops	black-fronted dotterel		
Entomyzon cyanotis	blue-faced honeyeater		
Eurystomus orientalis	dollarbird		Marine
Falco berigora	brown falcon		
Falco cenchroides	nankeen kestrel		Marine
Falco longipennis	Australian hobby		
Geopelia striata	peaceful dove		

Scientific name	Common name	NC Act status	EPBC Act status
Geophaps scripta	squatter pigeon	Vulnerable	Vulnerable
Grallina cyanoleuca	magpie-lark		
Grus rubicunda	brolga		
Haliaeetus leucogaster	white-bellied sea-Eagle		Migratory/Marine
Haliastur sphenurus	whistling kite		Marine
Himantopus himantopus	black-winged stilt		Marine
Irediparra gallinacea	comb-crested jacana		
Malurus melanocephalus	red-backed fairy-wren		
Manorina melanocephala	noisy miner		
Melithreptus albogularis	white-throated honeyeater		
Merops ornatus	rainbow bee-eater		Migratory/Marine
Microcarbo melanoleucos	little pied cormorant		
Myiagra rubecula	leaden flycatcher		
Ocyphaps lophotes	crested pigeon		
Oriolus sagittatus	olive-backed oriole		
Pachycephala rufiventris	rufous whistler		
Pardalotus striatus	striated pardalote		
Petrochelidon nigricans	tree martin		Marine
Philemon citreogularis	little friarbird		
Philemon corniculatus	noisy friarbird		
Platalea regia	royal spoonbill		
Platycercus adscitus	pale-headed rosella		
Pomatostomus temporalis	grey-crowned babbler		
Rhipidura leucophrys	willie wagtail		
Scythrops novaehollandiae	channel-billed cuckoo		Marine
Sphecotheres vieilloti	Australasian figbird		
Strepera graculina	pied currawong		
Struthidea cinerea	apostlebird		
Tachybaptus novaehollandiae	Australasian grebe		
Taeniopygia bichenovii	double-barred finch		
Threskiornis molucca	Australian white ibis		Marine
Threskiornis spinicollis	straw-necked ibis		Marine

Scientific name	Common name	NC Act status	EPBC Act status
Todiramphus macleayii	forest kingfisher		Marine
Trichoglossus chlorolepidotis	scaly-breasted lorikeet		
Trichoglossus haematodus	rainbow lorikeet		
Vanellus miles	masked lapwing		

Appendix B Eden Bann Weir terrestrial fauna survey results

					Wet Season							Dry Season						
Family	**Scientific Name**	**Common Name**	**EPBC Act Status**	**NC Act Status**	**Site 1**	**2**	**3**	**4**	**5**	**6**	**Opp.**	**Site 1**	**2**	**3**	**4**	**5**	**6**	**Opp.**
Amphibians																		
Bufonidae	*Rhinella marina*	cane toad		I	✓	✓	✓	✓		✓	✓							
Hylidae	*Cyclorana novaehollandiae*	New Holland 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 peronii*	Peron's tree frog									✓							
Hylidae	*Litoria rubella*	red tree frog							✓	✓	✓							
Myobatrachidae	*Limnodynastes peronii*	striped marsh frog								✓								
Myobatrachidae	*Limnodynastes tasmaniensis*	spotted grass frog					✓			✓	✓						✓	
Myobatrachidae	*Limnodynastes terrareginae*	northern bullfrog															✓	
Myobatrachidae	*Platyplectrum ornatum*	ornate burrowing frog			✓	✓	✓	✓	✓	✓								
Reptiles																		
Agamidae	*Physignathus lesueurii*	eastern water dragon					✓		✓	✓								
Agamidae	*Pogona barbata*	bearded dragon									✓							
Elapidae	*Furina diadema*	red-naped snake															✓	
Gekkonidae	*Gehyra dubia*	dubious dtella				✓			✓							✓		✓
Gekkonidae	*Heteronotia binoei*	Bynoe's gecko			✓	✓	✓	✓	✓						✓	✓		✓
Pygopodidae	*Lialis burtonis*	Burton's legless lizard				✓				✓								
Pythonidae	*Aspidites melanocephalus*	black-headed python									✓							

					Wet Season							Dry Season						
Family	**Scientific Name**	**Common Name**	**EPBC Act Status**	**NC Act Status**	**Site 1**	**2**	**3**	**4**	**5**	**6**	**Opp.**	**Site 1**	**2**	**3**	**4**	**5**	**6**	**Opp.**
Pythonidae	*Morelia spilota mcdowelli*	coastal carpet python									✓							
Scincidae	*Carlia munda*									✓					✓			✓
Scincidae	*Carlia schmeltzii*					✓	✓			✓								
Scincidae	*Carlia vivax*	lively rainbow skink					✓							✓	✓			
Scincidae	*Cryptoblepharus plagiocephalus*												✓					
Scincidae	*Cryptoblepharus virgatus*	wall skink			✓		✓		✓				✓		✓	✓		
Scincidae	*Ctenotus essingtoni*						✓							✓				
Scincidae	*Ctentotus robustus*	eastern striped skink				✓				✓								
Scincidae	*Ctentotus taeniolatus*	copper-tailed skink								✓								
Scincidae	*Eulamprus martini*	Martin's skink							✓									
Scincidae	*Menetia timlowi*				✓	✓	✓	✓		✓		✓		✓			✓	
Scincidae	*Morethia taeniopleura*	fire tailed skink					✓								✓			✓
Typhlopidae	*Ramphotyphlops ligatus*	blind snake						✓										
Mammals																		
Emballonuridae	*Saccolaimus flaviventris*	yellow-bellied sheath-tailed bat				✓			✓		✓							✓
Felidae	*Felis catus*	feral cat		I							✓							
Macropodidae	*Macropus parryi*	whiptail wallaby					✓											✓
Molossidae	*Chaerophon jobensis*	northern freetail bat												✓				✓
Molossidae	*Mormopterus beccarii*	Beccari's freetailed bat								✓								
Molossidae	*Tadarida australis*	white-striped freetail bat												✓				✓
Muridae	*Melomys cervinipes*	fawn-footed melomys					✓											
Muridae	*Mus musculus*	house mouse		I						✓			✓	✓			✓	
Muridae	*Rattus rattus*	black rat		I					✓									

					Wet Season							Dry Season						
Family	Scientific Name	Common Name	EPBC Act Status	NC Act Status	Site 1	2	3	4	5	6	Opp.	Site 1	2	3	4	5	6	Opp.
Peramelidae	*Isoodon macrourus*	northern brown bandicoot							✓			✓	✓		✓			
Petauridae	*Petaurus norfolcensis*	squirrel glider								✓								✓
Phalangeridae	*Trichosurus vulpecula*	common brushtail possum			✓	✓	✓		✓	✓	✓	✓						
Phascolarctidae	*Phascolarctos cinereus*	koala							✓					✓		✓		
Pseudocheiridae	*Petauroides volans*	greater glider				✓												✓
Rhinolophidae	*Rhinolophus megaphyllus*	eastern horseshoe bat			✓													
Suidae	*Sus scrofa*	pig		I		✓		✓			✓							
Tachyglossidae	*Tachyglossus aculeatus*	echidna					✓		✓									✓
Vespertilionidae	*Chalinolobus gouldii*	Gould's wattled bat				✓					✓							
Vespertilionidae	*Chalinolobus morio*	chocolate wattled bat							✓						✓			
Vespertilionidae	*Chalinolobus nigrogriseus*	hoary wattled bat							✓		✓				✓			✓
Vespertilionidae	*Chalinolobus picatus*	little pied bat		NT		✓					✓				✓			✓
Vespertilionidae	*Miniopterus australis*	little bent-winged bat			✓	✓			✓	✓				✓				✓
Vespertilionidae	*Miniopterus orianae oceanensis*	eastern bent-winged bat									✓							✓
Vespertilionidae	*Nyctophilus species*	undescribed long-eared bat									✓							✓
Vespertilionidae	*Scotorepens balstoni*	inland broad-nosed bat									✓							
Vespertilionidae	*Scotorepens greyii/S. sanborni*	little/nothern broad-nosed bat			✓	✓			✓	✓	✓							✓
Vespertilionidae	*Vespadelus baverstocki*	inland forest bat				✓												
Vespertilionidae	*Vespadelus troughtoni*	eastern cave bat																✓
Birds																		
Acanthizidae	*Gerygone olivacea*	white-throated gerygone									✓	✓	✓	✓	✓	✓	✓	
Acanthizidae	*Smicrornis brevirostris*	weebill			✓							✓						✓

					Wet Season							Dry Season						
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Accipitridae	*Aquila audax*	wedge-tailed eagle									✓						✓	
Accipitridae	*Aviceda subcristata*	Pacific baza									✓							
Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle	Ma; Mig (CAMBA)							✓	✓						✓	✓
Accipitridae	*Haliastur sphenurus*	whistling kite	Ma							✓	✓			✓	✓		✓	✓
Anatidae	*Anas superciliosa*	Pacific blackduck								✓	✓							
Anatidae	*Chenonetta jubata*	Australian wood duck								✓	✓			✓				
Anatidae	*Dendrocygna eytoni*	plumed whistling-duck									✓							
Anhingidae	*Anhinga melanogaster*	Australasian darter								✓	✓		✓				✓	✓
Anseranatidae	*Anseranas semipalmata*	magpie goose												✓				
Ardeidae	*Ardea alba*	great egret	Ma; Mig (CAMBA; JAMBA)								✓							
Ardeidae	*Ardea intermedia*	intermediate egret	Ma															✓
Ardeidae	*Ardea pacifica*	white-necked heron									✓							
Ardeidae	*Egretta garzetta*	little egret	Ma															✓
Ardeidae	*Egretta novaehollandiae*	white-faced heron								✓	✓		✓					✓
Ardeidae	*Ixobrychus flavicollis australis*	blackbittern						✓			✓							
Ardeidae	*Nycticorax caledonicus*	nankeen night heron	Ma								✓					✓		
Artamidae	*Artamus personatus*	masked woodswallow									✓							
Artamidae	*Cracticus nigrogularis*	pied butcherbird						✓	✓	✓	✓	✓		✓	✓	✓	✓	
Artamidae	*Cracticus tibicen*	Australian magpie			✓					✓		✓		✓	✓	✓	✓	
Artamidae	*Strepera graculina*	pied currawong			✓		✓			✓	✓	✓		✓	✓	✓	✓	
Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo					✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

					Wet Season							Dry Season						
Family	**Scientific Name**	**Common Name**	**EPBC Act Status**	**NC Act Status**	**Site 1**	**2**	**3**	**4**	**5**	**6**	**Opp.**	**Site 1**	**2**	**3**	**4**	**5**	**6**	**Opp.**
Cacatuidae	*Calyptorhynchus banksii*	red-tailed black cockatoo								✓	✓							
Cacatuidae	*Eolophus roseicapillus*	galah			✓							✓						
Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike	Ma					✓			✓			✓		✓		
Campephagidae	*Coracina papuensis*	white-bellied cuckoo-shrike	Ma		✓							✓						
Campephagidae	*Coracina tenuirostris*	cicadabird	Ma		✓													
Campephagidae	*Lalage leucomela*	varied triller										✓	✓					
Charadriidae	*Elseyornis melanops*	black-fronted dotterel									✓							
Ciconiidae	*Ephippiorhynchus australis*	black-necked stork		NT							✓						✓	
Cisticolidae	*Cisticola exilis*	golden-headed cisticola									✓			✓				
Columbidae	*Geopelia striata*	peaceful dove			✓			✓	✓		✓	✓	✓	✓		✓		
Columbidae	*Geopelia humeralis*	bar-shouldered dove										✓			✓		✓	
Columbidae	*Leucosarcia melanoleuca*	wonga pigeon											✓					
Columbidae	*Geophaps scripta scripta*	squatter pigeon	V	V				✓			✓	✓						
Columbidae	*Ocyphaps lophotes*	crested pigeon									✓	✓				✓		
Coraciidae	*Eurystomus orientalis*	dollarbird	Ma			✓			✓	✓	✓							
Corcoracidae	*Corcorax melanorhamphos*	white-winged chough									✓							
Corvidae	*Corvus orru*	Torresian crow			✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓
Cuculidae	*Centropus phasianinus*	pheasant coucal			✓	✓			✓	✓	✓			✓		✓		
Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo	Ma								✓	✓		✓		✓		
Cuculidae	*Eudynamys scolopacea*	common koel	Ma		✓		✓		✓									
Cuculidae	*Scythrops novaehollandiae*	channel billed cuckoo	Ma				✓			✓	✓							
Dicruridae	*Dicrurus bracteatus*	spangled drongo	Ma		✓	✓			✓	✓								

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Dicruridae	*Grallina cyanoleuca*	magpie-lark					✓	✓			✓		✓			✓		
Dicruridae	*Myiagra inquieta*	restless flycatcher									✓		✓		✓			
Dicruridae	*Myiagra rubecula*	leaden flycatcher								✓	✓			✓		✓		✓
Dicruridae	*Rhipidura albiscapa*	grey fantail										✓	✓	✓	✓	✓	✓	
Dicruridae	*Rhipidura leucophrys*	willie wagtail											✓	✓		✓	✓	
Falconidae	*Falco berigora*	brown falcon								✓	✓							
Falconidae	*Falco cenchroides*	nankeen kestrel	Ma								✓				✓			
Falconidae	*Falco longipennis*	Australian hobby									✓							
Halcyonidae	*Dacelo leachii*	blue-winged kookaburra							✓					✓				✓
Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra			✓		✓		✓	✓		✓	✓	✓		✓		✓
Halcyonidae	*Todiramphus chloris*	collared kingfisher			✓													
Halcyonidae	*Todiramphus macleayii*	forest kingfisher	Ma		✓				✓	✓	✓			✓	✓	✓		
Halcyonidae	*Todiramphus sanctus*	sacred kingfisher	Ma								✓							
Hirundinidae	*Hirundo neoxena*	welcome swallow								✓								✓
Maluridae	*Malurus melanocephalus*	red-backed fairy-wren											✓		✓		✓	
Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater			✓		✓	✓	✓	✓	✓	✓	✓	✓		✓		
Meliphagidae	*Lichenostomus virescens*	singing honeyeater												✓		✓		
Meliphagidae	*Lichmera indistincta*	brown honeyeater					✓		✓			✓	✓	✓	✓	✓	✓	
Meliphagidae	*Manorina flavigula*	yellow-throated miner												✓		✓		
Meliphagidae	*Manorina melanocephala*	noisy miner											✓	✓	✓	✓		
Meliphagidae	Meliphaga lewinii	Lewin's honeyeater									✓		✓					
Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater			✓		✓		✓	✓		✓	✓	✓	✓	✓	✓	
Meliphagidae	*Melithreptus gularis*	black-chinned honeyeater		NT		✓												

					Wet Season							Dry Season						
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Meliphagidae	*Philemon citreogularis*	little friarbird									✓	✓	✓	✓	✓	✓		
Meliphagidae	*Philemon corniculatus*	noisy friarbird				✓	✓			✓			✓	✓	✓	✓	✓	✓
Meliphagidae	*Ramsayornis fasciatus*	bar-breasted honeyeater									✓							
Meropidae	*Merops ornatus*	rainbow bee-eater	Ma; Mig (JAMBA)						✓	✓	✓	✓	✓	✓		✓	✓	
Nectariniidae	*Dicaeum hirundinaceum*	mistletoebird			✓												✓	
Oriolidae	*Oriolus sagittatus*	olive-backed oriole			✓				✓									
Oriolidae	*Sphecotheres viridis*	Australasian figbird							✓									
Otididae	*Ardeotis australis*	Australian bustard																
Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush						✓		✓	✓	✓	✓	✓		✓	✓	
Pachycephalidae	*Pachycephala rufiventris*	rufous whistler										✓	✓	✓	✓	✓	✓	
Pardalotidae	*Pardalotus punctatus*	spotted pardalote					✓					✓	✓	✓		✓		
Pardalotidae	*Pardalotus striatus*	striated pardalote			✓				✓	✓		✓	✓	✓	✓	✓	✓	✓
Passeridae	*Poephila bichenovii*	double-barred finch											✓	✓		✓		
Pelecanidae	*Pelecanus conspicillatus*	Australian pelican	Ma							✓	✓							
Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant																✓
Phalacrocoracidae	*Phalacrocorax varius*	pied cormorant									✓							
Podargidae	*Podargus strigoides*	tawny frogmouth			✓	✓					✓	✓				✓		
Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler									✓							
Psittacidae	*Aprosmictus erythropterus*	red-winged parrot			✓					✓	✓	✓		✓		✓		
Psittacidae	*Platycercus adscitus*	pale-headed rosella			✓		✓	✓		✓	✓	✓	✓	✓	✓	✓		
Psittacidae	*Trichoglossus chlorolepidotis*	scaly-breasted lorikeet										✓	✓		✓	✓		
Psittacidae	*Trichoglossus*	rainbow lorikeet			✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	

					Wet Season							Dry Season						
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	haematodus																	
Rallidae	*Gallinula tenebrosa*	dusky moorhen								✓								
Strigidae	*Ninox novaeseelandiae*	southern boobook	Ma								✓							
Sylviidae	*Megalurus timoriensis*	tawny grassbird												✓				
Threskiornithidae	*Platalea regia*	royal spoonbill									✓							
Threskiornithidae	*Threskiornis molucca*	Australian white Ibis	Ma								✓							
Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis	Ma							✓	✓							✓
Tytonidae	*Tyto alba*	barn owl									✓							
Zosteropidae	*Zosterops lateralis*	silvereye	Ma		✓		✓		✓			✓		✓		✓		

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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	N Clark J Simmonds S Hodgkison	N Witting G Squires	On file	L Delaere	On file	19/03/14
1	K Hryczyszyn	G Squires		L Delaere		25/07/2014

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