



SUNWATER PTY LTD
BURDEKIN FALLS DAM
POST-WET TERRESTRIAL
ECOLOGICAL SURVEY
RESULTS





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TERRESTRIAL ECOLOGICAL
SURVEY RESULTS**

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BURDEKIN FALLS DAM

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EXECUTIVE SUMMARY

Epic Environmental Pty Ltd (Epic) were engaged by Sunwater Ltd (Sunwater) to undertake a post-wet terrestrial ecological survey to support the raising of the Burdekin Falls Dam (BFD) wall by 2 metres (m) or up to 6 m (the Project). If approved, the Project would result in inundation of approximately 34,422.53 ha at Full Supply Level (FSL) (including islands) (2 m height increase to the dam wall) to 48,382.62 ha at FSL (including islands) (6 m height increase to dam wall) along lengths of several major watercourses associated with BFD. The Study Area included:

- **Works area** –the area potential directly impacted by construction activities;
- **Associated infrastructure area** –the area potentially directly impacted by necessary road, boat ramp or camping area relocations and Scartwater bridge;
- **Water storage area** –includes the existing Lake Dalrymple with its existing FSL and the potentially increased inundation area because of raising FSL by two (2) m or up to six (6) m (representative of 156 m and 160 m inundation contours respectively); and
- **Downstream affected environment** - which includes the Burdekin River and adjacent riparian environments.

This report describes the existing terrestrial ecological values of the Study Area, providing suitable data for possible future impact assessment under relevant legislation and the potential requirement for offsets. The report summarises the potential areas of impact associated with matters of National Environmental Significance (MNES) and matters of State Environmental Significance (MSES).

Summary of Survey Effort

The flora survey was conducted over 10 days between 28 May and 4 June 2019 by two (2) teams of two (2) ecologists. The flora survey resulted in 184 survey sites and catalogued 64 families, 166 genera and 271 vascular plant species, comprising two (2) species listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Queensland *Nature Conservation Act 1992* (NC Act), and 44 introduced species.

The fauna survey was conducted over 16 days between 12 and 28 June 2019 by two (2) teams of two (2) ecologists and included a total of 10 trapping nights across 16 trap sites and included 19 target sites. The post-wet fauna survey recorded 178 species of terrestrial vertebrate, comprising 35 mammal, 124 bird, 13 reptile and six (6) frog species. This included one (1) species listed as Vulnerable under the EPBC Act and NC Act, two (2) species listed as Migratory under the EPBC Act and nine (9) introduced species.

Matters of National Environmental Significance (MNES)

Two (2) MNES relevant under the EPBC Act were identified as part of the ecological assessment:

1. Listed threatened species and ecological communities –
 - Brigalow (Dominant and Co-dominant) TEC (Endangered).
 - Waxy Cabbage Palm *Livistona lanuginosa* (Vulnerable);
 - Black ironbox *Eucalyptus raveretiana* (Vulnerable); and
 - Squatter Pigeon (southern subspecies) *Geophaps scripta scripta* (Vulnerable);
2. Migratory species protected under international agreements –
 - Caspian Tern *Hydroprogne caspia*; and
 - Gull-billed Tern *Gelochelidon nilotica*.

Matters of State Environmental Significance (MSES)

MSES are listed in Schedule 2, Section 1-12 of the *Environmental Offsets Regulation 2014* (Offset Regulation) and are a component of the biodiversity state interest defined under the State Planning Policy (SPP). Four (4) MSES were identified within the Study Area, including:

1. Endangered REs under the VM Act
 - Regional Ecosystem (RE) 11.3.1
2. Of Concern REs under the VM Act
 - RE 9.3.23, 11.3.3, 11.3.36, 11.11.10 and 11.11.13
3. Protected Wildlife Habitat
 - Common Death Adder *Acanthopis antarcticus*
4. Wetlands and watercourses
 - Presence of Lake Dalrymple, a nationally important wetland.

Matters of Local Environmental Significance (MLES)

Four (4) species considered significant at the bioregional level were recorded in the post-wet survey, including:

1. Rufous Bettong *Aepyprymnus rufescens*;
2. Black-striped Wallaby *Notamacropus dorsalis*;
3. Barking Owl *Ninox connivens*; and
4. Brown Treecreeper *Climacteris picumnus*.

Summary of Impact Areas

Summary tables were used to support a quantitative representation of the existing environment within each potential impact area. Estimates of the specific area of impact associated with MNES and MSES are provided **Table 1** and **Table 2**.

Flora

Table 1: Verified Regional Ecosystems Recorded within the Project Boundary

Regional Ecosystem	Short Description (REDD V11.1 Apr 2019)	VM Act ¹ Status	EP Act Biodiversity Status ¹	Total Area (ha)*
RE 9.3.1**	<i>Eucalyptus camaldulensis</i> and/or <i>E. tereticornis</i> +/- <i>Melaleuca</i> spp. +/- <i>Casuarina cunninghamiana</i> fringing woodland on channels and levees	LC	OC	1,110
RE 9.3.3**	<i>Corymbia</i> spp. and <i>Eucalyptus</i> spp. dominated mixed woodland on alluvial flats, levees and plains	LC	OC	312
RE 9.3.5	<i>Eucalyptus brownii</i> +/- <i>Eucalyptus</i> spp. +/- <i>Corymbia</i> spp. open woodland on alluvial plains	LC	OC	21
RE 9.3.6**	<i>Eucalyptus platyphylla</i> +/- <i>Eucalyptus</i> spp. +/- <i>Corymbia</i> spp. woodland on alluvial plains	LC	NC	65
RE 9.3.12**	Riverine wetland or fringing riverine wetland	LC	OC	110
RE 9.3.23	<i>Acacia tephрина</i> open forest on alluvial clay plains	OC	OC	3
RE 9.12.1 RE 9.12.1a	<i>Eucalyptus crebra</i> and/or <i>E. xanthoclada</i> and/or <i>E. drepanophylla</i> low open woodland on igneous rocks	LC	NC	1,152
RE 9.12.28	<i>Eucalyptus melanophloia</i> low open woodland, often with <i>E. crebra</i> , on low hills on igneous rocks	LC	NC	214
RE 9.12.32	<i>Eucalyptus persistens</i> woodland on rhyolites and granites	LC	NC	30
RE 11.3.1	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains	E	E	19
RE 11.3.3**	<i>Eucalyptus coolabah</i> woodland on alluvial plains	OC	OC	4,812
RE 11.3.5	<i>Acacia cambagei</i> woodland on alluvial plains	LC	OC	65
RE 11.3.7	<i>Corymbia</i> spp. woodland on alluvial plains	LC	OC	200
RE 11.3.9**	<i>Eucalyptus platyphylla</i> , <i>Corymbia</i> spp. woodland on alluvial plains	LC	NC	565
RE 11.3.10	<i>Eucalyptus brownii</i> woodland on alluvial plains	LC	NC	1,830
RE 11.3.25**	<i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines	LC	OC	1,910

Regional Ecosystem	Short Description (REDD V11.1 Apr 2019)	VM Act ¹ Status	EP Act Biodiversity Status ¹	Total Area (ha)*
RE 11.3.27** RE 11.3.27a RE 11.3.27f	Palustrine wetland (vegetated swamp).	LC	OC	94
RE 11.3.36	<i>Eucalyptus crebra</i> and/or <i>E. populnea</i> and/or <i>E. melanophloia</i> on alluvial plains. Higher terraces	OC	OC	349
RE 11.3.37**	<i>Eucalyptus coolabah</i> fringing woodland on alluvial plains	LC	NC	0.47
RE 11.5.12	<i>Corymbia clarksoniana</i> woodland and other <i>Corymbia</i> spp. and <i>Eucalyptus</i> spp. on Cainozoic sand plains and/or remnant surfaces	LC	NC	513
RE 11.7.2	<i>Acacia</i> spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone	LC	NC	96
RE 11.7.3	<i>Eucalyptus persistens</i> , <i>Triodia mitchellii</i> open woodland on stripped margins of Cainozoic lateritic duricrust	LC	NC	322
RE 11.11.1	<i>Eucalyptus crebra</i> +/- <i>Acacia rhodoxylon</i> woodland on old sedimentary rocks with varying degrees of metamorphism and folding	LC	NC	198
RE 11.11.8	<i>Eucalyptus shirleyi</i> woodland on deformed and metamorphosed sediments and interbedded volcanics	LC	NC	121
RE 11.11.9	<i>Eucalyptus populnea</i> or <i>E. brownii</i> woodland on deformed and metamorphosed sediments and interbedded volcanics	LC	NC	539
RE 11.11.10	<i>Eucalyptus melanophloia</i> woodland on deformed and metamorphosed sediments and interbedded volcanics	OC	OC	2,876
RE 11.11.12	<i>Eucalyptus persistens</i> low woodland on deformed and metamorphosed sediments and interbedded volcanics	LC	NC	1,303
RE 11.11.13	<i>Acacia harpophylla</i> or <i>A. argyrodendron</i> low open forest with a secondary tree layer of <i>Terminalia oblongata</i> on deformed and metamorphosed sediments and interbedded volcanics	OC	OC	10
RE 11.12.1a	<i>Eucalyptus crebra</i> woodland on igneous rocks	LC	NC	190

¹Vegetation Management Act 1999, Environmental Protection Act 1994 LC = Least Concern, NC = No Concern, OC = Of Concern, E = Endangered.

*Total area (ha) of RE within maximum inundation area (160 m contour). **Wetland RE or RE that contains wetlands as per REDD.

Fauna

Table 2: Summary of MNES within the Study Area and Indicative Project Footprint

Matter	Habitat (as defined by RE)	160 m inundation area (ha)	156 m inundation area (ha)	Works area (ha)
Koala <i>Phascolarctos cinereus</i> EPBC Act: V NC Act: V	RE 9.3.1 RE 9.3.3 RE 9.3.5 RE 9.12.1a RE 9.12.28 RE 9.12.32 RE 11.3.3 RE 11.3.5 RE 11.3.9 RE 11.3.10 RE 11.3.25 RE 11.3.27a RE 11.3.27f RE 11.3.36 RE 11.3.37 RE 11.11.9 RE 11.11.10	15,820.25 (all) 10,079.73	6,779.56 (all) 4,754.21	<u>RE 9.3.1</u> 1.30 <u>RE 9.12.28</u> 2.82 <u>RE 11.11.10</u> 19.17
Greater Glider <i>Petauroides volans</i> EPBC Act: V NC Act: V	RE 9.3.1 RE 9.3.3 RE 9.3.5 RE 9.3.6 RE 9.12.1a RE 9.12.28 RE 9.12.32 RE 11.3.3 RE 11.3.7 RE 11.3.9 RE 11.3.10 RE 11.3.25 RE 11.3.27a RE 11.3.27f RE 11.3.36 RE 11.3.37 RE 11.5.12 RE 11.11.9 RE 11.11.10	16,533.12 (all) 8,443.62	6,974.72 (all) 4,260.27	<u>RE 9.3.1</u> 1.30 <u>RE 9.12.28</u> 2.82 <u>RE 11.11.10</u> 19.17
Squatter Pigeon (southern subspecies) <i>Geophaps scripta scripta</i> EPBC Act: V NC Act: V	RE 9.3.1 RE 9.3.3 RE 9.3.5 RE 9.3.6 RE 9.12.1a RE 9.12.28 RE 11.3.3 RE 11.3.7 RE 11.3.9 RE 11.3.10 RE 11.3.25 RE 11.3.27f RE 11.3.36 RE 11.5.12 RE 11.7.3 RE 11.11.8 RE 11.11.10 RE 11.11.12	17,660.47	7,251.68	<u>RE 9.3.1</u> 1.30 <u>RE 9.12.28</u> 2.82 <u>RE 11.11.8</u> 29.07 <u>RE 11.11.10</u> 19.17

Matter	Habitat (as defined by RE)	160 m inundation area (ha)	156 m inundation area (ha)	Works area (ha)
Red Goshawk <i>Erythrorhynchus radiatus</i> EPBC Act: V NC Act: E	RE 9.3.1 RE 11.3.3 RE 11.3.7 RE 11.3.9 RE 11.3.25 RE 11.3.27a RE 11.3.27f RE 11.3.37	86,43.45	4,359.72	<u>RE 9.3.1</u> 1.30
Australian Painted Snipe <i>Rostratula australis</i> EPBC Act: E NC Act: V	RE 11.3.9 RE 11.3.10 RE 11.3.27a RE 11.3.27f	2,505.37	1,358.06	NA
Curlew Sandpiper <i>Calidris ferruginea</i> EPBC Act: CE, M NC Act: E	Not assigned.	Not assigned.	NA	NA
Black-throated Finch (southern) <i>Poephila cincta cincta</i> EPBC Act: E NC Act: E	RE 9.3.1 RE 9.3.3 RE 9.3.5 RE 11.3.3 RE 11.3.7 RE 11.3.9 RE 11.3.10 RE 11.3.25 RE 11.3.27a RE 11.3.27f RE 11.3.36 RE 11.3.37 RE 11.5.12 RE 11.11.9	11,695.77 (all) 2,560.05	5,568.63 (all) 964.02	<u>RE 9.3.1</u> 1.30
Salt-water Crocodile <i>Crocodylus porosus</i> EPBC Act: M NC Act: V	RE 11.3.27a RE 11.3.27f	109.36	55.57	NA
Yakka Skink <i>Egernia rugosa</i> EPBC Act: V NC Act: V	RE 9.3.5 RE 9.3.6 RE 9.3.23 RE 11.3.1 RE 11.3.5 RE 11.3.7 RE 11.5.12 RE 11.7.2	982.12 (all) 114.99	291.59 (all) 20.19	NA

Matter	Habitat (as defined by RE)	160 m inundation area (ha)	156 m inundation area (ha)	Works area (ha)
Ornamental Snake <i>Denisonia maculata</i> EPBC Act: V NC Act: V	RE 11.3.1	18.69	0.02	NA
Fork-tailed Swift <i>Apus pacificus</i>	Not assigned.	Not assigned.	NA	NA
Glossy Ibis <i>Plegadis falcinellus</i>	RE 11.3.9 RE 11.3.10 RE 11.3.27a RE 11.3.27f	2,505.37	1,358.06	NA
Latham's Snipe <i>Gallinago hardwickii</i> Common Greenshank <i>Tringa nebularia</i> Common Sandpiper <i>Actitis hypoleucos</i> Pectoral Sandpiper <i>Calidris melanotos</i> Sharp-tailed Sandpiper <i>Calidris acuminata</i>	RE 11.3.9 RE 11.3.10 RE 11.3.27a RE 11.3.27f	2,505.37	1,358.06	NA
Gull-Billed Tern <i>Gelochelidon nilotica</i> Caspian Tern <i>Hydroprogne caspia</i>	Not assigned.	Not assigned.	NA	NA
Oriental Cuckoo <i>Cuculus optatus</i>	Not assigned.	Not assigned.	NA	NA
Eastern Osprey <i>Pandion cristatus</i>	RE 9.3.1 RE 11.3.9 RE 11.3.10 RE 11.3.27a RE 11.3.27f	3,616.21	1790.12	<u>RE 9.3.1</u> 1.30

Matter	Habitat (as defined by RE)	160 m inundation area (ha)	156 m inundation area (ha)	Works area (ha)
Rufous Fantail <i>Rhipidura rufifrons</i> Black-faced Monarch <i>Monarcha melanopsis</i> Satin Flycatcher <i>Myiagra cyanoleuca</i>	Not assigned.	Not assigned.	NA	NA
Waxy Cabbage Palm <i>Livistona lanuginosa</i> EPBC Act: V NC Act: V	RE 9.3.1 RE 11.3.25 RE 11.3.9 RE 11.5.12	Estimated individuals: 33,520 trees and 38,145 shrubs	NA	NA
Black Ironbox <i>Eucalyptus raveretiana</i> EPBC Act: V NC Act: V	RE 9.3.1 RE 9.3.12	Estimated individuals: 3070 sub-canopy shrubs and 10,400 trees	NA	NA

